ELECTRICAL AND IGNITION

SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q 1(a)

SB/NM.1/IP.

Subject : Replacement of Existing Types of Ignition Condenser. All $3\frac{1}{2}$ and $4\frac{1}{4}$ Litre Bentley.

Date of Issue 1st Jan, 1946.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

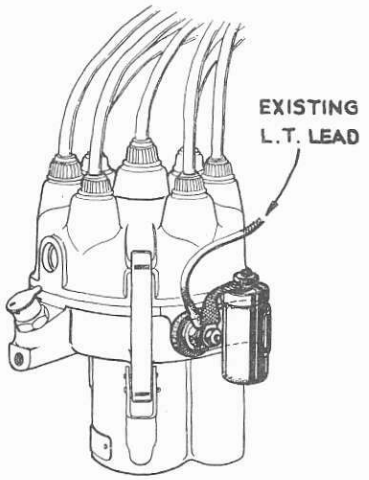
This leaflet cancels BM/Q1 and indicates additional condensers affected.

Owing to manufacturing difficulties encountered in producing further supplies of the old flat and tubular type condensers, Part Numbers D.75462 and D.74117 which were housed inside the distributor casing, it has been necessary to adopt an alternative type which will serve as a common replacement. This is tubular in shape, and is mounted externally on the existing low tension terminal as illustrated below. The Part Number of the new condenser complete with its connections is RD.3070. The existing condenser may either be removed or, if preferred its connections severed to prevent electrical contact.

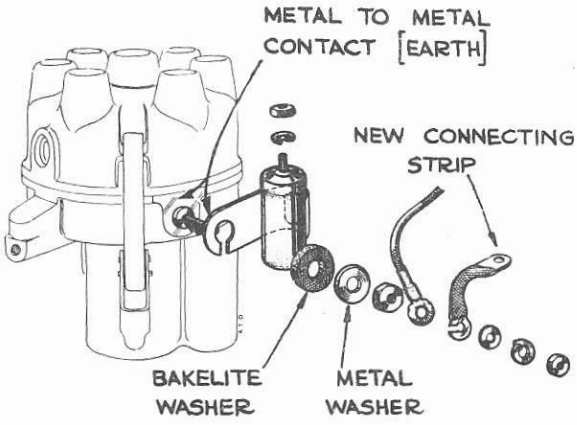
The method of fitting the new condenser is as follows:-

1. Disconnect the existing L.T. Lead.

2. Remove the nut, metal and bakelite washers.



NEW CONDENSER IN SITU



3. Place the new condenser with the flat supporting tab against the body of the distributor making sure that there is metal to metal contact between them, and that the insulating bush is centralised in the hole.

4. Next place the bakelite and metal washers over the stud and clamp up with the nut.

5. Replace the original L.T. Lead on the stud and follow with the short new connecting strip. Place the plain and lock washers on the stud, and clamp up with the nut.

6. Connect the short connecting strip to the top terminal of the condenser.

7. Check for clearance between condenser and the rocker oil feed pipe with the distributor in the fully retarded position, and if necessary bend the pipe to prevent fouling.

SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q2

SB. 3/IP.

Subject :
Replacement of Ignition Coils.
As fitted to all Bentley cars.

Date of Issue 16th March, 1946.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

Owing to manufacturing difficulties in producing the original type of coil D72503 it has been decided to use for replacement purposes coil D75673.

This replacement coil has a central H.T. outlet, and will obviously entail slight alterations to the existing wiring.

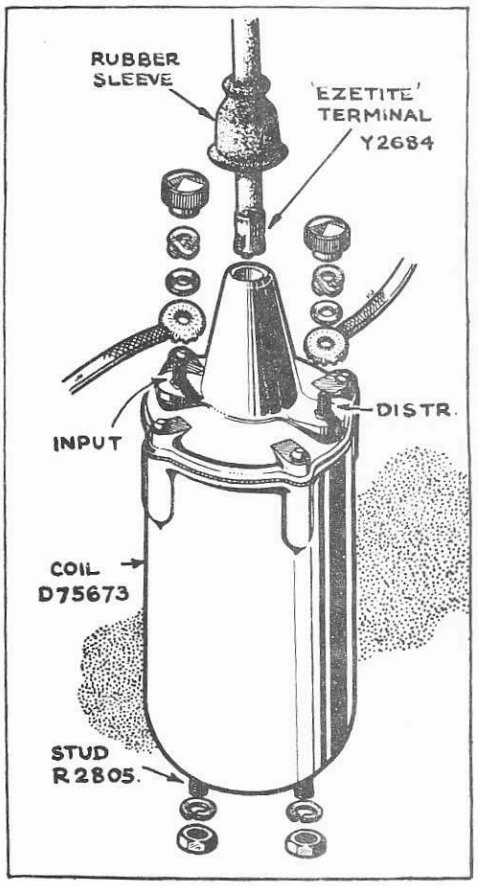
Fixing.

