


Title: Definition for inspection results in asanetwork			State: <input type="checkbox"/> Draft <input checked="" type="checkbox"/> Released
Document - No. : 99/05	Edition: 5.1	dated: 02.04.2015	Supersedes edition 4.0 dated 16.01.2008

Brief description:

Definition of a general model for presentation of inspection results and an implementation based on XML.

Notes on changes:

See chapter 5.

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Members of the technical committee are (in alphabetical order of the companies)


AVL	Eddy Weyden	Eddy.Weyden@avl.com
AxoNet	Martin Rothschink	Martin.Rothschink@axonet.de
Beissbarth	Stefan Straßer	Stefan.Strasser@beissbarth.com
Bosch	Ramon Amirpour	Ramon.Amirpour@de.bosch.com
Cartec	Andreas Aicher	cartec_brd_aa@t-online.de
Dekra	Thomas Ost	thomas.ost@dekra.com
MAHA	Peter Modlmeir	Peter.Modlmeir@maha.de
Siemens	Edgar Perret	Edgar.Perret@khe.siemens.de
Snap-On	Anthony Carroll	anthony.carroll@snapon.ie
Tecnotest (SPX)	Gaetano Riccardi	gaetano.riccardi@servicesolutions.spx.com

Contact for i•SHOP


AAIA	Ben Johnson	ben.johnson@aftermarket.org
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1 Introduction

1.1 Aim and overview

In a networked workshop, we can use vehicle testers and workshop equipment of different manufacturers. It therefore is necessary to use a common data to avoid multiple acquisition and conversion of test and measurement data.


The data format to be elaborated must be forward-looking, extensible and self-documenting and based on existing standards.

1.2 Notes on the breakdown

Chapter 2 lists the requirements for the data format.

Chapter 3 introduces a logical structure to map inspection results into a hierarchical model

Chapter 4 defines the implementation using XML and chapter 4.2 shows some examples.

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2 Requirements

The data format to be elaborated must

- be extensible in an easy and neutral way


New data and structures must be added without changing the base design.

At the same time these extension must be backward compatible to operate new and old software versions together.

- have a clear separation between structure and contents

The data format to be elaborated should

- have the possibility to verify the structure at runtime
- be human readable
- use international accepted standards

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3 Specification

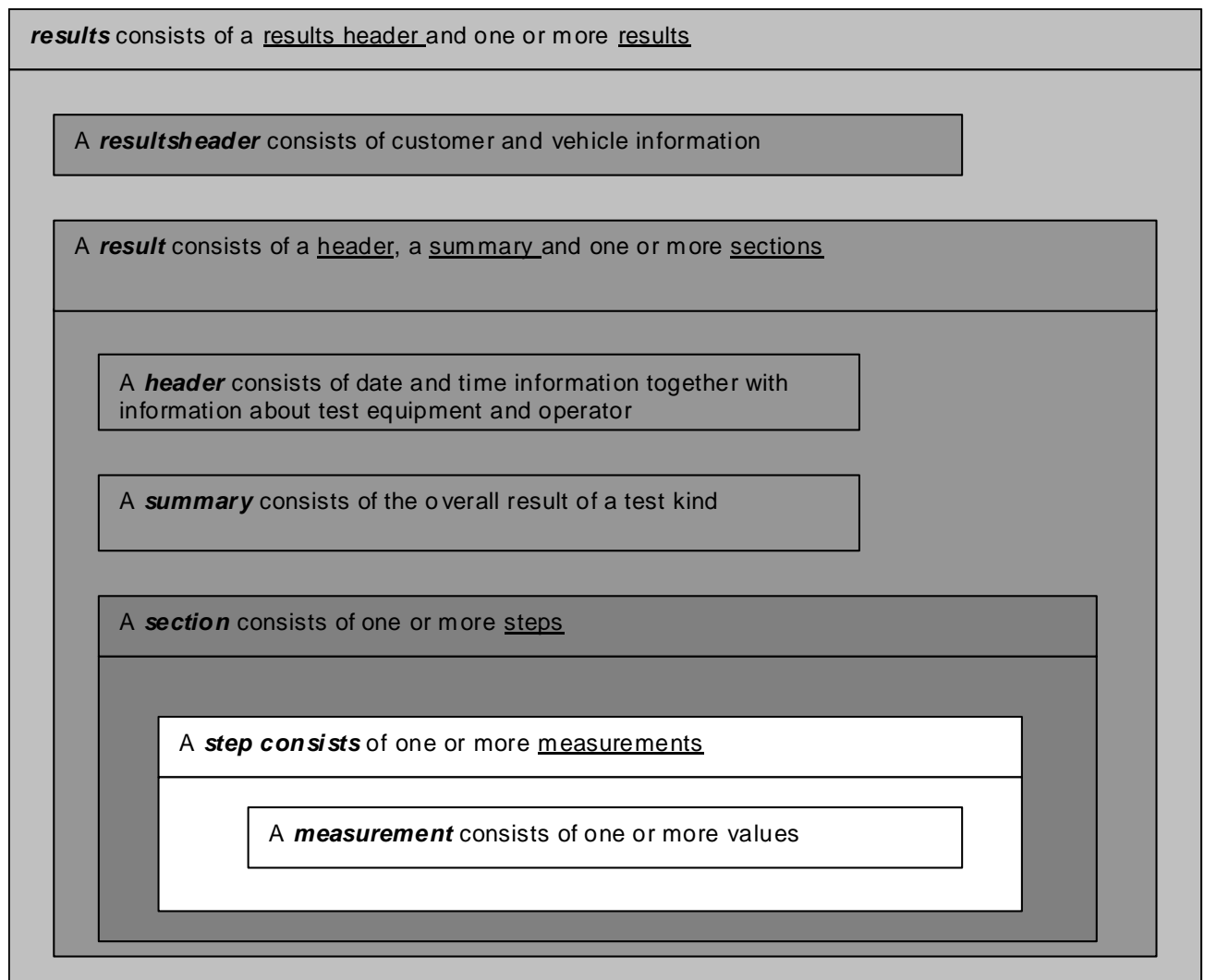
To map inspection results into a data format we have to consider two different levels:

