THE TOTAL ANAC **DIAGNOSTIC**

TOTAL
LUBRICANTS

TOTAL
ANAC

Let your oil do the talking!

WHAT IS **TOTAL ANAC?**

ANAC: the global lube oil analysis system by TOTAL

ANAC (abbreviation for ANAlysis Compared) is TOTAL's corporate oil analysis and diagnostic system for any automotive lubricant application. From a simple oil sample, TOTAL ANAC establishes a thorough diagnosis of all mechanical parts (engine, transmission, hydraulics) of your equipment without disassembly constraints.

WHY CHOOSE **TOTAL ANAC?**

With TOTAL ANAC, the full range of oil analyses for all activities and applications :

- ✓ You **REDUCE** your operating costs
- ✓ You **ANTICIPATE** and **PLAN** maintenance operations at the optimal moment
- ✓ You **INCREASE** the lifespan of your equipment
- ✓ You **IMPROVE** your equipments reliability and performance
- ✓ You **OPTIMISE** your oil change frequency

The TOTAL ANAC service, available throughout the world, gives you objective and scientifically proven answers that are easy to understand and exploit

Do you manage vehicle maintenance?
TOTAL ANAC PRO; the oil analysis diagnostic system for optimal fleet maintenance management.

TOTAL ANAC PRO is a diagnostic system for engines and drivelines, based on the scientific interpretation of used oil analysis data. This ANAC PRO oil analysis allows fleet maintenance and reliability engineers to reduce the maintenance costs of their vehicle / machine fleet.

In over 30 years, TOTAL ANAC has referenced approximately 15,000 types of mechanical components and engines and approximately 500,000 components are monitored in the ANAC database. That is why TOTAL ANAC offers you accurate computerised interpretation of your oil analysis results.

A unique colour-code simplifies report reading. Using a data compensation system, TOTAL ANAC PRO is the solution offered to all fleet maintenance and reliability engineers to accurately identify the wear condition of their vehicle driveline components.

TOTAL ANAC PRO is recommended for:
- Systematic follow–up of driveline component wear and lubricant behaviour.
- Prevention of breakdowns.
- Extension of the life time of driveline components.
- Application of conditional maintenance, hence reduction of cost price per km or hour.

MEASURED CHARACTERISTICS

Mechanical wear:

Wear elements: Iron, Lead, Copper, Tin, Chromium, Aluminium, Nickel (ppmc)

Oil contamination:

Silicon (ppm), Soot* (%), Water (%), Cooling Liquid*(presence), Fuel* (%)

*only for engines

Characteristics of the lubricant:

Oil viscosity (mm2/s) at 100°C or 40°C**
**hydraulic parts and ISO VG oils

Additive elements Ca, Zn, P, Mg, Mo, Ba, V, Na, B, K, Ag, Sulphated Ash

DIAGNOSIS AND COMMENTS

The ANAC diagnosis and comments are generated by the TOTAL ANAC application using:
- The ANAC database of feedback on successful corrective actions by the users.
- The TOTAL ANAC PRO diagnosis algorithms, allowing compensation for the effect of oil top up and mileages, hence focusing on the genuine wear condition of the component.
- The TOTAL ANAC PRO database with reference data of all current part types, calculated on more than 4 million performed analyses.

THE ANAC DIAGNOSIS REPORT

The ANAC diagnosis is available via e-mail or via the web portal. In urgent cases, the ANAC report will be faxed, as soon as the diagnosis is available.

PROVEN RELIABILITY

In competition, just by analysing a simple oil sample, TOTAL engineers and technicians can monitor engine reliability.

TOTAL ANAC provides the same service, designed to make the right decisions in extreme operating conditions.

TOTAL ANAC, made available to you by Total, helps make informed decisions to improve productivity and reduce maintenance costs.
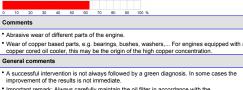

EASY TO **USE**

Diagnostic-reports

THE WEAR COEFFICIENT indicates the ratio between the current wear rate of an engine with the wear of all identical engines in the global ANAC database. This analysis indicates if your engine's lifetime expectation is higher, equal or lower than average for that specific engine type. The Wear Coefficient allows comparing relative engine wear between different vehicles/machines and is the ideal parameter for identifying machines where the cost per kilometre or per hour can be reduced.

The CAPS* report

In the event of a red report, i.e. observed anomaly, the CAPS report indicates the corrective actions to be carried out and their probability of success based on statistical processing of customer feedback.

