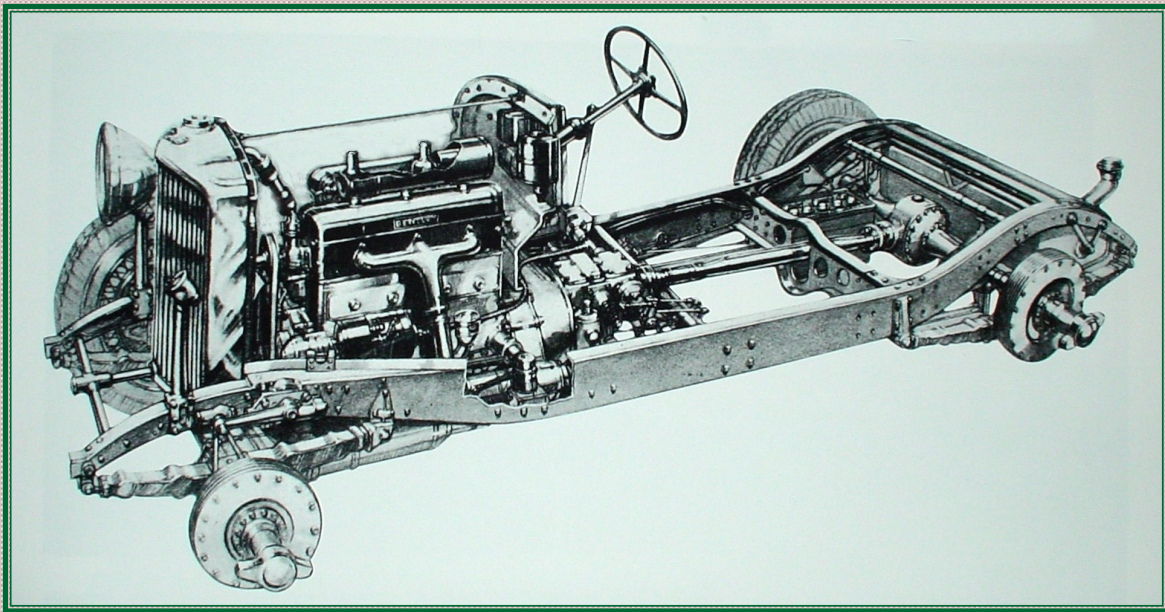


# DERBY BENTLEY AUTHENTICITY GUIDE

*2012 Edition*



*Presented by the*

***Derby Bentley Society***

# PREFACE

(2012 Edition)

Few owners of automobiles on the road today view their vehicles as having any historical importance. That perspective is probably correct as a very small percentage of cars produced during the past 100 years are of such significance that they truly deserve a place in history.

The Derby Bentley is certainly one vehicle deserving to be so honored. In the light of its importance in automotive history we have produced this “Derby Bentley Authenticity Guide”. It is intended as an aid to owners of these vehicles who choose to have them appear as they did when originally manufactured. It does not address technical issues, the Bentley Drivers Club’s “Derby Bentley Technical Manual” fulfills that need in superlative fashion. The scope of this publication is restricted to “cosmetics” i.e. The nuts, bolts, fittings, and finish of the chassis as it left the factory to be delivered to the coachbuilder.

Each Derby Bentley was an individual unit, the details of which often reflecting the customer’s individual taste. Myriad examples of this can be found such as one customer who wanted a Spirit of Ecstasy mascot and Wolf Barnato’s request for white instruments rather than black. For that reason the preparation of a Guide of this type represented a daunting challenge inasmuch as we recognize that many items cannot be said to have “always” or “never” existed in a particular form. What we have attempted to do is present the “standard” with some references to variations. Certain original alloys, paint, and fittings are no longer being produced. We have not attempted to recommend modern substitutes.

It was not expected that the first edition would be the final form of this Guide, and it was not. Even now it should continue to be viewed as a dynamic document constantly subject to additions and corrections.

If the owners of these superb motor cars find this information interesting and worthwhile then our Society’s mission will have been successful.

Stephen E. Styers  
Derby Bentley Society  
Authenticity Guide Chairman

# ACKNOWLEDGEMENTS

(2012 Edition)

It has been nine years since the first edition of this Guide. During that period we have had many expressions of appreciation and contributions for additions and clarifications. In this, the third edition you will find responses to many of those suggestions. The addition of new photos, information, and clarifying text is intended to make this an even more useful instrument than before. It is hoped you will find the effort worthwhile.

The individuals who have contributed information for use in this Guide are far too numerous to recall, much less identify. However, some individuals deserve special note.

In the U.S.A. Dick Frawley, Bob Jefferson, Dale Powers, Pierce Reid and Joel Barnett were all willing contributors.

In the U.K. Will Morrison and Tom Clarke gave freely of their personal time. Will Fiennes as well as Paul and Andrew Wood took time away from business to provide information and access to their shops for photos. Bob Thompson, Nicolas Haran and Ken Lea of the BDC Technical Committee provided input from their vast resources. James Tucker of the RREC was also a willing contributor.

Bernard King, author of "The Derby Built Bentleys" when asked if we could use photos from his book replied, "Delighted for you to use anything you like....". We did, the photo of the first mascot is his. The Bentley Drivers Club was most generous and allowed access to their archives for data collection. The distribution box photos are from their Derby Bentley Technical Manual. Not to be overlooked is Phil Brooks whose generous offer to edit the text was gratefully accepted.

Inasmuch as this is primarily a cosmetic manual, photos add a great deal to its content. Many owners, both Society members and non-members, contributed their vehicles for photos. Those who are known, other than the authors of this Guide, are Cliff Alexander, Rich Buckingham, David Filkins, Neil Henry, Glenn & Martha Kushner, Bob Merrifield, Steve Miller, Will Morrison, Nick Northeast, Ted Reich, Lawrence Smith, Blythe Stasson and Jim Turnbull .

While we have had many contributors, the responsibility for the accuracy of this Guide falls solely to the authors and the Society. We believe all the data to be factual, but it is only a guide and no guarantees in that regard are expressed or implied.

The Guide Committee:

John Haynes  
Bryan Jones  
Greg Millard  
Rod Quill  
Steve Styers, Chairman

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Data Collection, United Kingdom - Rod Quill

PUBLISHED 2003

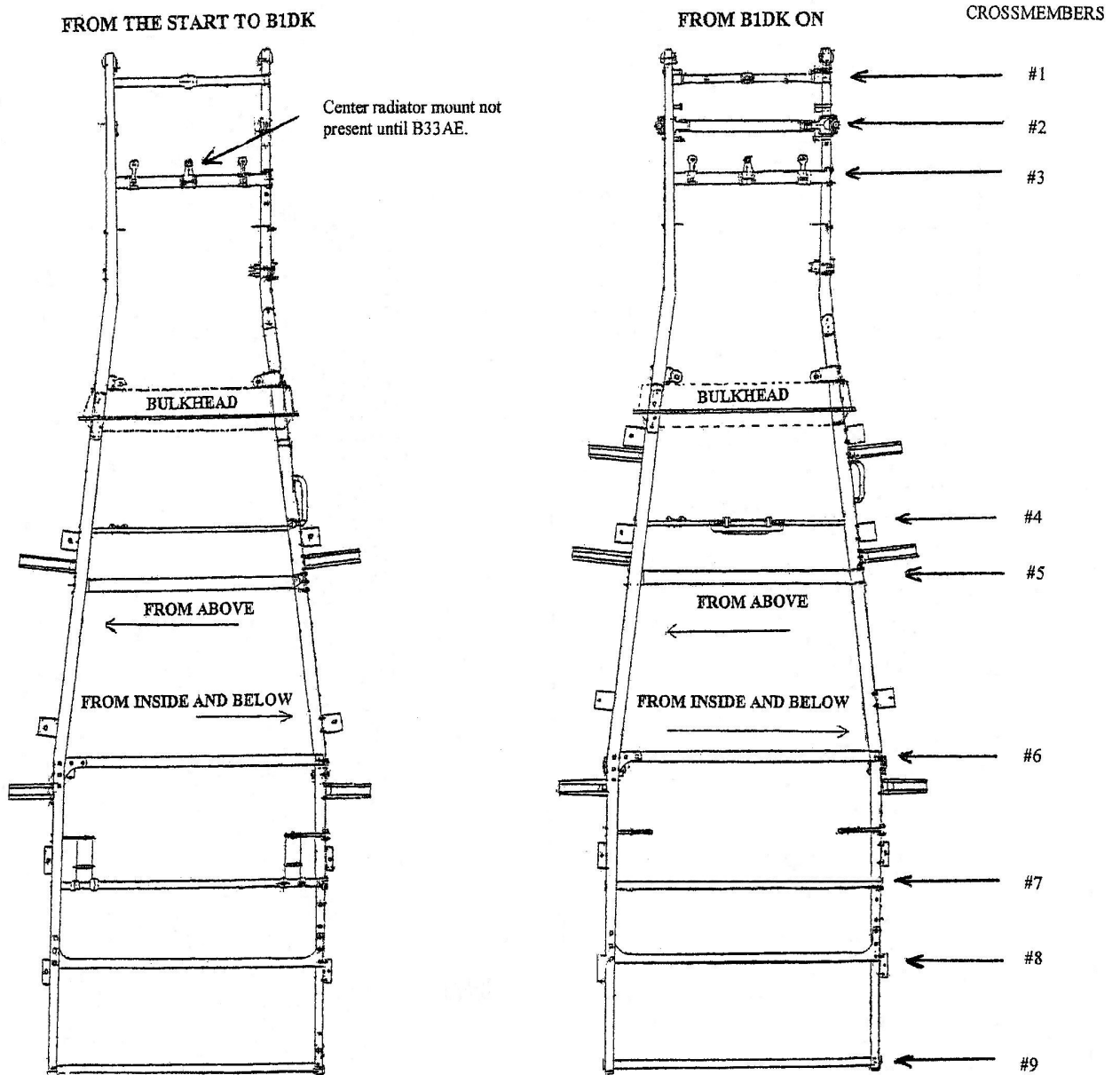
Revised 2006

Revised 2012

Cover Photo: A chassis drawing for "Autocar" by Gordon Crosby made at the Park Ward facility prior to the car's formal introduction.

# FRAME AND FITTINGS

The frame is of the traditional "ladder" design. On early cars the side members are connected by eight cross members with the most forward one being visible above the front apron. At chassis B2DG this member was lowered to beneath the apron. On chassis B1DK the factory followed the design first incorporated on Eddie Hall's B35AE racing Bentley by adding a ninth cross member between the headlight posts. The frame serves the expected functions of providing mounting points for essential components as well as attachment points for fluid and electrical lines as they are routed to various use points throughout the chassis. Details of its construction and fittings follow:



## CONSTRUCTION:

The front and rear cross members are permanently affixed to the side members and not designed for removal. The others are attached with bolts and studs. All bolts used are of square headed design, flat washers are chamfered except for the ones noted as "standard", and spring/lock washers are used under all nuts. Cross member details follow; quantities given are for one side.

First – Permanently riveted.

Second – (only after BIDK). The first 31/2L cars to carry the combined dropped cross member and headlamp mounting arrangement had studs that were 1/4" BSF at each end. Late 3 1/2 L and 4 1/4L cars had 5/16" studs, probably until the end of L-series. At this point the shorter end of the stud that carried the headlamp mounting was increased to 3/8". This cross member was added to reduce vibration of headlamps through increased torsional rigidity.

Third – Attached to the frame at four points. At the bottom two locations are found 5/16" BSF bolts with heads and flat washers to the outside. At the top, the forward bolt is a 3/8" BSF with the head to the outside over a standard flat washer. The rearward top fastener is a 7/16" BSF stud that also serves as an anchor for a shock damper on the outside of the frame rail. A removable center section is attached with four 5/16" BSF bolts at each end with heads toward the side rails. No flat washers are used as the forging is machined to take the side of the square head.

Fourth – It consists of three pieces. The center section is attached to right angled flange pieces at each end with 3/8" BSF bolts with heads forward. The angled sidepieces are affixed to the side rails with 3/8" BSF bolts with heads and flat washers to the outside.

Fifth - Five 5/16" BSF bolts are used. All five have flat washers to the outside. The original design called for the bolt heads to be to the outside but the top bolt was sometimes reversed.

