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THE FRONT SUSPENSION

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THE REAR SUSPENSION

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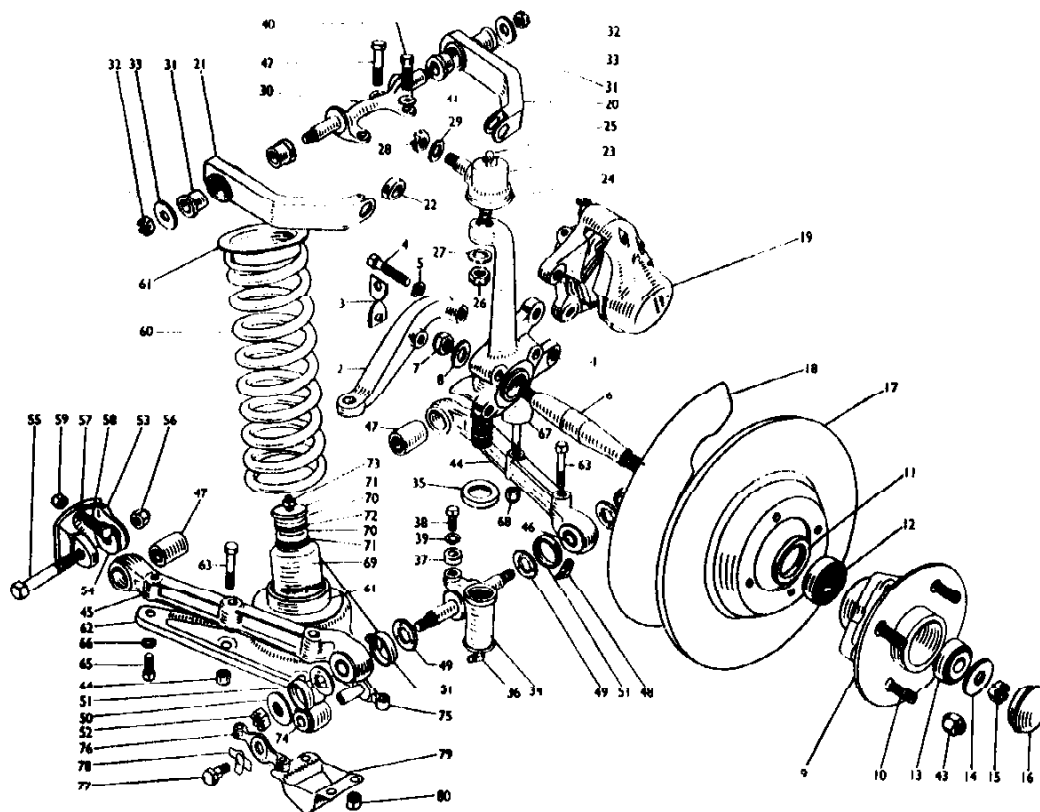


Figure M1.

Exploded view of front suspension unit.

1. Vertical link.
2. Steering lever.
3. Brake hose bracket.
4. Steering lever attachment bolt.
5. Steering lever lock washer.
6. Front hub stub axle.
7. Front hub stub axle securing nut.
8. Front hub stub axle washer.
9. Front hub assembly.
10. Roadwheel stud.
11. Front hub oil seal.
12. Front hub inner taper bearing.
13. Front hub outer taper bearing.
14. Front hub bearing washer.
15. Front hub bearing nut.
16. Front hub end cover.
17. Front brake disc.
18. Front brake disc dust cover.
19. Front brake caliper.
20. Top wishbone arm; R.H. front, L.H. Rear.
21. Top wishbone arm; R.H. rear, L.H. Front.
22. Top wishbone arm distance piece.
23. Top steering swivel.
24. Top steering swivel gaiter.
25. Top steering swivel lubricator.
26. Top steering swivel bottom nut.
27. Top steering swivel bottom washer.
28. Top steering swivel and wishbone arm securing nut.
29. Top steering swivel and wishbone arm washer.
30. Top wishbone fulcrum pin.
31. Top wishbone rubber bush.
32. Top wishbone fulcrum pin securing nut.
33. Top wishbone fulcrum pin plain washer.
34. Bottom trunnion and wishbone shackle pin assembly bottom steering swivel.
35. Bottom trunnion oil seal.
36. Bottom trunnion grease nipple.
37. Steering lock stop.
38. Steering lock stop securing nut.
39. Steering lock stop washer.
40. Top wishbone fulcrum pin outer securing bolt.
41. Top wishbone fulcrum pin spring washer.
42. Top wishbone inner securing bolt.
43. Roadwheel nut.
44. Bottom wishbone arm assembly, R.H. front and L.H. rear.
45. Bottom wishbone arm assembly, R.H. rear and L.H. front.
46. Bottom wishbone arm outer end bush.
47. Bottom wishbone arm inner end bush.
48. Bottom wishbone arm grease nipple.
49. Bottom wishbone arm shackle pin thrust washer.
50. Bottom wishbone arm spigotted lockwasher.
51. Bottom wishbone arm grease seal.
52. Bottom wishbone arm securing nut.
53. Bottom wishbone arm "U" bracket.

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| 54. Spigotted thrust washer. | 68. Bump rubber securing nut. |
| 55. Bottom inner wishbone fulcrum bolt. | 69. Front roadspring damper. |
| 56. Bottom inner wishbone fulcrum nut. | 70. Front damper top mounting bush. |
| 57. Camber correction shim. | 71. Front damper top mounting washer. |
| 58. "U" bracket securing bolt. | 72. Front damper centre mounting washer. |
| 59. "U" bracket securing nut. | 73. Front damper top securing nut. |
| 60. Front road spring. | 74. Front damper bottom rubber bush. |
| 61. Front roadspring rubber seat. | 75. Front damper bottom fulcrum and bracket. |
| 62. Front roadspring pan. | 76. Front damper bottom bracket. |
| 63. Roadspring pan securing bolt. | 77. Front damper bottom fulcrum bolt. |
| 64. Roadspring pan securing nut. | 78. Front damper bottom fulcrum bolt tab-washer. |
| 65. Roadspring pan securing bolt. | 79. Rebound plate. |
| 66. Roadspring pan securing washer. | 80. Rebound plate securing nut. |
| 67. Bump rubber. | |

DATA

	English	Metric
Track at ground level	4' 2"	1270.0 mm.
Camber angle	2°	2°
King pin inclination	7°	7°
Castor angle	2°	2°
End float of trunnion block	0.0120"	0.3048 mm.
and outer end of bottom wishbones	0.0040"	0.1016 mm.

DESCRIPTION

The two independent front suspension units are of the wishbone construction, the road shocks being absorbed by low periodicity coil springs assisted by telescopic dampers.

The top wishbone assembly has rubber bushes at its inner ends and mounted on a fulcrum pin attached to the top of the front suspension pillar, while the outer ends are secured by the shank of the ball joint situated at the top of the vertical link, this joint provides the axial and vertical movement for the top end of the vertical link.

The inner ends of the bottom wishbones are rubber bushed and are attached one each side of the suspension pillar assemblies by "U" shaped brackets. Shims interposed between these brackets and the chassis frame set the camber angle. The outer ends of the wishbones, have pressed in bush bearings, mounted one each side of trunnion block onto a pin passing right through the block. During initial assembly of the car a specific amount of end float is provided at this point and the provision of white metal faced thrust washers ensures long life and it will require no further adjustment. Rubber seals prevent the ingress of road dirt. The trunnion block is threaded vertically to accommodate the bottom end of the vertical link, this together with the ball joint of the top wishbone assembly provide the two swivels for the steering.

