Xcelplus

15 January 2018

~5x increase in engine lifespan

At 20,607 km a 2015 1.3 L (alloy engine) Yaris 5 door hatch was treated with Xcelplus Engine Treatment.

After treatment with Xcelplus engine wear was reduced by an average of 82 % (measured at 50,865 km): This is 1/5 normal wear and is equivalent to a ~5x increase in engine lifespan N.B. The primary wear metal in alloy engines is iron, followed by aluminium and copper.

Table 1 Reduction in wear

Metals	**ppm**			
	20,607 km	**50,865 km**	**Change**	**%**
Iron (Fe)	22	4	-18	-82
Copper (Cu)	11	1	-10	-91
Aluminium (Al)	7	3	-4	-57
Chromium (Cr)	0	0	n/a	n/a
Tin (Sn)	2	0	-2	-100
Nickel (Ni)	2	0	-2	-100
Lead (Pb)	1	0	-1	-100
Total	**45**	**8**	**-37**	**-82**
Viscosity @ 100 ºC	14.90	16.76	+1.9	+13
Viscosity @ 40 ºC	112.00	134.00	+22	+20

N.B. The Viscosity Variance Report showed improved oil quality.

Table 2 Oil and filter changes

Mileage	**Comments**
10,332 km	Oil change
20,607 km	First oil sample: Xcelplus added
30,622 km	Second oil sample
40,988 km	Third oil sample
50,865 km	Fourth oil sample

Figure 1 Yaris 2015 white 1.3 L 5 door hatch

N.B. Raised silicon (dirt) levels in the oil analysis correspond to driving on dirt roads in the country: The air filter was changed three times to ensure the problem was not a faulty filter. Dirt particles in the oil are one of the main causes of wear in an engine but after treatment with Xcelplus wear was reduced by an average of 82 %.

