

# **M.G.**

## **SERIES "Y" — 1947 - 1953**

### **To Remove the Windscreen Assembly.**

The removal and replacement of the windscreen assembly will be found to be perfectly straightforward.

Place the windscreen wipers in the parked position.

Wind the windscreen open approximately half an inch by means of the regulator in the centre of the dash.

Release the control chain from the bottom of the screen frame by unscrewing the two cheese-headed locating screws, and return the chain to its housing.

With the aid of an assistant, open the screen and remove from each screen hinge the  $\frac{1}{4}$  inch screen adjusting setscrew. Extract the windscreen from the hinges.

### **To Replace the Windscreen Assembly.**

Refitting of the windscreen assembly is carried out in the reverse manner to that detailed for removal, but care must be taken to see that the  $\frac{1}{4}$  inch screen adjusting setscrews are not fully tightened until the screen has been correctly adjusted to ensure an effective weatherseal. The rubber weatherstrip must bear evenly against the side pillars and windscreen top rail.

The adjustment is carried out with the windscreen fully closed, and on conclusion the screen is locked by tightening the adjustment setscrew.

### **To Fit the Windscreen Weatherstrip.**

Wind the windscreen to the fully open position (if fitted to the body).

Pull the old weatherstrip out of its groove in the screen frame.

Remove any portions of rubber from the groove with a small screwdriver and scrape the groove clear.

Stretch the new weatherstrip around the screen frame with the lip edge to face the body front face.

Insert one edge of the dovetail section of the weatherstrip into the dovetail-shaped groove in the edge of the frame and, using a blunt chisel or screwdriver, work in the other edge, taking care that it is fully entered at all points.

Take care not to cut or damage the new weatherstrip when pressing it into place.

### **To Fit a New Windscreen Glass.**

Remove the windscreen assembly as previously described.

Remove the weatherstrip as previously described.

It will be seen that the windscreen frame is divided between the top and bottom halves and the two portions are held together by four screws at each side, these being visible after removal of the weatherstrip.

Remove the four screws securing the top and bottom portions of the frame together. (The two upper screws at each side.)

Carefully prise apart the two portions of the frame.

Remove the old glazing and thoroughly clean the groove in the frame.

Place a new rubber glazing strip around the edge of the new glass, and fit the two portions of the screen frame.

Press tightly together and refit the four screws and tighten fully.

Trim off with a sharp knife the surplus glazing strip.

Refit the weatherstrip or fit a new one if required.

Refit the windscreen to the vehicle and adjust if necessary.

### **The Correct Procedure for Hanging the Doors.**

Fouling between a door and door frame may occur through incorrect hanging or as a result of an accident in which the body or door has become slightly distorted. The correct hang of a door is determined by the set of its hinges. The steady pin is provided solely as a means of supporting and steadying the door when closed. Fig. 1 clearly indicates the various points at which fouling between the door and door frame can occur, and the following procedure must be adopted to correct these faults:—

If, in rectifying one point, fouling is introduced at another, the further instructions should be followed and the hanging of the door corrected.

**Point "A":** The door fouling at this point indicates that the upper hinge has opened out, whilst the bottom hinge has possibly closed in. To rectify, proceed as follows:—

With the door closed, push a hinge wrench over the hinge, and endeavour to open the door. Excessive strain will not be necessary, but the action of doing this will close the hinge.

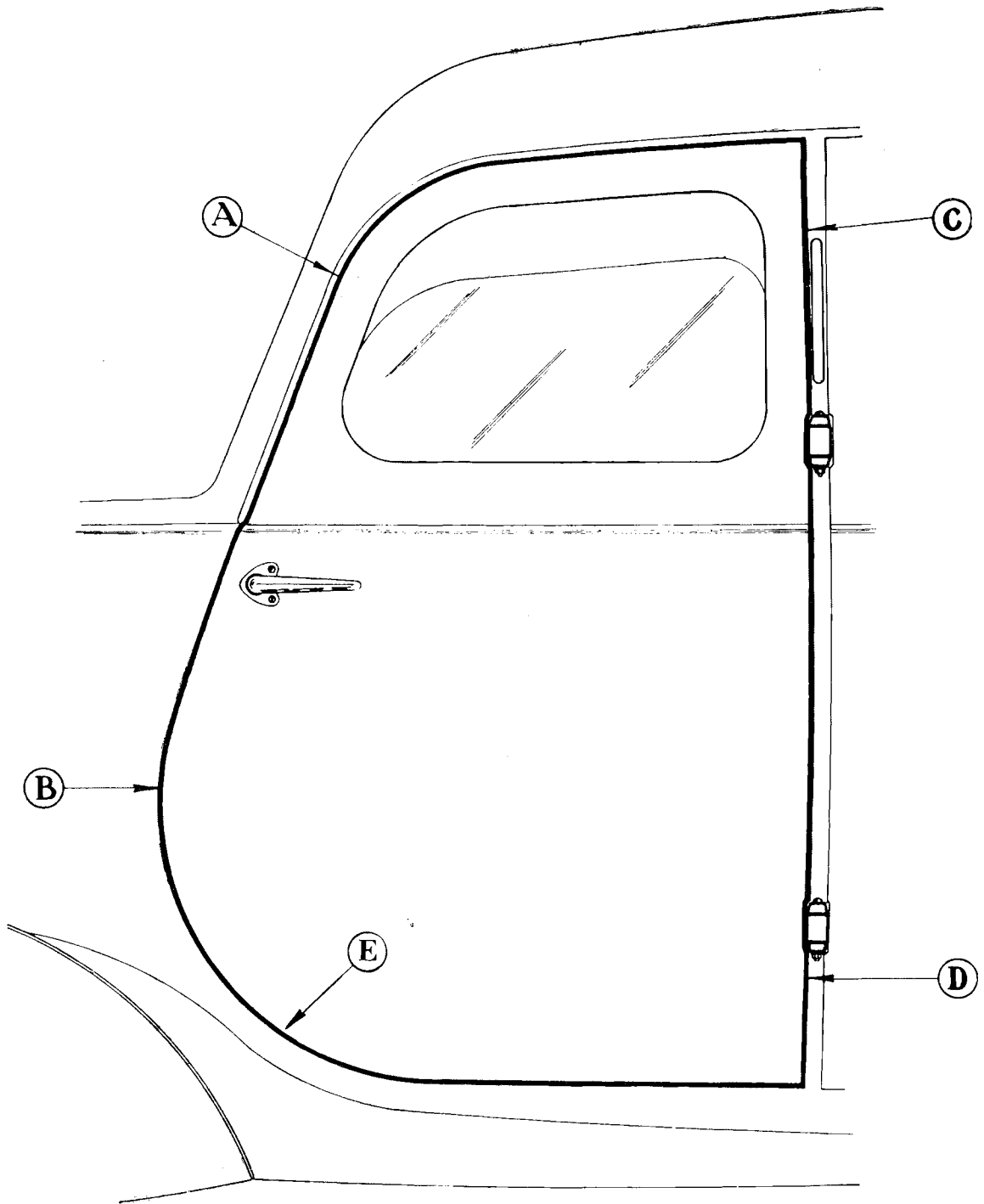


FIG. 1.—Showing points at which the door may foul the door frame.