- a structure, representing the frame of an inspection
- the data and their description

3.1 Structure


The mapping for inspection results uses a hierarchical model with max. 6 levels. Each level is provided with a keyword and some attributes.

3.2 Formal description



Formal:

results ::= results header, result +

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results header ::= country info, customer info, vehicle info

country info ::= regulation, language

customer info ::= name, address, ...

vehicle info ::= make, model, ...

result ::= header, summary, section +

header ::= date, time, equipment, operator

summary ::= overall result of test kind

section ::= step +


step ::= measurement +, measurement row +

measurement ::= Values +

measurement row ::= Values 1..n +

+ one or more occurrences of this symbol

Each level is introduced by a key word. The possible values for a key word are defined in dependence of the test kind.

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3.3 Key word overview

Every key word contains information (data) or additional key words (next level), which contain information.

Attributes are used to add supplemental information for key words.

Level	Key word	contents
1	RESULTS	the whole (inspection) result(s)
2	RESULTSHEADER	country, customer, vehicle
2	RESULT	one test, what and where is tested
2	SUMMARY	overall result(s) of all tests
3	HEADER	date, time, equipment, operator, order
3	SUMMARY	overall results of one test
3	SECTION	flow of the test process
4	SUMMARY	overall results of one section
4	STEP	additional subdivision
4	SUMMARY	overall results of the step
5	MEAS	measurements, generally physical values
6	VALUE	value
5	MEAS_ROW	measurement row containing arrays
6	ARRAY	array of values

3.4 Key word RESULTS

One or more results

Attributes

Key word	Attribute	required	Value	Explanation
RESULTS	VERSION	no	Version as string, e.g. "3.0"	Version of DTD at the time of XML implementation

Values

none

Next level

RESULTSHEADER (required)


RESULT (required, repeatable)

SUMMARY (optional)

XML DTD

<!ELEMENT RESULTS

(RESULTSHEADER, RESULT+, SUMMARY?) >

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3.5 Key word RESULTSHEADER

Common data for all tests including vehicle, customer ...

Attributes

none

Values

none

Next level

COUNTRY (required)	country
CUSTOMER (optional)	customer
VEHICLE (required)	vehicle
TRAILER (optional)	trailer
WORKSHOP (optional)	workshop or dealer
DRIVER (optional)	driver
REF (optional)	reference for previous test result

XML DTD

```
<!ELEMENT RESULTSHEADER (COUNTRY, CUSTOMER?, VEHICLE, TRAILER?, WORKSHOP?, DRIVER?, REF?)>
```

3.6 Key word COUNTRY


Country specific information

Attributes

none

Values

none

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Next level

REGULATION (required)	country identifier
	AMERICAN
	BRAZILIAN
	CHINESE
	CROATIAN
	CZECH
	DANISH
	DUTCH
	ENGLISH
	FINNISH
	FRENCH
	GERMAN
	GREEK
	HEBREW
	HUNGARIAN
	ITALIAN
	NORWEGIAN
	POLISH
	PORTUGUESE
	RUMANIAN
	RUSSIAN
	SLOVENE
	SPANISH
	SWEDISH
	TURKISH
LANGUAGE (required)	country identifier, same values as above

All above: no attributes, values as string, no next level

XML DTD

```
<!ELEMENT COUNTRY (REGULATION, LANGUAGE) >
<!ELEMENT REGULATION (#PCDATA) >
<!ELEMENT LANGUAGE (#PCDATA) >
```

3.7 Key word CUSTOMER


Customer data

Attributes

none

Values

none

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Next level

NAME (required)	first and last name
COMPANY (optional)	company title
ADDRESS (optional)	Street
ZIP (optional)	postcode, zip code
CITY (optional)	residence
TEL (optional)	(i•SHOP: primary phone number)
FAX (optional)	
CUSTNO (optional)	customer number (i•SHOP: CustID property)
ORDER (optional)	order number (i•SHOP: OrderNumber property)
FIRSTNAME (optional)	first Name
LASTNAME (optional)	last Name
EMAIL (optional)	e-mail address
STATE_PROVINCE (optional)	state (if US) or province (if Canada)
AAIA_ITEMID (optional)	(used by i•SHOP)


All above: no attributes, values as string, no next level

XML DTD

```

<!ELEMENT CUSTOMER (NAME, COMPANY?, ADDRESS?, ZIP?, CITY?, TEL?,
FAX?, CUSTNO?, ORDER?, FIRSTNAME?, LASTNAME?,
EMAIL?, STATE_PROVINCE?, AAIA_ITEMID?)>
<!ELEMENT NAME (#PCDATA)>
<!ELEMENT COMPANY (#PCDATA)>
<!ELEMENT ADDRESS (#PCDATA)>
<!ELEMENT ZIP (#PCDATA)>
<!ELEMENT CITY (#PCDATA)>
<!ELEMENT TEL (#PCDATA)>
<!ELEMENT FAX (#PCDATA)>
<!ELEMENT CUSTNO (#PCDATA)>
<!ELEMENT ORDER (#PCDATA)>
<!ELEMENT FIRSTNAME (#PCDATA)>
<!ELEMENT LASTNAME (#PCDATA)>
<!ELEMENT EMAIL (#PCDATA)>
<!ELEMENT STATE_PROVINCE (#PCDATA)>
<!ELEMENT AAIA_ITEMID (#PCDATA)>

```

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3.8 Key word VEHICLE and TRAILER

Vehicle data

Attribute

none

Values

none

Next level

- IDENT (required)
- ADDITIONALIDENT (optional)
- DATA (required)
- INSURANCE (optional)

XML DTD

```
<!ELEMENT VEHICLE (IDENT, ADDITIONALIDENT?, DATA, INSURANCE?)>
<!ELEMENT TRAILER (IDENT, ADDITIONALIDENT?, DATA, INSURANCE?)>
```

3.9 Key word WORKSHOP

Workshop or dealer data

Attributes

none


Values

none

Next level

- | | |
|-----------------------|---------------------------|
| NAME (required) | workshop/dealer name |
| NAME2 (optional) | additional info |
| ADDRESS (optional) | street |
| ZIP (optional) | postcode, zip code |
| CITY (optional) | residence |
| TEL (optional) | |
| FAX (optional) | |
| PERMISSION (optional) | registration number |
| EMAIL | Email Address of workshop |
| INTERNET | Web site URL |

All above: no attributes, values as string, no next level

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XML DTD

```

<!ELEMENT WORKSHOP (NAME, NAME2?, ADDRESS?, ZIP?, CITY?,
TEL?, FAX?, PERMISSION?)>
<!ELEMENT NAME (#PCDATA)>
<!ELEMENT NAME2 (#PCDATA)>
<!ELEMENT ADDRESS (#PCDATA)>
<!ELEMENT ZIP (#PCDATA)>
<!ELEMENT CITY (#PCDATA)>
<!ELEMENT TEL (#PCDATA)>
<!ELEMENT FAX (#PCDATA)>
<!ELEMENT EMAIL (#PCDATA)>
<!ELEMENT INTERNET (#PCDATA)>

```

3.10 Key word DRIVER

Driver data

Attributes

none

Values

none

Next level

NAME (required) driver name

All above: no attributes, values as string, no next level

XML DTD

```

<!ELEMENT DRIVER (NAME)>
<!ELEMENT NAME (#PCDATA)>

```

3.11 Key word REF


Reference for a previous test result

Attributes

Key word	Attribute	required	Value	Explanation
REF				what and where is tested
	OBJECT	Yes	see chapter 3.41	what is tested
	METHOD	No	see chapter 3.41	test procedure or method
	METHOD_TITLE	No	Name of method	in national language

Values

none

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Next level

TITLE (required)	description of the previous test in national language
START_TEST (required)	start of previous test
END_TEST (required)	end of previous test
CONTROL_NO (optional)	control number of test method
PROTOCOL_NO (optional)	protocol number of previous test
OPERATOR (optional)	operator of previous test
ORDER (optional)	order number of previous test

3.12 Key word IDENT

Vehicle identification data

Attributes

none

Values

none

Next level

REGISTRATION (optional)	i•SHOP: populates with LicensePlate
NOT_REGISTERED (optional)	Used instead of an empty REGISTRATION element to clearly flag a vehicle as not registered
MANUFACTURER (optional)	
MODEL (optional)	
TYPE (optional)	
KEY2; KEY3 (optional)	German KBA-Keys, part 2 and 3
CATEGORY (optional)	(European) Vehicle category M1, M2, M3 (passenger cars), N1, N2, N3 (trucks), O1, O2, O3, O4 (trailers)
VIN (optional)	Vehicle identification number from registration document
VIN1, VIN2, VIN3 (optional)	Vehicle identification number(s) reported via OBD if different
MANUFACTURER_ID (optional)	Manufacturer specific key or id
ENGINECODE (optional)	
PISTONDISPLACEMENT (optional)	Attribute UNIT
CYLINDERS (optional)	
FUEL1 (optional)	
FUEL2 (optional)	