The coil will be sent out with special studs which are long enough to accommodate any type of base. If set screws are used with the existing coil these should be discarded.

Electrical Connections.

The existing H.T. cable may have to be shortened to remove any unnecessary length, and a new "Ezetite" metal terminal secured to the end of the H.T. wire so that it makes electrical contact with the wire, and is a push fit in the bakelite moulding on the coil. A Delco-Remy rubber shield No. 120095 (R.R. No. 330/2950) should be pushed over the wire before fitting the terminal. The existing low tension wires require no alteration. The coil is marked "Input" and "Distr" to which the ballast resistance wire and the distributor wire should respectively be connected.

Existing coils D72503 may still be repaired and will be issued as replacements when available.



SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q3

SB.1/SF	Subject : SPARKING PLUGS. $3\frac{1}{2}$ & $4\frac{1}{4}$ Litre.	Date of Issue 7th. Oct., 1946

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

Owing to supply difficulties with certain plugs, it has been necessary to authorise two alternative types for use in pre-war Bentley cars. Both the $3\frac{1}{2}$ and $4\frac{1}{4}$ Litre Models may be fitted with either KLG. FLB30X or Champion LB8, 14 m.m. plugs.

SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q4

SB/GF.3/SF.

Subject : VOLTAGE CONTROL REGULATORS TESTING AND MAINTENANCE.

Date of Issue 3rd May, 1948.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

The purpose of this leaflet is to give the necessary information relating to the adjustment, maintenance, location and correction of faults in the types of regulators fitted to Bentley cars.

GENERAL DESCRIPTION.

A regulator is incorporated within the electrical system between the dynamo and battery, its function being to meet the varying demands of the battery while in service by controlling the output of the dynamo.

Thus, when the battery is in a discharged state, the rate of charge will be increased in order to restore the battery to its normal state in the minimum possible time. Conversely, when the battery is fully charged, there will be only a trickle charge, thereby eliminating the possibility of damage through overcharging. Current taken from the battery by use of lights and other electrical accessories is balanced by an increase of charging rate, this being provided for by the regulator.

It will, therefore, be seen that the correct functioning of the regulator will result in the longer life of the battery, and will protect all the other accessories which are dependent on the battery for their operation.

The actual operation of the regulator depends upon the fact that the voltage of the dynamo is kept constant, while the voltage of a battery varies between certain fixed limits, according to the state of charge of the battery, the voltage being a maximum when the battery is fully charged, and a minimum when fully discharged.

We illustrate below a typical installation.