Sixth – It is attached at eight locations, five of which connect a gusset to the top of the side member. The final three attach the cross member directly to the frame side rail, one through the bottom and two through the side. On A, B, and C series cars these were 5/16" BSF bolts. Later cars used 3/8" BSF bolts through the side with "collar nuts" as shown in photo FF-1. The two side rail bolts pass through the frame, a spacer, and the rear spring's forward mount. Many earlier cars were modified to the later specification.

Seventh - Four 1/4" BSF bolts are used. Their heads are on the inside located by the forging at the end of the cross member. Nuts and flat washers are to the outside. The rear battery box support is brazed to this cross member.

Eighth - Six 3/8" BSF bolts are used. Three connect it to the top of the side member and three to the bottom. All heads to the outside, no flat washers.

Ninth - Permanently riveted

## COLOR:

The frame was delivered from the factory painted with a heavy bodied, very durable, dark reddish brown primer, which is no longer available. The exact shade ranged from a current red oxide primer with some dark brown added to a chocolate brown. An example is shown in Photo FF-8. Customer requests or coachbuilders taste may have caused a color coat to be added before delivery, particularly to surfaces visible from outside the vehicle.

## ATTACHED COMPONENTS:

A variety of chassis components are attached to the frame. These include parts of the drive train, suspension, fluid lines, electrical system, coachwork, and misc. items. The first three of these were quite consistently installed with the layout shown on the factory's GA drawings. The remaining three sometimes varied depending upon customer requirements.

### DRIVE TRAIN:

The third cross member (second on early cars) provides support for both the front engine trunnion/motor mount and the radiator. The center hemispherical radiator mount (after B31AE) and engine are both connected to a forging which extends below the cross member. Two 5/16" BSF bolts retain the forging with heads facing forward. The support pieces which provide anchorage for the outer two radiator mounts also extend below the cross member and are connected to it by 3/8" BSF studs which protrude upright. No flat washers are used.

The rear of the combined engine gearbox unit is supported by two different methods. On chassis prior to B2DG it is affixed to the fourth cross member via an asbestos equipped trunnion with six 1/4" BSF studs. From B2DG a conventional rubber mount was provided. The mount is attached to a revised cross member by two 1/4" BSF bolts pointing down, no flat washers. To compensate for the softer mounting, two stabilizing pads were mounted on the top of the cross member. They are each attached with two 1/4" BSF bolts pointing down, no flat washers. This cross member also contains a bracket intended for connecting an exhaust system hanger. It is attached by three 1/4" BSF bolts with heads facing forward.

Lateral movement of the engine is restrained at two points. At the front the torque reaction damper mounting plates are attached to the frame by two 5/16 BSF bolts with heads on the inside and flat washers to the outside. Spacers are provided between the mounting plates and the frame at each bolt location.

On page FF-1, adjacent to the bulkhead can be seen the chassis supports for the rear engine bearer arms. They are each retained by six 5/16" BSF bolts with heads on the inside and standard flat washers to the outside. The center

two were typically fitted with thick spacers on the outside. On vehicles so equipped the bottom four also served to attach one of the arms for a side mounted spare. A reinforcing plate is located between the chassis support and the frame. Two ¼" BSF bolts with heads to the outside and no flat washers attach the support to the bottom of the frame rail.

#### SUSPENSION:

Related components consist of four on each side: two spring mounts and two rubber rebound stops. The front spring mount is at the rear of the spring and consists of two parts. The outer section extends down the side of the frame to its underside where it is retained by two ¼" BSF bolts with heads to the outside, no flat washers. The frame is "sandwiched" between the two forgings which are fixed in place by four BSF bolts with heads to the outside, no flat washers. On 3½ s these bolts are ¼" and on 4 ¼s they are 5/16". The front anchorage of the rear spring is attached by four 3/8" BSF bolt with heads to the outside. The front two pass through the frame, a strengthening spacer, and the fifth/sixth cross member. The rear two also pass through a strengthening plate as well as the frame. No flat washers are used. All four bolts are retained with the collar nuts addressed under the "Construction" section. (Photo FF-1)

The front rebound stop is equipped with a 3/16" thick plate, which is retained by two ¼" BSF bolts with heads to the in inside, no flat washers. At the rear the stop is connected to the frame with two 5/16" BSF bolts with head and square steel plates measuring 1 x 1 ¼ x 1/8" to the outside. No flat washers are used.

#### FLUID LINES:

The fuel line, central lubrication, and ride control lines (from B1CS) are routed throughout the chassis. They were anchored with a variety of clips. No flat washers were used with the various types of line clips. All aluminum clips were delivered to the coach builder in their natural finish.

Fuel lines are 5/16" copper tubing. There are routed from the tank across the penultimate cross member to the offside frame rail then forward to the bulkhead and retained with aluminum clips as shown on the right side in Photo FF-2. The clips are attached with 5BA x ¾" cheese head machine screws with heads to the outside. Prior to the "reserve tap" being deleted there were two fuel lines, then only one.

The ¼" copper ride control lines are routed from the initial junction located on the offside frame member. They are retained by aluminum clips similar to ones used for the fuels lines but are slightly more "peaked" to accommodate the smaller diameter tubing. Note an example of this on the left in Photo FF-2. These are attached with 5BA x ¾" cheese heads with heads to the outside. The line crosses to the nearside on the fourth/fifth cross member. Here it is retained by three metal clips of the type shown in Photo FF-3. These are painted black and attached directly to the cross member with 5BA x ¼"

cheese head machine screws. The junctions are attached to the frame rail bottom with square headed  $\frac{1}{4}$ " BSF bolts, heads to the outside.

The central lubrication system is by far the most complex of the fluid lines. Three different clip styles are used to retain the brass lines. One is solid aluminum designed for one line, see Photo FF-4. It is attached to the frame with 5BA x  $\frac{5}{8}$ " cheese head machine screws with heads to the outside. The second is also solid aluminum designed for two lines, also shown in Photo FF-4. It is attached to the frame with 5BA x  $\frac{5}{8}$ " cheese head machine screws. The third style is a metal stamping, see Photo FF-5. Seven of them are used across the rear axle housing. They are painted black and attached directly to the housing with 2BA x  $\frac{3}{8}$ " cheese head machine screws.

After road tests and for a variety of other reasons the chassis was occasionally repainted after the fluid lines were installed. Therefore, it was not uncommon to find them coated with paint when originally delivered.

#### ELECTRICAL SYSTEM:

The wires are conveyed to various points in the chassis through metal conduit. The conduit is affixed to the chassis by metal clips, which are attached with 3BA x  $\frac{5}{8}$ " square headed machine screws. More details on this system will be found in the Electrical section of this booklet.

#### COACH WORK AND MISC:

All bolts used in the following commentary are of square headed design; flat washers, where used, were chamfered. Spring washers were routinely used. Carriage style bolts, not square headed, with standard flat washers and spring washers were often used to secure the body to the frame. Park Ward used metalastic mounts as well.

Body mounts are attached with  $\frac{1}{4}$ " BSF bolts with heads generally to the outside, no flat washers. The exception is the final standard mount. In this case the GA drawings show all four bolts with heads to the inside. In some cases, however, the rear two bolts were positioned with head outside. Running board braces are attached with  $\frac{5}{16}$ " BSF bolts heads to the outside, no flat washers. Spare tire mount arms, bulkhead supports, and wing stays are also attached with  $\frac{5}{16}$ " BSF bolts but heads are to the inside, no flat washers.

Fuel tank hangers are placed on the frame at three locations. On each side member they are attached with two  $\frac{5}{16}$ " BSF bolts with heads to the inside and castle nuts outside, no flat washers. The third hanger is placed on the bottom of the penultimate cross member. It is attached with two  $\frac{1}{4}$ " BSF bolts with heads above the rail and castle nuts below, no flat washers.

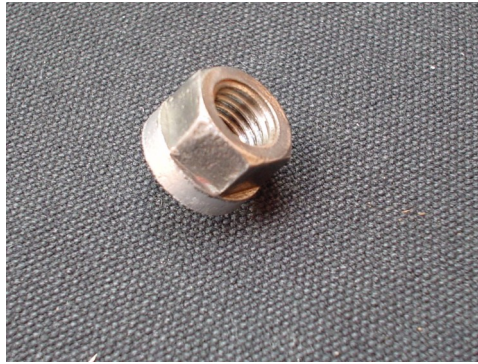
Rear shock damper mounting plates are attached to frame rails with  $\frac{5}{16}$ " BSF bolts with heads on the inside and flat washers to the outside.

A battery box is suspended from crossmembers #6 and #7. It is attached to #6 with two 5/16" BSF square headed bolts facing from rear to front with chamfered flat washers at both head and threaded ends. The bolts are secured with castle nuts with a spacer often found between the box and the cross member. The rear of the box is retained by a 5/16" BSF bolt facing from front to rear secured with a castle nut. The bolt is of a unique design with a 5/16" BSF stud protruding from its oversized head. The stud provides a chassis grounding point for the battery's negative post. On early cars this was not the case as there was a brass earthing post (ground) fitted to the vertical side of the offside chassis rail. Early battery boxes were plain steel; late cars have a thick protective coating.

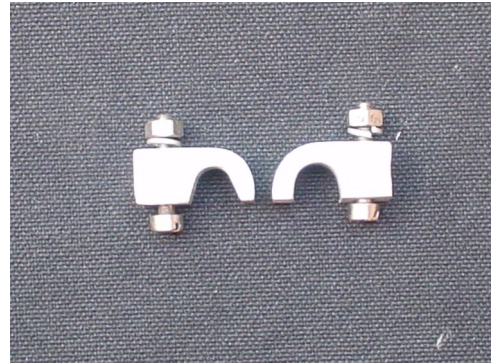
Two electrical junction boxes were installed on the frame. One is located toward the front on the interior of the offside frame rail across from the water pump (Photo FF-6). It serves as the junction point for the horn grounding circuit. The other is located on the rear of the sixth cross member (Photo FF-7). On 3-1/2L cars and early 4-1/4s it is fitted toward the nearside end of the cross member. After that it is positioned near the offside end. It serves as the distribution point for the coach and rear lighting circuits. Both junction boxes are of brown Bakelite, the covers of which are retained by single handled 3BA brass fasteners.

On early cars, into the "C" series at least, the floorboards surrounding the gear selector and crossing to the nearside, were fabricated of wood. On later cars the wood was replaced with heavily coated aluminum, which was retained to the frame by six 1/4" BSF cheesehead bolts.

# FRAME AND FITTINGS



**FF-1 Collar Nut**



**FF-2 Ride Control Clip-Left  
Fuel Line Clip-Right**



**FF-3 Ride Control Line  
Clip-Steel**



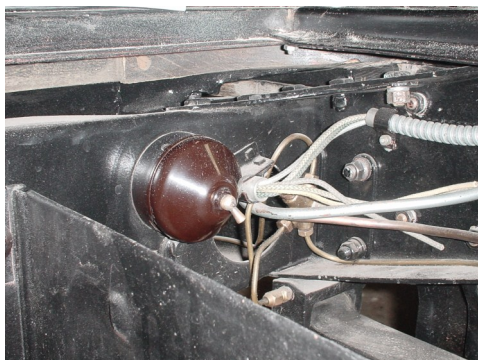
**FF-4 Bijur Line Clips**



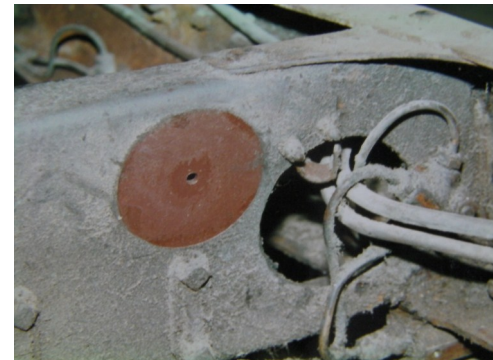
**FF-5 Bijur Line Clip-Steel**



**FF-6 Horn Wire Junction Box**



**FF-7 Wiring Junction Box**



**FF-8 OEM Primer Color**

# UNDERCARRIAGE

## (Suspension and Operating Controls)

The undercarriage is the portion of the car where extraordinary attention to detail is shown. Due to the light construction of the frame and the desire to refine ride and handling the company departed from the then current fashion. Basically, everything had a place, a reason, and a reason to be in that place. The systems considered here contain those items attached to the frame having a specific operational purpose:

Springs and Shocks  
Drivetrain  
Operating Controls  
Gaiters and Boots

Not included are parts of the body, frame, electrical, fuel, and Bijur systems.

Now, as at the time the cars were manufactured, not many owners care to explore these far reaches of the car's anatomy, but for those who do, this section is included.

A commentary on each major component of the systems covered is contained in the relevant section. It should be understood that where reference is made to studs and bolts, the bolts are square headed with plain nuts and lock/spring washers. The plain nuts used at the time of the car's manufacture are different in thickness from their modern equivalent. Detailed consideration of nut, bolt and washer forms is an interesting subject but would be better addressed in another forum. In those instances where castle nuts are identified cotter pins are also required.

Additional research data should come from, in order of priority, the appropriate GA & LOP drawing, the original owners handbook, an unmolested sample in the area of your interest, the BDC Technical Manual, and finally a friend's opinion.

### SPRINGS AND SHOCK ABSORBERS/DAMPERS:

#### SPRINGS:

The front and rear springs, which were factory tested for spring rate and ride height before installation, are pinned at the back of the front spring and the front of the rear spring. The opposite end of each spring is shackled to allow for its horizontal displacement. At both ends of each spring lubricating oil from the Bijur system passes through the hangers and pins then into the spring's masterleaf. From there the oil passes through a series of holes and channels to lubricate the next three leaves.

At the fixed end of each spring the mount's retaining bolts are installed with heads to the outside (Photos U-1 & U-2). The shackle pins front and rear are retained with castle nuts to the outside (Photo U-3). These are 5/16" BSF in the front and 3/8" BSF to the rear. The springs were typically cadmium plated to reduce friction and inhibit rust. At each of the four points where a stationary pin is used in the mount it is surrounded by aluminum housing which provides anchorage for the gaiter end cover. The use of these housings is illustrated in Photos U-1 (front spring) and U-2 (rear spring).

#### SHOCK DAMPERS/ABSORBERS:

At the front, the dampers are attached to the frame at three points. On early cars to some point in the BL series all bolts were 3/8" BSF. The lower bolt passed through a lug in the damper and secured a right angle bracket to the damper. The bracket was then attached to the frame rail with two 1/4" BSF bolts. Later cars were equipped with an adapter plate and were attached to the chassis with a 7/16" BSF stud at the top front, a 7/16" BSF bolt at the top rear and a 3/8" BSF bolt at the bottom of the plate.

At the rear, the front of each unit is suspended from mounting plates attached to the frame's side rail. The rear of the unit is suspended from the seventh crossmember. On early cars the front of the unit is suspended from the plates using one 5/16" BSF bolt facing back to front. Later cars had slightly modified mounting plates and used two bolts instead of one. The bolts were of the same size and positioning as on early cars. There was also a change from early to later cars in the manner in which the rear of the unit was mounted. On early cars it was suspended from the seventh crossmember with two 3/8" BSF bolts with heads toward the damper. Later cars used only one 7/16" BSF bolt, also with head toward the unit pointing outward. Shock dampers were painted black when installed.

At B1CW all chassis came equipped with adjustable dampers which are similar in appearance to the previous units except they have a fluid line connected to the end cover. (Photo U-4) Pressure is maintained by a gearbox mounted and driven pump and ride control governor. These items are contained in a cast aluminum case that is connected to the tubing system on the frame by a metal shielded flexible line. Both items were installed in their natural state. Their positioning in the chassis is shown in Photo U-5, location "A".

#### DRIVE TRAIN:

##### FUEL/PETROL TANK:

The tank is equipped with a 9/16" x 20 threads per inch Whitworth form stud at each end and a 5/16" BSF stud in the center pointing forward. All three studs are secured to the chassis with castle nuts, as are the bolts that attach the tank hangers to the frame (Photo U-6).

#### DRIVE/PROPELLER SHAFT:

The drive shaft was unpainted or sometimes painted black whereas the enclosed "U" joint was cadmium plated (Photo U-7). At chassis B2DG a 3.6 kilo mass was added to the flange on the output of the 3<sup>rd</sup> motion shaft of the transmission (Photo U-5, location "B"). Its primary purpose is to reduce "judder" when engaging the clutch. This damper was retained throughout the remainder of the 3½ litre cars. It was then discontinued but reinstated at B53JY. It is known that a number of cars produced during the "official" hiatus were fitted with the damper. The hub is natural brass, the surrounding plates that form the damper flywheel are painted black.

#### ENGINE MOUNTS AND STABILIZERS:

The engine's mounting system incorporates a front subframe pivot, (which also carries the radiator from B33AE) and a rear mount behind the transmission. Vibration and torque reaction of the engine are addressed at three additional points. First, by the rubber buffers at the rear of the gearbox (Photo U5, location "C") which did not appear until B2DG. Secondly, by the torque reaction supports which extend from the flywheel housing (Photo U-8). These "supports" are also referred to as engine bearer arms in the BDC technical manual. They are each attached to the frame through steel cups, a spacer and rubber buffers with a slotted countersunk-headed 3/8" BSF bolt and castle nut. Thirdly, at the front are torque reaction dampers, sometimes referred to as "Henry's little shockers" Photo U-9). Their intent is to resist rotational movement of the engine under and deceleration and perhaps provide vibration dampening at idle. The center bolt applies pressure to the chassis mounting plate through fiber friction discs. On 3½ litre cars the central bolt is a 3/8" BSF, which applies its load via a coil spring. On later cars a ¼" BSF bolt is used with the load being applied through a star leaf spring as shown in Photo U-9. The center bolt on both models is secured with a castle nut. All steel components of the mounts and stabilizers are painted black.

#### EXHAUST SYSTEM:

The system is very straight forward, the precise details of which can be found in the BDC's tech manual. For our purpose here it should be noted that the system's journey begins at the downpipe, the cladding of which is retained by Jubilee clamps finished in Watt's Cold nickel. At the first expansion box the system is permanently secured to the engine sump with a three piece bracket utilizing ¼" BSF nuts and bolts. From there it is suspended from three exhaust hangers of the double spring type which makes perfect sense as the first bump can be either up or down. The first two hangers are of the same "Y" form (Photo U-10). The final one is much smaller but equally complex (Photo U-11). Square headed bolts, castle nuts, Thackeray washers, and waisted spacers are used on each hanger. An exhaust cutout was offered as an option on 3 ½ litre cars but discontinued with the introduction of the 4¼'s at B2GA. It was manufactured of cast parts that were left natural and steel linkage, which was painted black.

## OPERATING CONTROLS:

### STEERING:

The original steering box was of the company's own manufacture. At B2MR a different unit became standard. It is known as the "Marles" box although a variety of other bearing companies: Ransome, Hoffman, and Pollard were also involved in its design and development. It was actually manufactured by the Adamant Engineering Company. Both units are painted black, the original being identified by noting that the steering column enters above the output rocking shaft (Photo U-12),, and has no identification tag whereas the Marles box does have such a tag.. The Marles unit can best be identified by an aluminum sleeve visible between the column mounting flange and the steering box. Also of note is that its steering column enters the box below the output shaft .

Control linkage and security of attachments are important and should be checked on technical drawings.

### THROTTLE:

The throttle pedal is nickel plated with serrations top to bottom (Photo U-13). A clamp containing two 2BA-machine screws controls height adjustment. Linkage from the pedal to under the bonnet controls is painted black.

### CLUTCH AND BRAKE:

Both clutch and brake pedals have rubber pads containing a molded "B" (Photo U-13). The originals clipped over the pedals. Height adjustment for each can be controlled by a clamp on the pedal shaft. The clamps are operated with 5/16" BSF bolts secured with castle nuts. Above the clamp is a spring, cup, and felt pad designed to prevent a draft from coming up through the toe board (Photo U-14).

The hand and foot brakes operate through shafts equipped with equalizers and lubricated by the Bijur system. The front brake shaft passes through the bell housing with the equalizer to the nearside. The hand and rear foot brake shafts are attached to the frame's fifth crossmember. Both are shown in Photo U-5 which also contains a small portion of the Bijur tubing layout. The hand brake shaft is at location "D" and the foot brake at "E". The linkage for all the brakes is very similar. The parts were either left as natural forgings, or purchased as "Bright stock". The brake linkage and shafts were commonly installed in their natural state. Occasionally, particularly on show cars, some or all of the components were painted black. A top hat security washer is used on each pivot pin. The security washers provide precise location of the cotter pin to minimize slop in the connection.

Note in Photo U-15 that the heads of the clevis pins on the rear foot and hand brake cables are to the inside to avoid fouling. In the photo the heads of the pins have been blackened to better show the relationship one to the other. The brake cables or “ropes”, as they are sometimes identified, are of high tensile strength stranded wire with a galvanized finish. The galvanizing provides corrosion protection as well as acting as a wetting agent for the end soldering operation. The forged ends have a tapered center with the larger end away from the cable. This allows the cable to be swaged with a shallow angled conical taper pin and soldered in place. This puts the solder joint in compression as the brake is applied. Neither the ropes nor ends were painted when installed.

The brake drums were all finned. On early cars the front fins were approximately  $\frac{1}{4}$ ” long and the rears  $\frac{1}{2}$ ”. The outer fin on the front drums is notched to provide for the insertion and removal of the drum’s outer plate retaining bolts. With the introduction of “M” series cars the rear fins were lengthened to  $\frac{3}{4}$ ”. A comparison of the two rear drums is shown in Photo U-16.

## GAITERS AND BOOTS:

A full set of gaiters and boots consists of 29 items, the originals having been manufactured of black leather by the WEFCO Company in the U.K. The items comprising a full set are listed below. The flash used to take the photos caused some of the gaiters and boots to appear gray. The rear side steering tube cover (Photo U-20) was used only through “K” series cars. “L” and “M” series chassis did not have a leather cover, but were fitted with a spring loaded “mud excluder”.

| Item                               | Quantity | Photo ID |
|------------------------------------|----------|----------|
| Spring Gaiters                     | 8        | U-17     |
| Gaiter End Cover                   | 4        | U-18     |
| Boot, Gear, Selector Shaft         | 1        | U-19     |
| Boot, Rear, Side Steering Tube     | 1        | U-20     |
| Boot, Front, Side Steering Tube    | 1        | U-21A    |
| Boot, Cross Steering Tube          | 2        | U-21B    |
| Boot, Front Shock Damper           | 2        | U-21C    |
| Boot, Front Brake Rod-Upper        | 2        | U-22A    |
| Boot, Front Brake Rod-Lower        | 2        | U-22B    |
| Boot, Rear Shock Damper Link-Upper | 2        | U-23A    |
| Boot, Rear Shock Damper Link-Lower | 2        | U-23B    |
| Boot, Front Brake Cable Opening    | 2        | U-24     |

## DETAIL REFERENCES:

For those who desire more detailed information on major components of the undercarriage, the following references are provided:

|    | <b>DESCRIPTION</b>               | <b>GA/LOP<br/>Drawing Ref No.</b> | <b>CD Loc</b> | <b>BDC<br/>Manual</b> |
|----|----------------------------------|-----------------------------------|---------------|-----------------------|
| 1  | Springs—Mounting (front)         | FB241 & FB242                     | DB3           | O                     |
| 2  | Sprints—Mounting (rear)          | FB994                             | DB3           | O                     |
| 3  | Engine Torque Reaction Damper    | EB178 & FB1505                    | DB3/4         | E                     |
| 4  | Engine Mounts                    | FB270 & FB1505                    | DB3           | R                     |
| 5  | Front Shock Absorber Mount       | FB1340 & FB1505                   | DB3           | O                     |
| 6  | Steering Box—3½ & 4¼             | FB239 & FB240                     | DB3/4         | E                     |
| 7  | Steering Box—M Series            | FB3248                            | DB4           | N                     |
| 8  | Exhaust & Hangers                | EB1155                            | DB3           | S                     |
| 9  | Exhaust Cutout                   | EB842, 829 & 837                  | DB3           | -                     |
| 10 | Clutch/Brake & Throttle Controls | FB358                             | DB3           | -                     |
| 11 | Drive Shaft—No Damper            | -                                 | DB3           | H                     |
| 12 | Drive Shaft—w/Damper             | GB702                             | DB3           | H                     |
| 13 | Front Brake Linkage              | GB517                             | DB3           | J                     |
| 14 | Rear Brake Linkage—Foot          | GB1075 & GB854                    | DB3           | J                     |
| 15 | Rear Brake Linkage—Hand          | GB488 & GB1123                    | DB3           | J                     |
| 16 | Brake Equalizers—Front           | GB517 & GB1075                    | DB3           | J                     |
| 17 | Brake Equalizers Rear—Foot       | GB1124                            | DB3           | J                     |
| 18 | Brake Cable, Stranded wire rope  | GB517 & GB1075                    | DB3           | -                     |
| 19 | Rear Shock Absorber—Non Adj.     | FB262                             | DB3           | -                     |
| 20 | Rear Shock Absorber—Adj.         | FB1339 & EB1771                   | DB3/4         | E                     |
| 21 | Ride Control Governor            | FB1341 & FB1192                   | DB3           | G                     |
| 22 | Battery Box                      | DB570                             | DB3           | -                     |

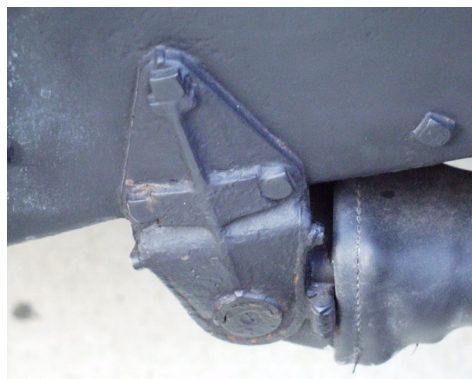
Location legend:

DB3 – 3 ½ litre section of Derby Bentley CD

DB4 – 4 ¼ litre section of Derby Bentley CD

DB3/4 – Combined section of Derby Bentley CD

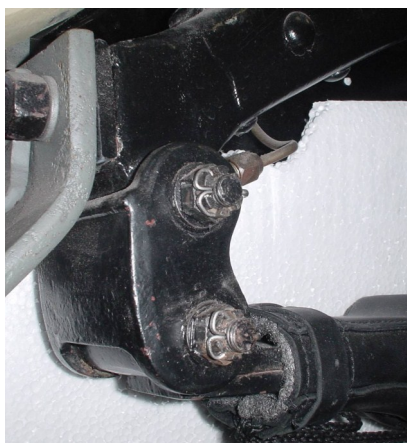
# UNDERCARRIAGE



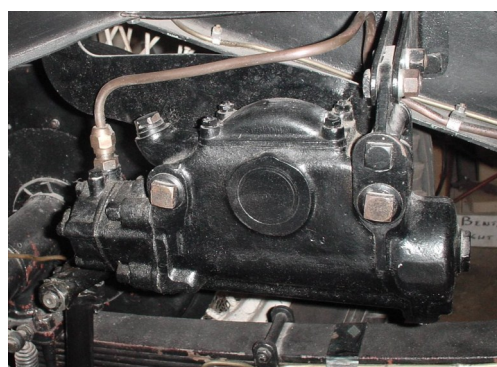
**U-1 Front Spring Mount**



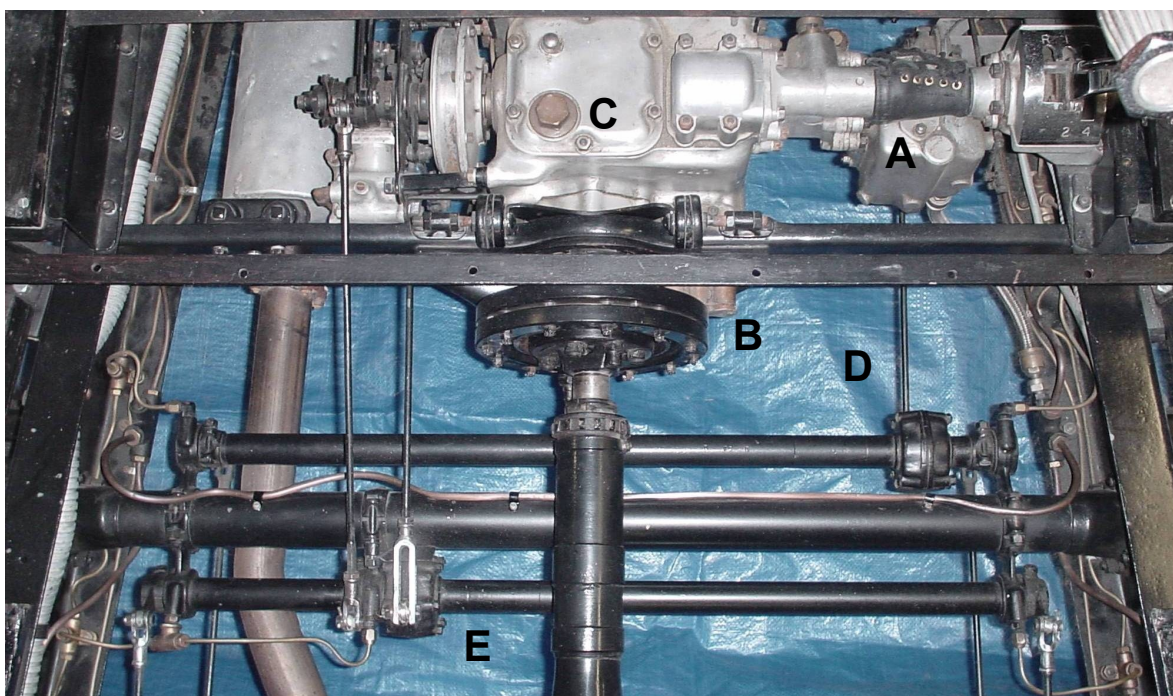
**U-2 Rear Spring Mount**



**U-3 Spring Shackle**



**U-4 Shock Damper w/ Ride Control**



**U-5 A—Ride Control Pump, B—Drive Shaft Damper, C—Engine Stabilizer  
D—Hand Brake Shaft, E—Rear Foot Brake Shaft**



**U-6 Fuel Tank Hanger**



**U-7 Drive Shaft-No Damper**



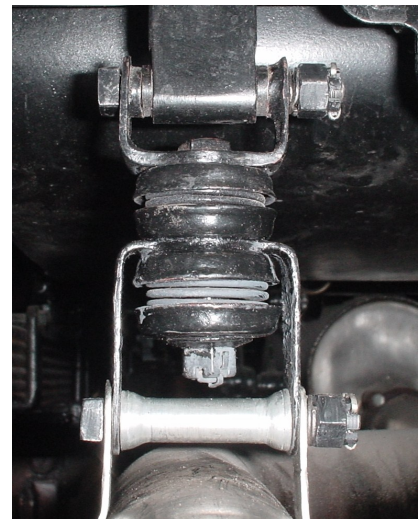
**U-8 Torque Reduction Support**



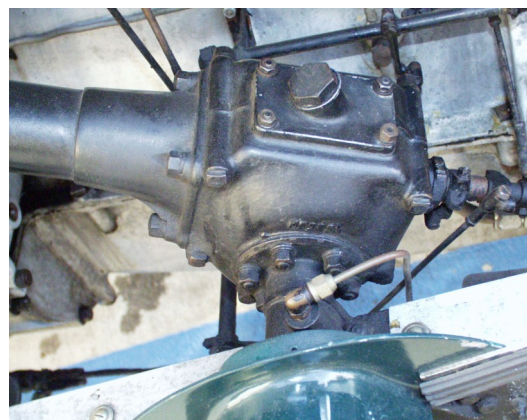
**U-9 Torque Reduction Damper**



**U-10 Exhaust Hanger**



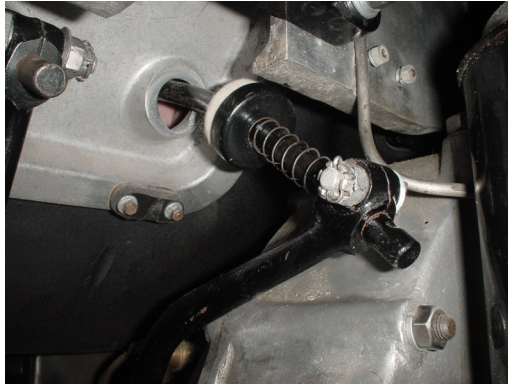
**U-11 Exhaust Hanger, Rear**



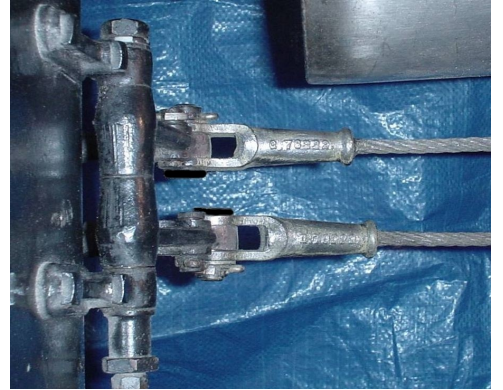
**U-12 Steering Box**



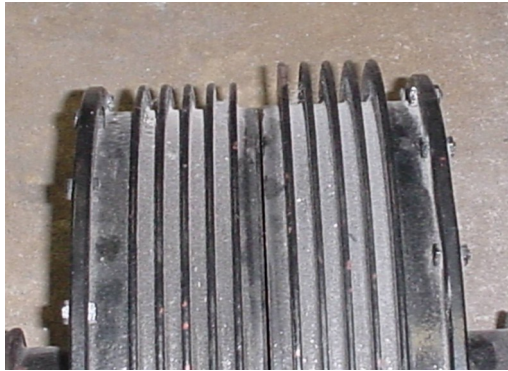
**U-13 Foot Controls**



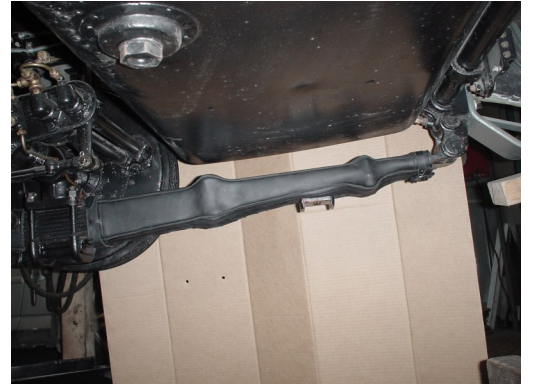
**U-14 Clutch Shaft**



**U-15 Brake Cable Pins**



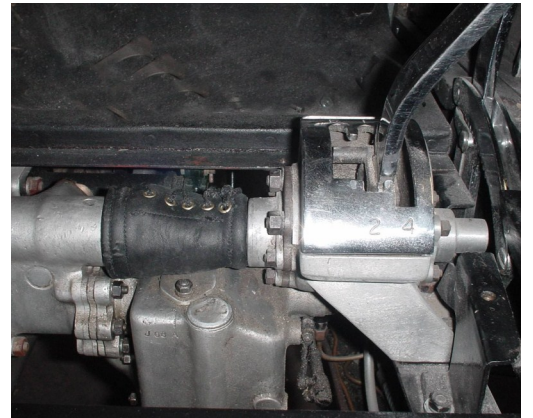
**U-16 Rear Brake Drums**



**U-17 Gaiter**



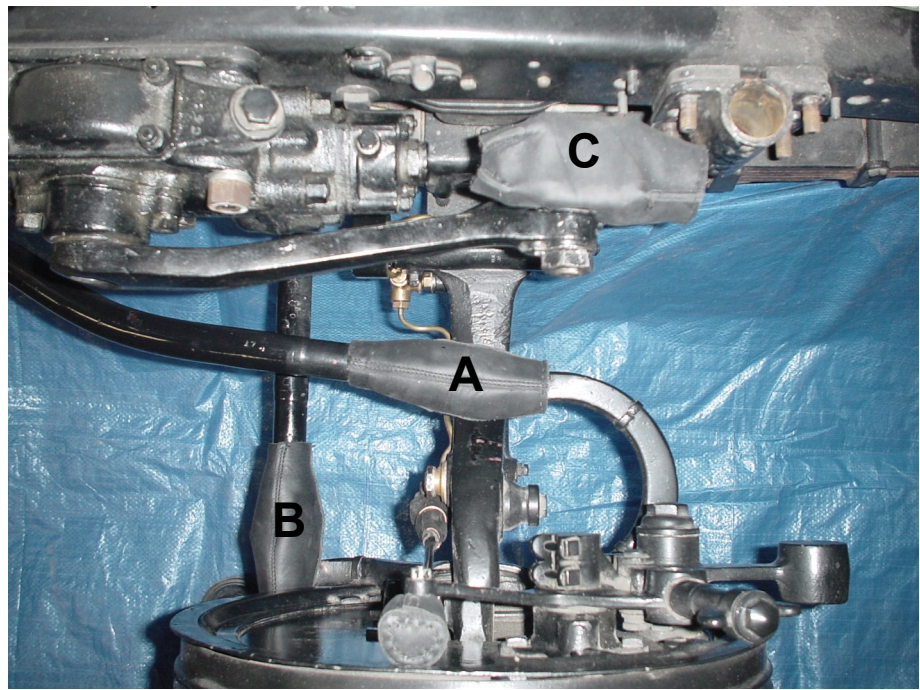
**U-18 Boot/Cover**



**U-19 Boot/Cover**



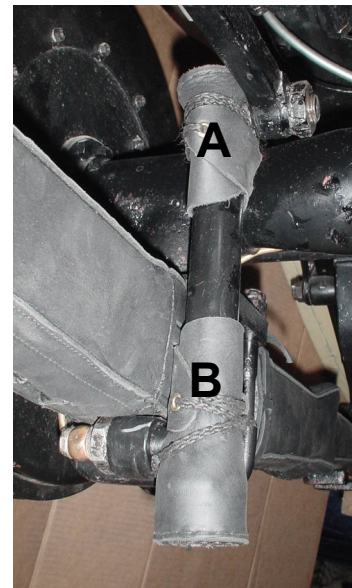
**U-20 Boot/Cover**



**U-21 A, B, C Boots**



**U-22 A, B Brake Rod Boots**



**U-23 A, B Shock Link Boots**



**U-24 Front Brake Cable Boots**

# UNDER THE BONNET

The features found in the engine compartment were very consistent. Customer and coachbuilder choices were, therefore, quite limited.

This section will cover four major areas: Engine-Exhaust/Nearside, Engine-Carburetor/Offside, Cooling System, Bulkhead and Misc.

## ENGINE-EXHAUST/NEAR SIDE:

### HEAD:

The head is painted black. Its valve cover is also black with the "Bentley" lettering natural aluminum, the frame around the word should be painted black. The lip around the bottom of the valve cover is natural aluminum. Information plate(s) are black with natural brass lettering and surround (Photo UB-1).

### BLOCK:

The block and side plates are painted black. Fasteners on 4 ¼ litre engines are painted black. On 3½ litre engines, the side plates are retained with 2 plated knobs each. The information plates on these engines should be black with natural brass lettering and surround.

### CRANKCASE AND SUMP:

Crankcase and sump are both natural aluminum. Crankcase fasteners, where the crankcase is fixed to the sump, are square headed, black metal, unpainted. On all cars through B203LE the oil filler cap contains a large black enameled "B". Starting at B2MR the "B" was eliminated.

### EXHAUST SYSTEM:

The exhaust manifold is gray/black. The flash used for the photos in this Guide cause the color to appear lighter than original. Both plain and long shouldered nuts were used. Photo UB-2 shows an example of each. Standard nuts of steel were those originally specified for 3-1/2 litre cars. Drawings show long shouldered and extended studs on the front and rear ports of "M" series cars. The specified fitment for the center port continued to be standard nuts. Many earlier cars were retrofitted with the long shouldered nuts and longer studs. It is unknown exactly when, but during the course of production the specification for the nuts was changed from steel to brass. The exhaust manifold is connected to the down pipe with three ¼" BSF bolts with heads above and nuts below. The bolt heads are chamfered on the underside to fit into the conical recess in the manifold. Chamfered washers are used above the nuts below the flange to achieve the same purpose. Lagging around the downpipe is retained with Jubilee clips.

(PAGE REVISED 2006)

#### GENERATOR AND STARTER:

The generator body and rear end caps have a nickel finish. The tachometer drive housing at its rear is painted black. Wires to the generator are connected by right angled eyelet/"D" fittings under special nickel-plated standard nuts. The wire to the upper, positive terminal is black, while the lower wire is black and white. The starter body is nickel and the end cap natural aluminum.

#### ENGINE-CARBURETOR / OFFSIDE:

##### CARBURETOR:

The entire carburetor set and air cleaner are painted black. The round serrated flange nut connecting the air cleaner and the carburetors is nickel plated, as is its spring retaining clip (Photo UB-3).

The carburetor air valve caps, all links, fixtures on top of the float bowls, and screws on the side of the air chamber are nickel-plated (Photo UB-3). As a general rule it can be said that all screws, nuts and bolts, which are routinely adjusted when working on the engine, are nickel plated, as is the fuel line near the carburetors.

All mechanical linkages, the steering box, steering column and its mounting are painted black. "TOP HAT" security washers (Photo UB-4) are utilized at six locations; two on the bottom of the mixture control links, two on the throttle coupling shaft near the front carburetor, and two on the timing control shaft connected to the distributor.

##### IGNITION:

Two mushroom type coils with brown finish were supplied from the start. These coils have side-exiting wires to the distributor. On the very late MK-V cars the engines were equipped with top exiting wires. From B1AE to B200CR the spare coil was mounted on the bulkhead. Starting with B1CW the spare coil was moved to stand alongside the operational coil and remained there until the end of production (Photo UB-3). The photo used causes the coils to appear much more red than their original dark "walnut" brown. The wire from the operational coil to the ballast resistor should be light blue. The loom through which the ignition wires pass is black. The wires end with eyelet connectors, which are attached to the spark plugs with knurled brass thumbnuts (Photo UB-5). Ross Courtney fittings were originally used as the eyelet, the one shown in the photo is one specified for Rolls Royce and is a common replacement item. A numbered wire marker is not visible in the photo but was called for at each end of the spark plug wires. The marker at the plug end was intended to have a "B" on the side opposite the number while the one at the distributor end contained no such identifier. Archive material indicates that a unique marker 1-1/4" in length was intended for the distributor end of the #4 wire on L and M series cars. How many, if any, found their way into production is unknown by the authors of this guide.

## COOLING SYSTEM:

### RADIATOR

The radiator tank, surround, and calorstat mechanisms are painted black. The overflow line running down the side of the radiator should be black. The radiator core is dull black (Photo UB-3). Information plates are black with natural brass lettering and surround (Photo UB-6).

### HOSES AND CLIPS:

On chassis through the "L" series the coolant passes from the engine to the upper radiator tank through a nickel-plated tube connected at each end with black rubber hoses and jubilee clips (Photo UB-1). "M" series cars do not have a separating pipe but just a single hose with jubilee clips. The water outlet at the bottom of the radiator connects through a short hose to a nickel-plated pipe then through another short hose into the bottom of the water pump (Photo UB-3). The water pump is painted black, as are the fastening nuts. The screw down greaser on the water pump is solid nickel silver (Photo UB-3).

### FAN:

The fan is painted black with its oil cup nickel-plated (Photo UB-7). The round, hand adjustment fixture for tightening the fan belt is natural bronze, as is the jam nut above it (Photo UB-7).

## BULKHEAD AND MISCELLANEOUS:

### FUEL SUPPLY:

The fuel line on the bulkhead to the fuel pumps is cadmium plated. The fuel pumps are black and mounted on a black aluminum centerpiece, which is fixed to the bulkhead. Both pumps are individually fused in their caps (Photo UB-8). The brass plug behind where the fuel line runs to the carburetter is nickel-plated. A metal shielded flexible line connects the fuel pump outlet line with the carburetors (Photo UB-3). The 3½ litre cars have a change over tap and fuel filter mounted on the bulkhead. Starting with the 4¼'s the fuel filter was moved to the proximity of the fuel tank, early 4-1/4's having twin filters. The change over tap remained as the standard fitment until B1HM when it was officially discontinued and the A/Both/B switch added. However it is known that it was installed on some chassis shortly before the "HM" series, B196HK being one of those.

### CHASSIS LUBRICATION:

The Bijur system oil reservoir and cap are painted black. Our review indicates that early cars had black caps with indented letters (Photo UB-9). The cap in the photograph is shown in its natural state to better reveal the lettering. On later cars the cap had the lettering formed on a separate aluminum disc retained to the cap with rivets. Some cars have been found with caps containing raised letters commonly displayed in white (Photo UB-10). There may have been other types used but these seem to be the most common.

#### MISCELLANEOUS:

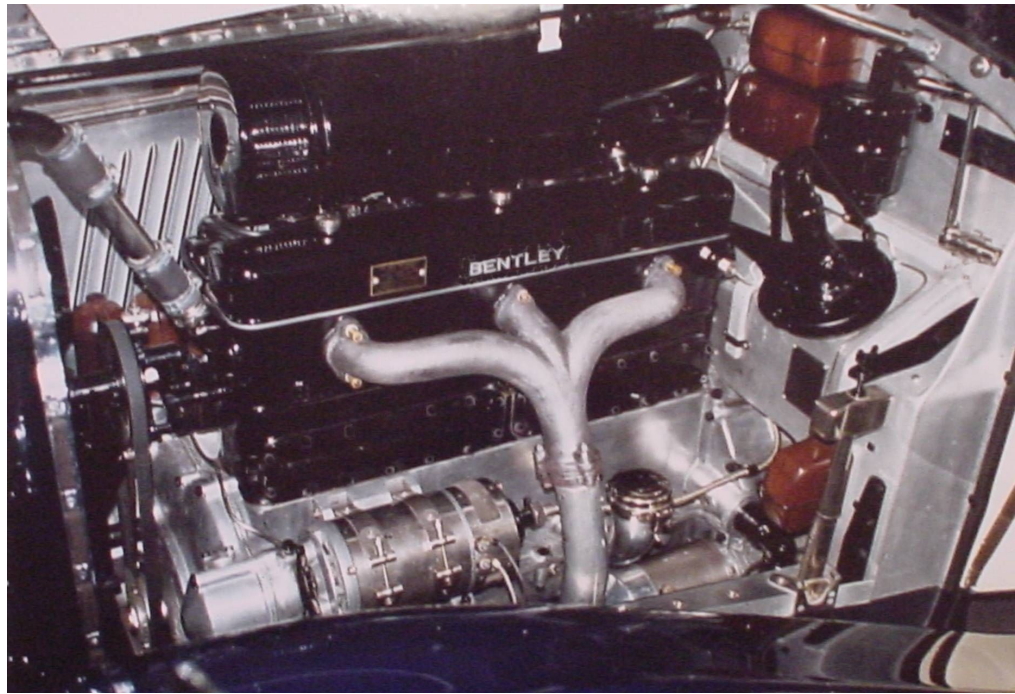
All cars had four pieces of "U" shaped black rubber molding fitted around the outer edge of the bulkhead. Molding was not used on the indented section of each side or on the top under the bonnet hinge. (Photo UB 10a) Squarehead and hexnuts on the engine side of the bulkhead are dull plated, unpainted. The formed aluminum channels on the bulkhead are secured with steel clips painted black. The clips to the outside are fastened with 2 BA countersunk flat headed machine screws with heads to the coach side (Photo UB-15). The clips on the center flat channel are fastened with 3 BA cheesehead machine screws (Photo UB-15). The metal rod running from the bulkhead to the radiator underneath the bonnet hinge is painted black. Engine mounts and dampers are also painted black.

Many cars are seen with a fabric strip wrapped over the scuttle in an attempt to protect the body from contact with the bonnet. It is unlikely that an original car had such fitted as it would have been disapproved of by Rolls-Royce since it would contravene one of the basic design principles that the bonnet was to be supported only by the bulkhead and radiator shell. In most cases it cannot be determined when a fabric strip was added. Perhaps very early in the life of the car, later on, or even by the current owner as is the case with B35HM. In view of the age of these cars, damage that might have occurred, and other factors unknown, a fabric strip on the scuttle might be considered a prudent addition if damage to the body would otherwise result.

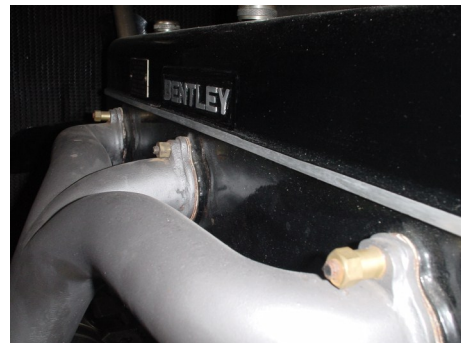
Windshield wiper motors are generally black, although on some cars they were left unpainted. The label on the top, if any, is generally black with unpainted lettering. Some labels may have been supplied in unpainted brass. In as much as these were coachbuilder added items, there was a large variety of units installed, both painted and plain finish.

The factory supplied a complete set of four aluminum undersheets/undertrays with each chassis (Photo UB-16). Each component contains the original engine number.