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EMISSIONCODE (optional)	German KBA-Key part 1 or new European 4 digit emission key
NO_EMISSIONCODE (optional)	Vehicle has no emission code (used instead of an empty EMISSIONCODE element!)
BRAKE_SYSTEM (optional)	Type of brake system, e.g. crossed
SERVICE_BRAKE (optional)	HYDRAULIC, MECHANICAL, PNEUMATIC or MIXED
AUXILARY_BRAKE (optional)	
PARKING_BRAKE (optional)	
PARKING_BRAKE_CONTROL (optional)	HAND, FOOT
PARKING_BRAKE_AXLE (optional)	FRONT, REAR
FOURWD (optional)	TRUE, FALSE
NUMBER_OF_AXLES (optional)	
PRODUCTION_SINCE (optional)	First year of production
PRODUCTION_UNTIL (optional)	Last year of production
PRODUCTIONDATE	Year of production (i•SHOP: future implementation)
INSPECTIONDATE	(i•SHOP: InspectionDate property of the liSHOPVehicle interface)
LASTINDATE	(i•SHOP: LastInDate property of the liSHOPVehicle interface)
AAIA_ID	(i•SHOP: AAIAid property in the liSHOPVehicle interface)
AAIA_TAGNAME	(i•SHOP: LicensePlate property of the liSHOPVehicle interface))
AAIA_LICENSESTATE	(i•SHOP: LicenseState property of the liSHOPVehicle interface)
AAIA_GOVERNMENTID	(i•SHOP: GovernmentID property of the liSHOPVehicle interface)
AAIA_UNITNUMBER	(i•SHOP: UnitNumber property of the liSHOPVehicle interface)
AAIA_TELEMATICSCONTACTNUMBER	(i•SHOP: future implementation)

All above: values as string, no next level

XML DTD

```
<!ELEMENT IDENT (REGISTRATION?, NOT_REGISTERED?, MANUFACTURER?, MODEL?,
TYPE?, KEY2?, KEY3?, CATEGORY?, VIN?, VIN1?,
VIN2?, VIN3?, MANUFACTURER_ID?, ENGINECODE?,
PISTONDISPLACEMENT?, CYLINDERS?, FUEL1?, FUEL2?,
EMISSIONCODE?, NO_EMISSIONCODE?, BRAKE_SYSTEM?,
SERVICE_BRAKE?, AUXILARY_BRAKE?, PARKING_BRAKE?,
PARKING_BRAKE_CONTROL?, PARKING_BRAKE_AXLE?,
FOURWD?, NUMBER_OF_AXLES?, PRODUCTION_SINCE?,
PRODUCTION_UNTIL?, PRODUCTIONDATE?,
INSPECTIONDATE?, LASTINDATE?, AAIA_ID?,
AAIA_TAGNAME?, AAIA_LICENSESTATE?,
AAIA_GOVERNMENTID?, AAIA_UNITNUMBER?,
```


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AAIA_TELEMATICSCONTACTNUMBER?,
COMBUSTION_STROKES?)>

```

<!ELEMENT REGISTRATION (#PCDATA) >
<!ELEMENT MANUFACTURER (#PCDATA) >
<!ELEMENT MODEL (#PCDATA) >
<!ELEMENT KEY2 (#PCDATA) >
<!ELEMENT KEY3 (#PCDATA) >
<!ELEMENT TYPE (#PCDATA) >
<!ELEMENT CATEGORY (#PCDATA) >
<!ELEMENT VIN (#PCDATA) >
<!ELEMENT MANUFACTURER_ID (#PCDATA) >
<!ELEMENT ENGINECODE (#PCDATA) >
<!ELEMENT PISTONDISPLACEMENT (#PCDATA) >
<!ELEMENT CYLINDERS (#PCDATA) >
<!ELEMENT FUEL1 (#PCDATA) >
<!ELEMENT FUEL2 (#PCDATA) >
<!ELEMENT EMISSIONCODE (#PCDATA) >
<!ELEMENT BRAKE_SYSTEM (#PCDATA) >
<!ELEMENT SERVICE_BRAKE (#PCDATA) >
<!ELEMENT AUXILARY_BRAKE (#PCDATA) >
<!ELEMENT PARKING_BRAKE (#PCDATA) >
<!ELEMENT PARKING_BRAKE_CONTROL (#PCDATA) >
<!ELEMENT PARKING_BRAKE_AXLE (#PCDATA) >
<!ELEMENT FOURWD (#PCDATA) >
<!ELEMENT NUMBER_OF_AXLES (#PCDATA) >
<!ELEMENT PRODUCTION_SINCE (#PCDATA) >
<!ELEMENT PRODUCTION_UNTIL (#PCDATA) >
<!ELEMENT PRODUCTIONDATE (#PCDATA) >
<!ELEMENT INSPECTIONDATE (#PCDATA) >
<!ELEMENT LASTINDATE (#PCDATA) >
<!ELEMENT AAIA_ID (#PCDATA) >
<!ELEMENT AAIA_TAGNAME (#PCDATA) >
<!ELEMENT AAIA_LICENSESTATE (#PCDATA) >
<!ELEMENT AAIA_GOVERNMENTID (#PCDATA) >
<!ELEMENT AAIA_UNITNUMBER (#PCDATA) >
<!ELEMENT TELEMATICSCONTACTNUMBER (#PCDATA) >

<!ATTLIST PISTONDISPLACEMENT UNIT CDATA #IMPLIED>

```

3.13 Key word ADDITIONALIDENT

Additional (manufacturer specific) vehicle identification

Attribute

none

Value


none

Next level

FEATURE (required)

