

ELECTRONICS

RESTORING A VINTAGE BURNS BASS

Bringing a 50 year old instrument back from the dead: A challenging, but not impossible mission

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If a car has been invaded by rust and does not run any more, then it is usually a candidate for the scrapyard. Except it is of a noble brand like Mercedes, Rolls Royce, or Jaguar; one then will risk everything to bring it back to the best possible condition. Whether one actually then drives it is another question.

Such a case was this Burns bass which was brought to me for repair (**Fig 1**, on this page). It was built in 1964 and became famous when it was played by the "Shadows", next to two



guitars with the same body shape. The Burns company was founded in 1960 in London by **James Ormston Burns** (1925 -1999). In that decade he built a lot of different electric guitars and basses. Later they fell into oblivion, but in 1991 production started again with the reissue of many of the old models, technically revised.

The nearly half a century that passed since this bass was made has not been kind with it. At first sight the many cracks in the varnish stand out, but this was no problem compared with some other issues, much more difficult to solve. No tone came out at first. After removing the pickguard and checking the pickups the reason was clear: All three pickups were dead. Also, two handles of the tuners got lost; the neck was extremely warped; the string action

was so high that it was impossible to play. The strings seemed to be as old as the rest of the bass, you can imagine how they sounded and looked. But the owner was a convinced Shadows enthusiast and wanted this bass ready to play and sounding good again, at all costs. This finally could be done, but it proved to be a hard challenge.

Basses with three pickups are relatively rare, so the first question that comes to mind is how the controls work. Very simple: Just like with the old Stratocaster. With the toggle switch you activate one the pickups at a time. Combinations of neighboring pickups are in principle possible if one you put the lever between two locking positions, but this is unsafe. The first pot is the master volume control; the other two are tone controls for



Fig 1 (in the opposing page). To be repaired: Burns „Shadow Bass“, 1964. Neck totally warped, all pickups dead, two tuner handles missing.

Fig. 2 (above): Three single coil pickups, controls like Stratocaster: master volume and two tones (no tone control for the bridge pickup).

the neck and the middle pickup. The bridge pickup doesn't have one. The bridge does not have separate segments but consists of a continuous piece put at an angle as a whole. It is adjustable in the direction of the strings (**fig. 2**). So the intonation can be adjusted quite well, to some extent. A rubber mute is mounted over the strings near the bridge which can make the tone shorter. This is what the bass players wanted in the old days. So if somebody speaks of a "vintage bass sound", then they are referring exactly to this short, extremely muffled tone. One can adjust the mute with a screwdriver or even completely remove it.

The bridge has a very unusual construction. It has a blade at the front side like the modern vibrato units on guitars. A black plastic cover is mounted on the back of the body here. Under this cover and out of sight there are two very strong springs, which pull the bridge down on the body (**fig. 3**). Not even the hard pull of the strings can move it up. Should this be a bass with vibrato? It looks so, but there is no operating lever, and no hole where it could have been fastened. Very strange.

