



The story of Provincial's air cooled diesel buses - Pt 1



Provincial Bus Community



Introduction

Growing up in Fareham in the 1950s and 1960s, my early life was filled with the constant presence of Provincial buses. My interest in buses was kindled at a very early age when in 1956, my family moved to a new house on the West End estate on the outskirts of Fareham. This was near the Fairfield Avenue terminus of Provincial's routes 1 and 3 to Gosport ferry. Over the years the terminus moved further into the estate as building work progressed, and for a number of years was almost outside our house. I remember cycling the hundred or so yards down St Michael's Grove to the terminus to note the numbers of all the buses operating on these routes each day. There were usually twelve which ran the service each week day, and only when the first recorded showed up again, would I return home.

There was a wide variety of vehicles in the early days, although two types predominated (AEC Regents and Guy Arabs), there were lots of different body styles. One day in the late 1950s a different type of bus appeared, this was no. 59 (EHO 965). Although I was used to the Reading full fronted double deckers with Nos. 32, 17 and 60, this sounded different. Whereas those three buses were basically re-bodied conventional Guy Arabs, this one had a diamond shaped plate on the front with "DEUTZ" emblazoned on it as well as the Guy Motors badge. I later discovered that this was the first Provincial bus to be fitted with an air cooled engine. So began my fascination with this group of vehicles, which I sometimes think have been looked down upon by conventional Guy and AEC aficionados over the years. I hope through these pages to present them to be equally worthy in their own quirky way.

Ray Tull
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From Inception to prototype

In the late 1950s H Orme-White, the Provincial Managing Director, became interested in air-cooled engines after listening to an employee who had been stationed in Germany with the RAF. On the continent it was not unusual to see air-cooled lorries and some buses. After a number of enquiries with the manufacturers Deutz in Cologne, in 1958 the first Deutz F6L 514 engine arrived.

This had several advantages over conventional water cooled engines, no radiator or complex hoses and water sealed joints to maintain, but it was not easy to heat the bus's interior. This first engine was installed in the chassis of Guy Arab No 59 (EHO 965) in late 1957. The wartime body of this bus had been damaged in an accident. A new Reading fully fronted body was built, similar in aspect to those used previously on numbers 32 and 60, but the engine had to be fitted at a 10° angle due to its size. The distinctive radiator grille now standardised on full-front bodies in the Provincial fleet hinged back completely to present a secondary shield in which is a sliding panel lined up with the engine blower of the air cooled engine. At first the sliding panel was adjusted from day to day to assess the ideal air input.



Engine installation - grille panel opened .
Photo: The Transport Journal

idling speed, when vibration is often noticeable in the seats and stanchions, there was complete absence of movement: this may be accounted for by the Deutz engines comparatively high idling speed of 500 RPM. Fuel and oil consumption figures approximate closely to the fleet average".

The Transport Journal's conclusion after their visit to Hoeford in 1958 stated :-
"It is too early to decide whether the air-cooled diesel engine will become widely accepted for British operation, but certainly the first results are promising. Soundproofing more than obviates any extra noise in operation and fuel consumption appears to be comparable with that of similarly sized water-cooled diesels. Due regard must be given to the fact that no radiator and attendant water cooling system is required; the complicated gaskets are eliminated; that the cooling air reached a temperature of 176 degrees Fahrenheit and can be used for saloon heating; and that buses with air cooled engines can be parked in the open in any weather, these factors must carry considerable weight in the minds of manufacturers and operators.."

Once No. 59 was in service a sign on the front bulkhead proclaimed "This bus is driven by an air cooled engine". Also a private hire poster which stated "This smooth and silent running bus can be hired for your next private party". which perhaps was a bit of an exaggeration, however they were

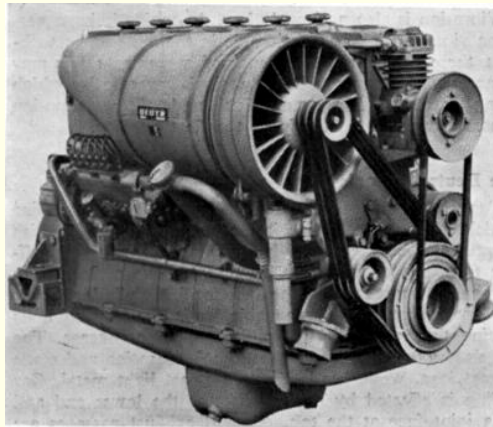
relatively quiet in service. Over the next ten years a number of other conversions followed, some on already owned chassis, others on purchased chassis. There were twelve Deutz conversions and all lasted in service until 1970-73. The early Guy conversions kept their original registrations, but the licencing authorities decided that the rebuild was so radical that they were in effect new vehicles and therefore had to be re-registered from 1962.

