

Derby Bentley Society – technical paper compilation

C

Maintenance & Fault Finding

FACTORY

SERVICE INSTRUCTION LEAFLET

ISSUED BY

BENTLEY MOTORS (1931) LTD.



BM/C1(a)

SF/VA.1/SF.

Subject :

MAINTENANCE DATA CHART.

Date
of

Issue 1st September, 1953

This Service Instruction Leaflet replaces Service Instruction Leaflet BM/C1, dated the 24th April, 1948, which should be destroyed, together with the Maintenance Data Chart EM/C1.

The accompanying revised Maintenance Data Chart EM/C1a, is intended as a means of easy reference in connection with the periodic maintenance of pre-war Bentley cars. It is necessarily abbreviated, and it has therefore been thought advisable to expand the information by means of this explanatory leaflet.

As continual reference to this leaflet would detract from the ease and rapidity with which the chart can be used, explanation of the notes on the more commonly used items have been printed on the chart itself.

It will be noted that certain figures differ from those in the Instruction Books and previous technical literature issued by Bentley Motors Ltd., and it should be understood that the information on the chart supersedes any given in previous publications.

EXPLANATION.

NOTE:

- B. The poundage is measured by means of a spring balance at $1\frac{1}{2}$ " from the axial centre line of the assembly with the radial driving springs removed. The figure quoted will be satisfactory under normal conditions, but a variation of plus or minus 1-lb. is permissible to suit individual engines. Generally speaking, a lower setting is beneficial in dealing with a low speed period on pick-up, while a higher poundage may be better to damp out periods at engine speeds of 2,000 - 3,000 r.p.m.

NOTE:

- C. The clearance between the friction linings and the friction drum is set by means of the hexagon headed nut on the servo shaft. This nut is locked by rounded serrations formed on its face which engage similar serrations on an adjacent washer. To check and adjust the servo, apply a bar to the flange of the friction drum and while pushing the drum towards the gearbox, simultaneously apply and release the brake pedal a few times, noting the amount of end float of the drum. Adjust as necessary until the drum has an end float of $1/32$ ".

NOTE:

- E. The side steering tube poundage must be adjusted on the front ball joint and the rear joint assembled as follows:-
- (i) The forward spring assembly must be so adjusted that the spring can be turned easily with the fingers without end play, when the castle nut is fully secured on the stem of the ball pad. If necessary, packing shims may be used between the spring guide and spring to obtain this adjustment, but it should be noted that the two nuts and tab washer, which are used instead of a split pin and castle nut, may be locked in position anywhere along the thread as necessary. Until the final assembly, do not bend over the tab washer.

ALL COMMUNICATIONS SHOULD BE ADDRESSED TO

BENTLEY MOTORS (1931) LTD., SERVICE STATION, HYTHE ROAD, WILLESDEN, LONDON, N.W.10

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- (ii) The loading between the ball and ball pads during final assembly is obtained by applying a certain pre-load to the springs. To obtain this loading, a pinch is applied to the springs as the steering tube nut is screwed on to the socket. To provide the correct pre-load, the rear spring guide, when the assembly has been placed in the socket, must project .012" beyond the end of the socket before the nut is screwed into position. This projection can be obtained by the use of packing shims between the rear spring and guide; however, when shims have been used to obtain this adjustment, care must be taken to see that the spring can still be turned easily by the fingers and that there is no end play.
- (iii) When the adjustments are correct, the tab washer can be bent down and the assembly completed. Screw on the steering tube nut to its full extent so that the pre-load of the springs is obtained. Replace the locking cap and secure the pinch bolts. Replace the end cap.

SERVICE INSTRUCTION LEAFLET

ISSUED BY

BENTLEY MOTORS (1931) LTD.



BM/C2

SB/GF.2/SF.

Subject :

PERIODIC LUBRICATION & ADJUSTMENT
SCHEDULES 'A' & 'B'.

Date
of
Issue

29th Sept.1947.

FOR MAINTENANCE DATA REFER TO SERVICE INSTRUCTION LEAFLET BM/C1.
FOR RECOMMENDED LUBRICANTS REFER TO SERVICE INSTRUCTION LEAFLET BM/D2.