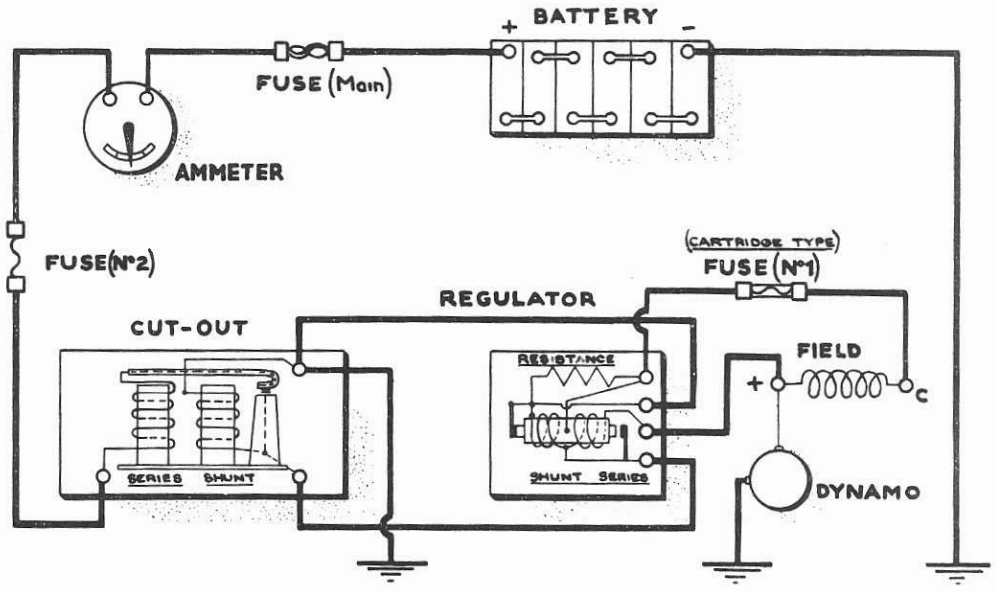


FIG. 1.

TECHNICAL DESCRIPTION OF OPERATION.

The regulator consists of a cylindrical steel shell, housing two windings, while an armature carried on a pair of guide springs, moves axially at its centre.

The armature carries at its two extremities the moving elements of two pairs of contacts, which control the field circuit, one pair serving to insert a resistance, while a second pair, on further movement of the armature, short circuits the field winding itself. The first pair of contacts are held closed by means of a spring when the regulator is inoperative.

The windings consist of a voltage winding, connected to and directly across, the dynamo terminals, and a current winding, which carries the full current from the dynamo to the battery. These coils assist each other in energising the magnet system, and thus in effecting movement of the armature.

When the dynamo voltage reaches a predetermined figure, the magnetic field due to the voltage winding becomes sufficiently strong to attract the armature. This causes the first set of contacts to open, thereby inserting the resistance in the field circuit. This reduction in field circuit lowers the dynamo voltage, and this, in turn, weakens the magnetic field due to the voltage coil. This allows the armature to return to its original position, thus closing the contacts, so that the voltage returns to the predetermined maximum. The cycle is then repeated, and the armature is set into vibration.

As the speed of the dynamo rises above that at which the regulator comes into operation, the amplitude of vibration increases, and the periods of interruption increase in length, with the result that the mean value of the voltage on the machine terminals undergoes practically no increase, once the operating speed has been attained.

When the amplitude of vibration increases beyond a certain point, the second pair of contacts come into operation, short circuiting the field winding of the machine. The initial movement of the armature therefore, inserts resistance in the field, and additional movement short circuits the field winding entirely, so as to give a still more pronounced regulating effect.

The series winding provides a compensation on this system of control, for, if the control were arranged entirely on the basis of dynamo voltage, there would be a risk of very seriously overloading the dynamo when the battery was in a low state of charge, particularly if the lamps were simultaneously in use. Under these conditions, the dynamo would be forced to give an output to bring the voltage of the system up to the same value as if the battery were in its normal fully charged state, and thus, with a battery of low internal resistance would necessitate an extremely heavy current, far beyond the normal capacity of the machine. The series winding assists the voltage coil, so that when the dynamo is delivering a heavy current into a discharged battery, the regulator comes into operation at a somewhat reduced voltage, thus limiting the dynamo output accordingly.

AMMETER READINGS.

The ammeter is merely a visible means of indicating the amount of current passing into, or out of, the battery and readings will depend upon the general conditions of the battery.

Providing the battery is fully charged, ammeter readings during normal daytime running, will seldom be more than a few amperes.

A discharge may, however, be observed immediately after switching on the head lamps or any other heavy consumer of current. This is normal, and usually indicates that the battery voltage is high. This voltage will fall after a short while, and the regulator will respond, causing the dynamo to balance the load by increase of output.

On the other hand, if a start has been made from cold by using the starter motor, the battery will be in a partially discharged state and the charging rate will rise to a steady maximum, remaining there for perhaps 10/15 minutes, after which it will drop to a steady charge suitable to the condition of the battery.