**Point "B":** Fouling at this point indicates that the lower hinge has opened out, and this should be corrected as detailed for Point "A" but on the lower hinge.

**Point "C":** Fouling at this point indicates that the upper hinge has closed. To rectify, proceed as follows:—

Open the door and insert a wood block between the two arms of the upper hinge. If an attempt is now made to close the door the arms of the hinge will be slightly bent so that the hinge is opened out.

**Point "D":** Fouling at this point indicates that the lower hinge has closed in, and this should be

corrected as detailed for Point "C", but on the lower hinge.

**Point "E":** Fouling at this point may indicate that the upper hinge may have closed out whilst the lower hinge may have closed in. Rectify as under points "A" and "D" respectively.

If the door stands proud of Points "A" or "B" it may be rectified as follows:—

Open the door and, at a point approximately level with the lockplate, place a wooden block (wrapped in felt to prevent damage) between the door and the pillar. The corners "A" or "B" can then be sprung inwards by exerting pressure at the top or the bottom of the door.

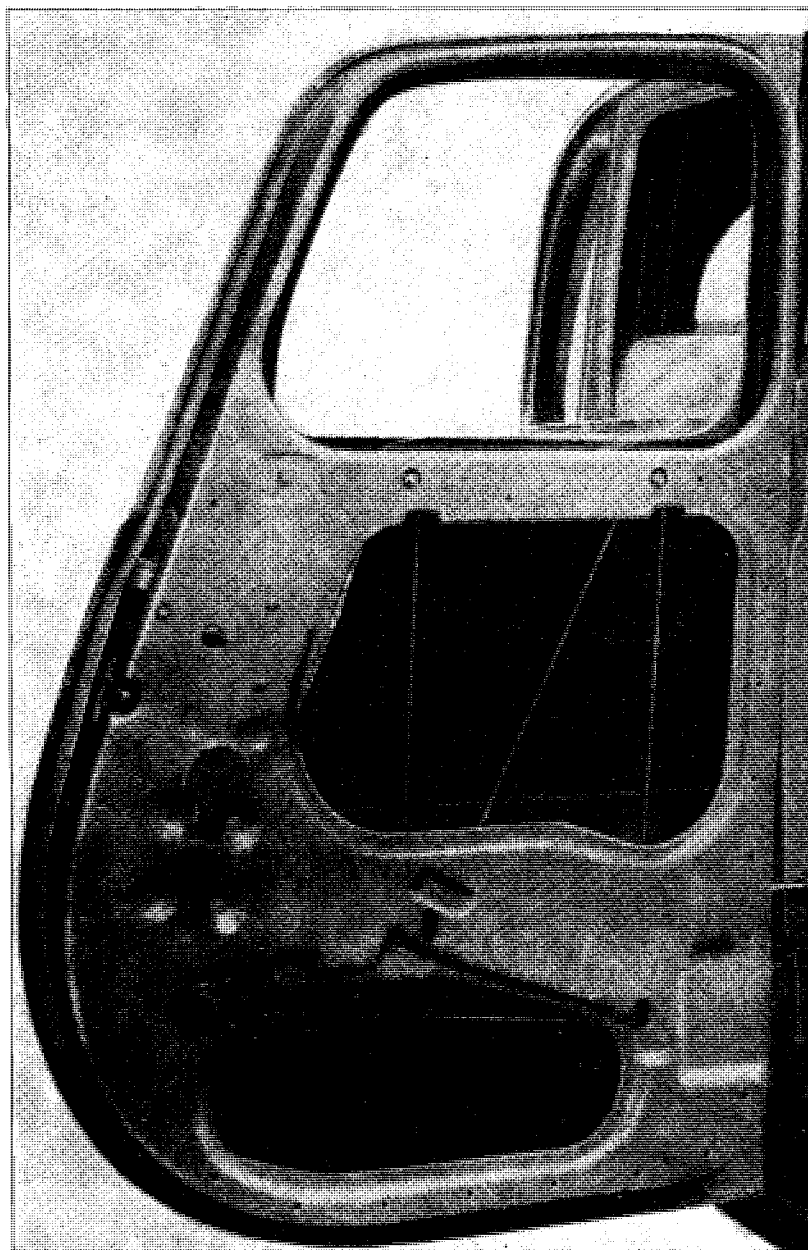


FIG. 2.—Showing the door with the door trim panel removed.

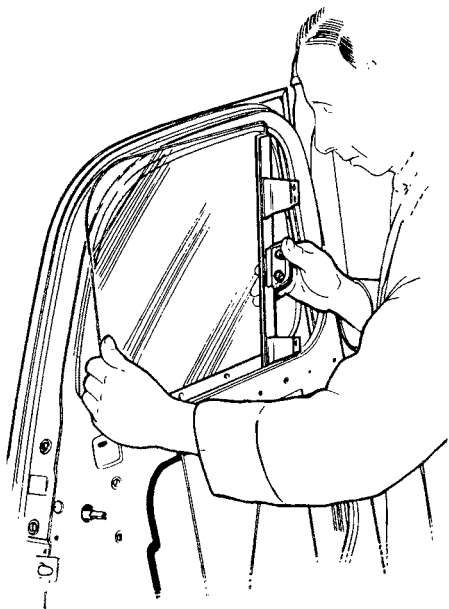


FIG. 3.—Removing the front door glass.

#### To Remove and Replace the Front Door Glasses.

Extract the eight recessed-head self-tapping screws securing the walnut surround to the front door and remove the surround.

Extract the chromium-plated setscrews and spring washers locating the window regulator and door lock handles to their spindles and remove the handles.

Slacken the two chromium-plated screws securing the door pin plate to the door frame and detach the door pin plate finisher by removing its fixing screws.

The door trim panel is fixed to the door frame by spring clips (19 front door, 17 rear door), and

can now be easily prised away from the door frame. Removal of the trim panel reveals the window regulator mechanism, door locks, etc.

Remove the inner glass draught excluder by taking out the four self-tapping screws with which it is fitted.

Release the two clamps locating the door glass channel to the regulator operating cables by unscrewing the two cheese-headed screws in each clamp.

Remove the centre stop plate, which is fitted with two cheese-headed screws.

Remove the outer glass draught excluder by prising out the four spring clips which are integral with it.

The glass can now be withdrawn by tilting the top inwards as it is raised from the frame. (See Fig. 3).

**Note.**—When refitting the door glass, the window regulator chain should be set to the midway position. The glass, complete with channel, is inserted in the door frame and held squarely in the midway position. The channel is then secured to the cable by the addition of the fixing clamps and necessary screws.