The vertical link has a tapered bore to accommodate the front road wheel stub axle and includes the mounting lugs for the disc brake caliper and the steering lever.

The front roadwheel hubs are mounted on a pair of opposed taper roller bearings located on the aforementioned stub axle. These bearings are not preloaded.

Lubrication is confined to five points, four by grease nipples, one in the outer end of each wishbone arm and the remaining one, by packing the hub end cover with grease.

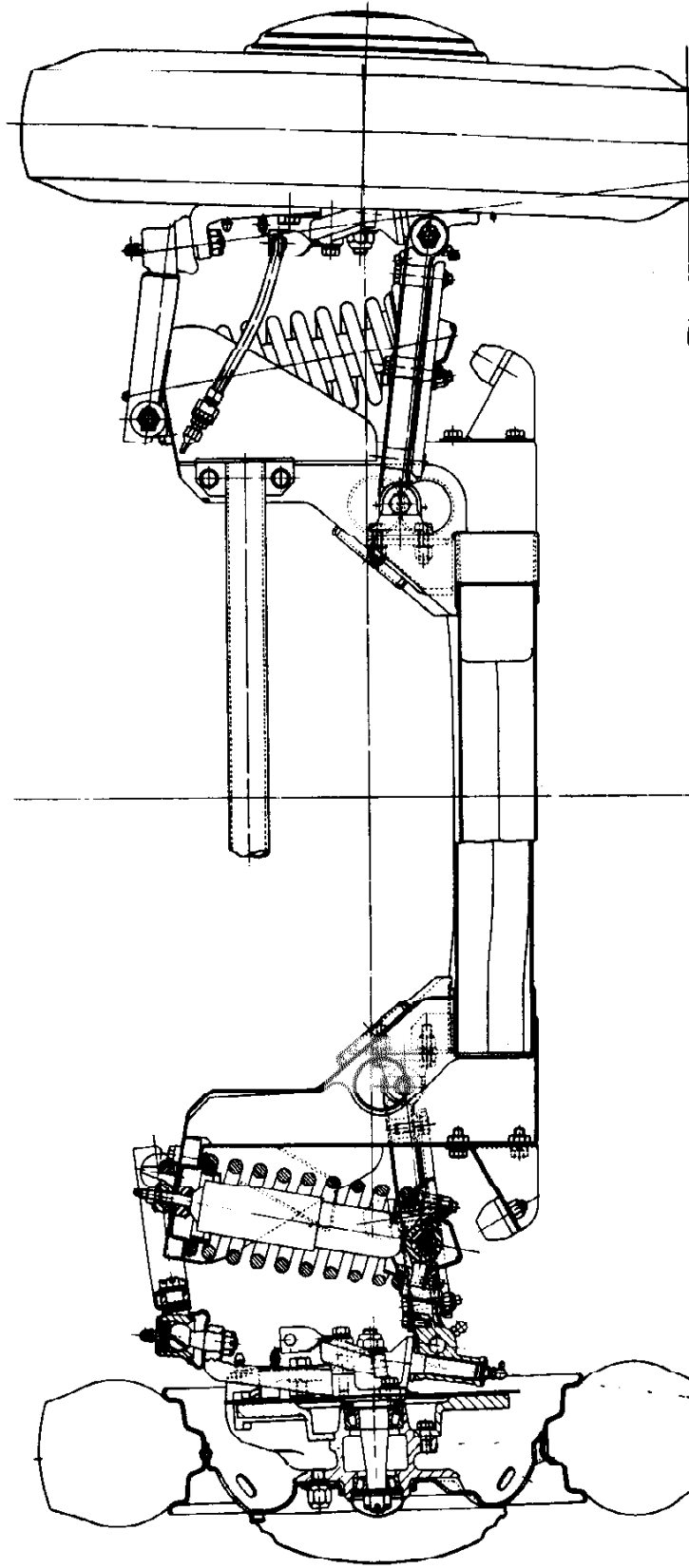


Figure M2.
Cross section through front suspension.

MAINTENANCE

FIRST 500 MILES (805 kms.)

Lubricate front hubs.
Lubricate front suspension joints.

EVERY 1,000 MILES (1,610 kms.)

Lubricate front suspension joints.

EVERY 5,000 MILES (8,050 kms.)

Lubricate front hubs.

EVERY 20,000 MILES (32,200 kms.)

Check end float between trunnion block and outer end of lower wishbone.

THE FRONT HUB ASSEMBLY

DESCRIPTION

The front hub assembly is mounted on two opposed taper roller bearings, the centre races of which are mounted on a short stub axle fitted in the taper bore of the vertical link.

No preload must be placed on these bearings and they are lubricated by packing the hub end cover with grease.

LUBRICATION FRONT HUBS

During initial assembly of the car, the front hubs are packed with grease between the two roller races and they are replenished by adopting the following procedure:-

Remove the hub cap from the roadwheel and prise off the hub end cover. Partially pack the end cover with grease and replace it on the hub. Fit the hub cap.

REMOVAL AND REPLACEMENT FRONT HUB AND STUB AXLE Fig. M3.

1. REMOVAL

Jack up the car and remove the roadwheel and the disc brake caliper assembly from the vertical link as detailed in THE BRAKING SYSTEM, SECTION N. Prise off the hub and cover and remove the castellated nut and washer from the end of the stub axle. Withdraw the hub and remove the inner cone assembly of the outer bearing from inside the hub. Remove the inner cone assembly of the inner bearing from inside the hub by prising out the grease shield or by removing the inner race and grease shield from the stub axle. Eject the two outer bearing rings from inside the hub shell. Withdraw the stub axle from the tapered bore of the vertical link by removing the nut from its inner end. Remove the brake disc from the hub as detailed in THE BRAKING SYSTEM, SECTION N.

2. REPLACEMENT

The replacement of the front hub and stub axle is the reversal of the removal sequence but particular attention must be given to the following point:

That the front hub bearings are adjusted as detailed below.

ADJUSTING FRONT HUB BEARINGS

The front hub bearing adjustment is set during the initial assembly of the car and will not normally require further adjustment until new replacement bearings are fitted. It can then be

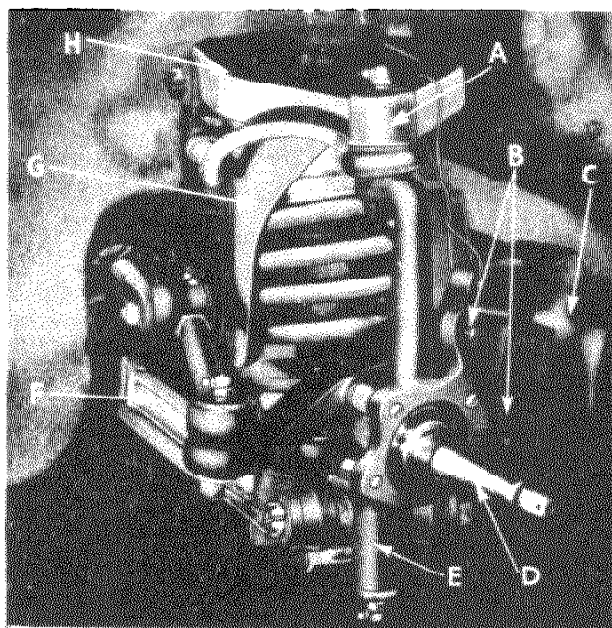


Figure M3.

Front hub assembly removed from stub axle.

- A. Top steering swivel.
- B. Brake caliper attachment bracket.
- C. Brake caliper assembly.
- D. Stub axle.
- E. Bottom trunnion (bottom steering swivel)
- F. Bottom front wishbone arm.
- G. Front suspension pillar.
- H. Top front wishbone arm.

effected in the following manner.