*Customer Assisted Prognosis System

Diagnostic report (right)

ANAC, a service of the TOTAL group

ISO 9001:2008   red

ANAC references : -SRG 4064 4064
Your references :
Vehicle: 4064
Component: Diesel engine

Make and type:
Vehicle: XXXX XXXXXXXXXX

Component: XXXX XXXXXXXXXX

SPECIMEN / ZZ-.

Diagnosis date: 3 may 2013
Oil : Total Rubia Tir 8900 10W40

		PRO	PRO	PRO	PRO	PRO
Sample date		30-NOV-11	06-MAR-12	02-JUL-12	29-OCT-12	21-FEB-13
Sample Number		2587484	2654458	2654507	2679217	2797354
Interm. sample			X		X	
Working time		501549 K	507531 K	513284 K	517257 K	518733 K
Mileage oil		8082 K	5982 K	11735 K	3873 K	5449 K
Wear						
Iron	ppmc	43	34	23	117	126
Lead	ppmc	2	< 1	< 1	< 1	2
Copper	ppmc	2	1	< 1	7	17
Tin	ppmc	< 1	< 1	< 1	< 1	2
Chromium	ppmc	1	1	< 1	8	8
Aluminium	ppmc	4	5	4	11	13
Nickel	ppmc	< 1	< 1	< 1	2	2
Contamination						
Si-Foreign	ppm	20	12	13	68	82
Soot	%	2.8	1.8	0.9	2.4	3.8
Water	%	<0.07	OK	OK	<0.07	OK
Cooling liq.		OK	OK	OK	OK	OK
Fuel	%	OK	OK	OK	OK	OK
Oil						
Visc. 100°C	mm2/s	16.4	15.1	14.2	15.6	17.9
Wear coefficient						

Wear coefficient values: 0.83, 0.74, 0.60, 3.08, 3.03

Comments
• Increase of the viscosity at 100°C in comparison with the indicated oil type.
Remarks
• A wrong statement of the type of oil used, can lead to an erroneous colour diagnosis.
• Please refer to the enclosed CAPS sheet

CAPS report (left)

ANAC, a service of the TOTAL group

ISO 9001:2008

ANAC references : -SRG 4064 4064
Your references :
Vehicle: 4064
Component: Diesel engine

Make and type:
Vehicle: XXXX XXXXXXXXXX

Component: XXXX XXXXXXXXXX

SPECIMEN / ZZ-.

Diagnosis date: 3 may 2013
Oil : Total Rubia Tir 8900 10

C. A. P. S.

Customer Assisted Prognosis System:

Based on the feedback from our customers, the percentage probability of the possible causes of this red diagnosis was calculated.

Possible causes	Prob
• Air intake system. Engine wear caused by penetration of sand or dust.	37 %
• Internal wear of the engine, not caused by the detected contamination of the oil.	25 %
• Malfunctionning of the fueling system or incomplete combustion.	20 %
• Service, usage and maintenance conditions.	12 %
Evaluation	

DEGREE OF IMPORTANCE

0 10 20 30 40 50 60 70 80 90 100 %

Comments

• Abrasive wear of different parts of the engine.
• Wear of copper based parts, e.g. bearings, bushes, washers,... For engines equipped with a copper cored oil cooler, this may be the origin of the high copper concentration.

General comments

• A successful intervention is not always followed by a green diagnosis. In some cases the improvement of the results is not immediate.
• Important remark: Always carefully maintain the oil filter in accordance with the manufacturer's instructions.

Please always contact your ANAC consultant before repairing or dismantling the engine. This CAPS report is based on the engine type provided by you.

Legend

Satisfactory diagnosis

Slight deviations

Anomaly noted

A potentially dangerous anomaly

TOTAL ANAC MAKES THE **DIFFERENCE!**

+ 4 ,000,000 diagnostics since the start

+ 200,000 diagnostics / year

+ 500 ,000 mechanical components monitored

+ 30 years of experience

TOTAL ANAC experts available throughout the world

- **One central European laboratory**
  This laboratory, based in Ertvelde (near Ghent in Belgium), applies the most modern oil analysis techniques and incorporates a very high level of automization.
- **A network of connected laboratories:** Australia, Morocco, Mexico, Senegal, Cameroon, Kenya, Ghana, Dubai, Singapore, India...
- **Local analysis:** TOTAL ANAC PRO samples are processed in Australia and compared to the global ANAC database.
- **19 languages used for diagnostics**
- **A technical contact at your disposal**

TOTAL ANAC, more than just lubricant analysis

A unique system of interpretation:

- The compensation system is based on sophisticated mathematical models which eliminate effects of oil top-up and oil service time.
- Calculation of the "wear coefficient" indicates the wear relative to an identical equipment in the database.
- The CAPS module recommends corrective actions to be undertaken, their probability of success and degree of urgency.

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