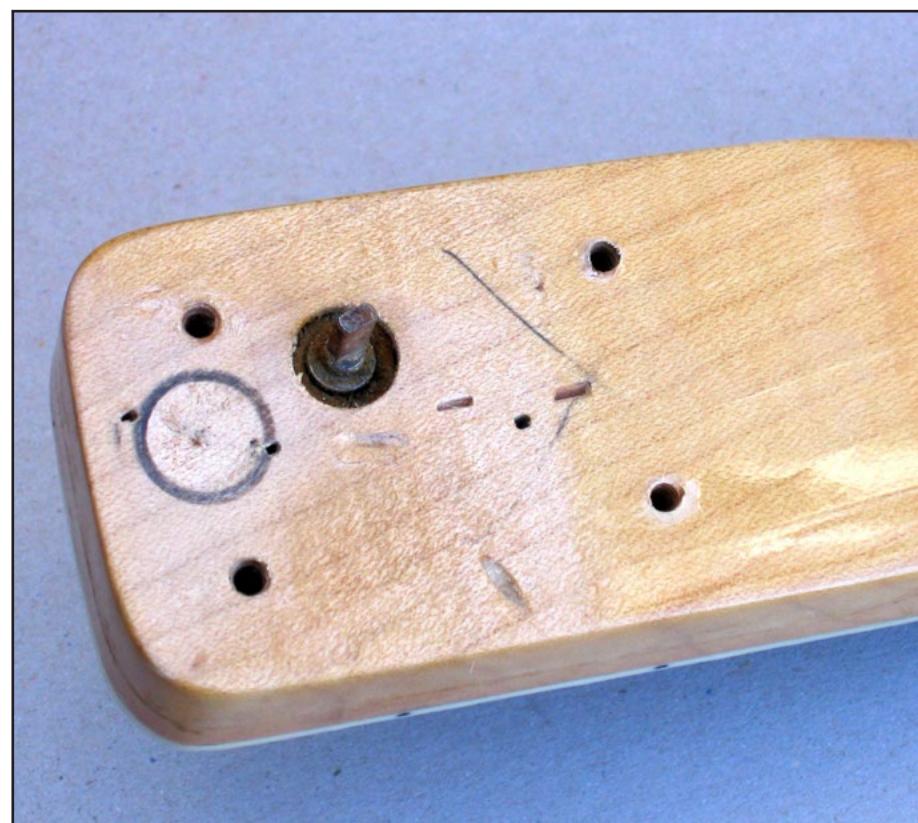


Fig. 4: Neck warp adjustment via an internal worm drive.

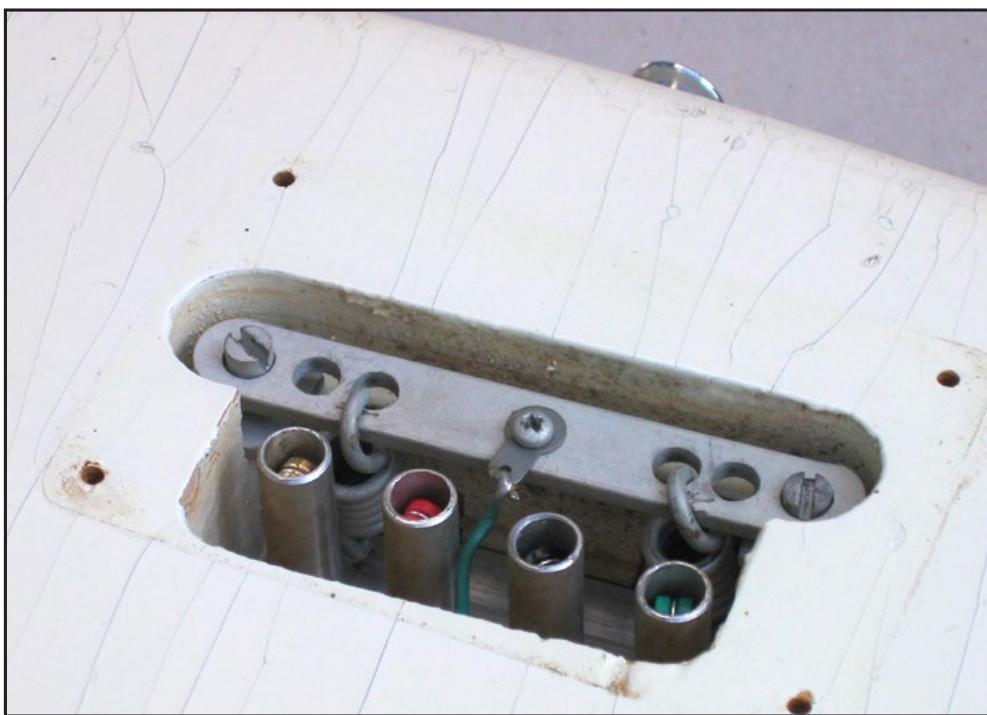


Fig. 3: The bridge unit is movable and hold by two strong springs. But there is no vibrato lever.