Jack up the front of the car, remove hub cap and hub end cover. Withdraw and discard the split pin in the end of the stub axle and castellated nut. Tighten the castellated nut until it just retards the spinning of the roadwheel and slacken off the castellated nut one to one and a half flats, according to the position of the split pin hole. Fit a new split pin and replace the other components by reversing the removal sequence.

THE FRONT ROAD SPRING

REMOVAL AND REPLACEMENT FRONT ROAD SPRING

1. FRONT SUSPENSION DAMPER

Remove the front suspension damper from inside the front road spring as detailed on page M16.

2. FRONT ROAD SPRING

Remove the bump rubber assembly from the top face of the rear wishbone arm by detaching the nut, follow by removing the centre nut and bolt of the front wishbone arm and feed in two guide bolts into the vacant holes. The guide bolts can be fabricated locally to the dimension on page M12. Position a small jack beneath the spring pan with suitable packing in between and take the weight of the suspension unit. Detach the four nuts on the underside faces of the two wishbone arms and lowering the jack ease the spring pan down the guide pins. On completion of the roadspring travel remove the jack and packing, the two guide pins, spring pan, a rubber washer, the road spring and a second rubber washer.

REPLACEMENT

The replacement of the front road spring is the reversal of the removal sequence.

DIMENSIONS
FRONT ROAD SPRING

	English	Metric
Free length	10.9400"	277.876 mm.
Fitted length	8.0500"	204.470 mm.
Fitted load	980 lbs.	444.5 kgms.

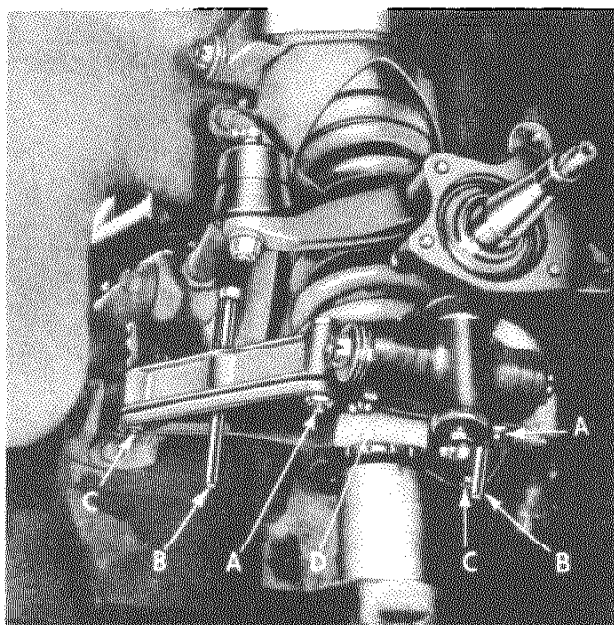


Figure M4.

Alternate method of removing front roadspring. Position jack under rebound plate, detach top damper mountings, remove outer nuts and bolts (A) and inner bolts (C) lower jack allowing spring pan to travel down guide pins.

- A. Outer spring pan nut and bolt.
- B. Guide pin, utilizing centre nut and bolt hole in front wishbone arm and bump rubber attachment bolt hole in rear wishbone arm.

THE TOP WISHBONE ASSEMBLY

DESCRIPTION

The upper wishbone assembly consists of two "U" shaped wishbone arms, the inner ends of which are mounted on the outer ends of a fulcrum pin with split rubber bushes interposed between and the second ends are interlaced with a distance piece between, so the closed face is upward. These outer ends and distance piece are secured by the threaded shank of the top ball joint while its tapered pin is secured to the top end of the vertical link and forms the top steering swivel.

REMOVAL AND REPLACEMENT

TOP WISHBONE ASSEMBLY Fig. M5.

1. REMOVAL

Block the bottom wishbone assembly as detailed on page M11 jack up the front of the car and remove the roadwheel.

Withdraw the split pin and slacken the castellated nut on the ball joint shank and partially withdraw the ball joint shank from the wishbone. Remove the wishbone fulcrum pin from the top of the suspension pillar by withdrawing two bolts and two nuts and bolts. Allow the vertical link to lay out on its cord or wire. Remove the top wishbone assembly from the threaded shank of the ball joint by removing the castellated nut and collecting the distance piece.

Alternatively, the foregoing procedure can be adopted but instead of detaching the thread shank from wishbones, withdraw the tapered shank of the ball joint from the top end of the vertical link by removing the castellated nut and utilizing a suitable extractor.

2. REPLACEMENT Fig. M6.

The replacement of the upper wishbone assembly is the reversal of the removal sequence but particular attention must be given to the following points:

- (i) That the fulcrum pin of the wishbone assembly is fitted to the top of the suspension pillar first with the nuts and bolts on the side of the fulcrum pin nearer the centre of the car and the bolts toward the outside of the car.
- (ii) That the fitting of the ball joint shank to the wishbone assembly or the tapered pin to the vertical link is left until after the fulcrum pin has been secured to the top of the suspension pillar.

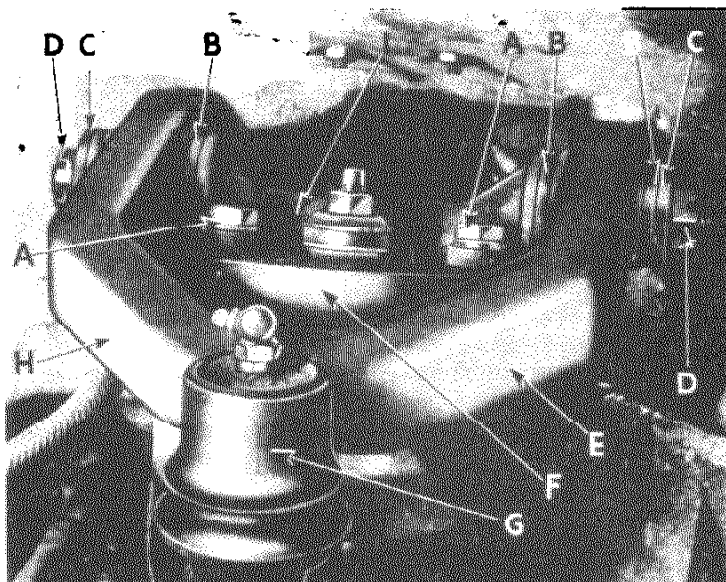


Figure M5.

Top wishbone assembly.

- A. Outer fulcrum pin bolts.
- B. Rubber bush.
- C. Plain washer.
- D. Castellated nut.
- E. Rear top wishbone arm.
- F. L.H. front suspension pillar.
- G. Top steering swivel.
- H. Front top wishbone arm.
- I. Top wishbone fulcrum pin.

DISMANTLING AND ASSEMBLING TOP WISHBONE ASSEMBLY

1. DISMANTLING

Withdraw the ball joint assembly and distance piece between the ends of the wishbone by removing the castellated nut. Remove the outer rubber bushes from the ends of the fulcrum pin by removing the castellated nuts and large washers, one from each end. Remove the two wishbone arms and the inner rubber bushes from the fulcrum pin.

2. ASSEMBLING

The assembling sequence of the top wishbone assembly is the reversal of the dismantling sequence, but particular attention must be given to the following points:-

- (i) That the inner rubber bushes are fed onto the fulcrum pin, flange end first.
- (ii) That the wishbone arms are offered up to the rubber bushes and the outer wishbone ends allowed to interlace so that with the fulcrum pin away from the handler the R.H. wishbone arm overlaps the L.H. wishbone arm. Fig. M7.
- (iii) That no details are tightened at this juncture, but left until it is being fitted to the car.