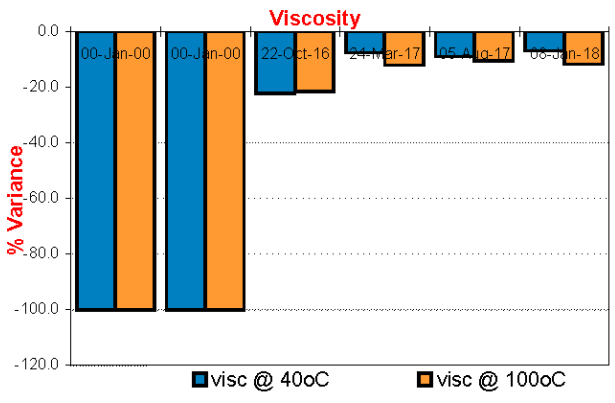
CONDITION MONITORING

TECHENOMICS

TECHNICAL ADVANCE FOR ECONOMIC GAIN

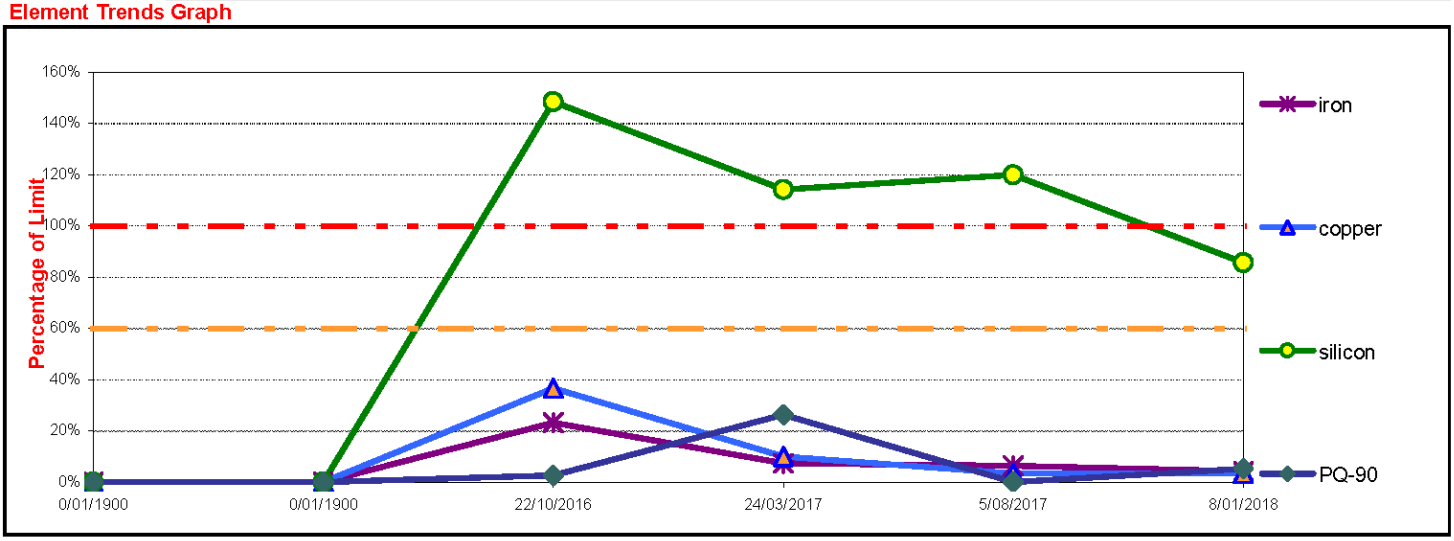
WATCH

Wear Metal Report: 356,546
Client MICHAEL CZAJKA
Attention
Machine: TOYOTA YARIS **ID No:** 1FD1FN
Oil Name: SYNTECH SEMI SYN15W50
Visc@40°C: 144 **Visc@100°C:** 19 **TBN:** 0
Compartm't TOYOTA YARIS



Sample Date	0/01/1900	0/01/1900	22/10/2016	24/03/2017	5/08/2017	8/01/2018			
Analysis Date	0/01/1900	0/01/1900	1/11/2016	29/03/2017	8/09/2017	12/01/2018			
Sample no.	0	0	343502	347771	352928	356546			
SMU	0	0	20,607 km	30,622 km	40,988 km	50,865 km			
Oil km	0	0		10,015	10,366	9,877			
Oil Changed	0	0	Yes	Yes	Yes	Yes			
Wear Metals	ppm	ppm	ppm	ppm	ppm	ppm	Caut	High	Comments on elevated results
lead	0	0	1	0	0	0	60	80	Silicon is elevated at 30ppm. Silicon is a highly abrasive material and can cause accelerated wear. Check air intake system.
iron	0	0	22	7	6	4	75	95	
aluminium	0	0	7	4	4	3	10	16	
copper	0	0	11	3	1	1	20	30	
chromium	0	0	0	0	1	0	10	15	
tin	0	0	2	0	1	0	10	15	
nickel	0	0	2	0	0	0	10	15	
Contaminants									
silicon	0	0	52	40	42	30	20	35	
sodium	0	0	4	5	4	3	20	30	
Oil Additives									
magnesium	0	0	3	2	2	1	0	0	
zinc	0	0	954	749	702	578	0	0	
molybdenum	0	0	6	4	1	0	0	0	
calcium	0	0	1767	1732	1731	1519	0	0	
phosphorous	0	0	0	620	629	554	0	0	
boron	0	0	0	0	0	2	0	0	
Infra Red									
TBN	0.00	0.00	0.00	0.00	0.00	0.00	-25%	-50%	
soot	0	0	1	3	0	0	50	70	
glycol%	0	0	0	0	0	0	1	2	
water (ppm)	0.00	0.00	0.00	0.00	0.00	0.00	1	2	
fuel dilution%	0	0	1	0	0	0	1	2	
oxidation	0	0	15	14	17	16	30	40	
nitration	0	0	11	10	11	22	30	40	
sulphation	0	0	20	19	24	23	30	40	
TAN	0.00	0.00	0.00	0.00	0.00	-	0	0	
Physical Tests									**Particle Cleanliness Analysis - ISO CODE 4406**
water %	0	0	0	0	0	0	0	0	4 µm: -
PQ-90 mg / ltr	0	0	0	0	0	2	20	38	6 µm: -
visc @ 100oC	0.00	0.00	14.90	16.70	17.00	16.76	+-10%	+-30%	14 µm: -
visc @ 40oC	0.00	0.00	112.00	133.00	131.00	134.00	+-10%	+-30%	SAE AS 4059 NAS CODE: 0

Element Trends Graph



For enquiries, contact: phone: fax: mobile: