

**A BRIEF GUIDE TO
ROLLS-ROYCE
AND
BENTLEY CARS**

1925 — 1955

“Faults and Remedies Supplement”

ROLLS-ROYCE

BENTLEY

1925 - 55

FAULTS AND REMEDIES

Much of that which follows will be obvious to many. A little may assist a few, by solving in a comparatively simple way, some problem which has caused hours of concern. It is a tribute to Sir Henry Royce that thousands of people all over the world still devote time and money to restoring and repairing machinery which he designed, whilst other contemporary products are only too often consigned to the scrap heap. Whilst these efforts can hardly aspire to the perfection which was his aim, it is possible that he would have some sympathy with the trials and troubles brought on by age, ignorance, neglect or sheer bad luck. This is an attempt to summarise the kind of troubles which we, over many years, have found to be quite commonplace in Rolls and Bentleys. It is not meant to include or be advice on commonplace faults found in any cars. Maintenance Manuals and Instruction Books are readily available and we have not sought to duplicate the kind of information they contain.

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BRAKES INEFFECTIVE - All Models

It is an interesting fact that worn linings prove the rarest cause of poor brakes. Often indeed the cars with the best brakes have somewhat worn linings. The explanation is not hard to find. Worn linkages, seized linkages, wrongly set up servo motor, badly lubricated brake cam or oily linings are the usual culprits.

Any of the above faults, which are only too common, prevent proper application of the linings to the drum. Not only will the brakes be poor, but the linings will not wear. Despite this, someone more likely than not has fitted new linings in a vain endeavour to improve matters. The new linings may worsen matters as they are unlikely to seat as well on the drums as the originals, and they will never seat until they can be properly applied.

Owners are strongly advised to inspect, clean, lubricate and ensure the proper assembly of the whole braking system before re-lining. Refer to the list below for likely snags.

(a) Oil on Linings

Front - Leaks from chassis lubrication pipework to king pins which runs inside the brake drum.

Rear - Leaks from chassis lubrication supply to brake actuating shafts.

Oil from differential assembly due to over-filling or blocked oil drain outlets on the back plates. Leaks from front wheel cylinders on post-war models, with hydraulic systems.

(b) Seizure of Actuating Shafts

Dismantle, clean, lubricate and re-assemble.

(c) Brake Servo incorrectly assembled or adjusted

(d) Oil on Brake Servo Linings

Make sure that the Oil Seal is renewed when the Servo is re-lined, in postwar models.

(e) Incorrect Bedding of Linings

When new linings are fitted, they should strictly be skimmed with a circumferential cutter. Few people possess this tool and the Makers can no longer supply it. Bedding may have to be carried out by trial and error. The use of a cutaway brake drum can be useful. It is unlikely that perfect bedding of new linings will be obtained but if the fitting is

carried out with maximum care and the actuating mechanisms are correct, the linings will soon bed in - in the course of use, providing the brake drums are not badly scored or worn. Owners should not expect the brakes to be at their best just after relining.

(f) Brake Squeal - All Models

The makers say that this is prevalent today since linings of the original specification cannot be obtained. No infallible remedy is known, but certainly it is worth removing all dust from inside the brake drums and ensuring that the linings are not loose on the shoes.

LOSS OF OIL FROM GEARBOX - Silver Wraith, Mk. VI or 'R' Type Bentley

Oil is held under pressure by the ride control pump to the rear shock absorbers when the car is running. The feed is via a flexible pipe. Porosity or leaks may result in a steady oil loss, not apparent when the car is stationary.

EXCESSIVE FREE PLAY ON TRANSMISSION - Pre-war Models

Although possibly due to worn universal joints, or slackness in the rear axle assembly, more often than not the fault derives from worn driving dogs. The fully floating half-shafts are splined into 'wheel drivers', which have extended splines mating with the hubs themselves. These drivers can be replaced by new ones with oversize splines. The splines themselves can be peened with a hammer to reduce the slackness to some extent.

WHEEL CREAK - All Pre-war Models

This is by no means always due to loose spokes, particularly if discs are fitted. Wire wheels 'give' slightly at very low speeds, which can cause the discs to rub slightly. Hire car operators were known to keep an oily rag inside the disc or, in an emergency, to throw a bucket of water at the wheels whilst the bride was in church, to save the embarrassing comments provoked by this occurrence!

FAILURE OF CARBURETTOR to respond to adjustments - All Models with Rolls-Royce Type Carburettors

Whereas the external movements operating the jets may be normal, if the return springs are broken or seized the jets will remain static. For instance, the high speed jet on the '20' and early 20/25 is kept up against the mixture control

arm by a spring loaded plunger in the plug at the base of the jet. If this plunger sticks, the jet will remain in the 'weak' position whatever adjustments are made externally. It should also be mentioned that air leaks in the induction side of the engine make carburettor tuning almost impossible.

GENERAL ENGINE DEBILITY when everything appears correct (See Ignition) '20' and 20/25 mainly

The inlet manifold gaskets all look alike at first glance. They are not. Two arms of the induction manifold feed two cylinders each, the other two arms feed one cylinder each. The slightly larger pair of gaskets must be placed with the larger ports.

We have seen numberless examples of cars with the larger ports partly restricted by a gasket of smaller internal diameter.

EXTREME LOSS OF POWER UNDER STRESS - particularly '20' and 20/25

Cars giving an excellent performance have been known to lose power very conspicuously when under stress as, for instance, during a long, hot ascent. The power mysteriously re-appears when conditions are relaxed. This can be due to overtight exhaust valves and/or lack of valve stem lubrication, causing the valves to stick when expanded by heat. The remedy is, of course, to clean the valve stems, check the oil supply, and ease the valve guides if there is still too little clearance. A blocked silencer can cause the same symptoms.

DIFFICULTY IN OBTAINING STABLE TAPPET SETTINGS - All Models

Apart from the obvious difficulty in setting tappets, if the rocker arms are worn, irregularities in the cam followers produce very erratic results. A tappet set at a clearance of .004" will possibly open up to .008", or even lose its clearance altogether after the engine has turned over a few times. Clearly the cam followers must be removed or re-surfaced, or new pins fitted where roller followers are used. In the meantime, it is wise to use a wide tappet setting to ensure that the valves always close completely.

IGNITION - All Models prior to 1945

The low tension supply to the ignition coil is taken through a ballast resistance which provides a voltage drop to supply the 4-volt coil. If the original coil is in use, the resistance in circuit may have risen due to corrosion, resulting

in a low voltage at the coil. Numerous cases occur where a 12-volt coil has been substituted for the 4-volt coil without by-passing the ballast resistance. The consequent weak spark is sufficient to fire the mixture if the plug gaps are small, but performance is indifferent, and we have known much time and money to be wasted in eliminating other possible causes of trouble. Check that the ignition setting is strictly according to the timing marks, as these engines will not knock or pink.

REPEATED FAILURE OF CLUTCH - particularly Rolls '20', 20/25 and Bentley 3½ Litre

The clutches on these cars are perfectly adequate, but will slip under severe strain even when in perfect condition. Any of the following faults will lead to scuffing of the linings and consequently excessively rapid wear accompanied by a strong tendency to slip:-

- (a) Toggles set with no free play
- (b) Worn spigot bearing
- (c) Corrosion of splines on the clutch shaft
- (d) Mis-alignment of the rotating parts

NOISE FROM REAR AXLE - All Models

Time has shown that the crown wheel and pinion gears are extremely durable. Noise of audible intensity should always be investigated. In the first instance, it is unlikely to result from the bearings. The commonest noise is experienced when the engine is pulling, thus creating the maximum thrust on the pinion thrust bearing. If the transmission is quiet under other conditions, renewal of this bearing will prove a cure. If the bearings have worn slack and allow the pinion to run out of mesh, damage to the gears will quickly result. Even if not positively damaged, the teeth will wear out of true, and a whine will probably be experienced when the bearings are renewed and the gears are restored to their correct mesh.

LITTLE END NOISE - All Models

This is a familiar sound to the experienced Rolls or Bentley owner, but causes much concern to those less well acquainted. Starting as a faint 'purr' on the over-run, it will, in the course of years, develop to a rattle. At idling speed a really worn little end bush will sometimes cause a conspicuous knock, particularly with worn pistons.

When new bushes are fitted, the boring and alignment must be carried out with the utmost precision, leaving no

clearance whatever. A roughly bored bush will set up audible noise in no time. Needless to say, new bushes are wasted on worn gudgeon pins, and the latter must be in perfect condition. The oil pipes, or drillings in the connecting rods, must be free from obstruction.

Slight audible noise from the small ends is a common fault, and is not a serious one that will lead to further trouble. Rectification can safely be deferred until other engine work is desirable.

CYLINDER HEAD SEIZED ON - Mk. VI Bentley, P.111 Rolls, Silver Wraith

This normally results from aluminium corrosion which virtually binds the head on to the steel studs. No amount of force will effect a cure. A circumferential cutter must be run down the studs to give a clearance before the head is lifted. Failure to carry out this action has led to attempts at levering off the head with resultant damage. We have direct knowledge of one head being sawn off!

LOSS OF ENGINE OIL - All Models

On many occasions, owners have expected to have new seals fitted to the water pump drive shaft, dynamo drive shaft, or front and rear of crankshaft to cure an excessive leak of oil at these points. Almost invariably the trouble is due to piston blow by, resulting in a build up of pressure in the crankcase. This pressure forces the oil out at the points mentioned, where in fact there are no positive seals. On dismantling, more often than not, broken rings and damaged pistons are discovered rather than excessive bore wear. Heavy oil consumption results from such leaks, which at the onset may not be noticed, since they occur more when the car is driven at speed than at other times.

NON-EFFECTIVE HEATERS - All Models

A few pre-war models were fitted with heaters, but many have had heaters added. The water connections have often been misplaced. The take-off should be from a core plug at the rear of the cylinder head, the return being made through the backplate of the water pump.

Heating systems of this kind, and of the kind fitted to the post-war models up to 1955 depend on:-

- (a) Freedom from scale in the heater element so that the circulation is free.

- (b) A high enough water temperature, maintained in cold weather by a properly acting thermostat in the case of later Bentleys, and radiator shutter control in the case of Rolls-Royce.

WATER LOSS, only when travelling - All Models

Basically, this is due to surge, causing water to be expelled from the radiator over-flow. The causes of this surge are various:-

- (a) If the radiator cap is not fitted with a "steam valve" the overflow is liable to take off water thrown forward on sudden de-celeration.
- (b) Local overheating in the cylinder head causes pockets of steam to form which raise the water level above the overflow. Again, if the steam valve is missing there will be nothing to discourage this water from entering the overflow.
- (c) Internal cylinder-head cracks, or a faulty cylinder-head gasket allowing exhaust gases to enter the water jacket will cause surge.

On a long run the water loss may be such that overheating sets in. This will exaggerate the loss under (b) and (c) and the results will be very serious.

There are strong grounds for naming the water temperature gauge the most important instrument on the dashboard.

See also under 'Cracked Cylinder-heads'.

OIL LOSS FROM ROCKER COVER - '20' and 20/25

These models were not fitted with a rocker cover gasket. The joint is a face joint and oil leaks can be prevented by grinding the surfaces in lightly with valve paste, cleaning thoroughly and tightening the thumb screw evenly and firmly. Frequently attempts have been made to fit a gasket, the result of which is generally most unsatisfactory. Owners are strongly recommended to remove any improvised gaskets that may have been fitted.

CRACKED CYLINDER HEADS - Especially '20', 20/25, 25/30 and pre-war Bentleys

Frost cracks call for no comment beyond the fact that repair may, or may not be possible.

Very many heads have surface cracks which result primarily from overheating. If the cracks are external and do not leak they are relatively harmless, but if the cause is not eliminated they will rapidly deteriorate and internal cracks of a more serious nature may develop from the same cause.

Some comment is necessary on the repairing of damaged cylinder heads. Repairs to aluminium heads are reasonably straightforward but the cast iron heads present enormous difficulty and it is unwise to risk a repair by any firm which has not had direct experience and successful experience of repairing this particular type of cast iron head. For one thing, an apparently successful repair which stands up to a water test, may quickly break down under running conditions. Since many new heads are not available and sound secondhand heads are scarce, it is a false economy to count the matter of cost in repairing a cylinder head. The quality of the repair should outweigh all considerations.

UNSTABLE STEERING - Middle Series 20/25's especially

Many people have experienced a tendency to "wobble" particularly after striking a pot hole or "level" crossing, or sometimes without provocation. More often than not, a very thorough examination of the steering gear reveals that all is correct. Cars with worn steering seldom seem troubled in this way.

The fact that steering is well balanced and freely responsive, makes it essential to have the spring loading on the track rod ends set to the right poundage. This loading damps the steering and is important. The trouble can also be caused by springs, shock absorbers, distorted wheels, etc., but the commonest and most frequently overlooked cause is that given above.

OVERHEATING - All Models

When a car overheats, first thoughts run to the radiator and water pump. With a pre-war Rolls-Royce or Bentley, further consideration is advisable.

Cooling water enters the front of the block and leaves the front of the head. In consequence, the rear of the engine has a restricted flow. When many years of accumulated scale has covered the water passages and partially choked the circulation, local overheating occurs in the cylinder head, and cracks develop as a result. Removal of core plugs and side plate is necessary to descale the block and head. This is a worthwhile procedure whenever the thermometer shows high running temperatures.

OIL PRESSURE

The following comments have at times proved useful to owners of cars with fluctuating oil pressure.

On hard braking or cornering, oil pressure on a '20' may be lost due to surge removing the oil from the pump intake. Keep the sump full.