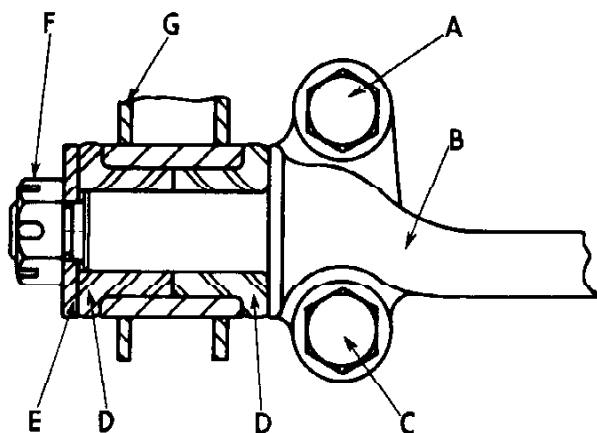


Figure M6.

Cross Section through top wishbone fulcrum pin

- A. Outer attachment bolt.
- B. Top wishbone fulcrum pin.
- C. Inner attachment nut and bolt.
- D. Rubber bush.
- E. Plain washer.
- F. Castellated nut.
- G. R.H. front or L.H. rear wishbone arm.

THE VERTICAL LINK

DESCRIPTION

The vertical link is a carbon steel stamping and carries the front wheel stub axle, in a tapered bore, on its outer face; the steering lever and brake disc shield are on the inner face. Protruding from the front and rear sides situated above the truncated thread are the steering lock lugs and on the rear face lugs for mounting the disc brake calipers. The vertical link is mounted on the outer ends of both top and bottom wishbone assemblies and pivots at the top on a ball joint and at the bottom in the threaded bore of the trunnion block.

REMOVAL AND REPLACEMENT VERTICAL LINK

1. REMOVAL

Apply the handbrake, jack up the front of the car and remove the roadwheel. Remove the brake caliper from the lugs on the rear face of the vertical link as detailed in **THE BRAKING SYSTEM, SECTION N**. Remove the roadwheel hub and stub axle as detailed on page M4. Block the bottom wishbone assembly as detailed on page M11. Detach the top end of the vertical link from the outer end of the top wishbone assembly by removing the castellated nut and withdrawing the threaded shank of the ball joint.

Alternatively, remove the vertical link from the tapered pin of the ball joint by removing the nut and utilizing a suitable extractor. Remove the steering lock stop by withdrawing the bolt. Ease the top of the vertical link outward and withdraw the bottom end of the vertical link from the thread bore in the trunnion block by unscrewing and withdraw the oil seal from the top of the truncated thread.

2. REPLACEMENT

The replacement of the vertical link is the reversal of the removal sequence, but particular attention must be given to the following:

- (i) That the trunnion block oil seal is fitted to the top of the truncated thread of the vertical link.
- (ii) That the vertical link is screwed into the trunnion block, without using force, until it bottoms, it is then unscrewed one full turn. Align the bore for the stub axle so it is positioned at right angles to the car centre line, and then check that it has full range of movement on both L. and R.H. locks; the steering lock stop and bolt is fitted to the spot facing having the threaded centre, this will locate

the trunnion block to the vertical link.

(iii) That the steering lock stops are reset as detailed in THE STEERING, SECTION L.

THE BOTTOM WISHBONE ASSEMBLY

DESCRIPTION

The bottom wishbone assembly consists of two cast steel arms, a bolt on pressed steel spring pan and a trunnion block. The inner ends of the bottom wishbone assembly have pressed in rubber bushes which are located in the "U" shaped mounting brackets by a spigotted thrust washer; once assembled these will require no attention. The outer ends of the wishbone arms have pressed in bush bearings and these are mounted on the shackle pin pressed into the trunnion block and are located sideways by thrust washers and a clearance is set to give each wishbone arm a specified clearance by using a special washer having a splined centre.

Each wishbone end has its own grease nipple for lubrication purposes and flat rubber oil seals are positioned over each thrust washer to prevent the ingress of road dirt.

LUBRICATION

BOTTOM OUTER WISHBOBE BUSHES Fig. M8.

The lubrication of the front suspension is confined to four points and is effected through nipples with a pressure or hand grease gun.

The four nipples are situated in the outer ends of the four wishbones, each being to the front or rear of the steering trunnion block.

Sufficient grease should be injected until it exudes from both sides of each wishbone; the excess grease is then cleaned away.

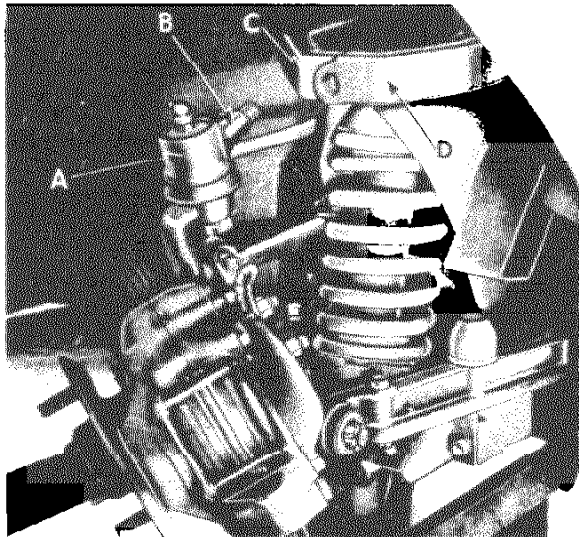


Figure M7.

View of the L.H. front suspension unit showing the overlap of the top wishbone arms. It will be noted that the rear top wishbone arm overlaps the front wishbone arm. The R.H. side is opposite i.e., the front top overlaps the rear wishbone arm.

- A. Ball Joint (Top steering swivel).
- B. Threaded shank of ball joint.
- C. L.H. front top wishbone arm, R.H. rear wishbone arm.
- D. L.H. rear top wishbone arm; R.H. front wishbone arm.

REMOVAL AND REPLACEMENT LOWER WISHBONE ARMS

1. REMOVAL

Remove the front road spring as detailed on page M5. Remove the castellated nuts at the

ends of the trunnion block shackle pin and remove the lock washers, the rubber seals and thrust washers. Detach the "U" bracket assemblies situated at the inner end of the bottom wishbone arms from the bottom of the suspension pillar by removing two nuts, plain washers and bolts each, collecting any shims that may be positioned between the bracket and the chassis frame. Remove the two lower wishbone arms, one from each side of the shackle pin and withdraw a second thrust washer and rubber seal from each shackle pin. Withdraw the nut and bolt from the "U" bracket on the inner end of each bottom wishbone arm and remove the "U" bracket, eject the metal and rubber bush from the inner end of each bottom wishbone arm and remove the spigotted thrust washer from each "U" bracket. Press the bush bearing from inside the outer end of the wishbone arm when it is well worn.

2. REPLACEMENT

The replacement of the bottom wishbone arms is the reversal of the removal sequence, but particular attention must be given to the following points:

- (i) That the lower wishbone "U" brackets are offered up to the inner ends of the bottom wishbone arms so the locating face for the head of the fulcrum bolt is positioned away from the set of the wishbone arm, i.e., toward the front and rear ends of the car for the front and rear wishbone arms respectively. Fig. M9.
- (ii) That the metal and rubber bush is pressed into the inner end of the lower wishbones and the spigotted thrust washer is fitted in the bore of the "U" bracket so its flat face is inside the lug opposite the bolt head. The wishbone arm and bush assembly is fitted inside the "U" bracket, the fulcrum bolt is fed through but the nut is not fully tightened until after the road spring has been fitted. A smear of soft soap will facilitate the entry of rubber components into the metal. Fig. M9.
- (iii) That a flat washer is positioned under the nut of each nut securing the "U" shaped brackets. This assists in spreading the load of the nut.
- (iv) That the shackle pin is positioned centrally in the trunnion block, this can be reset by the judicious use of a press.
- (v) That the end float of each outer bottom wishbone arm on the trunnion block shackle pin is set as detailed below.