The screw for adjusting the curvature of the neck is on the body side here. It is not the usual nut or recessed screw like in the case of other brands, but a rectangular axis sticking out from the back of the heel (fig. 4). An internal nut, and consequently the truss rod, is adjusted via a worm gear. That should work easier than the normal direct construction, but in this case it was the opposite, as everything was totally rusty. A lot of rust solvent was necessary to make it swivel again. The neck is fastened to the body with four strong screws which were hidden under a black plastic cover. The neck can be tilted against the body just as some Fender guitars from the 70s (they used only three screws, though). To tilt the neck, a fifth, very thick screw placed between the two inner ones is used. After one has solved how the other 4 screws work, one can turn this fifth screw to tilt the neck and then tighten the other four screws strongly again. Besides the adjustment of the warping, tilting was badly needed here to get an action reasonably low. Because of

the difficult access to the adjusting axis (**fig. 4**) when the neck is screwed on, this was a tricky job. It would work better with a special wrench which one could get –hopefully– from the Burns Company in London. The handles of the tuners are not available from Burns, only the complete units. Until these arrived two wrenches for radiator ventilation (square-headed, 5 x 5mm) were useful as a temporary solution. They matched exactly. So at least I could tune the strings. The most challenging problem was to bring the pickups back from the dead. This model of pickups is not available anymore. The ones on the new version of this bass are smaller and do not fit. So there was no option but to repair them. They are single-coils called „Rezo-Matik“. The covers consist of a very thin, fragile synthetic material, glued on tightly. So I turned them around and poured some turpentine in. After some hours the glue got weak and the coils could be taken out of the covers. Now it was visible how these pickups are constructed (**fig. 5**). They have no

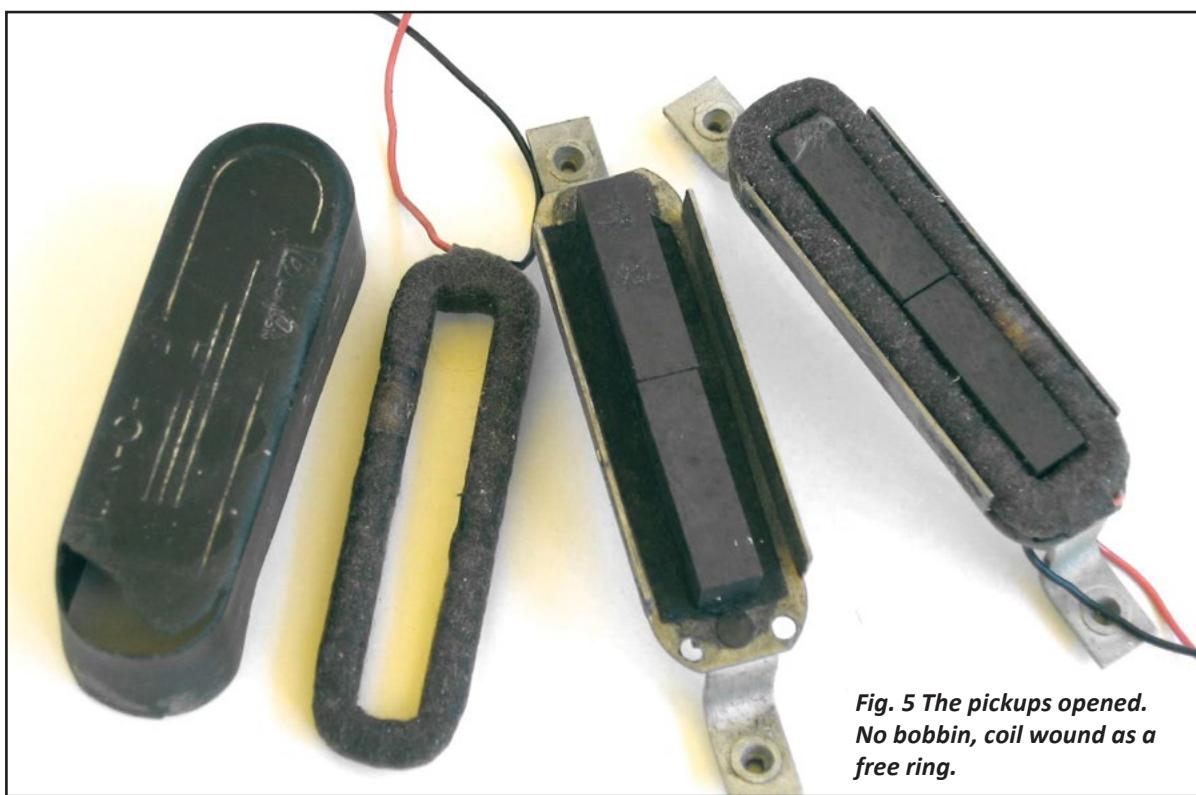


Fig. 5 The pickups opened.
No bobbin, coil wound as a
free ring.