XML DTD

```
<!ELEMENT ADDITIONALIDENT (FEATURE+) >
```


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ODOMETER (optional)	mileage	Attribute UNIT (note: i•SHOP users will populate this field with "OdometerIN")
AXLE_WEIGHT (optional)		Attribut UNIT, Axle=No
AXLE_WEIGHT_MAX (optional)		Attribut UNIT, Axle=No
TOTAL_WEIGHT (optional)		Attribute UNIT
TOTAL_WEIGHT_MAX (optional)		Attribute UNIT
DIESEL_GT_35 (optional)	Diesel vehicle, weight exceeds 3,5t	Boolean
NOISE (optional)	noise level	Attribute UNIT
NOISE_RPM (optional)	speed for noise level	Attribute UNIT
REGISTRATION_DATE (optional)	first registration	Attribute UNIT
LAST_REGISTRATION_DATE (opt)	Last registration	Attribute UNIT
COLOR (optional)	Color of vehicle	
ODOMETEROUT (optional)	Mileage out	(used in i•SHOP)
INSPECTION_DATE (optional)	Data of last inspection (if applicable)	(used in i•SHOP)

All above: values as string, no next level

XML DTD

```

<!ELEMENT DATA (ODOMETER?, AXLE_WEIGHT*, AXLE_WEIGHT_MAX*, TOTAL_WEIGHT?, TOTAL_WEIGHT_MAX?, TRAILING_LOAD?, DIESEL_GT_35?, NOISE?, NOISE_RPM?, REGISTRATION_DATE?, LAST_REGISTRATION_DATE?, COLOR?, ODOMETEROUT?, INSPECTION_DATE?)>

<!ELEMENT ODOMETER (#PCDATA)>
<!ELEMENT AXLE_WEIGHT (#PCDATA)>
<!ELEMENT AXLE_WEIGHT_MAX (#PCDATA)>
<!ELEMENT TOTAL_WEIGHT (#PCDATA)>
<!ELEMENT TOTAL_WEIGHT_MAX (#PCDATA)>
<!ELEMENT NOISE (#PCDATA)>
<!ELEMENT NOISE_RPM (#PCDATA)>
<!ELEMENT REGISTRATION_DATE (#PCDATA)>
<!ELEMENT COLOR (#PCDATA)>
<!ELEMENT ODOMETEROUT (#PCDATA)>
<!ELEMENT INSPECTION_DATE (#PCDATA)>

```



```

<!ATTLIST ODOMETER          UNIT CDATA          #IMPLIED>
<!ATTLIST AXLE_WEIGHT      AXLE CDATA          #REQUIRED
UNIT CDATA          #IMPLIED>
<!ATTLIST AXLE_WEIGHT_MAX  AXLE CDATA          #REQUIRED
UNIT CDATA          #IMPLIED>
<!ATTLIST TOTAL_WEIGHT     UNIT CDATA          #IMPLIED>
<!ATTLIST TOTAL_WEIGHT_MAX UNIT CDATA          #IMPLIED>
<!ATTLIST NOISE            UNIT CDATA          #IMPLIED>
<!ATTLIST NOISE_RPM        UNIT CDATA          #IMPLIED>
<!ATTLIST REGISTRATION_DATE UNIT CDATA          #IMPLIED>
<!ATTLIST ODOMETEROUT      UNIT CDATA          #IMPLIED>

```

3.16 Key word INSURANCE

Insurance data

Attributes

none

Values

none

Next level

COMPANY (required) name of insurance company

CONTRACT (optional)

ADJUSTER (optional)

TEL (optional)

All above: values as string, no next level

XML DTD

```
<!ELEMENT INSURANCE                    (COMPANY, CONTRACT?, ADJUSTER?, TEL?)>
```

3.17 Key word RESULT


Result data of a test

Attributes

Key word	Attribute	Required	Values	Explanation
RESULT				what and where is tested
	OBJECT	Yes	see chapter 3.41	what is tested
	METHOD	No	see chapter 3.41	test procedure or method
	METHOD_TITLE	No	Name of method	in national language
	MODE	No	DEMO, DEMO_MEAS, DEMO_LIMITS or REAL	results from a demo, only demo results, only demo limits or real measurement re- sults
	GL	No	1,2,3,4,5	Used Guideline (Leitfaden)

Values

none

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Next level

TITLE (required), description of test in national language, e.g. "Exhaust gas test"

HEADER (required)

SECTION (required)

SUMMARY (optional)

XML DTD

```

<!ELEMENT RESULT (TITLE, HEADER, SECTION+, SUMMARY?)>
<!ELEMENT TITLE (#PCDATA)>
<!ATTLIST RESULT OBJECT (EMISSION | BRAKE | WHEEL_ALIGNMENT | HEAD_LIGHT
| SIDE_SLIP | NOISE | SUSPENSION | VISUAL_INSPECTION | OIL_MANAGEMENT |
CAR_MEASUREMENT | SAFETY_CHECK | DIAGNOSIS | WHEELBALANCER | TIRE_CHECK | BRAKE_FLUID |
MOTOR_TEST | COATING_THICKNESS | AIRCONDITION) #REQUIRED
METHOD (OBD | SMOKE | SMOKE_TURBO | SMOKE_OBD | GAS | GAS_OL_CATALYST | GAS_CL_CATALYST |
GAS_OBD_CATALYST | GAS_BIKE | GAS_BIKE_CL_CATALYST | QUICK | STANDARD |
DETAILED | MANUFACTURER_SPECIFIC | ACCIDENT_VEHICLE | FOURWD | FIRST_EXAMINATION |
RE_EXAMINATION | DYNAMIC | STATIC) #IMPLIED
MODE (DEMO | REAL | DEMO_LIMITS | DEMO_MEAS) "REAL"
GL (1 | 2 | 3 | 4 | 5) "5">