Ammeter readings, although dependent principally on battery condition, may however, indicate irregularities in regulator performance, but this should be supported by other corroborative evidence, as abnormal ammeter readings may be the result of one or several faults developing within the complete electrical system. Examination of such items as the wiring system, including switches, battery and dynamo should, therefore, be carried out before making an adjustment to the regulator.

A fault locating chart will be found on Page 7 of this leaflet, which will assist in determining whether an electrical fault lies in the regulator, or in another part of the circuit.

TYPES OF REGULATORS USED ON BENTLEY CARS.

Regulator Type:	Bentley Chassis:
B2 CJ 1	3½ litre(B-1AE to B-159-FC incl.) 4¼ litre(B-2-GA to B-203-HM incl.)
B2 CJ 1A	4¼ litre(B-2-JD to B-22 MR incl.)
B2 CJ 11	4¼ litre(B-22-MR to B-203-MX incl.)

NOTE: Regulator B2 CJ 1 is now obsolete, and has been superseded by type B2 CJ 1A.

TESTING OF REGULATOR - B2 TYPE.

All settings for type B2 regulators are tested on open circuit, the battery being isolated from the dynamo, and all load due to lamps and other accessories switched off. To isolate the battery from the dynamo, all that is necessary is to insert a piece of thin dry paper between the cut-out points.

The limits of open circuit voltage setting for the four regulator types fitted to Bentley cars are as follows:-

Regulator:	Limits of Open Circuit Voltage:
B2 CJ 1	15.0 - 15.5 volts (now obsolete)
B2 CJ 1A	15.3 - 15.8 "
B2 CJ 11	15.8 - 16.4 "

PROCEDURE FOR TESTING ON OPEN CIRCUIT.

1. Isolate battery from dynamo.
2. Connect a moving coil voltmeter, calibrated in 1/10ths of a volt, across the dynamo terminals. (One reading from 1-20 volts would be most suitable).
3. Start the engine, and run the dynamo up to a speed of 1000/1500 r.p.m. when the reading should become steady. If it falls between the limits of open circuit voltage relating to that particular type of regulator, then regulator is functioning correctly.
4. If however, the readings do not fall between the limits, then STOP the engine and carry out the following adjustments to contacts.

NOTE: When this test is being carried out, the regulator MUST be cold.

For the purpose of regulator contact adjustments and open Circuit Voltage tests, the relationship between engine and dynamo speeds is given in the following table:-

CAR MODEL:	DYNAMO GEARING:	ENGINE R P.M.	DYNAMO R.P.M.
Bentley $3\frac{1}{2}$ & $4\frac{1}{4}$ litre	Engine Speed	1,000 R.P.M.	1,000 R.P.M.

ADJUSTMENT AND SETTING.

Before making any adjustments, it is necessary to have the proper tools available. These are as shown in Fig.2. below, and are obtainable from this Service Station.

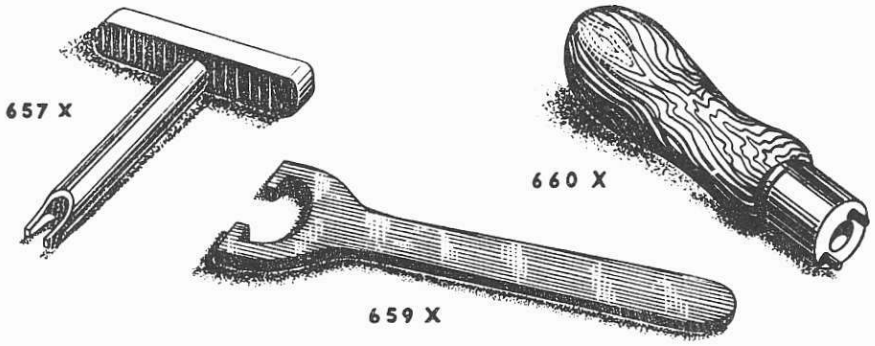


Fig.2. Tools for B2 Type Regulator.

When an adjustment is necessary, it is essential to remember the following points:-

1. Always STOP engine before moving adjusting screws.
2. Use only a high grade moving coil voltmeter; calibrated in 1/10ths of a volt.
3. Be sure that the battery is isolated or disconnected from the dynamo.

PROCEDURE - METHOD OF ADJUSTMENT.

1st Operation with engine STOPPED:

a) Slacken off locknuts (X,R & Y) using 659X and 657X.

b) Screw back contact (J), using tool 660X.

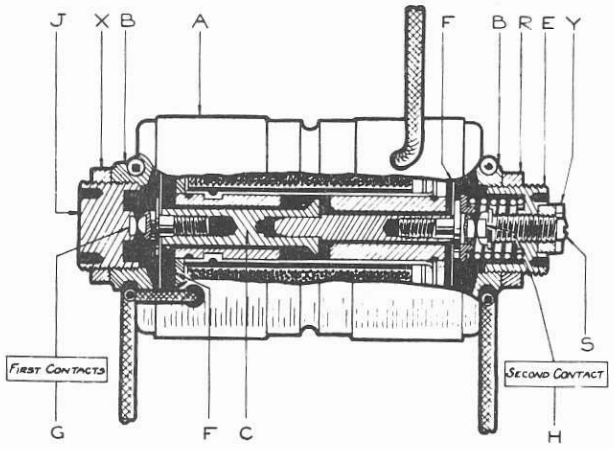
c) Screw back second contact (S) as far as possible.

d) Screw back the sleeve (E), using tool 660X.

e) Screw IN the first contact (J) as far as possible, until the armature (C) makes contact with the sleeve (D).

f) Screw back the first contact approximately one and a half turns.

g) Lock the first contact screw (J) in this position by means of the locking nut (X).



2nd Operation with engine RUNNING:

a) Run dynamo at approximately 1000 r.p.m.(see table giving engine to dynamo speeds.)

b) Screw in sleeve (E) until the voltmeter reading is within limits of setting.

c) Run dynamo for one minute.

d) Adjust sleeve (E) until first contact setting is not more than 0.3 volt ABOVE lowest limit of setting, (e.g. if the setting should be 15.8/16.4v - set 1st contact at 15.8 to 16.1v).

e) Lock sleeve (E) in position by means of locknut (R).

f) STOP engine - screw in contact (S) as far as possible. Turn contact (S) back one complete turn, and then lock in position by locknut (Y).

g) Start dynamo and run up to 2000 r.p.m. Voltage setting on second contacts should be at least 0.1 volts above first contact setting, but within the general limits of setting. Assuming first contacts set at 16.1 volts, second contact must be set at 16.2/16.4 volts.

h) If second contact voltage is above limit, stop dynamo and screw in (J) slightly, re-check contact setting and then proceed in same manner as (f) in 2nd operation.

j) If second contact voltage is below that of first contact, stop dynamo and screw OUT (J) slightly. Re-check first contact setting and then proceed in same manner as (f) in 2nd operation.

The adjustment of contact (S) is only possible while the dynamo is stationary. If the contact is screwed up while the dynamo is running, a short circuit is caused on the dynamo, resulting in a fusing or welding of the regulator points.

NOTE: In actual practice, there will often be occasions when the open circuit voltage can be varied within the limits shown, by simply screwing in or out,the spring tensioning screw (E), and leaving the contact settings unaltered.

To carry this out, check the open circuit voltage,and,should it require for example,a 1 volt rise, stop engine, slacken off lock ring (R),and screw in (E) one quarter of a turn,(this giving approximately, the required 1 volt rise). Lock (R) tightly. This will have taken contact (S) in with it so slacken off locking ring (Y) and turn (S) back to its original position. Lock (Y) tightly and test.

INTERCHANGEABILITY OF SETTINGS: B2 CJ 1A AND B2 CJ 11:

The incorporation within the electrical system of additional heavy consumer accessories, imposes a greater demand upon the battery,necessitating an

increase in dynamo output to balance the load.

On those chassis fitted with a B2 CJ 1A regulator, this demand for increased dynamo output can be met by the alteration of the contact setting to correspond to that of the B2 CJ 11.

Conversely, persistent overcharging experienced on a chassis fitted with a B2 CJ 11 regulator can be overcome by an interchange in contact setting. The normal working limits appertaining to these two types of regulator are as follows:-

	Min:	Max:
B2 CJ 1A	5 - AMPS -	12
B2 CJ 11	10 - " -	15

As the settings of these regulators are interchangeable, a method of determining the actual settings has been agreed upon, consisting of the following identification marks:-

a) If a B2 CJ 1A is set to a B2 CJ 11 setting, a yellow spot should be painted adjacent to the series winding lead.

b) If a B2 CJ 11 is converted to a B2 CJ 1A setting, a blue or green spot should be painted in the same location.