GENERAL:

For the purpose of assisting Retailers with the maintenance of Bentley cars in their areas, a system of periodic lubrication and adjustment on a fixed mileage basis has been evolved.

It is recommended that this be instituted as a normal maintenance routine, and that appropriate arrangements be made with any owners who may wish to take advantage of this service.

It is confidently believed that owners will readily subscribe to this system of maintenance, and it is suggested that Retailers make arrangements to provide the necessary information, pointing out the advantages to be gained, such as regularity of maintenance, minimum amount of time that the car will be required, question of having a fixed rate of charge, and the knowledge that the performance and condition of the car will be kept to the maximum standard of efficiency.

It will be noticed that this system is a consolidation, on a bulk mileage basis, of the various routines shown in a handbook, and as such, does not in any way supersede the instructions as laid down in the respective handbook, to owners who may wish to carry out their own maintenance inspections.

This system consists of two Schedules A and B, and operates in the following manner:-

SCHEDULE 'A'. At the conclusion of every 5,000 miles and covers all those items associated with the engine and chassis requiring lubrication and adjustment.

SCHEDULE 'B'. At the conclusion of every 10,000 miles, in addition to the repetition of the whole of Schedule 'A', covers the complete change of lubricant of remaining main components, together with the inspection and rectification of those items not included at the lower mileage.

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SERVICE INSTRUCTION LEAFLET

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BENTLEY MOTORS (1931) LTD.



BM/C2
3½ LITRE

SB/JSL.6/NT.

Subject :

SCHEDULE 'A' EVERY 5,000 MILES
AND
SCHEDULE 'B' EVERY 10,000 MILES.

Date
of 22nd April, 1953.
Issue

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SCHEDULE 'A'.

LUBRICATE:

1. All bonnet fasteners and locks.
2. Fan pulley.
3. Water pump bearings.
4. Battery ignition distributor and governor.
5. Starter motor and dynamo bearings.
6. All engine and steering column controls, linkage joints, including radiator shutters.
7. Accelerator pedal and countershaft.
8. All brake system joints.
9. Clutch shaft and toggle levers.
10. Both universal joints.

CHECK OIL LEVEL AND REPLENISH WHERE NECESSARY:

1. Chassis oil tank.
2. Steering box.
3. Shock dampers and manual control pump.
4. Gearbox.
5. Rear Axle.

ENGINE:

Drain crankcase, remove and clean oil filter, and refill with fresh oil.

ADJUSTMENTS:

1. Check water and replenish as necessary.
2. Adjust fan belt if necessary.
3. Check, and if necessary, reset tappet clearances.
4. Clean and reset spark plug gaps.
5. Clean and reset battery ignition contact breaker points.
6. Clean carburettor air cleaner element.
7. Clean carburettor float chamber and lubricate air valve guides.
8. Check fuel pumps.
9. Clean all petrol filters.
10. Check, and if necessary, adjust clutch pedal free movement.
11. Check, and if necessary, adjust external adjustments for all brakes.
12. Check, and if necessary, adjust steering column thrust race.

13. Check steering and shock damper ball joints.
14. Check for excessive oil leakage at any point in chassis lubrication system.
15. Check, and if necessary, adjust all tyre pressures.

ELECTRICAL SYSTEM:

1. Check battery acid level, and if necessary, top up with distilled water.
2. Clean all battery terminals.
3. Check and reset ignition timing as necessary.
4. Check electrical equipment.
5. Remove brush dust from dynamo and starter motor.

SCHEDULE 'B'

EVERY 10,000 MILES.

1. Carry out the whole of Schedule 'A'.
 2. Drain gearbox and refill with fresh oil.
 3. Drain rear axle and refill with fresh oil.
 4. Clean cut-out points.
 5. Remove road wheels and grease hub splines, refit wheels.
 6. Change water in engine unless it is filled with anti-freeze.
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SERVICE INSTRUCTION LEAFLET

ISSUED BY

BENTLEY MOTORS (1931) LTD.



BM/C 2
4¼ LITRE

SB/JSL.2/NT.