Relief valves are liable to stick open due to the presence of foreign matter. This frequently happens after engine overhaul. Keep the valves clean.

Many pre-war cars are running with an unduly high pressure due to sludged-up oil ways. We have seen more bearing trouble result from this cause than from any other.

CHARGING FAULTS - All pre-war Models

The charging circuit is unconventional in that the dynamo is not wired on an earth return basis. Any breakdown in the insulation from the dynamo windings or brushes to the frame will cause trouble. More often than not dynamo failures result from a fault in the charging circuit and if installing a reconditioned or repaired dynamo, it is most advisable to make absolutely certain that the external circuit is absolutely correct. Another important point to bear in mind is that although the dynamos fitted to various models appear interchangeable, their charging characteristics vary. To go into full detail would be beyond the scope of this booklet but it was thought wise to include this warning, since the casual replacement of dynamos has caused trouble.

SLIPPING STARTER DRIVE - pre-war Models

The drive from a self-starter armature is transferred to the pinion through the medium of a cork clutch assembly. If the cork discs become oily the starter will slip. It is wise to replace these corks when an engine is overhauled, since many a starter clutch, which would drive a worn engine fails to drive an engine tightly assembled after overhaul. See also under the heading 'Loss of Engine Oil', the possible reasons for starter clutch becoming saturated with oil.

STARTING HANDLES - pre-war Models

The splines between the crank portion and the shaft portion become worn rendering the handle unusable. This wear would never occur, if, whenever the handle was used, care was taken to ensure that the crank was pushed firmly home on the shaft. This warning has usually come too late.

A good remedy is to drill through the crank and shaft whilst the two are mated together and insert a silver pin or dowel. This is usually preferable to the other cure which is to braze the two portions together.

STORAGE

1. Cleaning

(a) Wash down engine, gear box, axle, running gear and under carriage to remove dirt, grease, road film and foreign material. Do not use steam cleaning or other high pressure methods since these will cause rusting of ferrous metals and serve to drive grit and dirt into working parts.

(b) Wipe off any remaining residue of cleaning solution and allow to dry. Retouch exposed ferrous metal with prevailing colour in good enamel.

(c) Thoroughly clean interior coachwork. Cloth upholstery should be lightly sponged to remove spots and surface soil. Leather should be washed with a high quality neutral soap and warm water. After thorough drying, it should be treated with a saddle soap or preservative such as Connolly's "Hide Food." When the interior is thoroughly clean, it should be carefully treated with moth-proofing spray, taking care to reach all corners and crevices.

(d) Wash interior of coachwork, removing grease, tar, road film, and adhering foreign matter. Retouch chipped spots in the paint work and polish entire surface using a hard wax finish. All bright work should be polished with a suitable compound to remove oxides, rust, dirt, etc. and lightly coated with vaseline or other neutral lubricant.

2. Engine

(a) Drain and flush cooling system thoroughly to remove loose scale, rust, sediment and any residual antifreeze solution.

Inspect water hose connections and all gasketed joints for leaks or seepage. Make necessary replacements. Refill cooling system with a 50/50 mixture of inhibited alcohol-type anti-freeze. This will protect up to -30°F . Leaving the cooling system drained will result in more rusting than leaving filled as described above.

(b) Drain engine oil. Remove and clean any sump strainers, filters, or pressure relief valves. Refill sump with oil of correct viscosity.

Remove spark plugs and by means of the starter rotate the engine until full oil pressure registers on the gauge. This serves to circulate fresh oil to all parts of the engine to form a protective film.

Inject into each cylinder a half cup of oil and slowly rotate engine with the crank to distribute an oil film over the cylinder walls.

Remove the valve cover and thoroughly slush the rocker mechanism with engine oil.

Replace valve cover and spark plugs. Do not run engine again until ready to remove from storage.

Inspect and clean generator, magneto, and distributor, removing any deposit of carbon or dirt. Apply a light coating of vaseline to breaker cams.

Lubricate engine at points recommended in manual.

3. Gear Box and Clutch

(a) Lubricate all linkages, clevises and oil cups.

(b) Block out clutch slightly to relieve pressure on cones or plates. Failure to do this may result in a stuck clutch when car is put back in service.

4. Miscellaneous

(a) Operate pump of one-shot chassis lubrication system (if any) twice.

(b) Remove, clean (with ammonia) and store battery in a warm dry place. A trickle charge once a month is helpful. Wash out battery box with ammonia and dry thoroughly. Repaint.

(c) Inflate tyres to 40 p.s.i. and jack up all four wheels. Cover tyres to avoid deterioration from light.