The glass is otherwise assembled in exactly the reverse manner to that detailed for removal.

#### The Window Metal Guide Channel.

This is fitted at the front inside of the door and by means of slotted fixing holes provides for side adjustment of the glass in the sliding channels.

The removal of the adjustable window metal guide channel is straightforward when the door glass is withdrawn. It is located to the door inner panel by two hexagon-headed screws and spring washers.

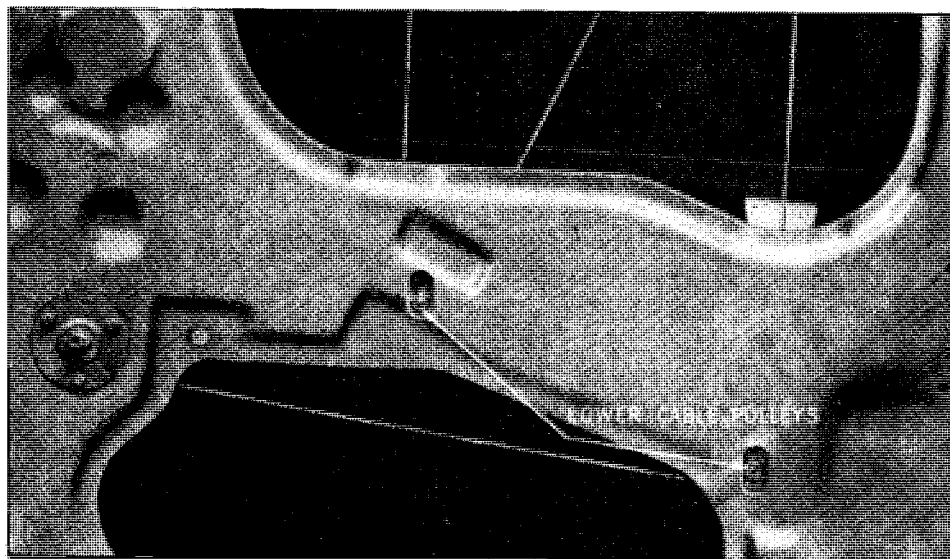


FIG. 4.—Showing the elongated holes to which the lower cable pulleys are located.

## The Window Regulators.

Cable-type window regulators are fitted to both front doors. Provision is made for the adjustment of the cable tension by the two lower pulley spindle bolts, which are located in elongated holes in the door frame. (See Fig. 4.)

To adjust, the spindle bolt nuts are slackened and the pulleys moved in the desired direction. This adjustment makes it unnecessary to remove the pulleys when replacing a cable assembly.

The cable ends are attached to a chain which, in turn, passes over a sprocket located to the regulator spindle by a  $\frac{3}{16}$  inch bolt. The sprocket assembly is easily removed by taking out the three bolts fixing it to the inner door panel.

## To Remove and Replace the Door Locks.

Remove the walnut surround and door trim panel as detailed in "To Remove and Replace the Front Door Glasses".

To detach a door lock, extract the outer handle by unscrewing the two chromium-plated screws

locating the escutcheon plate to the outside panel. The right-hand-side front door outer handle, which incorporates the private lock, is in addition secured at the inner end of its spindle by a countersunk-headed metal threaded screw which must be removed before the handle can be withdrawn.

After the door glass has been raised to its fullest extent, and the front metal guide channel is released from the inner panel, the lock can be extracted by the removal of the screws locating it to the inner panel and door shut. (See Fig. 5.)

Replacement is carried out in the reverse manner to that detailed for removal.

## To Remove and Replace the Door Checks.

Access to the check assemblies on all doors is gained by the removal of the door trim panels.

Remove the walnut window light surround and the door trim panel, as detailed under "To Remove and Replace the Front Door Glasses".

Extract the rivet connecting the door check arm to the lug on the centre pillar.

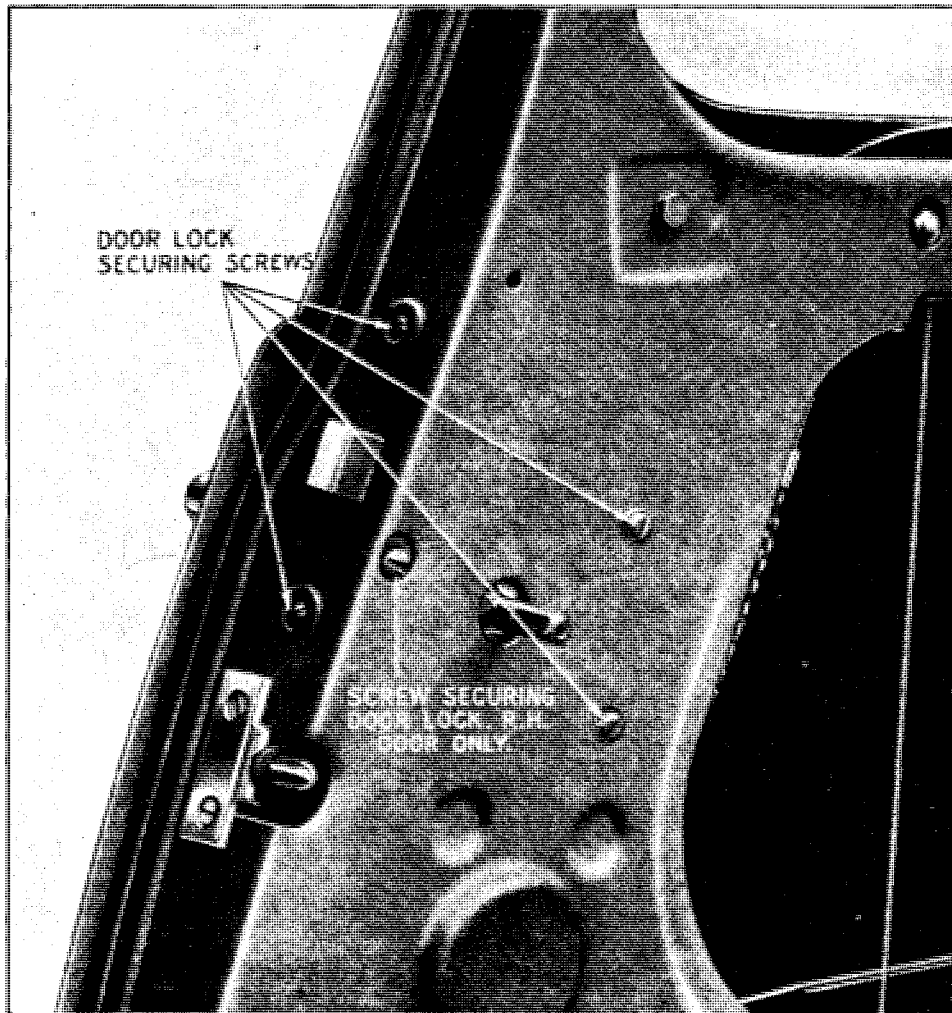


FIG. 5.—The door lock fixing screws.