The Deutz Air-cooled Engine

The Deutz engine was the F6L 514 six-cylinder in-line model. Air cooling is effected by a large capacity fan on the offside (vee belt driven), with ducting to give a flow from starboard to port through cylinder fins. Cylinder barrels are separate units with detachable heads, the securing bolts passing through the heads and into the crankcase. The barrels are spigotted top and bottom for location and made in cast iron, while heads are die-cast in light metal. Gas sealing is effected by rubber rings at the lower end and by a joint face at the top. Air and exhaust passages are on the same side to the head, opposite the injector and heater plug. Gudgeon pins are offset towards the exhaust side for smooth running. The drop-forged connecting rods are H section and the big ends are split diagonally: bearings are lead-bronze shell type.

Of high-grade steel, the crankshaft runs in seven steel-backed lead-bronze bearings. The camshaft and tappets are carried in the crankcase and light alloy push rods operate the overhead valves; eats and valve guides are renewable. Rocker arms on bronze bushes and an oil tight cover enclose the valve gear.

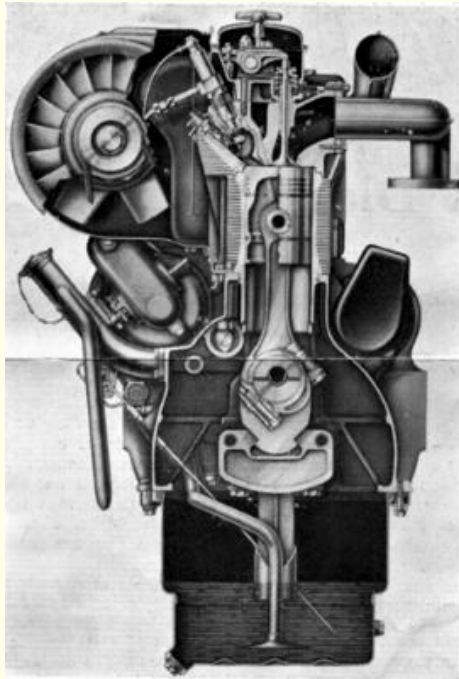
The thoroughness of German design is evidenced by several safety measures built into the engine. For example, a temperature indicator is built into the cylinder head and this can be coupled to either an audible warning device or a shut down mechanism. Similar devices are operated by a simple spring mechanism attached to a the vee belt jockey wheel to warn of any belt breakage. Lubricant is force fed by a gear pump driven from the crankshaft, a secondary line feeding the camshaft and rockers. An oil cooler is also provided. Fuel injection pump is by Bosch and is gravity fed, while the engine incorporates a Deutz injection timing device and governor for idling and maximum speed. Various fuels may be used in this engine, the normal one being gas oil, but the range includes brown coal fuel oil, tractor fuel, kerosene, and petrol/lubricating oil mixture in the ratio 90%-10%. One more unusual mixture is that of 99% motor spirit and 1% Kerobrisol, this latter substance raising the ignition quality and cetane number of light fuels.