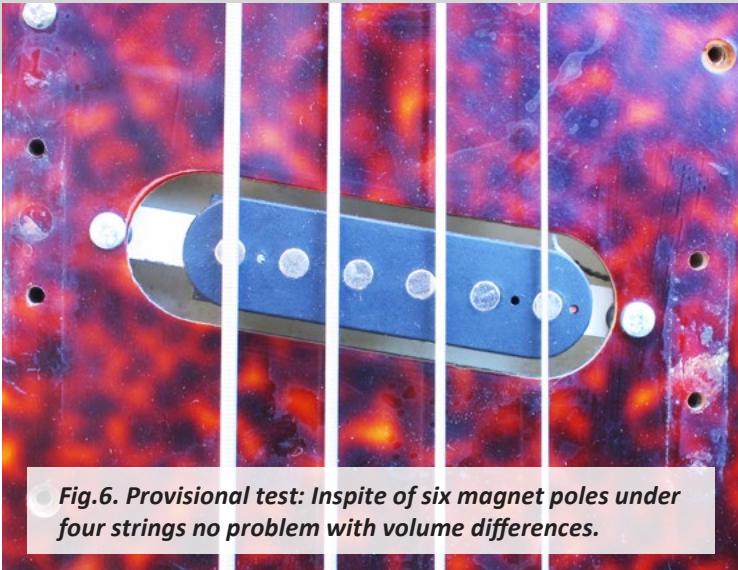


Fig. 6. Provisional test: Inspite of six magnet poles under four strings no problem with volume differences.

conventional bobbins. The wire is wound in a free open ring and then isolated with adhesive tape. Inside the coil two ceramic magnets are placed.

I have been rewinding many a pickup but all of them with a real bobbin. I would not just wrap a wire around the magnet, on an open ring. It would have been necessary to make fitting bobbins first, totally by hand (an arduous work) and then to wind them. So I found another solution that was faster and cheaper, by far. I took three coils of other pickups that were readily wound and also waxed. The choice fell on two dismantled Far East humbuckers, acquired for very few money, with six steel slugs inside. They were a bit smaller than the Burns covers so they fitted in without problems. Unfortunately, it was impossible to find out the original inductance of the Burns pickups. (This is the really relevant electric magnitude, not the DC resistance which does not say anything about the sound.) The new coils had 3 Henries. This seemed to be a good figure, not far away from the Fender Jazz Bass pickups. Two ceramic bar magnets 58 x 6 x 6 mm (about 2 1/4 x 1/4 x 1/4 in.) were placed underneath. The question is now: would this work correctly with six magnets and four strings, or

will there be problems with volume differences between the strings? The proof of the pudding is in the eating. In a provisional experiment I proved that all strings practically sounded even (**fig. 6, on the left**). This positive result saved a lot of work. Flat-wound strings were used here for “vintage” reasons.

The cover of one of the pickups was damaged severely and could not be repaired (fig. 5 on previous page). The solution was more difficult here. With an unbroken cover I made a negative form made of silicone rubber (**fig. 7, below**). This can be bought as a two-component set. Both components are mixed together and have to cure for about one day. Then I hung the coil into it with about 1 mm of distance to the bottom of the form. I poured in fluid epoxy resin, black tinted, and waited for another day. Once it was ready it was hard to distinguish to from the original covers. I completely put the bass together again and tested it. It is working great now, with a rewarding, crisp sound. The only remaining problem was the neck, which is rather weak compared to other basses. But nevertheless the owner was happy. ||||

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Fig. 7: Silicone rubber negative form for pickup.