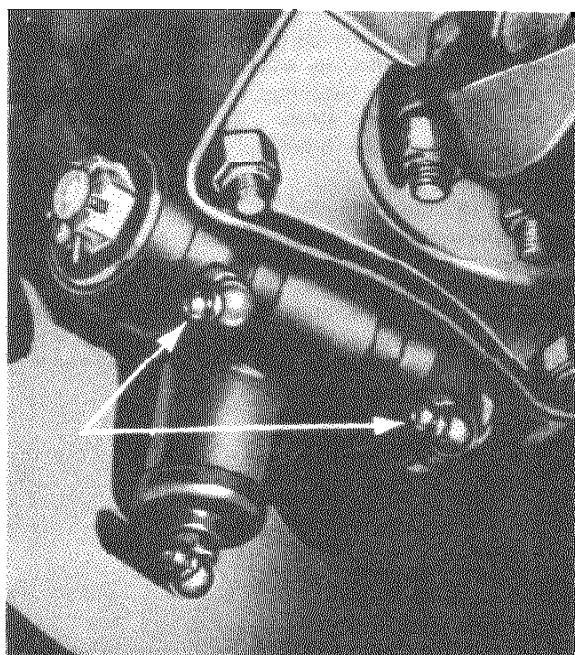


Figure M8.

Location of outer bottom wishbone lubricators.

BOTTOM OUTER WISHBONE ARM
SETTING TRUNNION BLOCK
SHACKLE PIN END FLOAT. Fig. M10.

1. ASSEMBLING

Ensure that the shackle pin is mounted centrally in the trunnion block. Feed a thrust washer and an oil seal onto the trunnion block shackle pin and abut them to the trunnion block, followed with the two bottom wishbone arms. Attach the wishbone arms to the chassis frame at a point fore or aft of the suspension pillar with any shims interposed between that were removed during the dismantling sequence, and secure with two bolts, washers and nuts, which are left slack at this juncture.

Fit a second thrust washer to each side of the shackle pin, followed by the lockwasher and nut, the latter only being tightened sufficiently to contact the lockwasher.

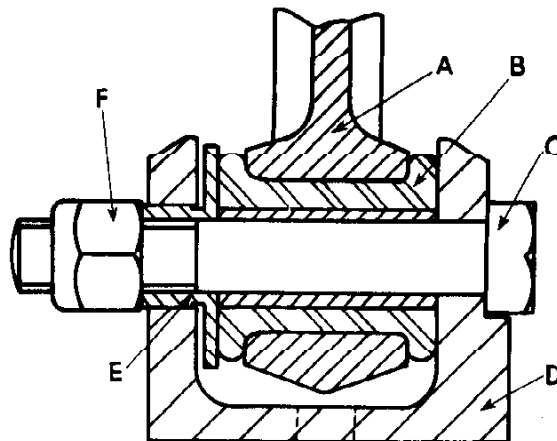


Figure M9.

Cross section through bottom wishbone fulcrum bolt.

- A. R.H. rear or L.H. front bottom wishbone arm.
- B. Metal and rubber bonded bush assembly.
- C. Bottom inner wishbone fulcrum bolt.
- D. Bottom wishbone arm "U" bracket.
- E. Spigotted thrust washer.
- F. Nyloc nut.

2. CHECKING AND SETTING END FLOAT Figs. M10 and M11.

Grip the two wishbone arms together, utilizing a piece of cord to eliminate all end float. Tighten the shackle pin nut to close the lock and outer thrust washers together, checking the reducing clearance with feeler gauges. Observe the alignment of the split pin holes and when the specified clearance is almost attained, consider whether the fitting face of the castellated nut will require attention to align the split pin holes when the exact clearance is obtained, fit the oil seal and the split pin. Repeat with the second bottom wishbone arm.

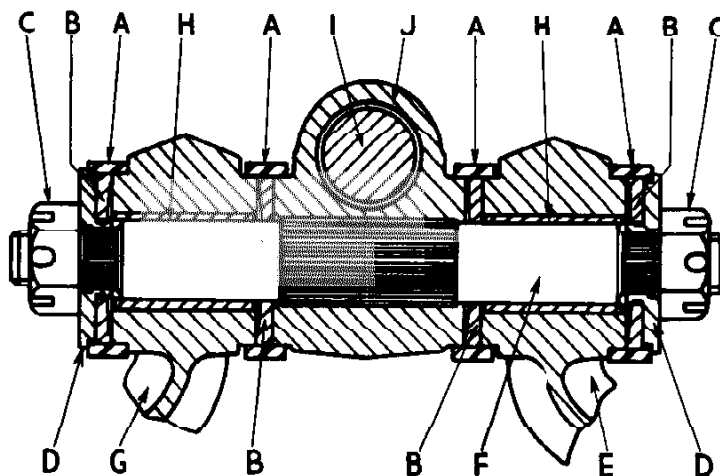


Figure M10.

Cross section through bottom wishbone shackle pin assembly.

- A. Grease seal.
- B. Thrust washer.
- C. Castellated nut.
- D. Spigotted lock washer.
- E. R.H. rear or L.H. front bottom wishbone arm.
- F. Shackle pin.
- G. R.H. front or L.H. rear bottom wishbone arm.
- H. Bottom wishbone arm bush.
- I. Bottom end of vertical link.
- J. Bottom steering swivel.

BLOCKING THE BOTTOM WISHBONE ASSEMBLY Fig. M12.

The positioning of a block between the rebound rubber and abutment bracket will prevent the suspension unit from dropping when the front roadwheels are lifted from the ground, and after care has been taken during its fabrication and fitting it can be used to control the road spring while some dismantling sequences are being carried out.

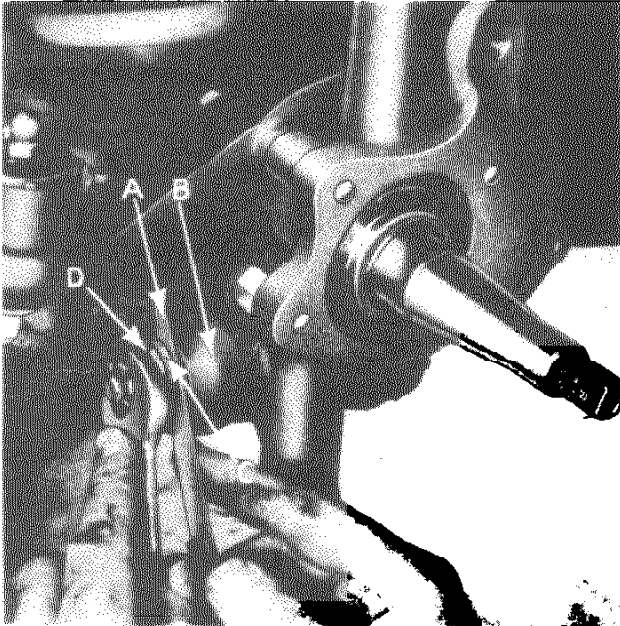


Figure M11.

Checking end float of bottom outer wishbone shackle assembly. Both sides of steering swivel must be checked:

- A. Feeler gauge.
- B. Outer end of wishbone arm.
- C. Thrust washer.
- D. Spigotted lock washer.

The block can be made cup shaped to slide over the top of the rebound rubber or the rebound rubber can be removed and replaced by a 3.000" (76.200 mm.) long bolt with two washers and two nuts.