Subject :

SCHEDULE 'A' EVERY 5,000 MILES
AND
SCHEDULE 'B' EVERY 10,000 MILES.

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SCHEDULE 'A'.

LUBRICATE:

1. All bonnet fasteners and locks.
2. Fan pulley.
3. Water pump bearings.
4. Battery ignition distributor and governor.
5. Starter motor and dynamo bearings.
6. All engine and steering column controls, and linkage joints, including radiator shutters.
7. Accelerator pedal and countershaft.
8. Both universal joints.
9. All linkages and connections of brake system.

CHECK OIL LEVEL AND REPLENISH WHEN NECESSARY:

1. Chassis oil tank.
2. Steering box.
3. Shock dampers and manual control pump.
4. Gearbox.
5. Rear axle.

ENGINE:

Drain crankcase, remove and clean oil filter, and refill with fresh oil.

ENGINE AND CHASSIS ADJUSTMENTS:

1. Check water and replenish as necessary.
2. Adjust fan belt if necessary.
3. Check and reset tappet clearances.
4. Clean and reset spark plug gaps.
5. Clean and reset battery ignition contact breaker points.
6. Clean carburettor air cleaner element.
7. Clean carburettor float chambers, and lubricate air valve guides.
8. Check fuel pumps.
9. Clean petrol filter.
10. Check, and if necessary, adjust clutch pedal free movement.
11. Check, and if necessary, adjust steering column thrust race.

ALL COMMUNICATIONS SHOULD BE ADDRESSED TO

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12. Check, and if necessary, adjust all external adjustments for brakes.
13. Check, steering and shock damper ball joints.
14. Check for excessive oil leakage at any point of chassis lubrication system.
15. Check, and if necessary, adjust all tyre pressures.

ELECTRICAL SYSTEM:

1. Check battery acid level, and if necessary, top up with distilled water.
2. Clean all battery terminals.
3. Remove brush dust from dynamo and starter motor.
4. Check and reset ignition timings as necessary.
5. Check electrical equipment.

SCHEDULE 'B'

EVERY 10,000 MILES.

1. Carry out the whole of Schedule 'A'.
 2. Clean fuel strainer on the rear chassis cross members.
 3. Clean cut-out points.
 4. Drain gearbox and refill with fresh oil.
 5. Drain rear axle and refill with fresh oil.
 6. Change water in engine unless filled with anti-freeze.
 7. Remove and refit road wheels, grease hub splines.
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C

Maintenance & Fault Finding

RREC, RROC & Misc Articles

Freedom For The Clutch

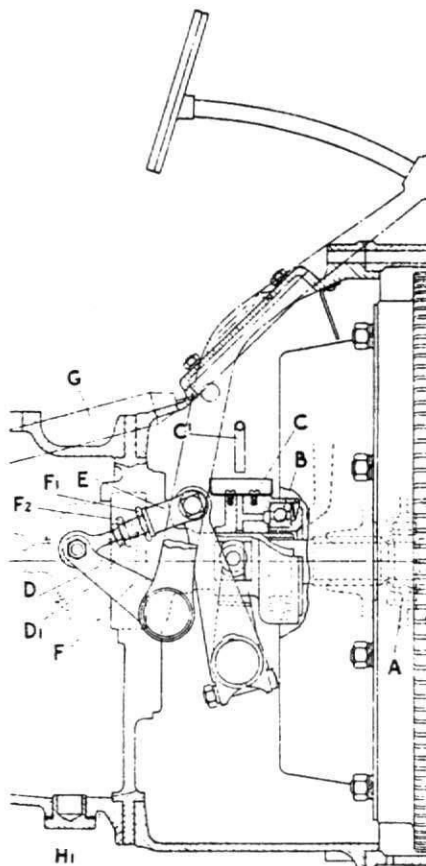
by James H. Hise

Recently I went through a traumatic experience with the clutch in my 25/30, Maberly Sport Saloon. It seems to me that similar problems may occur in other cars with the same type of Borg & Beck clutch. This well-known British component was fitted to the 4½ Bentleys and prewar Wraiths in addition to the 25/30 series of Rolls-Royce cars. I'd like to share this experience for the benefit of other club members with these cars.

