Technical problems explained

Within the trip reports I reported that we had various technical problems during our journey from Saint-Leger-des-Vignes to Saint-Jean-de-Losne. Some readers have requested an explanation of the problems and the steps undertaken to repair or alleviate them. Also the workings of the bow-rudder. Let me try and address these questions....

At the start of the journey, the problem of stalling occurred when we cut the revolutions to tick-over in order to change gear from forward to reverse (or vice-versa). We change gear by moving a large steel lever, located on the rear deck, forward of backwards. There is a direct link from the gear-lever to the gear-box via steel bars and linkages. The engine cut out basically because, as we tried to 'ease' the boat into gear, the resistance of the clutch engaging dropped the revolutions resulting in a stall. We realized that the gear-shift had to be made rapidly (resulting in quite a 'thump' as the gear engaged) so the gear lever on the rear deck was forced quickly into position preventing a drop in revolutions. We were understandingly rather timid with the engine and gear-box initially – the Baudouin motor is a classic, aged, 3-cylinder unit and had not been run for many years. Indeed, as Aster had historically cruised the Canal du Nivernais, the motor had never run for extended periods at speed which means between 300 and 700 revs. Our trip was a test with which we were unsure it could cope.

Late one day one the gear box became so hot that it started smoking. Throughout the trip the gear-box ran hot, but not to this extend. Still a little unwary of the sea-worthiness of our equipment, it was obvious that something was wrong – to the extent that we though our trip may be over before it had barely begun. The solution was mercifully simple. A rag had been tied to one of the steel bars connecting the gear lever on deck to the gear box. This was simply to warn people in the engine room not to bang their heads on the steel bar. The rag had slipped down to one of the linkages so it could not extend or contract to it's full extent. The restriction of movement was only very small but it meant that the clutch cone was prevented from fully engaging. It was the slipping plates that engage in a machined cone in the flywheel that created the over-heat and smoke. The rag was removed and after some fine readjustment the problem was solved. We were lucky – it could have been a much more serious mechanical problem.

The other potentially serious problem we had was with the universal joint that connects the propeller shaft to the propeller. You will see from a diagram on the St. Jean museum web site (http://www.musee-saintjeandelosne.com) that the propeller shaft exits through the hull and connects to a universal joint immediately at the stern. The joint is connected to the propeller (at the rear of the rudder) via another section of shaft. We were told by Mr Cretier (who captained Aster for many years on the Canal du Nivernais) that we must not exceed a 30 degree shift of the tiller from central in either direction, otherwise too much pressure would be put on the universal joint. On one occasion the tiller was wrenched from the steerer's grip and the rudder ended up at 90 degrees to the stern. There was a fearful grinding noise and we pulled into the bank immediately. Luckily the engine had stalled due to huge pressure on the universal joint. This undoubtedly prevented any real damage being done. It is testament to the strength of the equipment and quality of the engineering that this problem, and the two mentioned above, did not bring our voyage to a premature end.

The bow rudder is not something you come across every day and is worthy of explanation. It is an interesting piece of equipment which, when we arrived initially to prepare for our trip, had been hanging idle down the side of the boat having been dismantled years ago. The underwater section is a large, heavy fin attached to a short shaft. We hauled the shaft up through a tube in the bottom of the boat by means of an attached chain until the fin was in position immediately below the bow of the boat (about 3 metres from the front). It actually comes up through the hull into the bar area and protrudes by 60 centimetres or so.

Here it is temporarily secured by means of a steel pin inserted through a pre-drilled hole in the shaft. A permanent collar, which prevents the assembly disappearing through the bottom of the boat was then attached to the shaft, and the pin removed. A further shaft was fed down from the fore-deck above through another tube and attached to the top of the rudder-shaft inside the boat. Finally what resembles a huge set of bicycle handlebars is attached to the top shaft on deck. Two trailing ropes, one attached to each end of the 'handlebars' are fed back to the rear deck from where the bow-rudder is operated on instruction from the steerer. Quite simply, pulling the ropes turns the rudder below the bow and helps steer the front of the boat.

While ascending locks the 'handlebars' must be removed. This is because the violent movement of the water below the boat puts pressure on the rudder below and swings the handlebars violently on deck – very dangerous for anyone standing in the way. We were told that simply tying them in position is not sufficient as there would be too much 'twist' pressure as the rudder tries to move in the violent currents below. After each lock procedure the rudder had to be turned back into its “straight forward” position with a big spanner and the 3.5 meter handlebar had to be repositioned on top of the shaft.