Withdraw the door check from the inside of the door assembly between the inner and outer panels.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Adjust the Door Checks.**

Adjustment is effected by inserting the metal stop washer into the correct slot in the check arm, after which it is securely locked into position by bending over the tabs of the hollow stop retainer washer.

**Note.**—It is important that each door check be adjusted to ensure that when both doors on each side of the car are fully opened the handles or panels of one door do not come into contact with those of the other.

#### **The Rear Doors.**

##### **To Remove and Replace the Door Glasses.**

Remove the walnut surround and door trim panel as detailed in "To Remove and Replace the Front Door Glasses".

Slacken off the three screws holding the regulator mechanism to the inner panel, and disconnect the operating arm from the glass channel by winding the roller along until it comes out at a point where the channel groove is enlarged.

The regulator need not be removed completely.

Remove the inner glass draught excluder by taking out the four self-tapping screws with which it is fitted.

Detach the window felt guide channel from the door frame by unscrewing the six countersunk-headed self-tapping screws located in the top and sides of the guide channel.

The glass can now be withdrawn by tilting the top inwards as it is raised from the door frame.

Replacement of the door glass is carried out in the reverse manner to that detailed for removal.

##### **To Remove and Replace the Door Locks.**

The removal of the rear door lock necessitates the withdrawal of the door glass and metal guide channel, as previously detailed.

Extract the two screws securing the escutcheon plate and remove the outer door handle.

Remove the screws passing through the inner panel, together with the screws passing into the box nuts located in the door shut face, and detach the door lock through the access holes in the inner door panel.

Replacement is carried out in the reverse manner to that detailed for removal.

##### **To Remove and Replace the Window Regulators.**

The rear doors are equipped with rack and pinion regulators, which are located to the door inner panel by the three cheese-headed metal-

threaded screws and spring washers. The removal of the screws will enable the regulator operating arm to be released from the glass channel. The mechanism can then be withdrawn through the access holes in the inner door panel.

Replacement is carried out in the reverse manner to that detailed for removal.

##### **To Remove and Replace the Rear Quarter-Lights.**

Remove the tacks securing the trim piping around the rear quarter-light to the "D" post.

Extract the two recessed-head self-tapping screws securing the strap to "D" post and remove the strap.

Extract the two recessed-head self-tapping screws and tacks securing the "D" post trim fillet and remove the trim fillet.

Extract the two recessed-head self-tapping screws securing the lower quarter-light fillet and remove the fillet.

Extract the screw nails securing the quarter-light rear trim fillet and remove the fillet.

Extract the screws securing the clips around the top, rear and bottom of the glass and remove the clips.

The glass can now be eased out of the lower spring clips and withdrawn from the body.

Replacement is carried out in the reverse manner to that detailed for removal.

When replacing the glass it will be found advisable to tie the rubber surround strip in its outer groove with string. If a length of string is left hanging this will enable the outer sealing flange to be pulled through the body aperture.

##### **To Remove and Replace the Rear Window.**

Remove the tacks from the trim piping above the rear light and around the back of the body.

Disconnect the blind cord and remove the screw eyes and pulleys.

Remove the tacks securing the head cloth at the top rear and pull back the head cloth.

Remove the tacks from the trim piping around the rear of the quarter-lights.

Extract the screw nails securing the quarter-light rear trim fillet and remove the fillet.

Remove the rear blind shield; this is fitted by three bifurcated rivets.

Remove all the tacks from the cloth trimming on the left, right and bottom of the rear window light.

Pull the trimming aside and remove the screws securing the trim fillets to the wood packing blocks attached to the body shell.

Remove the screws securing the spring clips around the sides and the top of the rear window glass.

The glass can now be eased out of the lower spring clips and withdrawn from the body.

Replacement is carried out in the reverse manner to that detailed for removal.

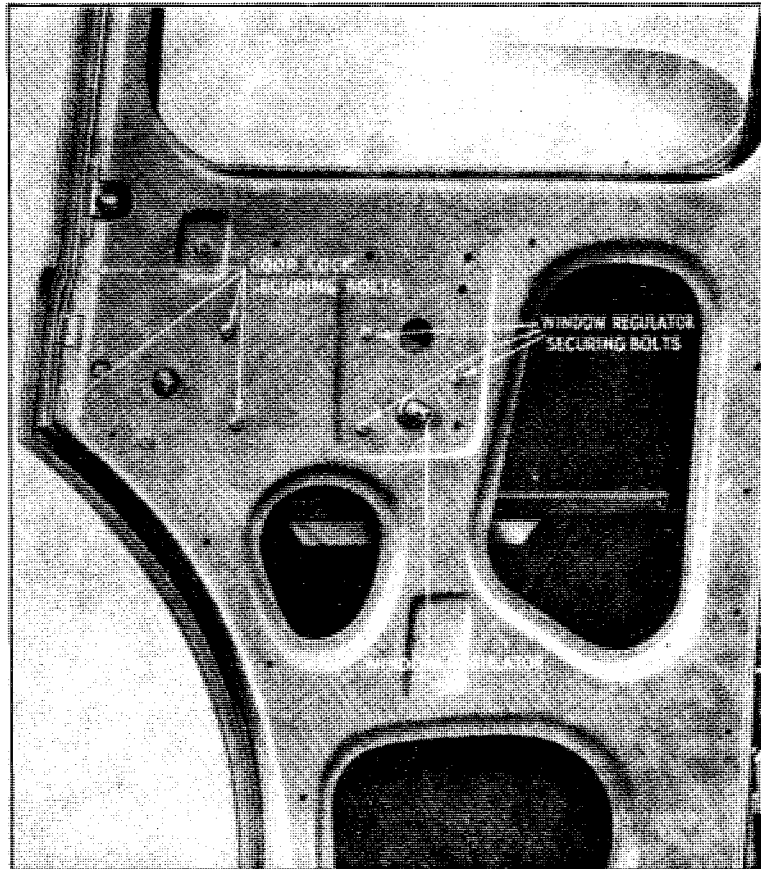


FIG. 6.—Showing the location of the window regulator.

When replacing the glass it will be found advisable to tie the rubber surround strip in its outer groove with string. If a length of string is left hanging this will enable the outer sealing flange to be pulled through the body aperture.

#### To Remove and Replace the Sliding Roof.

For repair or re-trimming, the sliding roof assembly (which includes the lock and lifting device) can be removed complete from the guide channels.

Remove the three recessed-head self-tapping screws securing the left- and right-hand roof opening fillets and withdraw the fillets.

Open the sliding roof approximately half-way to expose the two guides located to the sliding portion.

Extract the fixing bolts securing the guides to the sliding roof and release the guides from the runners by pushing them outwards. These guides are fitted with a felt insert.

Insert a sheet of paper in the aperture between the top of the sliding head and the roof of the body. This will prevent damage to the finish on the sliding roof on removal.