I have owned GRO77 since 1968. Shortly after I bought the old girl I refinished the body and put on a new set of wheels and tires. After that I have simply driven, maintained and enjoyed the car. Last year I had the car out perhaps four times and then it sat in my unheated garage over the winter until this March. After the usual preparations before startup I got in the car with its freshly installed battery, cranked her over, and found to my horror that the clutch was stuck...like with "Super Glue". The usual remedies for this malady, including rocking in gear with a spanner on the crank nut to lock the engine were to no avail. We tried running the engine until all was hotter than Hades and then rocking it without success. Bob Shaffner was consulted and his ideas paralleled ours. It began to look as though we were going to have to lift out the engine.

My good friend, and long time Rolls-Royce mechanic, Harry Oldham, was asked to look at the situation and he agreed to see what he could do before proceeding to dismantle the car. He was able to free the clutch and I am describing his method with his permission and admonition that it shouldn't be attempted by anyone lacking a practical knowledge of these cars.

After removing the carpet and front floor boards the inspection cover was removed from the flywheel housing. This exposed the pressure plate and the clutch release mechanism. Using a pressure oil can with a long flexible spout, CRC 5-56 solvent was liberally forced into the clutch mechanism and onto the exposed transmission drive shaft. During this process the clutch was turned over several times in order to distribute the penetrant as widely as possible. Dripping solvent was captured in a pan under the car, and when it started to



PART SECTIONAL VIEW OF CLUTCH.

run off relatively clean, was filtered and reused. This process was performed repeatedly for 5 days.

We then tried rocking the car again...no success. This clutch was really glued tight. Harry then removed one of the nuts holding the pressure plate assembly to the flywheel. Careful measurement indicated that about 3/8 inch of separation could be obtained between the flywheel and the pressed steel pressure plate cover. This allowed some direct access to the pressure plate and central clutch disc. Harry fashioned a right angle tool with a very thin tapered edge from a modern brake adjusting spoon. By careful manipulation through the inspection port, after the pressure plate was backed off, he was able to pry the disc from the flywheel. It remained stuck to the pressure plate, however, and access to that side was not possible.

In order to hold the clutch assembly together, it was necessary to leave the nuts on the flywheel studs and the 3/8" space was all he dared to allow himself. Examining his options of access to the back side of the clutch disc, Harry observed that the central sliding spider of the disc was visible on

the splined shaft. The car was chained to a solid post with a "come-along", reverse gear engaged, and considerable tension placed on the drive train. Harry then took a long brass bar shaped for the purpose, and placed it on the disc spider hub close to the splined shaft. One solid tonk with a heavy hammer on the brass bar broke the disc loose from the drive plate. The car went rolling toward the post, free at last.

Now with a free clutch other problems manifested themselves. The disc was so saturated with penetrant the car would not drive. Judicious slipping in gear to burn off the solvent worked fine, and although there is still some slippage, it continues to improve. I have since survived a wedding and some three hundred miles of anxious driving without incident.

Some observations...The clutch release bearing in these cars is lubricated by the bijur system and the dripping oil will inevitably fly out and onto the clutch disc. Normal driving burns this stuff off the friction surfaces and no accumulation of gumpf remains on the disc to turn itself into super-glue... I think more driving and use would prevent this problem entirely. Blocking the clutch all the way in during storage may be all right for Ghosts with their cone clutches but it seems to me that stressing the springs for long periods of time will have a weakening effect. My friend Harry agrees.

A word about Harry Oldham. His poor health forced him to curtail a lot of his activities. His expert help in this case deserves recognition, and I'm sure his many friends in the Ohio region will agree. His interest and knowledge of the cars is vast and this is only surpassed by the modesty he shows when appreciation for his help is extended. His pristine Cloud I, restored from a rusted-out hulk, says a lot about Harry!

To my best recollection and after much searching, I have found no reference to clutch problems and their cures in *The Flying Lady*. Furthermore, little information is given in the 25/30 Handbook other than to explain the workings of the mechanism and adjustment procedures. Perhaps other small horsepower car owners who have had drive train problems might contribute something to our collective knowledge.