```

3.18 Key word HEADER

Information about one test

Attributes


none

Values

none

Next level

EQUIPMENT (required, repeatable)	used equipment
START_TEST (required)	
END_TEST (required)	
CONTROL_NO (optional)	code number for test method
PROTOCOL_NO (optional)	
OPERATOR (optional)	
COUNTRY (optional) see 3.6	
ORDER (optional)	
HUMIDITY (optional)	

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TEMPERATURE (optional)

ATMOSPHERIC_PRESSURE (optional)

XML DTD

```
<!ELEMENT HEADER (EQUIPMENT+, START_TEST, END_TEST, CONTROL_NO?,
PROTOCOL_NO?, OPERATOR?, COUNTRY?, ORDER?,
HUMIDITY?, TEMPERATURE?, ATMOSPHERIC_PRESSURE?)>
```

3.19 Key word EQUIPMENT


Attributes

make and model of equipment:

Key word	Attribute	Req.	Values	Explanation
EQUIPMENT				equipment used for test
	TYPE	Yes	CONTROL	computer used for control and operation
			BRAKE	test block for brake test
			GAS	test bench
			SMOKE	test bench
			WHEEL_ALIGNMENT	wheel alignment tester
			LIGHT	head light tester.
			SIDE_SLIP	side slip tester
			NOISE	noise level meter
			SUSPENSION	suspension tester
			OIL_MANAGEMENT	oil management system
			INTERFACE	if asanetwork interface is realised as separate module
			OBD	device used for read out
			WHEELBALANCER	Device used for balancing wheels
			HANDHELD_DIAGNOSTIC_UNIT	Handheld device used for Diagnostics
			WORKSTATION_DIAGNOSTIC_UNIT	Workstation device used for Diagnostics
			IGNITION_ANALYZER	Device used for ignition analysis
			ENGINE_ANALYZER	Device used for engine analysis
			BATTERY	Device that diagnosis Battery and associated electrical systems
			COATING_THICKNESS_TESTER	Coating thickness tester
			TIRE_PRESSURE_TESTER	Tire pressure tester
			AIRCONDITION	Air condition service unit

Values

none

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Next level

TITLE	in natural language
MANUFACTURER (required)	(i•SHOP uses EquipmentMfg property)
MODEL (required)	(optional i•SHOP – found in EquipmentID property)
PROCEDURE (optional)	measurement principle used. Note: i•SHOP uses DiagnosticType to populate
SERIAL_NO (optional)	(optional i•SHOP – found in EquipmentID property)
HOMOLOGATION_NO (optional)	
VERSION (required)	(software) version number Note: i•SHOP does not use)
DATA_RELEASE (optional)	Release data of nominal data (setpoint data), quarterly, format X/YYYY where X = I II III IV and YYYY = Year
CALIBRATION_EXPIRES (optional)	
CALIBRATED_BY (optional)	
CHECKSUM (optional)	Check sum
SUPPORTS (optional)	Supported OBD protocols

All above: no attributes, values as string, no next level

XML DTD


```

<!ELEMENT EQUIPMENT (TITLE, MANUFACTURER, MODEL, PROCEDURE?,
SERIAL_NO?, HOMOLOGATION_NO?, VERSION,
DATA_RELEASE?, CALIBRATION_EXPIRES?,
CALIBRATED_BY?, CHECKSUM?, SUPPORTS?)>

<!ELEMENT PROCEDURE (#PCDATA)>
<!ELEMENT SERIAL_NO (#PCDATA)>
<!ELEMENT HOMOLOGATION_NO (#PCDATA)>
<!ELEMENT VERSION (#PCDATA)>
<!ELEMENT DATA_RELEASE (#PCDATA)>
<!ELEMENT CALIBRATION_EXPIRES (#PCDATA)>
<!ELEMENT CALIBRATED_BY (#PCDATA)>
<!ELEMENT CHECKSUM (#PCDATA)>
<!ELEMENT SUPPORTS (#PCDATA)>

<!ATTLIST EQUIPMENT
TYPE (CONTROL | BRAKE | GAS | SMOKE |
WHEEL_ALIGNMENT | LIGHT | SIDE_SLIP |
NOISE | SUSPENSION | OIL_MANAGEMENT |
INTERFACE | OBD | WHEELBALANCER |
HANDHELD_DIAGNOSTIC_UNIT |
WORKSTATION_DIAGNOSTIC_UNIT |
IGNITION_ANALYZER | ENGINE_ANALYZER |
BATTERY | TIRE_ANALYZER |
BRAKE_FLUID_TESTER |
COATING_THICKNESS_TESTER |
TIRE_PRESSURE_TESTER | AIRCONDITION)
#REQUIRED>

```

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3.20 Key words START_TEST, END_TEST

Start and end of test

Attributes

UNIT = DateTime (optional)

Values

start/end of test with date, time

Next level

none

XML DTD

```

<!ELEMENT START_TEST          (#PCDATA) >
<!ELEMENT END_TEST           (#PCDATA) >
<!ATTLIST START_TEST         UNIT      (DateTime)          "DateTime">
<!ATTLIST END_TEST          UNIT      (DateTime)          "DateTime">

```

3.21 Key word OPERATOR

Operator data

Attributes

none

Values

none

Next level

NAME (required) no next level

PERMISSION (optional)

XML DTD

```

<!ELEMENT OPERATOR           (NAME, PERMISSION?) >

```

3.22 Key word PERMISSION

Attributes

none

Values


none

Next level

ID1 (required) permission number 1

ID2 (optional) permission number 2

EXPIRES (optional) expiry of permission

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All above: no attributes, values as string, no next level

XML DTD

```
<!ELEMENT PERMISSION          (ID1, ID2?, EXPIRES?)>
<!ELEMENT ID1                  (#PCDATA)>
<!ELEMENT ID2                  (#PCDATA)>
<!ELEMENT EXPIRES              (#PCDATA)>
```

3.23 Key word CONTROL_NO

Official code number

Attributes

none

Values

control code/registration code as string

Next level

none

XML DTD

```
<!ELEMENT CONTROL_NO          (#PCDATA)>
```

3.24 Key word PROTOCOL_NO

Protocol number

Attributes

none

Values

number as string

Next level

none

XML DTD

```
<!ELEMENT PROTOCOL_NO        (#PCDATA)>
```

3.25 Key word HUMIDITY

Attribute


UNIT

Values

as string

Next level

none

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XML DTD

<!ELEMENT HUMIDITY (#PCDATA)>

3.26 Key word TEMPERATURE

Attribute

UNIT

Values

as string

Next level

none

XML DTD

<!ELEMENT TEMPERATURE (#PCDATA)>

3.27 Key word ATMOSPHERIC_PRESSURE

Attribute

UNIT

Values


as string

Next level

none

XML DTD

<!ELEMENT ATMOSPHERIC_PRESSURE (#PCDATA)>

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3.28 Key word SECTION

A section of a test

Attributes

Key word	Attribute	Required	Values	Explanation
SECTION				flow in the test process
	OBJECT	Yes	see chapter 3.41	what is tested
	TYPE	No	see chapter 3.41	how is tested
	TYPE_TITLE	No	Name of TYPE	in national language
	AXLE	No	Integer	1 = front axle
	AXLE_TITLE	No	Name of axle	in national language
	NO	No	Successive numbers starting with 1	For repeating sections
	LOC	No	Location	Where is tested
	LOC_TITLE	No	Name of LOC	In national language

Values

none

Next level

TITLE (required), title of section in national language e.g. conditioning, initial measurement

(STEP or MEAS) or MEAS_ROW or DIAGRAM or DEFECT (required, repeatable)

SUMMARY (optional)


XML DTD

```

<!ENTITY % sm                "(STEP|MEAS|MEAS_ROW|DIAGRAM)">
<!ELEMENT SECTION            (TITLE, (%sm;)+, SUMMARY?)>
<!-- TITLE                    already defined in Level 3 -->

<!ATTLIST SECTION           OBJECT      (REPAIRED_DEFECTS | VISUAL_INSPECTION |
                                     CONDITIONING | FAST_IDLE | NATURAL_IDLE |
                                     CLOSED_LOOP_CTRL | GAS_BLAST | FOURWD | STANDARD |
                                     SINGLE | TIRE_INSPECTION | RUNOUT_COMPENSATION |
                                     MEASUREMENT | INITIAL_MEASUREMENT |
                                     FINAL_MEASUREMENT | TRACK_CURVE_MEASUREMENT |
                                     SIDE_SLIP | LOW_BEAM | HIGH_BEAM | FOG_BEAM |
                                     SILENCER | HORN | SUSPENSION | OIL | OTHER_DEFECTS
                                     | INNER_WHEEL_BRAKE_CHECK | MIL | OBD_CTRL |
                                     TROUBLE_CODES | IGNITION | UNBALANCE | RIDEHEIGHT
                                     | TIRE_TROUBLES | OBD_ANALYSIS | FUNCTION_TEST |
                                     MEAS_ROWS | BRAKE_FLUID | CYLINDER | CIRCUIT |
                                     DEFECTS | REFRIGERANT | RECOVERY | VACUUM |
                                     LEAKTEST | CHARGE | FLUSHING | PERFORMANCE)
                                     #REQUIRED
                                     AXLE      CDATA #IMPLIED
                                     LOC       CDATA #IMPLIED
                                     TYPE     (0 | 1 | 2 | 3 | 4 | 5 | 9 | PERM | INTERM)
                                     #IMPLIED
                                     NO       CDATA #IMPLIED
                                     AXLE_TITLE CDATA #IMPLIED
                                     LOC_TITLE CDATA #IMPLIED
                                     TYPE_TITLE CDATA #IMPLIED
>

```

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3.29 Key word SUMMARY

A summary of a section, step or a complete test result

Attributes

none

Values

none

Next level

TITLE (optional), summary in national language, e.g. visual inspection

STEP or MEAS or MEAS_ROW or DIAGRAM (required, repeatable)

XML DTD

```
<!ENTITY % sm                "(STEP|MEAS|MEAS_ROW|DIAGRAM) ">
<!ELEMENT SUMMARY           (TITLE?, (%sm;)+)>
```

3.30 Key word STEP

Further division of a section into steps

Attributes

Key word	Attribute	Required	Values	Explanation
STEP				additional subdivision
	OBJECT	No	see chapter 3.41	what is tested
	NO	No	Successive numbers starting with 1	For repeating steps, e.g. gas blasts
	NO_TITLE	No	Name of nr/gas blast	in national language

