

Featured Engine No. 48

Doxford Engines

to the end of the Great War
Sourced from the Friends website

The foundation of Doxford as a shipbuilding concern started in 1840 when William Doxford began building wooden ships at Coxgreen. They were quite successful and moved into iron hulls in due course. They did not start building their own engines until 1878 and the first engines were steam compound, next triple expansion, then quadruple expansion, and later steam turbines. In 1910 fire destroyed the engine works and new premises were built. In 1905 gas engine development began but other developments lead to the construction of Diesel engines.

The first Doxford single piston oil engine was a Diesel, constant pressure, single cylinder, crosshead developing BHP at 130 rpm. It had a bore & stroke of 19.50" X 37". The engine featured air injection of the fuel, the compression and maximum combustion being about 500 psi. In itself it was not envisaged that it would be used for production but small numbers did find their way onto the market as stationary engines. The factory saw it as a development unit for a four cylinder marine engine of 1,000BHP. Experimental work and prolonged, thorough testing revealed several design weaknesses in the cylinder heads and in the transference of heavy piston loadings into the crankcase. Doxford decided that an opposed piston layout would solve many of their difficulties and their Chief Designer Karl Otto Keller and W.H. Purdie designed a vertical opposed piston engine and the earliest engines of this type began development in 1913.



This engine had a bore of 500mm and equal upper and lower strokes of 750mm, designed for a normal rating of 450 BHP at 130 rpm. Tests on this engine commenced in July 1914 and after a period of preliminary operation, the engine satisfactorily completed a 35-day full power endurance test during

November and

1st Opposed Piston Engine

December 1914 supervised by Lloyds Register. The results more than fulfilled Doxford's expectations and justified their decision to proceed with a full scale engine. The intervention of the First World War delayed development of this project but research continued throughout the War. During 1915-1916, a

medium speed single cylinder opposed piston oil engine, was designed and built and then ordered by the admiralty. This engine developed 400 BHP at 360 rpm in a cylinder of 370mm bore with



High-speed 400HP Submarine Engine

a total stroke of 720mm employing a differential stroke arrangement the lower piston being 340mm and the upper 330mm.

The power obtained represented a considerable increase over the cylinder powers in use by the Admiralty at that time which was about 100BHP per cylinder. The reason for the production of this medium speed single cylinder experimental unit was that four sets of six cylinder engines could be arranged in tandem pairs driving twin screws with a total power of 9600 BHP and would occupy about the same machinery space as the turbines in the K class submarines, but would give the same sea speed of 21 knots with about half the fuel consumption, roughly doubling the boat's range. The conclusion of hostilities saw the end of this engine's development and no units were made after the Admiralty contract ran out.

The experimental single cylinder opposed-piston unit was converted from air injection to airless or solid injection of fuel in 1916. This was a departure from the cycle invented by Dr. Diesel and was a tremendous step forward at that time. It was soon discovered that with solid injection more time was required for burning the fuel. This was obtained by lowering the compression pressure, thus enabling the fuel to be injected earlier without causing an undesirable increase in maximum combustion pressure. With a compression pressure of about 300 psi and a maximum pressure of 600 psi, the mechanical efficiency increased from 75% to 82% within accompanying reduction in fuel consumption. The 7% improvement came from eliminating a three-stage compression, which was operationally unreliable and by reducing the compression pressure from 600psi to 300 psi. The 600psi waste pressure used for the air injection system.

Calendar of Events

Key. CN = Club Night. CU = Crankup

Jan 31st. CN. Dennis Chedgy. "Tale of two towers." A power struggle in Radstock Aristocracy

Feb 13th. Sale. Selwood Preservation Society. Zeals Airfield Nr Frome.

Feb 28th. CN. Annual General Meeting. This year there will be a FREE buffet. Please do make the effort to attend and have YOUR say in the running of your club

March 5th Saturday. Spring Sort Out. Cranmore Station.

March 28th CN. Robin Lambert will give a **slide show**.

April 3rd. Sunday. **Club Visit.** Drive yourself trip. Weston Zoyland Pumping Station. In Steam day.

April 9th Saturday. Spring Enstone Sale.