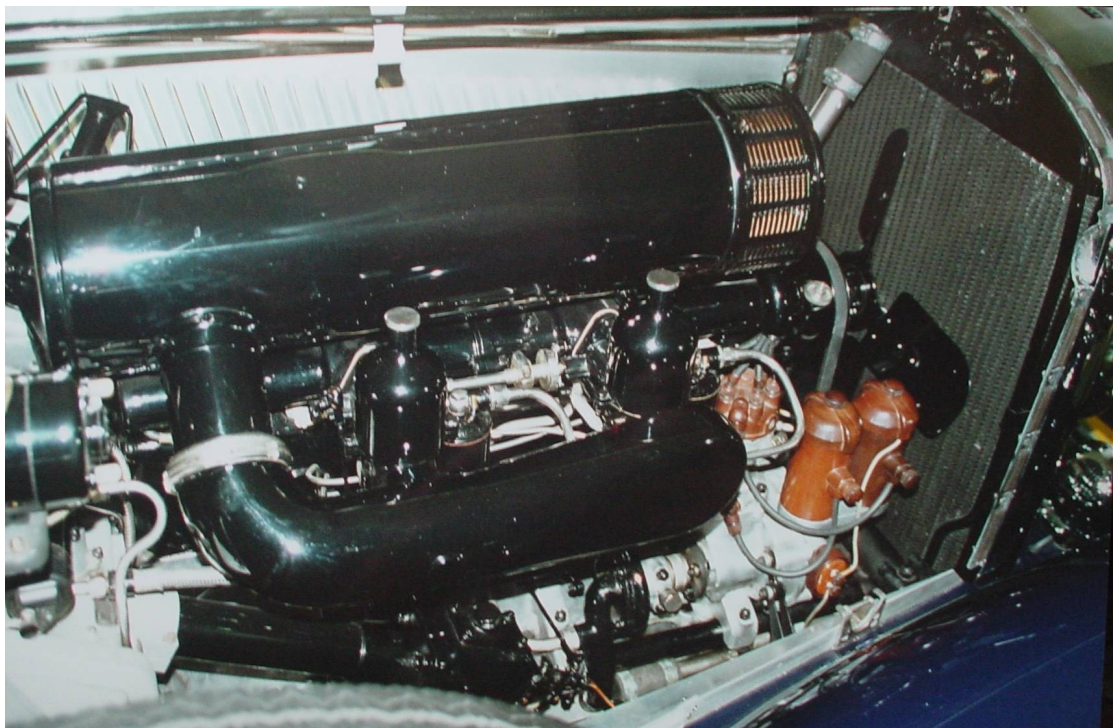
# UNDER THE BONNET



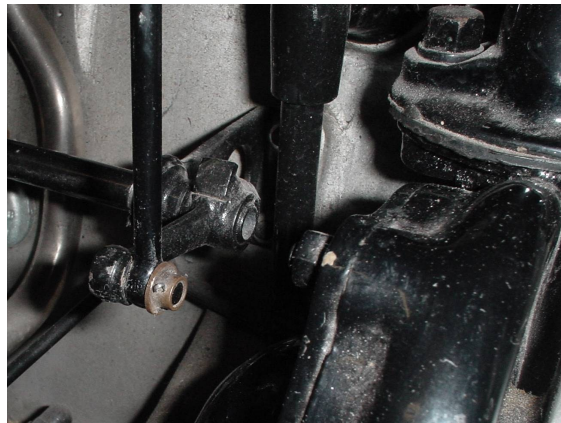
**UB-1 4-1/4 Engine-Nearside**



**UB-2 Exhaust Fasteners**



**UB-3 4-1/4 Engine-Offside**



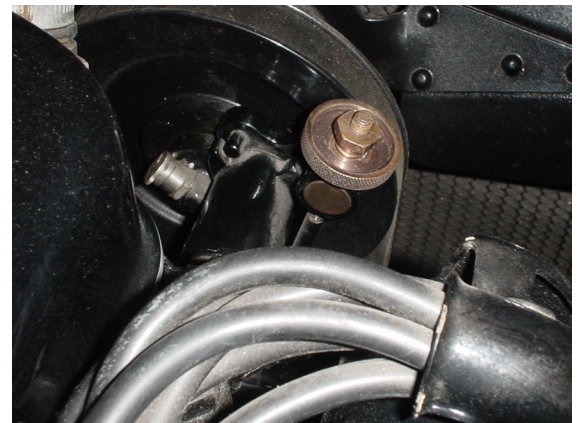
**UB-4 Tophat security washer**



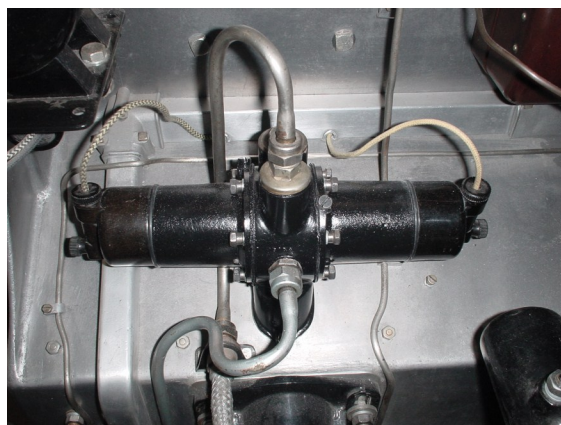
**UB-5 Spark Plug Fittings**



**UB-6 Radiator Plate**



**UB-7 Oil cup & fan belt adjuster**



**UB-8 Fuel Pumps**



**UB-9 Bijur Tank cap-early**



**UB-10 Bijur Tank Cap-late**



**UB 10a Bulkhead Molding** UB 6



**UB-11 Un-numbered Dunlop**



**UB-12 Dunlop 29**



**UB-13 Dunlop 37**



**UB-14 Dunlop 35**



**UB-15 Bulkhead Fittings**



**UB-16 Undersheets/Undertrays**

# ELECTRICAL COMPONENTS

This section will cover the three major “cosmetic” areas of the original electrical system: Wire Style, Connections and Conduit.

Many owners and restorers do not consider authentic color code pattern, end terminals, clips, etc. as important because a car can be operated with deviations from the original design. However, replacing the old perished wiring is vital in order to eliminate a major fire hazard. This work is labor intensive and, as the cost of the wire is a small part of the entire expense, an effort should be made to obtain and use the correct wire and fittings.

## WIRE STYLE:

### INSULATION AND COLOR CODING:

The stranded wire used on all Derby Bentleys was sheathed in thick natural rubber and then covered in cloth with a herringbone pattern weave. In post-war cars, the wire covering was changed to a spiral pattern weave. However, this is not correct for the pre-war cars. Examples of the pre-war herringbone weave (on the left) and the post-war spiral weave (on the right) are shown in Photo E-1. Wire with the original herringbone weave is available and should be used to retain authenticity. The wiring diagrams in the owner's handbook should be consulted to assure that the correct wire color-coding is followed.

### CONDUCTOR DESIGN/STRAND FORM:

Pre-war wiring consisted of a number of strands of wire, each individual strand being of 36 gauge thickness, which on the British Imperial Standard system equals .0076". Electrical current ratings were increased by increasing the number of strands used. The number of strands varied from 14 to 90, corresponding to ratings of 2 to 20 amps (wire size 14/36 to 90/36). Exceptions to this were the starter and battery cables with a wire size of 84/25 (84 strands each of 25 gauge strand thickness) corresponding to a current rating of 120 amps.

While the original wire configurations are no longer available, similar modern stranded wiring can be obtained, shielded in PVC insulation and covered with herringbone weave cloth. Due to the higher insulating qualities of PVC, which allows for thinner insulation, modern stranded wire of higher current capacity can be used, with the overall size of the wires being equal to or smaller than the original wiring.

Unlike the original wire, modern stranded wire comes in various strand gauges or diameters. The greater the strand diameter, the fewer strands are needed for any particular amperage application. Photo E-2 shows two stranded wires, each rated as 12 gauge. The one on the left has 19 strands, each .018" thick.

The one on the right has 44 strands, each .012" thick. Both will carry the same current of 25 amps. Thick and thin stranded wires are both available with a herringbone fabric covering. The one with 44 strands is more original and desirable because of it's greater flexibility.

## WIRE CONNECTIONS:

### END FITTINGS:

The wires connected to the generator have special eyelet/ "D" shaped terminals of right angle/flag form. The design used on the 3-1/2 differed from that on the 4-1/4. The 3-1/2 version (Photo E-11) has two tangs intended to bend down over the dynamo posts. The design used for the 4-1/4 (Photo E-12) is not so equipped. The black wire to the upper post has a "+" marker within the terminal. The terminal on the lower black and white wire contains a "C" marker. The starter and battery cables have heavy copper ring connectors. Other wire connectors are plated Ross Courtney terminals, an example of which is shown in Photograph E-3. The wires are numbered at the distribution box.

### DISTRIBUTION/FUSE BOX DESIGN:

Three different wiring arrangements are found in the distribution box. The fuses in all 3 ½ litre cars plus 4 ¼ litre cars up to B60GA consist of single strand No. 30 SWG copper wire (diameter .0124"). An exception to this is the emergency fuse, which consists of three strands of No. 30 SWG wire, and the dynamo field fuse, which is a cartridge type of 4.5 amp capacity (Photo E-8). The fuses in 4 ¼ litre cars from B62GA to B61LE consist entirely of cartridge type fuses (Photo E-9). The fuses in cars from B63LE to the end of production reverted back to the original arrangement of all wire fuses except for the cartridge type dynamo field fuse (Photo E-10). The fuse holders in these later cars have a slightly different shape than the early cars. These differences are more completely explained and illustrated in the text and photographs found in the Bentley Drivers Club's "Derby Bentley Technical Manual".

## CONDUIT:

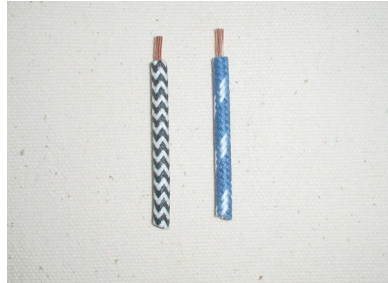
### DESIGN AND SIZE:

All chassis wires are encased in flexible conduit to the proximity of the use points. The original conduit was galvanized, not stainless steel. Two examples of modern conduit which look very much like the original are shown in Photograph E-4. The upper one is "Greenfield" and the lower one is "Super Flex". Both have been bent to their minimum radius. Note that the Greenfield conduit is not as flexible as the other and is not suitable for automotive use. The following sizes of conduit were originally used: ¼", 3/8", ½", 5/8", and ¾", which correspond to the following modern sizes: 6mm, 10mm, 12mm, 16mm and 20mm. Wiring harnesses were not used. An exception to the flexible conduit was the lead sheath which encased the wires to the front wing lights from angled fittings on each front frame rail's outer side.

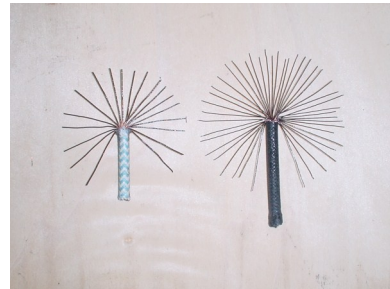
#### FERRULES AND CLIPS:

The conduit ends are protected with ferrules as shown in Photograph E-5. The ferrules are used to keep the sharp ends of the conduit from cutting through the wire insulation. The conduit is held in place with specially designed clips, painted black. An example is shown in Photo E-6. The clips vary in size depending on the size of the conduit. All are fastened to the frame with 3BAx5/8" square head machine screws. Aluminum "ties" were often used to attach one length of conduit to another to prevent rattles (Photo E-7).