MAINTENANCE OF B2 TYPE REGULATORS.

With the exception of the cleaning of the contacts, no attention to the regulator is required.

After prolonged periods of running, the contacts should be inspected, and if dirty, cleaned with spirit or very fine carborundum paper. On no account should a file or coarse grit be used.

PROCEDURE FOR REMOVAL OF CONTACTS.

a) Slacken back locknut (X) and screw out first contact (J).

b) Slacken back locknut (R) and screw second contact (S) by means of sleeve (E).

FAULT LOCATION.

OSCILLATION.

PROBABLE CAUSES:	REMEDY:
1. Dynamo connections loose.	
2 Battery connections loose.	Examine connections and tighten.
3. Regulator connections loose.	
4. Greasy commutator or brushes.	Clean with petrol and soft rag.
5. Brushes not seating properly	If worn, replace. Seat correctly.
6. Cut-out points dirty.	Clean with spirit or fine Carborundum paper.
7. Ammeter not functioning correctly.	Examine and replace if necessary.
8 Faulty regulator	Replace regulator.

LOW OUTPUT.

1 Fully charged battery	No action.
2. Regulator contacts incorrectly set	Check and adjust.
3. Dynamo brushes worn out.	Replace.

HIGH OUTPUT.

1. Regulator shunt circuit broken.	Examine connections, replace & tighten.
2. Regulator contact settings incorrect.	Adjust accordingly.
3. Regulator first contacts sticking.	Examine, clean and replace.
4. Field lead earthed between dynamo and regulator.	Examine, and rectify.

NO OUTPUT.

1. Dynamo connections broken.	Replace and tighten up.
2 Dynamo main or field fuse blown.	Replace fuse.
3. Cut-out points remain open.	Examine & clean, or replace.
4. Commutator dirty or greasy.	Clean with petrol and soft rag.
5. Battery connections broken.	Replace and tighten.
6. Dynamo burnt out.	Replace dynamo.
7. Regulator burnt out.	Replace regulator.
8. Dirty regulator contacts.	Clean and re-adjust.

REGULATOR BURNT OUT.

1. Regulator contacts fused or welded)	
)	Replace regulator.
2. Dynamo to regulator leads crossed.)	

SLUGGISH RESPONSE TO DISCHARGE RATE.

1. Battery completely discharged.	Charge from external source.
2. Dynamo brushes worn.	Replace brushes.
3. Regulator contacts incorrectly set.	Adjust.

SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q5(a)

SB/VA.1/SF.

Subject : BATTERIES.

Date of Issue 29th March, 1954.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

The batteries recommended for pre-war Bentley cars are as follows. Those specified are currently available and are not necessarily the type originally supplied. This Service Instruction Leaflet supersedes Leaflet No.BM/Q5, which should be destroyed.

Model	Type	Make	Bentley Part No.	Length	Width	Height
3½-Litre	6-MXP-9R	Exide	RD-4358	13-3/16"	6-13/16"	10" With cover
4¼-Litre	6-HZP-9S	Dagenite	Y-3004	13⅛"	6¾"	10⅛" With cover

NOTE: The above are 12 volt batteries.

SERVICE INSTRUCTION LEAFLET

ISSUED BY
BENTLEY MOTORS (1931) LTD.

BM/Q6

SB/VK.1/JSB.

Subject :
OVERHAUL OF STARTER MOTOR DRIVES.
BENTLEY 3½ & 4¼ LITRE.

Date of Issue 1st September, 1953.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

GENERAL:

A friction drive is embodied in the Starter Motor of these chassis in order to prolong the life of the starter pinion and the flywheel teeth.

This leaflet is intended as a guide when overhauling Starter Drives, assuming the electrical system to be in order. Excessive oiliness of the clutch pit, due either to over-use of the one-shot pump or poor condition of the rear main bearing, will lead to slipping of the drive. In such cases attention to the primary cause is necessary.