April 17th Sunday. CU at Nunney Catch

April 18th. CN. *Early because of Easter BH.* Mike Horler. "Michael the country boy."

April 25th Easter Monday Event at Mells. Contact Robin Lambert 01373 463526 if you want to attend.

May 23rd. CN. Guest speaker John Heron. "The RAF Harrier in the Cold War"

June 1st Wed. CU. D-Day Cranmore station Yard. Bring something military if you can.

June 18/19th Wessex Midsummer Vintage Gathering. Our club rally at Semington.

June 25/26th. Event. Please bring an engine **Cranmore Railway Station.** An in steam day at this popular venue.

June 25/26th. Event. 27th **1000 Engine Rally**, Astle Park.

June 27th. CN. Richard Harris. "Restoring a Bedford TK."

July 25th CN. Crankup at The Court Hotel

July 31st Sunday. Event. Mini rally at **Haynes Museum**, Sparkford mini - rally Haynes motor museum.

August 22nd CN. *Early because of bank holiday.* **Photo presentation** by the members. Bring along ten photo's or slides. Prize for best effort.

Sept 10/11th. Event. Stockbridge Working Weekend. *Please phone Alan Vickery for details 01256 703169*

Sept 18th Sunday. Club Visit. Coach trip to Kew Bridge Steam Museum.

Sept 26th CN. Kim Siddorn. "Engines at the 1000 Engine Rally"

Oct 8th. Sat. Skittle match. South Parade Club, Frome.

Oct 15th. Sat. Autumn sortout at Cranmore Station Yard.

Oct 31st CN. Selwood preservation club. **Inter club quiz.**

Nov 12th Saturday. Autumn Enstone Sale.

Nov 28th. CN Guest speaker Patrick Hassell. "Bristol Before Rolls-Royce"

Dec 4th Sunday. Antifreeze CU at Nunney Catch. December **no club night.**

Dec 27th. Mince Pie **CU** at The Court Hotel

All events are listed in good faith. You should always ascertain if an event is taking place before you go. If in doubt, ring Brian Baker on 01749 342671

Chairman's report (printed as received)

By Brian Baker

The biggest disappointment to me during 2010 was having to cancel the Mince-Pie crank-up on the 27th December. I was thinking of cancelling it due to the weather when I had a phone call from John Paget who wanted to know if it was still on. John lives in Midsomer Norton which isn't far from the Court Hotel, he then told me he had been up to the Court and the car park where we display the engines was under a foot of snow. Also the driveway into the hotel and the area outside was so slippery

with ice that you could not stand up. That made up my mind to cancel; I rang quite a few members and told them to pass the message on. I rang Sue, the landlady of the Court to let her know, and she told me they had a disastrous Christmas with almost all their bookings cancelled, in future if the weather affects any of our events please ring me to know if its going ahead or not, my number is 01749 342671. It has been brought to my notice by quite a number of members that they are dissatisfied with the content of our newsletter. The main grouse has been the number of long articles on aero engines, this subject I have been told has nothing to do with our hobby, namely stationary engines, and a spitfire engine doing around 300 mph is hardly "stationary". This is not the fault of our editor Kim, he can only print what he has available, and this is where you the members sadly let him down. When I was editor I had a large number of scribes who gave me brilliant articles on a regular basis on a wide range of themes. What has happened to those scribes now? You are still members, I implore you, pick up your pens once more, give Kim something worthwhile to print, and you all attend rallies, shows, sales, sortouts, meetings, social events etc, where is the reports on all these functions? The AGM will soon be with us and I would like to remind all members that we are still operating without a SECRETARY. This is a deplorable situation when you consider how many members belong to this club. This has meant more work for the rest of the committee, made all the harder due to the fact we now have the smallest committee in the clubs history. Although the committee is depleted we seem to get through more work more quickly than when the numbers was higher, but I would like to see some new faces on the committee and it is certainly time we had a secretary. So come on members do your bit for the club --- VOLUNTEER. At this years AGM we are having a buffet laid on after the meeting, so forget the postal vote, come along and have your share. We are also having the usual raffle so prizes will be most welcome. A very happy New Year to all our Members.

Social news

Happy birthday to Ken Rendall for 7th January.