The assembly is now pulled forward and raised at the front end until it is clear of the body edge and free from the body.

Replacement is carried out in the reverse manner to that detailed for removal.

**Note.**—When replacing the roof assembly, locate the centralising rod (which is attached to the rear framework) to the slot in the rear face. Ensure that the rear felt guides enter the runners at both sides, then push the roof backwards, lowering the forward end until it is finally in position.

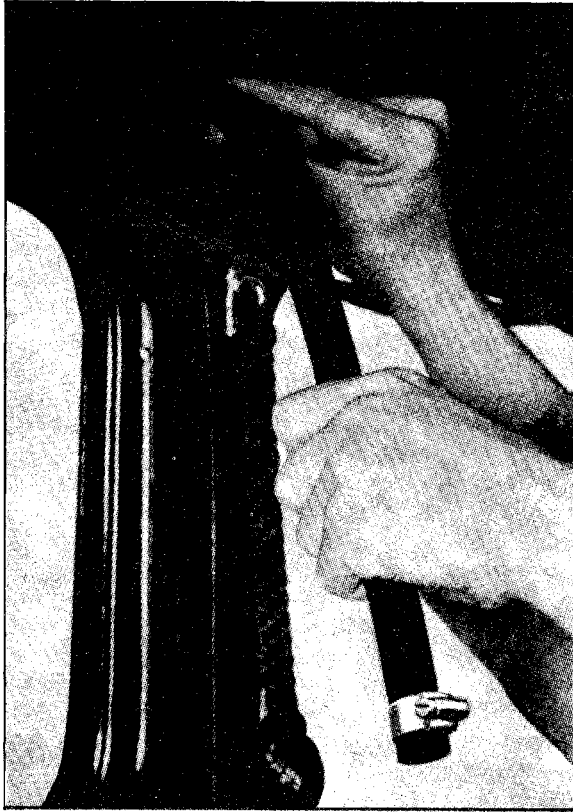
#### To Remove and Replace the Rear Sliding Roof Drain Tubes.

Water from the sliding roof assembly is expelled below the car through rubber tubes which pass down the left- and right-hand side "D" posts. They can be withdrawn for the purpose of cleaning or renewal in the following manner:—

Detach the roof trimming adjacent to the "D" post for approximately 12 inches. This will expose the roof channel and drain pipe to which it is secured by means of a hose clip at the top end of the rubber tube. (See Fig. 7.)

Pierce a hole through the bottom end of the drain tube where it protrudes on the under side of the wing, and attach a suitable length of draw wire.

Slacken the hose clip at the top and release the drain tube.



**FIG. 7.**—Showing the removal of the sliding head rear drain tube.

Withdraw the tube upwards into the car until the attached wire is drawn up into the "D" post.

Disconnect the wire from the tube when it is clear, leaving the wire in position to enable the tube to be pulled through again when it is replaced.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Front Sliding Roof Drain Tubes.**

The removal and replacement of the front drain tubes is carried out in a similar manner to that described for the rear drain tubes. The bottom ends protrude through the lower part of the body, immediately below the "A" posts. Access to the hose clips securing the top ends is gained by detaching the roof trimming in the neighbourhood of the "A" posts for approximately 12 inches each side.

#### **To Remove and Replace the Front Wings.**

Remove the headlamp from the headlamp bracket and disconnect the cables.

Remove the two nuts, spring washers and stiffener plate securing the headlamp tie-rod bracket and the headlamp cable clip to the wing.

Draw the headlamp cables through the headlamp bracket and wing.

Remove the two bolts securing the sidelamp and sidelamp cable support clip to the wing, and disconnect the cable to the sidelamp.

Remove the three bolts, nuts and spring and plain washers securing the wing to the front valance, and the three bolts, nuts and spring and plain washers securing the wing to the wing valance.

Remove the two bolts and spring and plain washers securing the wing to the body.

Remove the three bolts, nuts and spring and plain washers securing the wing to the running-board and lift the wing clear of the car.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Right-Hand Rear Wing.**

Remove the one bolt, nut and spring and plain washers securing the wing to the running-board.

Remove the nine bolts and spring and plain washers securing the wing to the wheel arch and lift the wing clear of the car.

A valance support stay is fitted to the second bolt from the rear end.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Left-hand Rear Wing.**

Remove the spare wheel and tools from the spare wheel compartment.

Slacken off the top jubilee clip securing the fuel tank filler connecting hose to the fuel tank filler extension.

Withdraw the filler extension through the wing.

Remove the wing as detailed for the right-hand.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Running-Boards.**

Remove the three bolts, nuts and spring and plain washers securing the running-board to the front wing.

Remove the bolt, nut and spring and plain washers securing the running-board to the rear wing.

Remove the four bolts and spring and plain washers securing the running-board to the body and lift the running-board clear of the car.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Front Valance.**

Remove the two dome nuts and spring and flat washers securing the front bumpers to the chassis frame front extension and remove the bumper.

Remove the spot-lamp and bracket from the left-hand chassis frame front extension bolt and disconnect the cable to the spot-lamp.

Remove the two rubber covers from the chassis frame front extensions.



Remove the four countersunk-headed setscrews (two each side) securing the front valance to the left- and right-hand wing valances.

Slack off the remaining wing securing bolts; this will enable the wing to be sprung back to facilitate easy withdrawal of the front valance.

Remove the three bolts each side securing the front valance to the front wing and wing valance and withdraw the front valance forward from the car.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Left-hand Wing Valance.**

Remove the front wings.

Remove the front valance.

Withdraw the headlamp and sidelamp cables through the hole in the valance.

Remove the two bolts, nuts and spring and plain washers securing the wing valance to the chassis frame front extension.

Remove the three bolts and spring and plain washers securing the valance to the chassis frame.

Remove the bolt and spring washer securing the top rear corner of the valance to the body and withdraw the valance.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Right-hand Wing Valance.**

Remove the front wings.

Remove the front valance.

Remove the nut and spring washer securing the cable clip to the rear bonnet fastener bracket.

Remove the nut and spring washer securing the cable clip to the rear bonnet fastener bracket.

Remove the nut and spring washer securing the cable clip to the front bonnet fastener bracket.

Withdraw the cables through the hole in the valance.

Remove the two bolts, nuts and spring and plain washers securing the valance to the chassis frame front extension.

Remove the three bolts and spring and plain washers securing the valance to the chassis frame.

Remove the bolt and spring washer securing the top rear corner of the valance to the body and withdraw the valance.

Replacement is carried out in the reverse manner to that detailed for removal.

#### **To Remove and Replace the Body.**

Extract the two round-headed screws securing the rear bonnet support to the dash and lift the bonnet clear of the car.

Disconnect the positive and negative leads to the battery.

Extract the two battery holding-down bolts and lift the battery from the battery box.

Remove the front wings.

Remove the running-boards.

Remove the rear wings.

The above two items are only removed to prevent damage. If left on, remove the fuel filler neck.