The rebound rubber is removed and the bolt, with a nut and washer is fed in to take its place. A second washer and nut is fitted to the underside of the bracket; the bolt head can be brought up to the underside of the abutment bracket by the setting of the bottom nut and then held in position with the top nut.

The car can now be jacked up without the madwheels and front suspension units lowering.

While the car has these bolts in position, the cockpit must be ticketed to ensure that it **MUST NOT BE DRIVEN**.

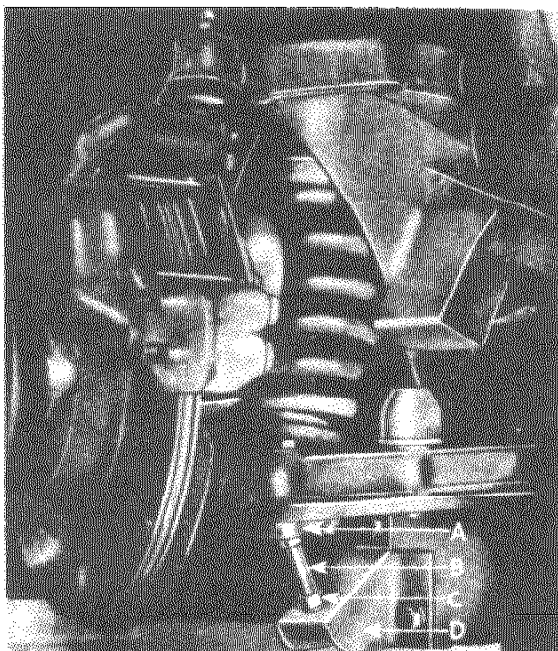


Figure M12.

Blocking the bottom wishbone assembly.

- A. Rebound rubber plate.
- B. Bolt.
- C. Nut and washer, also on underside.
- D. Rebound rubber mounting.

CAMBER CORRECTION

It will be observed that camber correction shims are positioned between the "U" shaped brackets on the inner ends of the bottom wishbone arms and the chassis frame. These shims will only be fitted to cars where due to a build up of manufacturing tolerances the camber angle cannot be obtained by direct means.

No attempt should be made to alter the camber angle setting by the addition or subtraction of any shims.

THE STEERING SWIVELS

DESCRIPTION

The top steering swivel is a ball joint attached to the outer end of the top wishbone assembly by a distance piece and screwed shank to the top of the vertical link by its tapered pin. The bottom steering pivot is a length of truncated thread machined on the bottom extremities of the vertical link, and this locates in a threaded bore in the trunnion block situated between the outer ends of the two bottom wishbone arms.

The two steering pivots are lubricated through two grease nipples, one situated in the top face of the ball joint and a second in a plate pressed into the underside face of the threaded bore in the trunnion block. Oil sealing is effected at the top steering pivot by a rubber boot fitted to the body of the ball joint and the top face of the vertical link. The bottom steering pivot is sealed by a flat rubber seal positioned between the bottom and top faces of the vertical link and trunnion block respectively.

BOTTOM STEERING SWIVEL (TRUNNION BLOCK) REMOVAL AND REPLACEMENT

1. REMOVAL

Remove the front suspension damper and roadspring as detailed on pages M16 and M5 remove the front brake caliper and disc shield as detailed in THE BRAKING SYSTEM, SECTION N. Remove the front hub from the vertical link as detailed on page M4. Remove the bottom wishbone arms from the chassis frame and trunnion block shackle pin as detailed on page M9. Unscrew the bottom steering swivel (trunnion block) from the lower extremities of the vertical link and collect the rubber seal.

2. REPLACEMENT

The replacement of the bottom swivel pin is the reversal of the removal sequence.

- (i) That the shackle pin end float is set as detailed on page M11.
- (ii) That the camber correction shims are replaced to their original positions and a washer is positioned under the "U" bracket securing nut so its load is spread.
- (iii) That the roadwheel hub is assembled and adjusted as detailed on page M4.

REMOVAL AND REPLACEMENT TOP STEERING SWIVEL (TOP BALL JOINT)

1. REMOVAL

Block the front suspension as detailed on page M11 jack up the car and remove the road wheel. Withdraw the threaded shank of the top steering swivel from the outer end of the top wishbone assembly as detailed in "REMOVAL AND REPLACEMENT, TOP WISHBONE ASSEMBLY" on page M6. Remove the tapered shank of the top steering swivel from the top end of the vertical link by removing the castellated nut and utilizing a suitable extractor.

2. REPLACEMENT

The replacement of the top steering swivel is the reversal of the removal sequence.

THE BUMP AND REBOUND RUBBERS

DESCRIPTION

The bump and rebound rubbers are mounted on top of the rear wishbone and on a bracket attached to the chassis frame sidemember beneath the bottom wishbone assembly. The bump rubber will bump to a bracket welded into the construction of the front suspension pillar and a bracket included in the bottom suspension damper attachment beneath the bottom wishbone assembly will abut to the rebound rubber.

During normal motoring these rubbers are not used and are only fitted to prevent metal to metal contact in extreme circumstances.

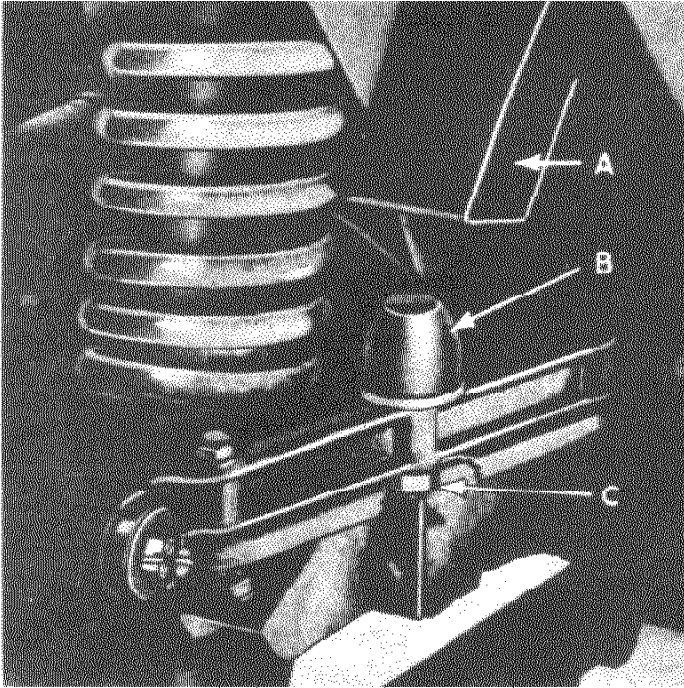


Figure M13.
Bump rubber and bracket.

- A. Bracket welded to chassis frame.
- B. Bump rubber.
- C. Bump rubber securing nut.

REMOVAL AND REPLACEMENT BUMP RUBBER Fig. M13.

1. REMOVAL

Remove the bump rubber from the centre of the rear lower wishbone arm by detaching the nut beneath.

2. REPLACEMENT

The replacement of the bump rubber is the reversal of the removal sequence.

REMOVAL AND REPLACEMENT REBOUND RUBBER, BRACKET AND PLATE Fig. M14.

1. REMOVAL

The rebound rubber can be detached from the bracket mounted on the outside face of the chassis frame sidemember by removing a nut or detaching the rebound rubber and mounting bracket complete by withdrawing three bolts. Remove the rebound plate from beneath the bottom suspension damper bracket attachment studs by detaching four nuts.

2. REPLACEMENT

The replacement of the rebound rubber, bracket and plate is the reversal of the removal sequence, but particular attention must be given to the following point:

That the rebound plate is fitted to the underside of the bottom wishbone assembly so that the thicker end is toward the roadwheel.