General view of the engine. Photo: The Transport Journal

Specification of Deutz F6L 514 Engine

No of cylinders	6 in-line
Injection principle	Indirect :swirl chamber
Maximum torque	332 ft lb at 1,200 RPM
BHP	125 at 2,300 RPM
MEP	86.9 lb per square inch
Bore and stroke	4.125 inches X 5.5 inches
Compression ratio	17.8:1
Specific fuel consumption	.396 lb/bhp/hr at 1,1200 RPM
Starter	12 volt
Net weight	1430 lb



Cross section through the engine. Photo: The Transport Journal

Into Service

No. 59 (EHO 965), the prototype conversion entered service on 10 June 1958 on Route 17 Fareham Market to Wynton Way, and was followed just over a year later on 9 September 1959 by another conversion of an existing Utility Guy Arab of the same batch , no. 61 (EHO 966). This differed from no. 59 by having hopper windows on the upper and lower decks, as opposed to the sliding vents fitted on no. 59, which had caused complaints from passengers about draughts. The other difference to the appearance from no. 59 was the grille which had an apex rather than being square. The design used for no. 61 was to be repeated on the following ten conversions, with some minor detail differences, such as the position of the grille and the addition of hoppers in the front windows on some later conversions.

The construction method used for the body was that the lower half was built by the Company on teak framing, and then sent to Reading's for the top half to be built using light alloy sections and this saved up to 6 cwt in vehicle weight.

The next additions to the air cooled fleet came in 1961. This year two conversions were carried out. The first was to 1945 Guy Arab no. 31 (EOR 877) which entered service on 9th August. This was re-numbered to 73. The other was no. 8 (GHO 595) which was re-renumbered to 74. This was a later Arab III which was delivered along with its sister no. 9 (GHO 596) in 1948. The rebuilt bus entered service on 12th November.

In late 1961, another Guy Arab chassis was acquired from a dealer. This came from a Yorkshire Woolen District bus of 1947 (no. 525 - HD 7658).

1962 saw two further conversions enter service. The first was no. 58 (EHO 870), a 1943 Arab which was re-numbered 75 before entering service on 9th May . This was the first to have a lowered grille.



No. 59 was the first Guy Arab so converted. It is seen here in West Street Fareham outside the Melgrade, which was the starting point of the 17 route to Wynton Way. It seems to be surrounded by Austin A30s !
Photo : Stephen Didymus Collection

The other was the above mentioned dealer chassis, which became no. 76 (941 EOR), and entered service on 1st June.

The next two conversions were in 1963. These were constructed on on two 1947 Guy Arab chassis which were formerly Yorkshire Woollen District 518 (HD 7651) and 524 (HD 7657) respectively. They were given fleet numbers 1 (883 HHO) and 2 (884 HHO) and also had the lower grille first seen on no. 75. Reading could only produce identical bodies when they were built together e.g. the Guys 70/1 built in 1958. This meant that nos.1& 2 were probably the only two identical Guy/Deutz conversions. This may have had something to do with the fact that Orme White made frequent visits and changes to his buses whilst in build at Readings. Rumour has it that on at least one occasion he had a body partially dismantled to check that the materials specified by him were being used. There was only one Deutz conversion carried out in 1964. This time a current Provincial Arab



Converted in 1964, on a former Midland Red chassis, No 72 (HHA 84) seen here on a schools duty.

Photo: Fred York

chassis was used, this was former Midland Red utility no. 72 (HHA 84). Its former body was removed and destroyed at Hoeford, before a new Reading body was fitted. There was, however another air cooled engine conversion in 1964, but this was something different and will be covered in detail in a later chapter.

Another solitary conversion was made in 1965. This was on a bought in Guy Arab II utility chassis, which was originally London Transport G276 (GYL 416). Upon withdrawal from LT, this vehicle was passed to the Ministry of Supply in June 1952 and to a Gosport Building contractor (Hawkins) in 1959. Its chassis was purchased by Provincial in May 1963. It entered service as no. 33 (CHO 449C). By September 1965 the ten conversions had covered 1,600,000 miles between them and they were returning a fuel consumption average of 9.8 mpg, against 9.46 mpg for conventional Guy Arabs with a Gardner 6LW engine. The air cooled Deutz buses were so successful for private hire that they put the out of breath Guy Arabs no. 57 and no. 60 out of use for private hire.

After a year's break, the conversion activity resumed in 1967 with two vehicles entering service on 1 January. The first, no. 36 (HAA 771E), was a conversion on a former United Welsh Arab II chassis (no. 676 - DWN 378). It was, as usual, a double decker, but this time reverting to the higher positioned grille. The other vehicle was something completely different, a single decker. This was built on another United Welsh chassis, this time an Arab III (no. 1201 - HCY 296). It entered service as fleet number 8 (HOR 676E). Although it had the usual Deutz F6L514 engine fitted, its Reading

body had perimeter seating for 27, the additional space created provided room for 14 standing passengers. It seemed as though no. 8, during its short life, was used mainly on service 18 to Knowle Hospital.