Happy Birthday to Ray Earle of Langport who will be 91 this month, Ray is probably our clubs most senior member , so congratulations Ray and best wishes from us all.

Good to hear that Babs and Alan Vickery's son and his mates all returned home safely in November from overseas Service.

Liz had her kidney transplant at last on 22nd December – her birthday too! She and Arthur are both doing well - although Arthur thinks he's become a pharmacist! Get well soon Liz.

As the Years go By

By Lin Pike

We went to Cranmore Sortout in November and I remembered our first ever rally there in September 1978. Our three children were toddlers, it rained most of the weekend and the kids spent most of their time in the Army helicopter!

Well, the weather never put Roger off. We've been rallying now for over thirty two years, twelve of which Roger saw service on the WSEC committee.

Roger celebrated his sixtieth birthday on 18th November and I'm sure you'd like to join me in wishing him many more in the future.

Reflections of Times Gone By

By Robin Lambert

Now and again Jackie asks me the question, what do you think we would have done if Stationary Engines had not played such a big part as to how we have led our lives over the past three and a half decades ?, A good question I must admit and I am sure a lot of our club members also must have similar thoughts along these lines as they reflect what may have been a large chunk of their lives as time now seems to pass by at the speed of an express train. Now in our retiring years our hobby is fairly easy to deal with , the very heavy machines have been found new homes, the remainder are on easily movable trolleys, the trailer has been customised to our requirements and the old caravan has been replaced with a motorised version, We can even move to a week end show on the Friday and leave on the Monday , all very laid back and cosy. What a difference to the early days when work was an obstacle to all this leisure time, we used to rush home from work Friday afternoons!

Everything was hitched up and ready to roll, our catering manager would have all the weekend supplies packed into cardboard boxes, the loo tent put on board complete with spade as quite often there was no Elsan tips available. Our children were briefed not to hang around on their way home from school and to make sure they put some books and games on board just in case it was a wet weekend.

Talking of kids I often wonder if we dragged ours around too much when as they grew older perhaps they should have been doing other things with their friends , I sometimes ask them this as they are now in their forties and the tell me it never did them any harm but perhaps they are being polite. So back to the original question, I don't really know the answer, we are not ones for lying on the beach all day, half an hour is OK to read the newspaper but all day - oh no.

I like poking about in junk and charity shops & Jackie likes her garden. She used to like going on the back of our old motorbike but has not done this for a while, I think she gets a bit light headed if the bends come up too quickly! She rather likes doing a Darby & Joan in our old Triumph car. I really like chatting to friends old and new its a good way of learning all

sorts of things (Jackie says I talk too much, but I totally disagree with her!!)

So my reason for writing this is. How do you our members feel about the time you have spent with our hobby? Often when I look around the room on club night or along the engine line at many of the exhibitors, I get the feeling they are like an extended family that has always been there. A very comforting feeling that is hard to explain, and on reflection I know I could not have found a nicer and more interesting hobby to be involved with.

Earwig's Bit

Spotted by in a Railway magazine auction column, "Bristol Wagon Works Co. Cast iron plate with nice crest" It made £2,800 in the sale, WOW!

The Automatic Rammer

By Robin Lambert

This machine was widely used in the construction industry well into the 1970s mainly for the compaction of trenches by the service industries and can occasionally be seen around the rally fields demonstrating how they were used.

They were very successful for compacting long lengths of trench but sometimes difficult to use if the trench was deep and narrow and especially if it came down on an awkwardly positioned rock it would fly back up in every position except vertical.

Its weight was around 230lbs and is in effect a leaping stationary engine. The initiation of the cycle of operations are taken by the operator who lifts the machine's casing. The piston is of course just an extension of the conn rod and ramming foot. When raised and dropped it draws in a charge of fuel and air. If the casing is now dropped, the charge will be compressed and the operation of a trigger twitches the armature of a magneto to produce a spark in the cylinder. This fires the charge and the casing is thrown upwards and the foot downwards!

It could leap almost two feet so the operator would need to keep his toes well out of the way as it came back down and of course never lean over it and trip the magneto at the same time as this would leave him with a thumping headache.

There is a display of Warsop Rammers to be seen most years at the Astle Park 1000 engine rally. A chap called Gary owns a number of them – Ed.