FRONT SUSPENSION UNIT

REMOVAL AND REPLACEMENT FRONT SUSPENSION UNIT

1. FRONT ROAD SPRING

Remove the front road spring from inside the front suspension unit as detailed on page M5

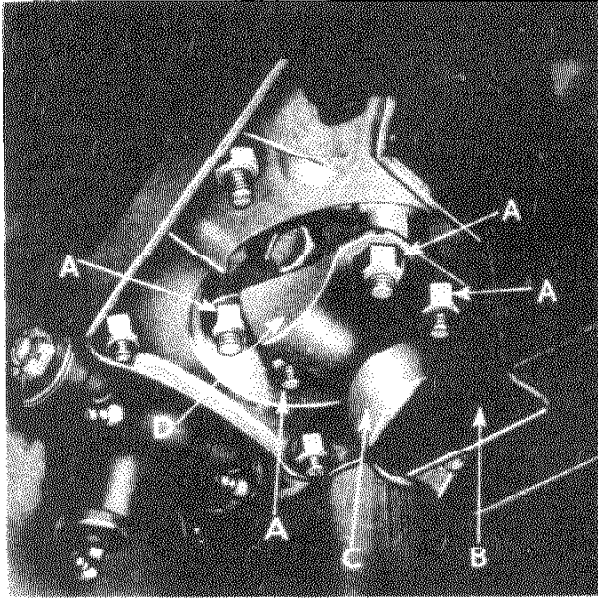


Figure M14.

Rebound rubber and plate.

- A. Rebound plate and bottom damper securing details.
- B. Rebound rubber mounting bracket.
- C. Rebound rubber.
- D. Rebound plate.

2. OUTER TIE ROD

Remove the outer tie rod from the steering lever as detailed in THE STEERING UNIT, SECTION L.

3. BOTTOM WISHBONES

Detach the inner ends of the two bottom wishbones from their fitting faces each side of the suspension pillars on the top face of the chassis frame by withdrawing two nuts and bolts each and collecting and identifying any shims positioned between the "U" shaped brackets and the fitting faces.

4. TOP WISHBONES

Remove the fulcrum pin from the top of the suspension pillar by withdrawing the two bolts and two nuts and bolts.

5. REPLACEMENT

The replacement of the front suspension unit is the reversal of the removal sequence, but particular attention must be given to the following points:

- (i) That when fitting the top wishbone assembly fulcrum pin to the top of the suspension pillar the bolts are fitted to the top face of the suspension pillar nearer the roadwheel and the nuts and bolts nearer the centre of the car.
- (ii) That the bottom wishbone shims are replaced according to their identification markings to a position between the "U" brackets of the inner bottom wishbone ends and their fitting faces adjacent to the front suspension pillars and secure with bolts fed in from the bracket side and plain washers and nuts on the second side. The purpose of these washers is to spread the load of the nut over a wider area.
- (iii) That the front wheel alignment is checked as detailed in THE STEERING UNIT, SECTION I.

THE CAMBER ANGLE

The camber angle is the angular distance the front roadwheel inclines outward at the top away from the vertical. The camber angle is said to be positive when the road wheels are further apart at the top than at the bottom when viewing the car from the front. Excessive camber will result in an exceptional amount of tyre wear on only one side of the tyre. Excessive positive camber will result in too much tyre wear on the outside portion of the tread and excessive negative camber will result in the wear being on the inner portion of the tread; the latter condition should never be experienced. A car having an unequal camber angle on the two road wheels will cause it to

persistently steer to the side having the greater amount of camber angle when it is being driven on a FLAT road, i.e. it has no crown.

The camber angle is set by the disposition of shims between the front suspension pillars and the "U" shaped brackets on the inner ends of the wishbone arms, but only to counteract any discrepancy caused by the build-up of manufacturing tolerances.

THE CASTOR ANGLE

The castor angle is the angular distance that the top of the vertical link is inclined toward the front or rear of the car as viewed from the side. The castor angle is said to be positive when the top of the vertical link is inclined toward the rear of the car; conversely the castor angle is said to be negative when it is inclined toward the front of the car. This has little effect on tyre wear but the correct amount of castor helps to keep the front road wheels in the straight ahead position.

When turning left or right, castor and king pin inclination act as a lever, assisting the driver in turning the front wheels back to the straight ahead position.

THE KING PIN INCLINATION

The king pin inclination (or vertical link inclination) is the angular distance that the steering axis is inclined inward at the top swivel away from the vertical when viewed from the front of the car. The steering axis is a line through the two steering swivels at the top and bottom ends of the vertical link. This angle has little effect on tyre wear. The king pin inclination fixes the turning point of the front road wheel inside and near the centre of road and tyre contact and together with the castor angle improves the car's steering.

THE FRONT SUSPENSION DAMPERS

DESCRIPTION

A telescopic damper is fitted to a point in the centre of each front road spring. It has a stem fitting at the top with rubber bushes and cup washers while at the bottom end it is secured by an eye, split rubber bushes, a bolt and two brackets to the underside of the road spring pan. The damper is a sealed unit and cannot be serviced.

REMOVAL AND REPLACEMENT

FRONT SUSPENSION DAMPER Figs. M15, M16 and M17.

1. REMOVAL

Ensure that the handbrake is hard on, jack up the front of the car and remove the road wheel. Detach the damper from the top of the suspension pillar by removing a nut, a thick cup washer, a rubber bush and a thin cup washer. Remove the rebound rubber and bracket assembly from the chassis frame below the bottom wishbone assembly by withdrawing three nuts and bolts. Withdraw the damper from inside the coil spring of the suspension unit through the bottom wishbone assembly by detaching four nuts and a rebound plate. Remove the second rubber bush, distance piece and a second thick cup washer from the top of the damper. Remove the two rubber bushes and the two mounting plates from the eye of the damper by withdrawing the fulcrum bolt.

2. REPLACEMENT

The replacement of the front suspension damper is the reversal of the removal sequence, but particular attention must be given to the following points:

- (i) That the fulcrum bolt of the damper eye is tightened until it bottoms and then the locking tab turned up over the bolt head.
- (ii) That the rubber bushes are fitted to the stem of the damper, spigots toward one another and with the distance piece in their centre, the securing nut is tightened until the distance piece is gripped between the two thick cup washers.

THE ASSESSMENT OF ACCIDENTAL DAMAGE Figs. M18, M19, M20 and M21.

The suspected components must be removed from the car, thoroughly cleaned and examined on a surface table. The reproduced drawings will assist in the assessment.

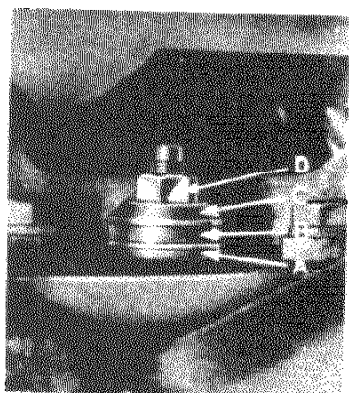


Figure M15

Front road spring damper top attachment.

- A. Thin cup washer.
- B. Rubber bush.
- C. Thick cup washer.
- D. Securing nut.

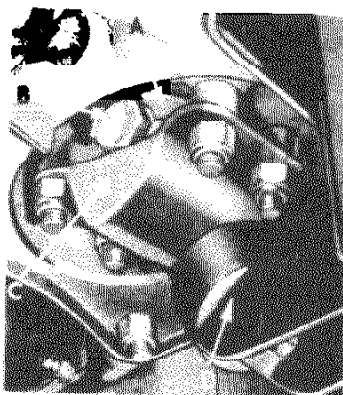


Figure M16.