# ELECTRICAL COMPONENTS



**E-1 Color Code Patterns**



**E-2 Wire Types**



**E-3 Ross Courtney Terminal**



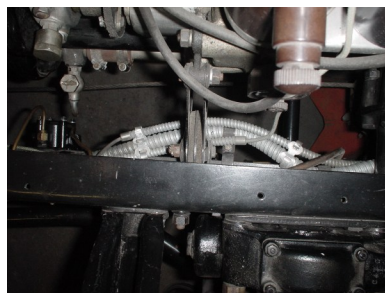
**E-4 Wire Conduit**



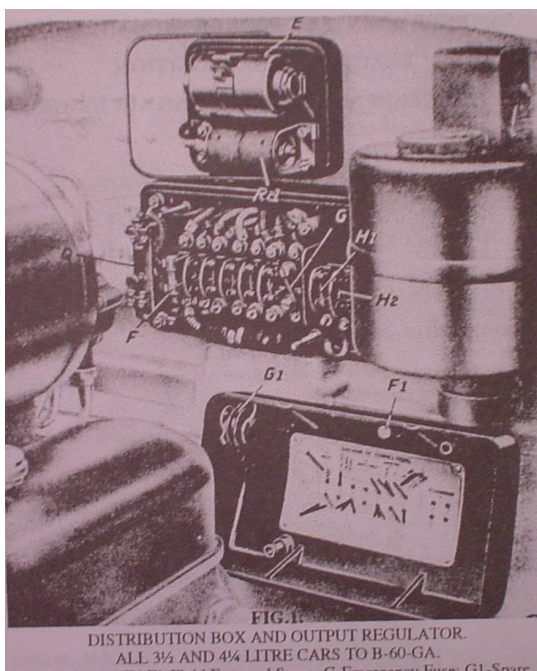
**E-5 Conduit Ferrule**



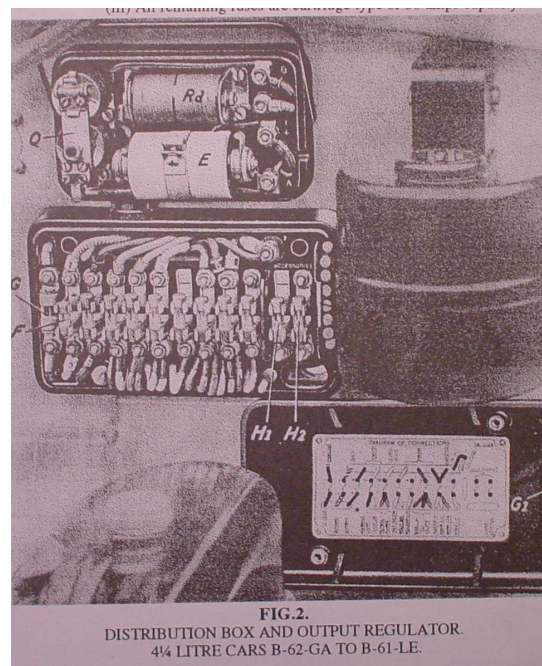
**E-6 Conduit Clip**



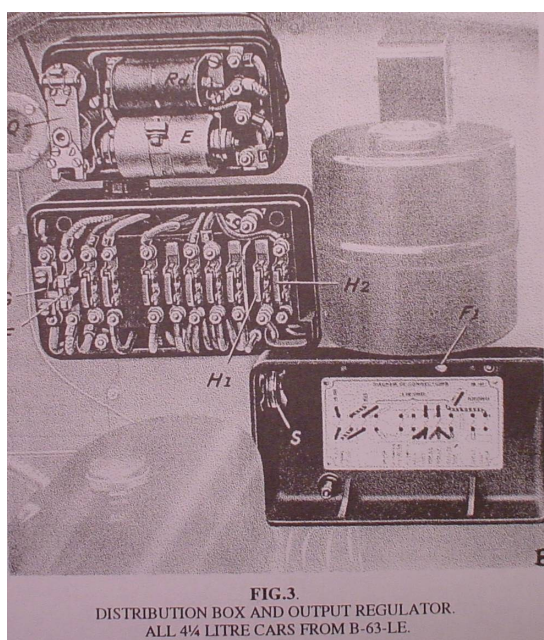
**E-7 Conduit Ties**



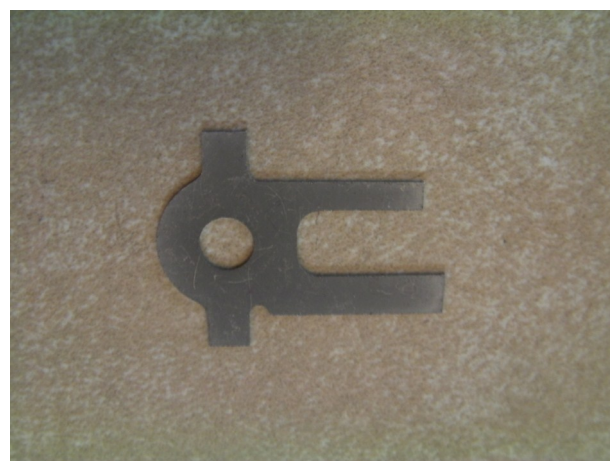
E-8



**E-9**



E-10



## E-11 3-1/2 Dynamo Fitting



## E-12 4-1/4 Dynamo Fitting

# EXTERIOR AND INTERIOR FITTINGS

The exterior and interior fittings found on Derby Bentleys varied substantially due to company-initiated specification changes and customer requests. In view of these differences this section will primarily address only factory supplied items. A slight departure from that theme will be comments made with respect to wing lights, tail lights, registration plates, and driving/fog lights. If it is desired to add one of these items to a vehicle the period and application appropriateness of a specific lamp should be confirmed by a specialist in the field.

## EXTERIOR:

### RADIATOR SHELL AND SHUTTERS / LOUVERS:

The shape of the radiator shell remained constant throughout the entire production run. The shutters however, were changed. On chassis A-L they are movable with a Calorstat in the radiator header tank controlling their position. On early cars these movable shutters had a symmetrical cross-section. Midway through 31/2 litre production an asymmetric cross-section was introduced with the longer portion to the rear. The intent was to have the air passing through hold them open and reduce their tendency to rattle. It should be noted that on early cars no flap was provided for the starting handle to pass through the shutters. The process was to disconnect the Calorstat and manually open them. "M" series chassis have fixed louvers with coolant temperature controlled by a conventional thermostat.

### MASCOT:

The evolution of the mascot is a story in itself with three different profiles offered. Their history has been covered in various books and makes interesting reading. In sum, it can be said that the first cars offered for sale had none. Very early in the production run a single winged "B" appeared but was soon dropped (Photo EI-1). It is estimated that fewer than 100 of these may have been fitted. It was replaced by a two-winged forward leaning "B" (photo EI-2). This style remained for most of the cars produced. In an attempt to coincide with the introduction of the overdrive "M" series cars, the mascot was changed for the final time to a backward leaning winged "B" (photo EI-3). It is unknown if any non-overdrive cars were delivered with a mascot of this style. Because of its more "sporty" appearance it is known that many earlier cars were retrofit with the final version. It is also clear that some purchasers of "M" series cars opted for the earlier forward leaning design due to the inconvenience of having to move the backward leaning version through 90° in order to open the bonnet. In view of its history it cannot be determined with which style each car was delivered. For purposes of this "Guide", however, it can be said that any car delivered with a mascot after December 1935 generally came with the large winged, forward leaning "B" (Photo EI-2) until "M" series cars arrived and then in all probability the backward leaning "B" (Photo EI-3) was the mascot of choice.

## HEADLAMPS:

With the understanding that customers could have ordered lamps produced by manufacturers other than Lucas, the following can be said of those typically fitted.

Four different basic styles were offered. Some were equipped with different "dipping" systems, but for the purposes of this "Guide" comments will be confined to outward characteristics. Most cars were delivered with headlamps and horns chrome plated. Some, however, were ordered painted as was the case with B170HK.

R170S—It is a small lamp measuring 10-5/8 inches in diameter. It has the bulb mounted in the reflector with a bipod equipped with a hood to its rear in front of the bulb. This lamp was introduced in 1930. At that time it had a flat lens with vertical flutes; later versions had a convex lens. The model used on Derby Bentleys had the convex lens and a slimmer body than the earlier versions (Photo EI-4). Additional pictorial examples of R170S lamps can be found in "Bentley The Silent Sports Car", on pages 71 and 249. These should not be confused with the P80 style, which had a tripod and different lens structure.

P100S – These became available in 1932 and were used on early cars along with the R170S lamp. The difference between the two is well illustrated on page 71 of "Bentley The Silent Sports Car" where both types are pictured side by side. The P100S continued on through most of the 3-1/2 litre cars. It is approximately 12 inches in diameter with a tripod containing a rear facing bulb. The lens came in two forms. Both had large vertical flutes, one with small "U" shaped flutes in the center similar to those on the fog light in Photo EI-14. The other with a clear center which is referred to as a "speed" lens (Photo EI-5). Although very rare, some were fitted to the 4-1/4 Litre cars.

P100R – This appeared on early 4-1/4s and late 3½ s. It is approximately 12 inches in diameter with the bulb mounted in the reflector. It is equipped with a tripod that supports a bulb shield. The lens has large vertical flutes with a clear center. No small fluted "U" pattern was offered (Photo EI-6).

R100 – This was introduced in 1938 and is exclusive to Rolls-Royce and Bentley automobiles. It too measures approximately 12 inches in diameter with the bulb mounted in the rear of a distinctive fluted reflector. A vertical bipod holds a chrome bulb shield and a small badge containing the Bentley "B". The lens is clear (Photo EI-7). This style continued to the end of production including the Mark V.

## HORNS:

The standard horn supplied was the 5 ¼ inch Lucas New Alto unit (Photo EI-8). Slight differences are found in the front grill. An example is the location of the Lucas medallion. It is found in the center as in Photo EI-8 and on other units toward the bottom. Both short and long trumpeted horns were frequent options, as can be seen in historical photos. To determine if a specific design is period and application appropriate it is best to check with a reputable parts supplier.

## BUMPERS:

The first cars shown had none, front or rear. The Wilmot-Breeden front bumper became standard in the fall of 1935 on FB series cars. Prior to this it had been an option made available at customer request. It is designed to provide protection to the coachwork and to serve as a harmonic stabilizer for the chassis. To achieve the dampening effect the bumper blade ends contain lead weights and are attached to the ends of the two steel beams with ½" BSF studs. The beams are suspended from the front dumb iron extension studs by specially designed U-bolts which go over a metalastic bushing and shroud. The dumb iron extension stud is threaded and pinned to the chassis. The nuts holding the metalastic silent block bushings to the studs are secured with locking tab washers. The nuts used to attach the bumper blade to the mounting beams are castle nuts with cotter pins as are the nuts used on the "U" bolts retaining the mounting beam to the metalastic/silent bloc bushings. The mounting beams were supplied in black but sometimes changed to body color. The silent bloc shroud, U-bolt, and front bumper buffer cup were most frequently black or chrome but also occasionally body color.

In 1936 a safety strap was designed to catch the bumper should it become detached. In May of that year the factory ordered that all cars with Wilmot-Breeden bumpers should be retrofit with these safety straps/bumper hooks. There are to be two, each extending from the first crossmember forward, and up and back around the two lower bumper beams (Photo EI-9). The Bentley Drivers Club's Technical manual details the installation procedure on both early and later chassis.

Bumperettes / overrides began appearing in LS series cars and were almost universally fitted to "M" series chassis. A standardized rear bumper was never offered by the factory, however many were added later.

## WING LIGHTS:

On many vehicles these were flared into the coachwork and their authenticity therefore well established. The majority of the other cars came fitted with either Lucas or Ace Cornercroft lights. Lucas manufactured a variety of styles, any one of which might have been ordered by the customer or chosen by the coachbuilder. Most 3 ½ litre cars and some 4 ¼s used Lucas lamps with the familiar "Lucas look" (Photo EI-10). Essentially, all 4 ¼ litre cars and perhaps some 3 1/2s were equipped with Ace Cornercroft lights (Photo EI-11). Both Lucas and Ace Cornercroft used frosted lens.

## DRIVING/FOG LIGHTS:

It is worth mentioning that period photos confirm many cars were not equipped with driving/fog lights. Owners who chose to install them had many styles available from which to choose. Although not typically found on early cars one of the more common varieties was the oval Notek lamp (Photo EI-12). Others used were round models. Some having a fluted lens side to side (Photo EI-13), others with large flutes to the outside and "U" shaped flutes in the center (Photo EI-14). Still others with a clear lens. These are only a few examples of the many models available.

#### TAIL LIGHTS:

Once again it was customer or coachbuilder choice. Many had one or two designed into the coachwork (Photo EI-15). Others had a single combined tail and brake light (Photos EI-16 & EI-17). Typically these were of the Gothic form (Photo EI-16) or the "D" design (Photo EI-17). Another popular form was a round design. A number of companies manufactured these. The Lucas unit was a popular item containing a single red lens. The one shown in the photo (EI 18) has also been a popular choice. It contains a dual lens and is known as a "Ford" light for obvious reasons. Also common was a registration plate and tail light module (Photo EI-19). Many other styles were used and would be considered period and application appropriate. It needs to be said that the triangular Lucas light (Photo EI-20) did not appear until post war and therefore would not be considered period appropriate for a Derby Bentley. However, many have been installed to comply with British lighting regulations.