These were to be the final conversions, as H Orme White retired in December 1966, and Provincial would never be the same again. The emphasis of vehicle policy shifted away from refurbish and rebuild to buy new or second hand.

Guy/Deutz conversions in order of year of conversion

Fleet No.	Reg No.	Chassis Type	Date of conversion	Original reg No.	Source of chassis	Withdrawal date
59	EHO 965	Arab II	1957	EHO 965	Provincial	1970
61	EHO 966	Arab II	1959	EHO 966	Provincial	1970
73	EOR 877	Arab II	1961	EOR 877	Provincial	1971
74	GHO 595	Arab III	1961	GHO 595	Provincial	1972
75	EHO 870	Arab II	1962	EHO 870	Provincial	1972
76	941 EOR	Arab II	1962	HD 7658	Yorkshire Woollen District No. 525	1972
1	883 HHO	Arab II	1963	HD 7651	Yorkshire Woollen District No. 518	1972
2	884 HHO	Arab II	1963	HD 7657	Yorkshire Woollen District No. 524	1972
72	HHA 84	Arab II	1964	HHA 84	Midland Red No. 2589	1971
33	CHO 449C	Arab II	1965	GYL 416	London Transport No. G276	1972
36	HAA 771E	Arab II	1967	DWN 378	United Welsh No. 676	1972
8	HOR 676E	Arab III	1967	HCY 296	United Welsh No. 1201	1972

Ruston and Hornsby Conversion

Fleet No.	Reg No.	Chassis Type	Date of conversion	Original reg No.	Source of chassis	Withdrawal date
14	270 MHO	AEC	1964	270 MHO	AEC Regent (see page 10)	1972

The other one



In 1964 after successfully fitting Deutz air cooled engines in a number of Guy Arab chassis, attention was turned to trying an all British air cooled engine.

This was to be a Ruston and Hornsby unit, a company more usually associated with marine or railway locomotive engines. It was thought for some time that the chassis for this was formed of parts left over from dismantled AEC Regents including nos. 16, 36, 37, and 39. It is now generally accepted that the chassis used was that of no. 33 (ACN 172), although parts from other withdrawn Regents may possibly have been incorporated. The reason for a more positive identification is that the Company Records refer to the chassis as a 'Regent II' and as there is no disposal recorded for the chassis of 33, it is fairly safe to assume that this information is correct.

The Ruston engine proved to be noisy, unreliable and noisier than its Deutz counterpart. Having ridden on this bus numerous times in its five years in this form, I can personally vouch for this. In September 1965 no. 14 was returning an average fuel consumption figure of 9.3 mpg against an average of 9.8 for its Deutz counterparts.

It was replaced by a conventional AEC 7.7 litre engine in 1969, after H Orme White had retired. No.14 (270 MHO) had the same outward appearance as the Deutz conversions, as the Reading body was to the same design, but was again fitted with the lower front grille.

Another quirk with this bus was that its interior was pink. Provincial always had a high standard of internal decor, but it was usually green. No 14 had red seats, and everything else from seat backs to side panels was bright pink Formica. This was apparently due to the fact that Readings had material left over from one of the other companies for which they produced bus bodies and it was economically convenient to use the material in this bus. Due to the mixed origin of the chassis, there was some head scratching at the Winchester licensing office when it was first registered.

No. 14 was withdrawn and scrapped in 1972.

Above Photo: No. 14 (270 MHO) in West Street Fareham, opposite the Bus Station, being followed by another air cooled Provincial bus.
Photo: Fred York



Close up of the front of no.14, showing Ruston badge with phrase "Ruston Air Cooled Diesel". Compare this with the photo on the previous page and you will see two further ventilators have been added. The engine and cab temperature must have been unacceptable.

Photo from PROVINCIAL - The Gosport & Fareham Story by Patrick Miller