Front road spring damper bottom attachment.

- A. Bottom plate.
- B. Fulcrum pin.
- C. Rebound plate.
- D. Rebound rubber and bracket.

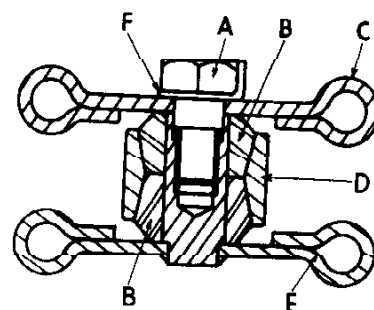


Figure M17

Cross section through bottom road spring damper attachment brackets.

- A. Fulcrum bolt.
- B. Rubber bushes.
- C. Bottom bracket.
- D. Damper eye.
- E. Bottom fulcrum and bracket.
- F. Tabwasher.

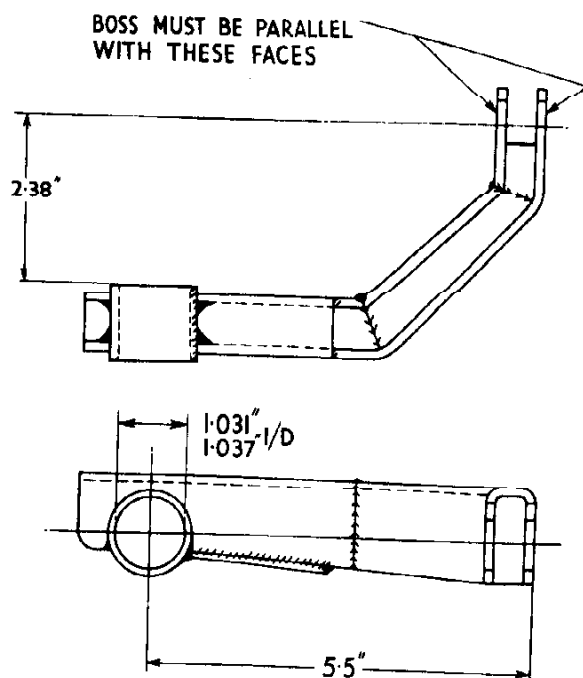


Figure M18

R. H. front or L. H. rear top wishbone arm.

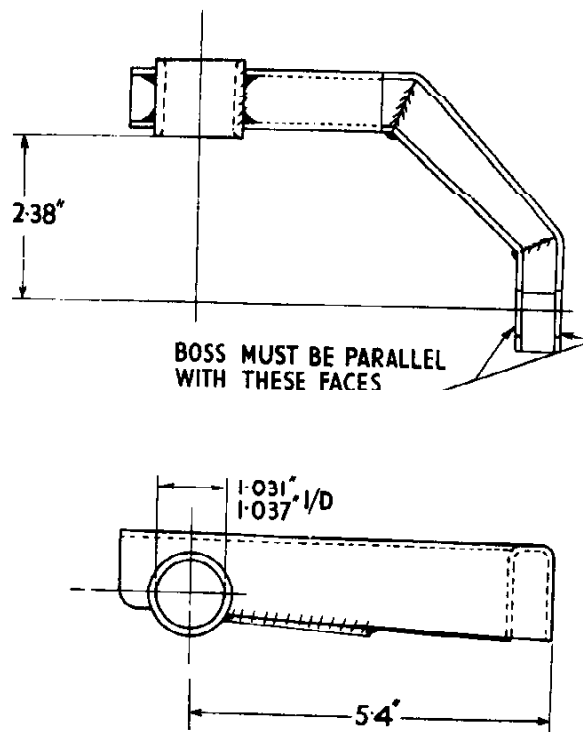


Figure M19.

R. H. rear or L. H. front top wishbone arm.

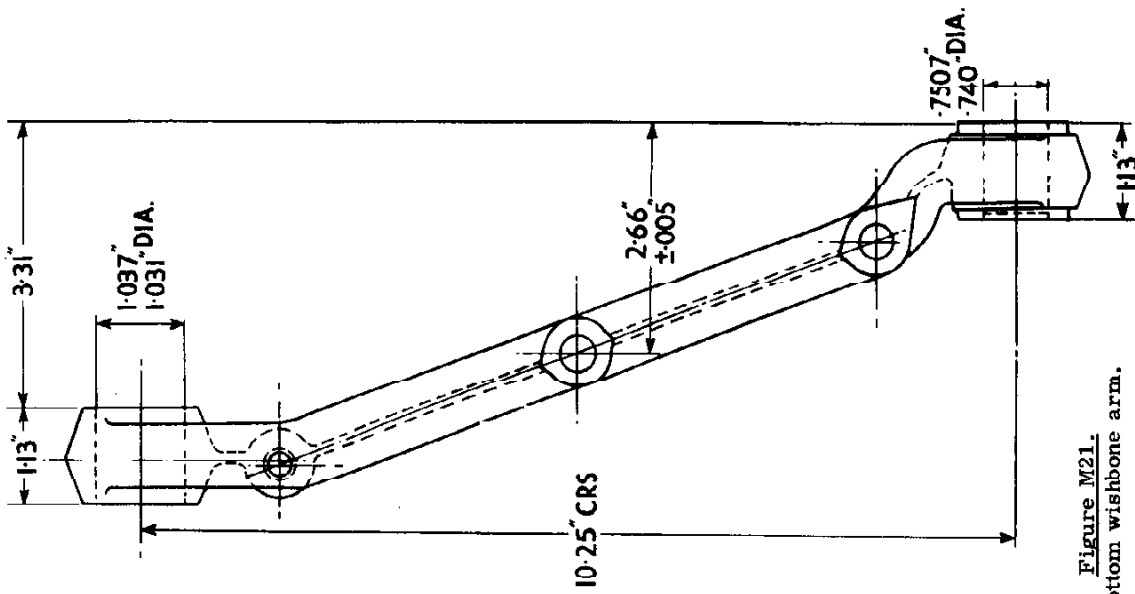


Figure M21.
The bottom wishbone arm.

R. H. rear and L. H. front bottom wishbone arm shown.
R. H. front and L. H. rear are symmetrically opposite.

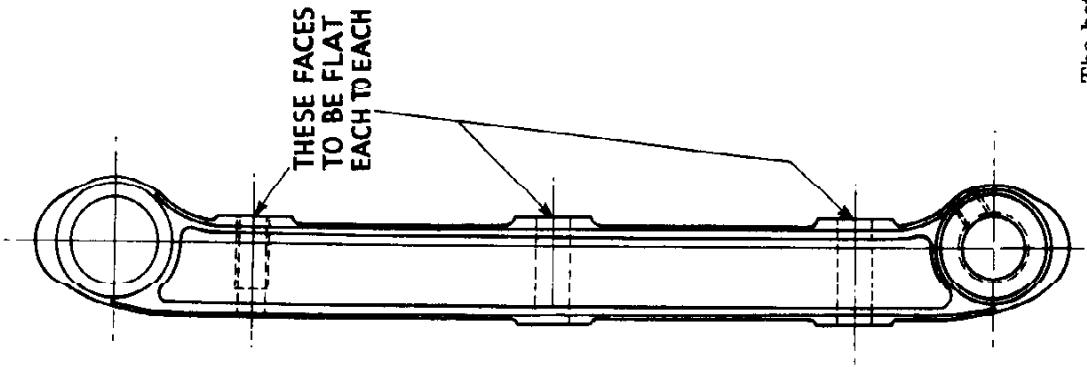


Figure M20.
The vertical link.
R. H. shown.
L. H. symmetrically opposite.