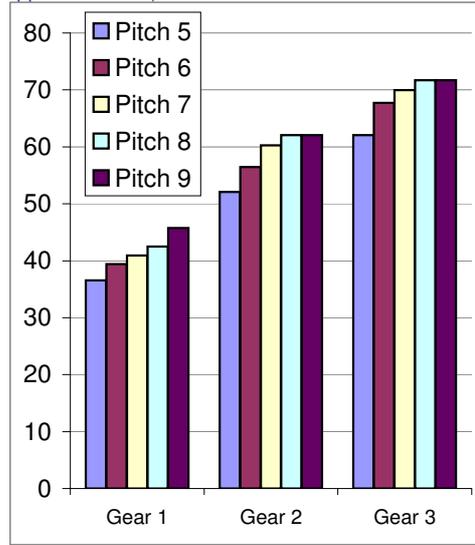
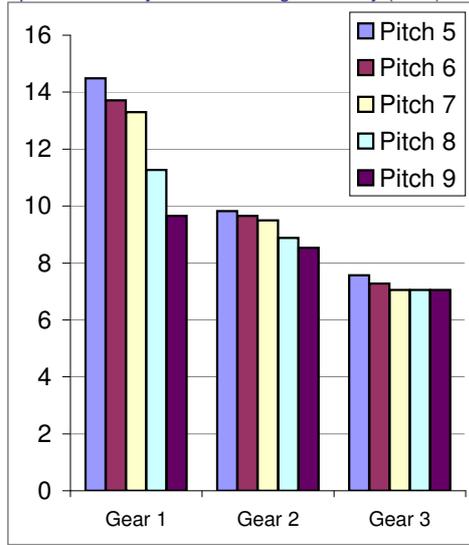


Magnus 950, figures given by manufacturer

Speed (m/min) pitch 5..9 and all gears. At half charged battery (44 V). (Max. speed at full charge is approx 76m/min).



Range (km) with double cylinders, no stages. Pitch 5..9 and all gears. Calculated from speed/efficiency at a half charged battery (44 V).



Magnus 950 (&Mojo) speed tests

8-9.6.2010.

Divers Taija & Jukka

Speed and range depends on divers size and drag. Would be good idea for every diver to do some testing with their own scooters and diving gear.

We wanted to test how different situations effect on speed; different gear, pitch, number of stages, spare scooter, towing, etc.

We tested our new Magnus scooters, and 2 years old Mojos.

Our (Taija & Jukka) times were so close that we won't specify them here. In most cases Taija was a bit faster, diver's size matters. All tests were timed twice.

Our results are well in line with figures given by the manufacturer. CCR seems to be comparable with double cylinders. Comparing manufacturer's figures to our test results in situation A (CCR, no stages); 1(7) 41m/min and in our test 45m/min, 2(7) 60m/min and we tested 58m/min, 3(7) 70m/min and we did 68m/min, or full speed 72m/min and we tested 71m/min.

Speed (m/min) & how many minutes it would take to drive 1km.

gear (&pitch) ->	Magnus 950						Mojo		Swim
	1 (1)	1 (7)	2 (7)	3 (6)	3 (7)	3 (9)	(7)	(9)	
A CCR, no stages			60,0 17		73,2 14	75,0 13			
B CCR, 2 stages	33,0 30	45,1 22	58,3 17	65,2 15	68,2 15	71,4 14	50,0 20	54,5 18	25,0 40
C CCR, 4 stages			50,0 20						
D CCR, 2 stages + spare scooter			54,5 18						
E Towing (both with CCR, 2 stages) x)			42,0 24	x) towed diver holds on to towers crotch strap					
F Towing; diver + damaged scooter xx)			33,2 30		43,1 23				

Max speed with Magnus was 100 m/min !!! (not with "tech gear" ;) ...so 1km would take 10 minutes...

Stages used in this test: 7L steel, 12L steel, 7L AL, 63cf (9L) AL, 80cf (11,1L) AL. Spare scooter Mojo42. xx) short rope from towers crotch strap D-ring to towed scooters nose and towed diver is like "driving" the scooter (both divers with CCR and 2 stages)

* Without stages the speed was only a little faster than with two stages, but with four stages speed slowed down significantly. This result is logical because two stages were rigged as side mount style and quite streamlined, but two extra stages were hanging however. More streamlined rigging has strong effect on speed. It didn't matter though are those four stages two each side, or one on right and three on left side of the diver. Surprisingly size of stages was not so relevant to the speeds.

* Spare scooter slows the speed down less than two extra stages. We got faster scooter towing speeds when the spare scooter was attached to D-ring at diver's hip, compared to the crotch strap D-ring.

* Towing speed slowed down surprisingly much when towing another diver and damaged scooter.

* With CCR and 2 stages scootinging 1 km would take 14 minutes on full speed, with setting 3 (7) 15 min, 2 (7) 17 min, and 1 (7) 22 minutes, or 1 (1) 30 minutes.

* 2 (7), two stages + extra DPV scootinging 1km would take 18 min, or with four stages 20 min, and towing 24 min (both divers with CCR and 2 stages) or 30 min when towing diver and damaged scooter.

* Swimming 1 km with CCR and 2 stages would take 40 minutes (swimming speed in our test was quite slow, thinking we should keep the pace e.g. 2km).

* Max speed was 100 m/min! (with that diving gear we couldn't make so long or demanding dives though ;)

Test results and information about scooters speeds and ranges are important when planning dives and e.g. when pondering on what kind of dives do we need extra scooters, or when deciding what to do if something goes wrong; should we then drive home on full speed or do we need to save the battery, or do we leave the damaged scooter and/or used stages behind or not, etc.

We weighted Magnus scooters to perfect trim by adjusting the battery closer to the nose and with "keel weight". This way the torque of the prop was minimum and no need to compensate this torque by pushing the handle down or cranking with fin, this way the fastest speeds are also achieved. On "travel speed" (gear 2 pitch 7) driving is relaxed and there is no torque. On gear 3 we can feel some torque by the prop that we need to compensate.



On May 2008 we did tests with Mojo's and UV26 scooters, then we noticed that Mojo's and UV26's have equal speed. Now we got the same speeds with Mojo, so our 2 years old Mojos still run as new. This backs up our thrust in Li-Po batteries also in scooters. Li-Po batteries has been used for many years in our HID lights with success. On 2008 tests UV26 speeds were likewise the same as when they were new (in 2002), so UV26 is very good and reliable scooter; like new after 6 years in active use. Those now over 8 years old units are still in use. The only "flaw" in UV26 is it's big size and weight (lead acid batteries).

2 (7) is good travel speed. It has nice speed, and range can be a couple of kilometers longer than with gear 3, and 7 is good pitch as 9 (with gear 2 and 3) is only a little bit faster but it would shorten the range especially with gears 1 and 2.