Remove the tank filler hose, floor sealer plate and rubber dirt excluder.

Remove the two radiator stay tubes.

Remove the rear bonnet fastener brackets (one each side).

Extract the two bolts and spring and plain washers (one each side) securing the top rear corner of the wing valances to the body.

Remove the four bolts, nuts and spring washers securing the rear bumper brackets to the chassis, disconnect the earth cable and withdraw the bumpers, complete with brackets, from the car.

Disconnect the cables to the stop and tail, and reverse and tail lamps, and withdraw the cables through the hole in the spare wheel compartment floor.

Remove the front bucket seats.

Remove the rear seat cushion.

Remove the trim boards around the rear seat pan. To do this, pull back the trimming at the top and remove the bifurcated rivets which attach it.

Remove the dipper switch rubber cover.

Remove the floor carpets and felts, and rear tunnel carpet.

Remove the carpet over the gearbox cover.

Remove the gear lever knob and locknut.

Extract the four screws securing the gear lever draught excluder and retaining plate to the gearbox cover and remove the draught excluder.

Extract the seventeen countersunk-headed screws and cup washers securing the gearbox cover to the floorboards and toeboard and remove the cover.

Extract the thirty-two screws securing the carpet retainers to the floorboards and remove the carpet retainers.

Extract the fourteen countersunk-headed screws and cup washers and the eight setbolts and plain washers securing the front and rear floorboards, and remove the floorboards.

Extract the two screws and spring washers securing the dipper switch to the toeboard and remove the dipper switch. Do not disconnect the wiring.

Extract the three bolts securing the steering column draught excluder and retaining plate to the toeboard, slacken off the clip and draw the draught excluder and retaining plate up the steering column. (One bolt secures the body stiffener bracket to the body.)

Remove the slotted accelerator cable retaining bolt from the lug on the inlet manifold and disconnect the cable at the carburetter lever.

Push the accelerator pedal down, remove the cable trunnion screw and withdraw the cable from the trunnion.

Unscrew the accelerator cable guide from the body and pull the cable clear of the body.

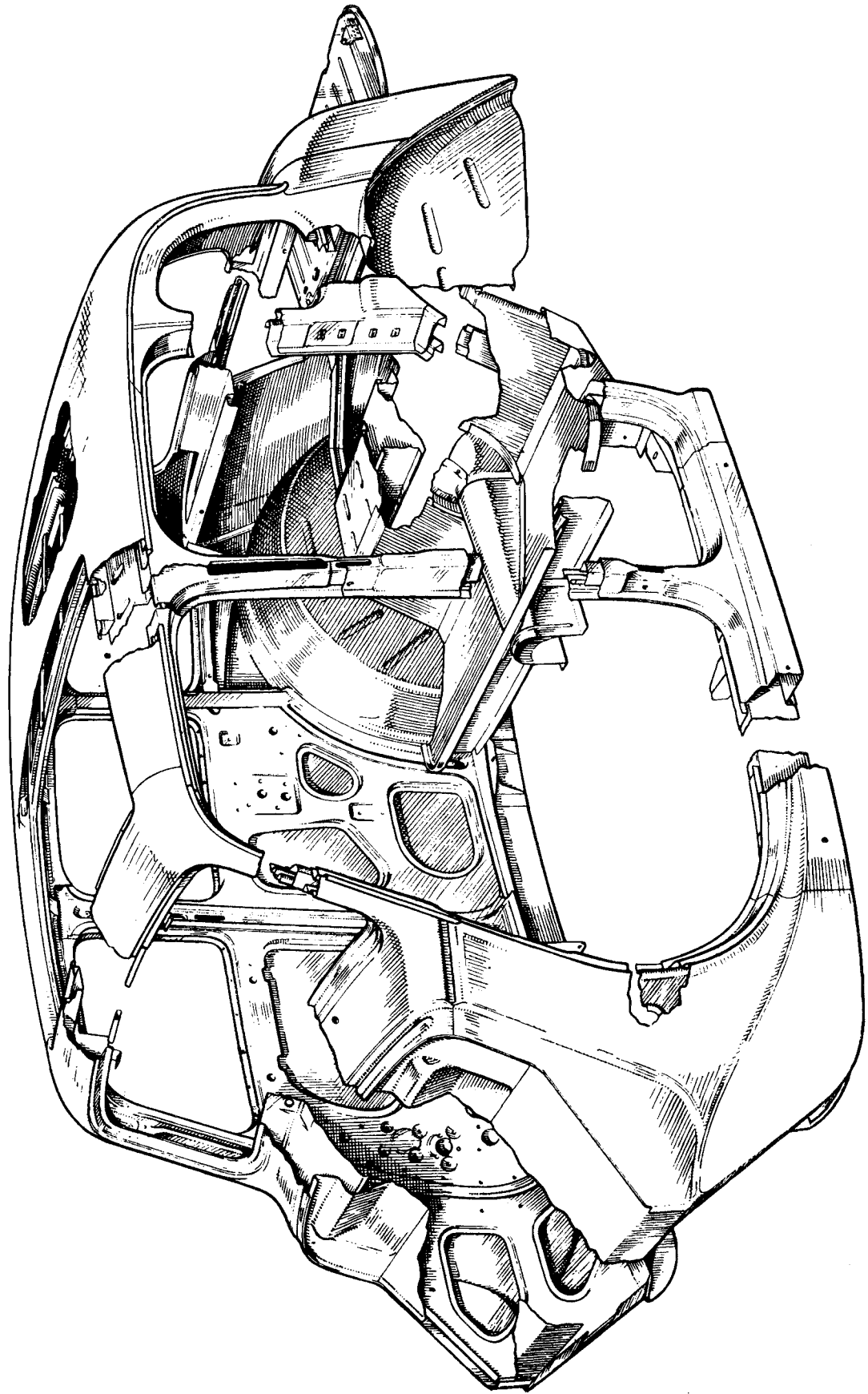


FIG. 8.—Sectional view of the body.

Extract the two bolts and spring washers securing the accelerator pedal assembly to the toeboard.

Extract the eight countersunk-headed screws and cup washers securing the toeboard to the body and remove the toeboard.

Remove the bolt, nut and two plain washers securing the steering column clamp to the steering column support bracket, and slide the clamp down the steering column.

Disconnect the trafficator and interior light cables from the connectors on the right-hand side of the chassis.

Extract the bolt securing the harness cables clip to the dash.

Disconnect all main harness cables from the control and junction box.

Disconnect the starter cables from the starter switch on the dash.

Disconnect the cable to the windscreen wiper remote drive, located on the dash.

Remove the earthing cable, and the two cables to the fuel pump.

Disconnect the speedometer cable from the instrument.

Disconnect the choke control at the carburetter.

Disconnect, at the fuel pump, the flexible pipe from the fuel pump to the carburetter.

Disconnect the copper pipe from the fuel pump to the tank.

Remove the high-tension coil.