The friction drive is positioned at the end of the Starter Motor armature shaft and is separately detachable. The drive consists of either a 3-plate or 5-plate spring compressed clutch designed to slip at a figure within the limits 15-30 lbs/ft.

The three-disc drive is used on all models up to the end of D-Series, when the five-disc type was introduced with the geared starter drive.

REMOVAL OF THE STARTER DRIVE FROM THE CAR:

On all models the Starter Drive may be withdrawn from the rear leaving the Starter Motor in position. On models up to the end of D-Series, it is necessary to remove the cap situated to the rear of the bell-housing, undo the nut on the end of the shaft, and withdraw the Starter Drive. On all other 3½ and 4¼ litre models removal of the outermost ring of four nuts permits the withdrawal of the Starter Drive complete with the end bearing assembly. In either case care must be taken to ensure that the spiral spring position between the motor and the pinion is not lost.

DISMANTLING PROCEDURE:

Three-Disc Type (B-1-AE to B-199-DK):

Prise out the externally-dogged retaining ring and pull off the end cap and the second dogged ring. The member housing the buffer spring and bush will then be pushed from the casing by the spring, carrying with it the shaft and engaging nut (L/Hand thread). The latter may then be removed and the friction washers examined. To remove the buffer spring, pass the threaded end of the shaft through the member and screw on the nut until the bush is pressed clear of the ring; the ring may now be prised out.

Five-Disc Type (B-2-EF onwards):

Undo the three securing nuts and remove the end cap. Release the tab washer, undo the shaft nut and draw the housing, bearing and stop nut off the shaft. The clutch assembly may then be dismantled as previously described.

INSPECTION AND OVERHAUL OF THE FRICTION DISCS:

Three-Disc Drive:

As the desired grade of cork is at present unobtainable for replacement purposes, recourse has been made to Ferodo discs (Part No. RD.3726). These discs are thinner than the originals, therefore four discs are necessary to obtain the correct length of pack, fitting two discs face to face. Should the slipping torque of 15/30 lbs. not be obtained, the thickness of pack may be increased by inserting an additional steel washer, D.51584, between the discs fitted face to face. The total thickness of pack should be .638".

Five-Disc Drive:

When overhauling a five-disc drive, opportunity should be taken to modify it to the later seven-disc pattern. The use of Ferodo discs, R.3726 in place of the cork ones will be found beneficial. Seven discs are now provided and it will be necessary to modify the existing friction plates and the driving shell stiffener, and one each additional friction plate, D.51584 and RD.3727 will be supplied in replacement. The conversion scheme is given below.

RE-ASSEMBLY PROCEDURE:

Three- Disc Drive:

1. Using the shaft and nut, compress the buffer spring, and refit the spring ring.

2. Clean all parts and oil sparingly, taking care to keep the friction washers and discs dry. Ensure that the red fibre washer is in position between the pinion and the housing.

3. Assemble the various parts into the housing as follows:-

   a) Place the coil spring in the casing.
   b) Enter the shaft through the pinion.
   c) Assembly on the engaging nut in the following order:- 1 Ferodo washer, 1 externally serrated plate, 1 Ferodo washer, 1 steel washer (D.51584), 1 Ferodo washer, 1 internally serrated plate, 1 Ferodo washer and the member containing all the parts.
   d) Fit the assembly into the casing, screwing the shaft lightly through the nut.
   e) Replace the ring and washer.
   f) Fit the cap and locking ring.

The fitting of the cap is facilitated by mounting the drive on two wooden blocks arranged so that the weight of the unit and the re-action of compressing the springs is taken on the rounded end of the casing.

Clean and lightly oil the armature shaft, position the spiral spring on the drive shaft, and slide the starter drive onto the armature shaft, followed by the stop, the bearing, a plain washer, the tab washer and the nut.

Five-Disc Drive:

1. Place the fibre washer with the chamfer outwards, over the pinion and place the pinion in the shell.

2. Enter the shaft into the pinion.

3. Place the engaging spring in the shell.

4. Place the end clutch plate and damping spring assembly over the shaft and into the engaging spring and shell.

5. Hold the operating vertically and assemble the discs to it in the following order:-
1 Ferodo disc, 1 steel disc with projections, 1 Ferodo disc, 1 spigotted steel disc, 1 Ferodo disc, 1 steel disc with projections, 1 Ferodo disc, 1 Spigotted steel disc, 1 Ferodo disc, 1 steel disc with projections, 1 Ferodo disc, 1 spigotted steel disc and 1 Ferodo disc.