#### REGISTRATION PLATES:

Registration numbers were displayed in a single line (Photos EI-16 & EI-19) or two lines (Photo EI-17). The rear plates are to be illuminated and the digits 3½" high on both front and rear plates. 3⅛" digits did not become the standard until 1963. Many original number plates were branded "Homo Hygrade". They were pressed aluminum and attached with square-headed bolts. Photos EI-15 and EI-19 are both "Ace" units, with transparent back lighted letters and digits.

### INTERIOR:

#### INSTRUMENTS:

All standard instruments are identified as authentic by the distinctive Bentley "B". They are black with white lettering and illuminated. The ancillary switches supplied on most chassis were of the push/pull variety with a black mounting plate containing engraved letters identifying its purpose. They were secured to the dashboard with #2 oval headed screws (Photo EI 21). It is known that on some chassis, due to coachbuilder preference or customer request, other designs and methods of attachment were used. Exceptions to the push/pull switches were those for the fuel pumps (Photo EI 22), trafficators (Photo EI -23), gauge lighting (Photo EI 24), and headlight dipping. The fuel pump A/Both/B switch is a rotational device affixed to the instrument panel on its reverse side with wood screws. Its bezel is a separate piece and was designed to be a snug fit in a hole in the panel and normally retained by being center punched into the wood in 2 or 3 places on its inside diameter. As years passed the bezel commonly came loose and was retained by wood screws similar to the other switches as shown in Photo EI-22 . The A/Both/B switch was retrofit to many earlier cars.

The trafficator switch is normally a spring driven geared timer by the Swiss firm Scintilla. It is believed that Bosch sometimes supplied them as well. It is operated with a lever that can be moved in either direction to operate the desired indicator. The switch could be mounted with the lever pointing any way but up or down were the most common choices. It appears to be another case of customer or coachbuilder choice. The instrument light switch, identified by an arrow in Photo EI24, is operated by either pushing in for momentary illumination or pushing in and rotating clockwise for permanent lighting. The headlight dipping switch was on the steering wheel hub until B1CW when it became foot operated.

## DASHBOARD

The original dashboard layout which continued through most of the cars produced (Photo EI-25), positioned the switchbox in the center surrounded by the four basic gauges; ammeter, oil pressure, water temperature, and petrol level. On very early cars these instruments and switchbox were carried on a black painted steel oval panel inset into the wooden dashboard. The speedometer and tachometer/clock unit are positioned to the right of the steering column. At B132 GP a low fuel level warning light was added. Around the start of M series cars the speedometer was moved to the center where the switchbox had been located, the switchbox repositioned to the far right, and the tachometer set adjacent to it on the left. The clock was removed from the tachometer and relocated to the position previously occupied by the oil pressure gauge. A combined oil pressure and water temperature gauge was placed in the previous location of the water temperature indicator. The "Standard" layouts and most custom designs also contained a cigar lighter, ash tray, and glove compartment.

## STEERING WHEEL, COLUMN and MISC.

Factory supplied steering wheels were semi gloss black with chrome lower collar. The center hub was black with unpainted engraved lettering. The hub originally contained controls for the throttle, timing, mixture control and headlight dipping. At B1CW the headlight dipping switch was removed and replaced on the hub with the ride control adjuster. At B2EF the original 1- $\frac{1}{4}$ " horn button was increased to 1- $\frac{3}{4}$ ". The control knobs were chrome plated with their operating levers dull black to prevent them from being seen through the slots in the steering wheel hub.

Steering wheels with four spokes were originally supplied and continued through the 3- $\frac{1}{2}$  litre cars. With the introduction of the 4- $\frac{1}{4}$ s a three spoke design became standard and remained so through the end of production. During the transition period it is known that some cross fitting occurred. Two different methods of construction were used. Some have a hollow steel rim while others are formed by two aluminum rings, one on each side of a circular spring steel core. The steering column form also changed during the course of production. On A – L series cars the steering "shaft" is carried in a black sheath from the steering box to a thrust bearing just beneath and forward of the dashboard. The exposed portion of the shaft from there to the steering wheel is chrome plated. On "M" series cars the black sheath continues to the proximity of the steering wheel where its end is encased in a chrome collar. The steering shaft is not exposed.

Beginning with the HK series 3/4" "Seapak" noise and heat insulation was fitted to the bulkhead above the toeboard, a portion of which is shown in Photo EI 26.

## TOOLS

Factory tools were part of every Derby Bentley produced. There was a standard set with additional, even alternate items sometimes being added, most frequently at the coachbuilders behest. It is believed that not often did the customers get involved in precise tool selection. Tool sets were sometimes divided so that the small more frequently used tools were contained within the cabin with others located elsewhere. Photos EI-27 and EI-28 demonstrate that approach. Photo EI-29 shows an extensive set contained in one tool roll. Where the body design made it possible the entire tool set could be contained in a fitted locker. (Photo EI-30)

If it is unknown which tools were originally supplied with a particular vehicle a “proper” kit can be assembled by choosing from the list below. These were most of the common tools available to the standard set. Other items could have been added as an owner or coachbuilder option.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| 3/16” x 3.25” Tommy Bar                 | Contact Feeler Gauge                    |
| 1/4” x 3/625 “Tommy Bar                 | Feeler Gauge Set                        |
| 5/16” x 4.75” Tommy Bar                 | 3” Screwdriver                          |
| 7/16” x 7.5” Tommy Bar                  | 5” Pliers                               |
| 5BA x 2BA Jaw Spanner                   | Adjustable Spanner—Lucas Girder         |
| 3BA x 1/4” BSF Jaw Spanner              | Tire Gauge & Pouch                      |
| 1BA x 1/4” BSF Jaw Spanner              | Sparkplugs (KLG or modern equivalent)   |
| 5/16” x 3/8” BSF Jaw Spanner            | Valve Springs (commonly 2)              |
| 7/16” x 1/2” BSF Jaw Spanner            | Valve Spring Replacement tool (2 parts) |
| 1 1/16” x 13/16” BSF Jaw Spanner        | Grease Gun— Enots Auto Lub No. 5        |
| 7BA x 5BA Box Spanner                   | Kay’s No. 81 oil can                    |
| 3BA x 2BA Box Spanner                   | Petrol tank drain plug key              |
| 1BA x 1/4” BSF Box Spanner              | Oil syringe                             |
| 3/4” x 13/16” BSF Box Spanner           |                                         |
| 5/8” BSF Box Spanner                    |                                         |
| Claw/”C” Spanner—Air Silencer *         |                                         |
| Claw/”C” Spanner-Head Water Pipe        |                                         |
| Tappet Adjusting Spanner **             |                                         |
| Distributor Spanner (“D” Series to end) |                                         |

- There are different sizes for the 3-1/2 and 4-1/4, the 4-1/4 tool being larger

\*\* Only for the 4-1/4

During the course of production many part numbers were changed. In most cases the difference, if any, between one tool and the other is unknown to the authors of this Guide. If significant differences are discovered in the future, they can be addressed in subsequent editions of this document. For those interested in pursuing the part number question, lists of those numbers can be found in the factory's LOP. *The Bentley Drivers Club's Technical Manual*, Ellman-Brown's book *Bentley, The Silent Sports Car*, and Bernard King's book *The Derby Built Bentleys*.

## WHEEL SPANNERS

Three different styles of wheel spanners were specified for Derby Bentleys. The first was identified as part GB 741 (Photo EI 31). It was supplied only with "A" series chassis. It was made of flat, mild steel stock .275 inches thick, 11.9 inches long and approximately 6.2 inches across the "head". It was painted black.

The second was GB910 (Photo EI 32). It was supplied with "B" through "E" series chassis. It was made of mild steel and cadmium plated. It can be identified by its round head and raised ridge surrounding the entire tool.

The final version FB2051 (Photo EI 33) was also made of mild steel and cadmium plated. It continued as the standard item until the end of production. It is identified by its part-octagonal shaped head with no raised ridge around the head.

Tools somewhat similar to the original FB2051 were cast in the United States. These can be identified by the fact they are bronze, not steel and have the tool number cast in the handle. The original has no such identification.

Clarifying Notation: Tool GB 741 is symmetrical in form. The angle at which the photo was taken makes it appear wider on one side than the other. The handle on tool GB901 is as originally constructed with a .625 radius at the end. The handle on tool FB2051 began life with the same end form but has become deformed/curled due to numerous hammer blows.

## JACKS

A jack was provided with each chassis and typically, but not universally mounted on the bulkhead. . The original jack supplied was an unnumbered Dunlop unit of cast iron (Photo UB-11). At the chassis B2GA the aluminum bodied Dunlop 29 was specified (Photo UB-12) and finally at B73HM the domed top aluminum bodied Dunlop 37 became the company's choice and continued so to the end of production (Photo UB-13). The final two proved to be rather unreliable and were commonly discarded. The Dunlop 35 (Photo UB-14) was never a company specified unit but is typical of the type used as a replacement for the original. It should be remembered that other models were available and could have been requested by the customer or coach builder.

# EXTERIOR AND INTERIOR FITTINGS



**EI-1 First Mascot**



**EI-2 Second Mascot**



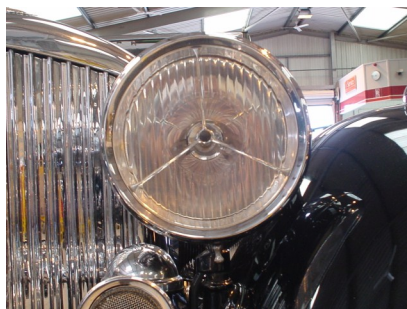
**EI-3 Third Mascot**



**EI-4 R170S Headlamp**



**EI-5 P100S**



**EI-6 P100R**



**EI-7 R100**



**EI-8 Standard Horns**



**EI-9 Safety Straps**



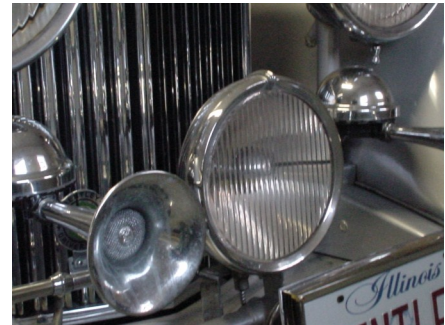
**EI-10 Lucas Lamp**



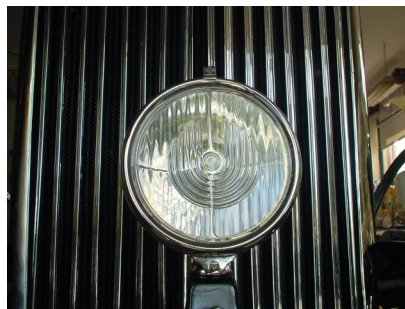
**EI-11 Ace Cornercroft Lamp**



**EI-12 Driving/Fog Lamp**



**EI-13 Driving/Fog Lamp**



**EI-14 Driving/Fog Lamp**



**EI-15 Tail Lamp Sample**



**EI-16 Tail Lamp Sample**



**EI-17 Registration Plate Sample**



**EI-18 Tail Lamp Sample**



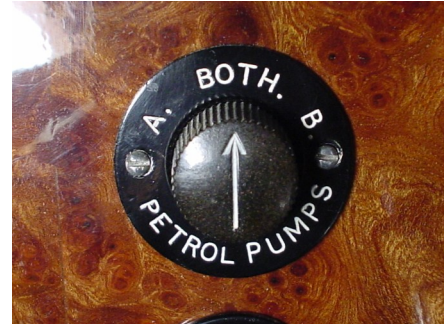
**EI-19 Registration Plate Sample**



**EI-20 Post War Tail Lamp**



**EI-21 Standard Switch**



**EI-22 Petrol Pump Switch**



**EI-23 Trafficator Switch**



**EI-24 Instrument Lamp Switch**



**EI-25 Standard Dash—Early**



**EI-26 Seapak Insulation**



EI 27 Kick Panel Tool Set B16MR



EI 28 Supplemental Tool Roll B16MR



EI 29 Larger Tool Roll B166BL



EI 30 Fitted Tool Set B190HK



EI 31 GB 741



EI 32 GB 910



EI 33 FB 2051