Disconnect the screw securing the ignition cable clip to the dash and remove the clip.

Remove the two bolts, nuts and spring washers securing the Jackall supply tank to the operating cylinder, drain and remove the supply tank.

Extract the screw securing the Jackall pipe clip to the dash and remove the clip.

Disconnect the copper pipes from the operating cylinder to the front and rear jacks.

Remove the nut and spring washer from the bolt securing the stay tube to the left-hand body stiffener bracket, withdraw the fuel pipe clip from the bolt and bend the pipe clear of the dash.

Remove the bolt, nut and washer securing the oil gauge pipe clip to the bracket on the cylinder block.

Disconnect the oil gauge pipe from the union in the block.

Remove the three remaining bolts, nuts and spring washers securing the body stiffener brackets to the body.

Slide the propeller shaft tunnel forward.

Remove the ten bolts and spring washers (four inside the spare wheel compartment) securing the body to the chassis.

Place a suitable sling around the body and hoist clear of the chassis.

Replacement of the body is carried out in the reverse manner to that detailed for removal.

### **To Remove and Replace the Instrument Panel.**

Disconnect the battery cables.

Disconnect the cable from the starter and withdraw from the same terminal the cable from the starter to the ammeter.

Disconnect the instrument cables from the control and junction boxes, ease the rubber grommet from the hole in the dash, and withdraw the cables through the rubber grommet and the hole in the dash.

Unscrew the speedometer cable from the back of the speedometer.

Unscrew the oil gauge pipe from the back of the oil pressure gauge.

Disconnect the choke control cable from the carburetter.

Unscrew the starter button and remove the starter cable locknut, or, on later cars, disconnect at the adjuster in the pushrod.

Remove the wing nuts securing the instrument panel to the brackets on the facia board and withdraw the instrument panel.

Replacement is carried out in the reverse manner to that detailed for removal.

### **To Remove and Replace the Facia Board.**

Remove the instrument panel complete as detailed above.

Remove the steering column support brackets.

Remove the four countersunk-headed screws securing the facia board to the brackets on the body and withdraw the facia board.

Replacement is carried out in the reverse manner to that detailed for removal.

### **To Check the Front Crossmember**

When a car has sustained damage to the front suspension, necessitating the dismantling of the assemblies, it is essential that the chassis frame should be checked for correct alignment, especially at the front crossmember. This will avoid excessive tyre wear and steering wander, etc.

A method of making an approximate check is shown in Fig. 9.

Place the car on a flat surface.

Remove the front suspension and the rear wheels.

Lower the frame on to three blocks (dimensions as shown in Fig. 9). These put the frame into such a position that the front crossmember, if not distorted, should run parallel to the ground.

Bolt on to the front crossmember the four bars, Tool No. T.120.

Parallelism and alignment of these bars can then be checked by measurement and by sighting one rod to the other.

When measured at the points "A", "B", "C" and "D" from the flat surface on which the car or frame is placed, all the bars should run parallel to it within a tolerance of  $\frac{3}{16}$  inch.

The bars should be parallel to each other at the points "E" and "F" within a tolerance of  $\frac{3}{16}$  inch.

Between the points "G" and "H", or "J" and "K", the bars should also be parallel with a tolerance of  $\frac{3}{16}$  inch.

If a fore and aft plumb-bob centre line is dropped down from the front and rear centre of the frame and points also dropped down from the bars at each end, the points "L", "M", "N" and "P" may be checked to the centre line to ensure the alignment of the bars fore and aft.

If misalignment is found in the top bars only, it may be this can be corrected by removing the top bar and bolting a similar but stiffer bar to the crossmember, which can be used as a lever to slightly twist the outer end of the crossmember to its correct alignment with the lower bars.

### Diagonal Frame Check (Complete Car).

In checking the frame for distortion, diagonal measurements as shown in Fig. 10 may be taken without removing the body from the chassis by using a plumb-bob as follows:—

Place the car on a level surface and block up the car equally at each wheel approximately 12 inches high with all tyres properly inflated.

Perform the measuring with accuracy and care.

Suspend the plumb-bob from various corresponding points on the frame, such as indicated by the diagonal lines in Fig. 10. The plumb-bob should be suspended slightly above the floor. When the plumb-bob comes to rest, mark the floor directly underneath it. The marks made on the floor will represent various points of the frame to be checked diagonally.

Measure the diagonal distance between the points; this distance should agree within  $\frac{1}{4}$  inch to  $\frac{3}{8}$  inch, as shown in Fig. 10.

Care must be taken to see that any two diagonals compared represent exactly corresponding points on each side of the frame.

Upon the result of this preliminary investigation a decision can be taken whether the frame can be repaired in position or whether the frame must be stripped out completely. In regard to repairs with the frame in position, it may be assumed that the damage caused is in front of the engine bulkhead plate.

Damage rear of the engine bulkhead plate involves the stripping out of the frame. This also applies to any damage to the rear end of the frame.

To recover the front end of the frame to permit the correction, location and operation of the front suspension and steering the correct mounting of the engine, etc., it will probably be found that it is necessary to disregard non-essential features of the finish and those parts of the frame that do not require functional accuracy.

### Alignment.

Checking the alignment of the frame bare is relatively a simple matter, especially if the frame can be set up on a large flat surface or face plate. It involves establishing a datum or centre line, from which all measurements can be taken. Diagonals are checked from suitable fixed locating points, which can be cross-checked at the centre line on which the diagonals should cross, as detailed in the chassis dimensional drawing (Fig. 10).

The angle of the front crossmember should be  $2^\circ$  but may be given an allowance of  $+$  or  $- \frac{1}{2}^\circ$ . Diagonal measurements quickly determine which section of the frame is bent.

Accuracies of sidemembers are usually checked with suitable straight-edges, and squareness of side rails is checked with straight-edge and square. Twist is checked visually against straight-edges laid transversely across the frame at suitable points.