Having assembled the discs hold them closely together with the fingers and remove the operating nut and measure the thickness of the pack, which should be 1.108" (- .010"). If the thickness is above this figure the Ferodo discs may be rubbed down with glass paper on a flat surface. If below this figure increase the thickness by selective fitting of the Ferodo discs, which are initially .094" thick. When the correct thickness of pack has been obtained, soak the Ferodo discs in oil for 30 minutes and re-assemble onto the operating nut as previously described.

Mount the shell and pinion assembly vertically in a vice and screw the shaft through the operating nut together with clutch assembly. Place the fibre distance washer, chamfer downwards, into the clutch ring; the clutch ring and washer can then be placed onto the outer clutch disc and held down by turning the shaft. This facilitates fitting of the cover and lock-ring. Finally, assemble the key, the stop operating bush, the bearing, a new locking washer and the slotted nut onto the shaft.

At this stage check the slipping torque of the drive; it should fall between the limits 15 - 30 lbs/ft., after the drive has been slipped by hand for at least ten revolutions. Correction is effected by selective fitting of the Ferodo washers or by reducing the thickness as required.

If a torque spanner is used it will be necessary to substitute a standard $\frac{1}{2}$" B.S.F. nut for the slotted ring nut. The drive is held vertically by the pinion in a vice and the torque spanner applied to the nut. Should no torque spanner be available, a torque arm may be made up from a piece of steel plate one end of which is shaped to engage two or three of the pinion teeth. The arm should be 12" in length between the hole centres and used with a 0 - 35 lb. spring scale. By keeping the spring scale at right angles to the torque arm, accurate torque readings can be obtained.

SERVICE INSTRUCTION LEAFLET

ISSUED BY

BENTLEY MOTORS (1931) LTD.

BM/Q 7

SB/VK/TRY.

Subject : REPLACEMENT IGNITION COILS.

Date of Issue 22.2.57.

IMPORTANT

THE CONTENTS OF THIS DOCUMENT ARE STRICTLY CONFIDENTIAL AND ARE NOT TO BE TRANSMITTED TO ANY UNAUTHORIZED PERSON.

The original design ignition coil fitted to Bentley $3\frac{1}{2}$ and $4\frac{1}{4}$ litre models is no longer available, and in future all replacements will be of the later coil of more advanced design as fitted to the latest model Bentley 'S' Type motor cars.

It will be necessary for brackets to be supplied with the latest ignition coils owing to the different method of attachment from the original.

IMPORTANT.

This coil operates at full battery voltage, and no ballast resistance is required. Therefore the ballast resistance should be cut out of circuit by attaching both ballast leads to the same terminal. This will be better than short circuiting the resistance as it will be obvious that the ballast is not in use in the event of an original Bentley coil being substituted again at a later date. If only one coil is being replaced, the ballast resistance for that coil only is to be deleted as above.

MATERIALS.

The ignition coil assembly Part No. is R.5435. consisting of:

	PART NO.	NO.OFF.
Ignition Coil	UD.1983	2
Mounting Bracket	R. 5434	1
Coil Mounting Bolt	KC. 296	2
Coil Mounting Nut	K. 4009	2
Coil Mounting Spring Washer	K. 9009	2
Bracket Mounting Bolt	KC.173	2
Bracket Mounting Nut	K. 4006	2
Bracket Mounting Spring Washer	K. 4006	2
Existing Coil Mounting Bolts (where applicable)	K. 173	2

NOTE:

On this final assembly, if one coil only is to be changed, the remaining coil is to have the 2 BA studs removed from the base and mounted on the bracket R.5434 by two bolts (K.173) through the mounting bracket and into the base of the coil.

It is permissable to use up existing stocks of Delco-Remy ignition coil RD.7993 on all pre-war motor cars in place of the Lucas coil UD.1983.

Note that the Delco-Remy ignition coil can be used for either negative or positive earth electric systems whereas the Lucas coil is to be used for negative earth electrical systems only.