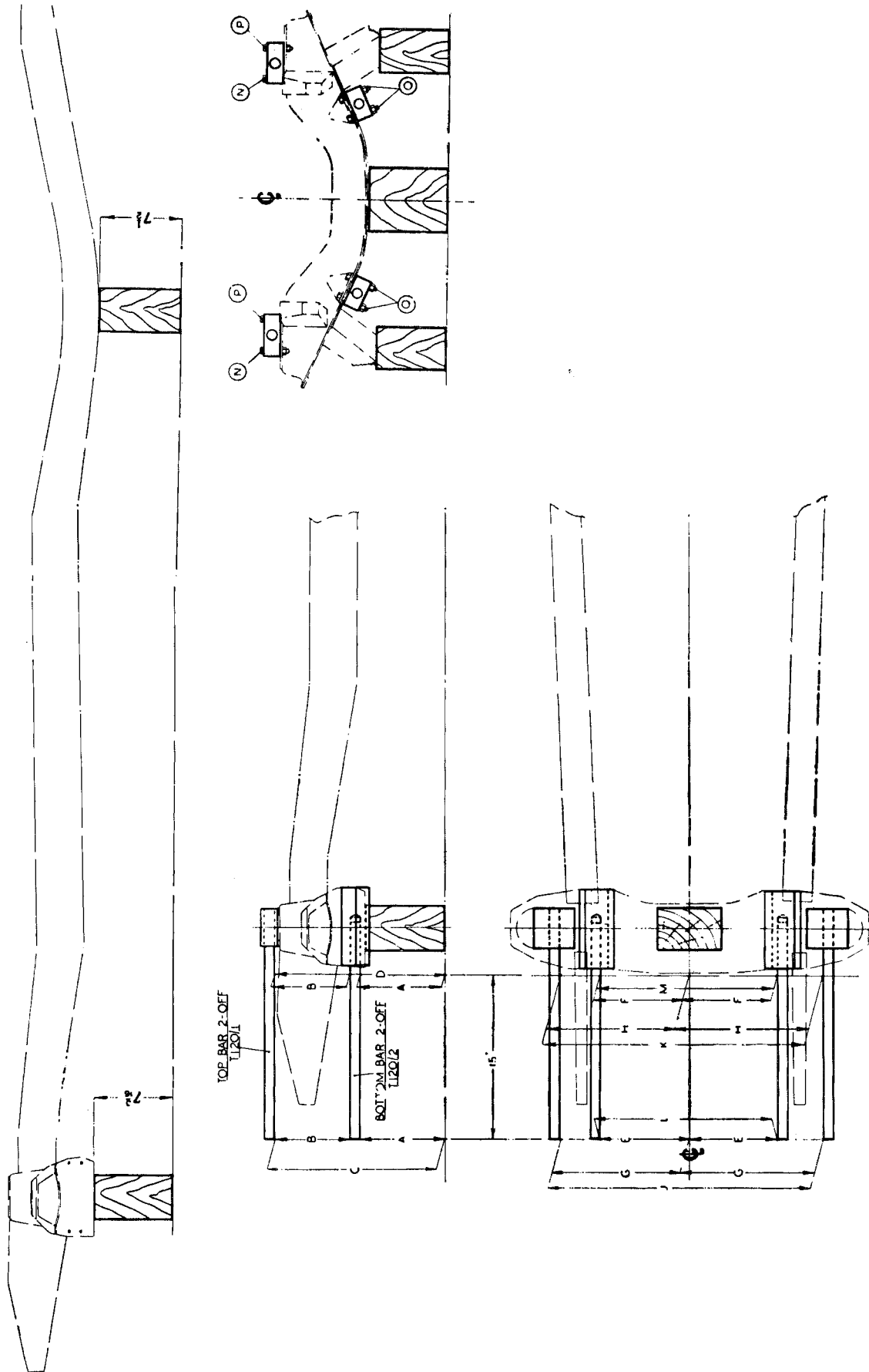


FIG. 9.—Checking the alignment of the front suspension crossmember.

Note: This section taken from **The Auto-Body Repair Manual** published by Scientific Magazines of Australia.

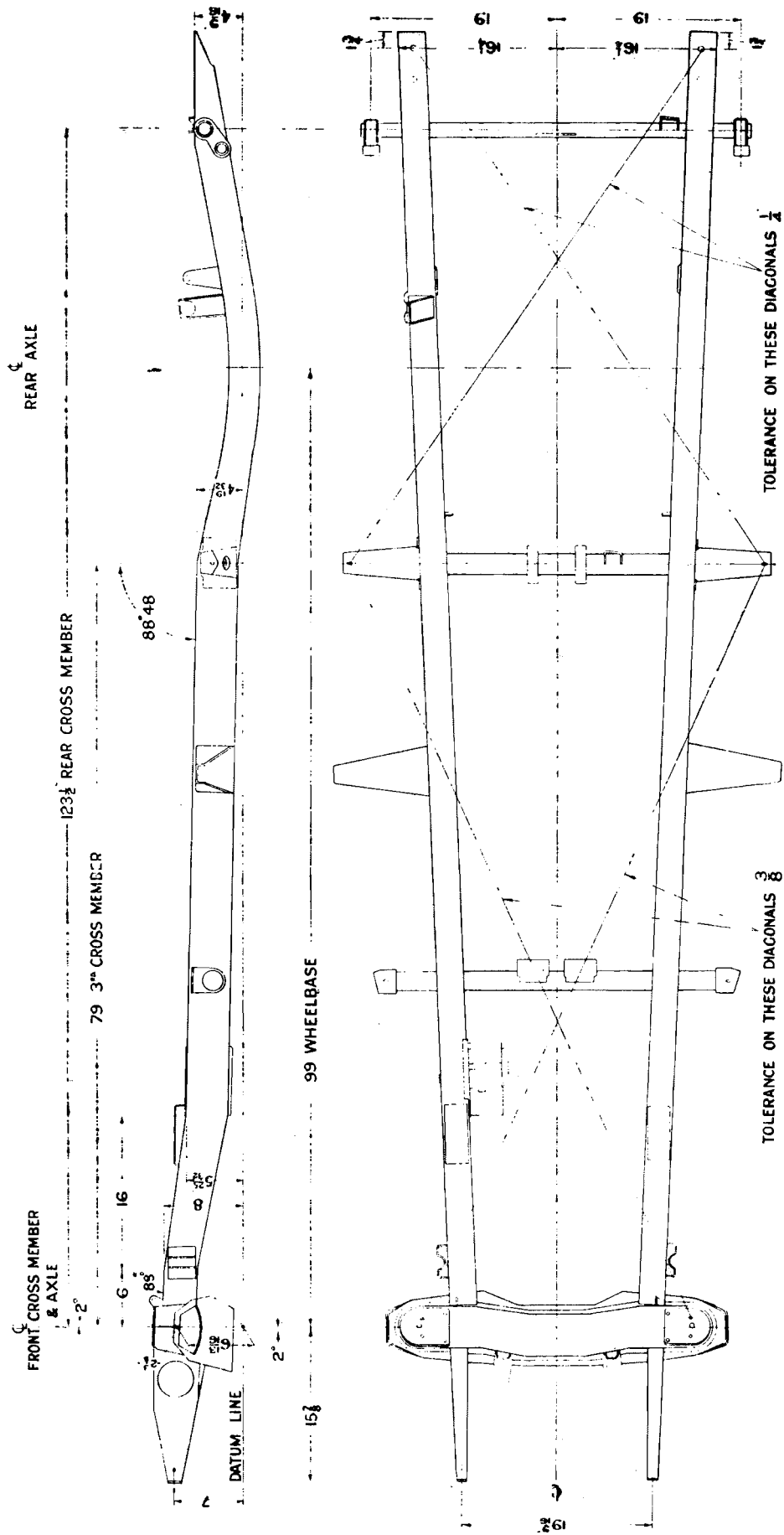


FIG. 10—Chassis dimensional diagram