Values

none


Next level

TITLE (required) , step in national language, e.g. disturbance on, left wheel

MEAS or MEAS_ROW (required, repeatable)

DIAGRAM (optional)

SUMMARY (optional)

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XML DTD

```

<!ELEMENT STEP (TITLE, (MEAS|MEAS_ROW)+, SUMMARY?)>
<!ATTLIST STEP
OBJECT (BASE_VALUE|DISTURBANCE_ON|
DISTURBANCE_OFF|SETTLED_ON|SETTLED_OFF|
SERVICE_BRAKE|PARKING_BRAKE|
AUXILARY_BRAKE1|AUXILARY_BRAKE2|
VERTICAL_POSITION|HORIZONTAL_POSITION|
ADDITIONAL|TROUBLE_CODES|READINESS|
STATE|PROBE_TEST|CYLINDER|SEGMENT|
TIRE_TROUBLE|OBD_O2_SENSOR_OUT_VOLTAGE|
OBD_O2_SENSOR_SHORT_TERM_FUEL_TRIM|
OBD_WIDE_RANGE_O2_SENSOR_OUT_LAMBDA|
OBD_WIDE_RANGE_O2_SENSOR_OUT_CURRENT|
OBD_WIDE_RANGE_O2_SENSOR_OUT_VOLTAGE|
CONTROLLERS|IDENTIFICATION|ACTUAL_VALUES|
ACTUATORS|BEFORE|AFTER) #IMPLIED
NO CDATA #IMPLIED
NO_TITLE CDATA #IMPLIED>

```

3.31 Key word DEFECT

Used inside of a SECTION for REPAIRED_DEFECTS

Attribute

Key word	Attribute	Required	Values	Explanation
MEAS				measurement
	OBJECT	Yes	see chapter 3.41	what is measured

Values

none

Next level

TITLE (required), physical value in national language, e.g. brake force


VALUE (required, repeatable)

XML DTD

```

<!ELEMENT DEFECT (TITLE?, (STEP | MEAS+)>
<!ATTLIST DEFECT
OBJECT (NONE|VISUAL_INSPECTION|CONDITIONING|
FAST_IDLE|NATURAL_IDLE|
CLOSED_LOOP_CTRL|GAS_BLAST|
CONTROL|FOURWD|STANDARD|SINGLE|
TIRE_INSPECTION|RUNOUT_COMPENSATION|
MEASUREMENT|INITIAL_MEASUREMENT|
FINAL_MEASUREMENT|
TRACK_CURVE_MEASUREMENT|SIDE_SLIP|
LOW_BEAM|HIGH_BEAM|FOG_BEAM|
SILENCER|HORN|SUSPENSION|OIL|
OTHER_DEFECTS|INNER_WHEEL_BRAKE_CHECK|
MIL|OBD_CTRL|TROUBLE_CODES|IGNITION) #IMPLIED

```

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3.32 Key word MEAS

Measurement object and values

Attributes

Key word	Attribute	Required	Values	Explanation
MEAS				measurement
	OBJECT	Yes	see chapter 3.41	what is measured
	LOC	No	see chapter 3.41	where is measured
	LOC_TITLE	No	Name of LOC	in national language
	DISTANCE	No	distance in meters	distance e.g. for head light test

Values

none

Next level

TITLE (required), physical value in national language, e.g. brake force

VALUE (required, repeatable)

XML DTD

```

<!ELEMENT MEAS (TITLE, VALUE+)>
<!ATTLIST MEAS
  OBJECT CDATA #REQUIRED
  LOC CDATA #IMPLIED
  DISTANCE CDATA #IMPLIED
  LOC_TITLE CDATA #IMPLIED>

```

3.33 Key word VALUE

Measurement value and additional information

Attributes

Key word	Attribute	Required	Values	Explanation
VALUE				
	TYPE	No	MAX MIN AVG (Default) DELTA DISP PERM INTERM ABS RMS POTENTIAL PENDING CONFIRMED_ACTIVE PREVIOUSLY_ACTIVE NOX_EXCEPTION	method: maximum value minimum value average delta displayed value differs from measurement permanent value/error intermittent value/error absolute value weighted average value Potential error Preliminary error Confirmed and active error Previously active error Error on manufacturer exception list, not evaluated!
	UNIT	No	see chapter 0	unit of measurement
	DIGITS	No	number of digits of value	resolution of measurement
	DISPDIGITS	No	number of digits displayed.	resolution of displayed value



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Key word	Attribute	Required	Values	Explanation
	RESULT	No	0 (Default)	Result of measurement, default undefined
			1	ok, symbol green, TRUE
			2	warning, symbol yellow
			3	severe fault, defective, symbol red, FALSE
			4	severe fault, symbol danger
			5	aborted
			6	can't be expressed, overflow
			7	timeout
	REF	No	signal reference name	e.g. GROUND
	REF_LOC	No	location of signal reference	e.g. ABS connector pin 1
	SOURCE	No	HAND	input by hand
			MEASURED (Default)	measured
			signal source name	e.g. UBat
	SOURCE_LOC	No	location of signal source	e.g. ABS connector pin 2
	CALIBRATED	No	0 (false)	uncalibrated measurement
			1 (true)	calibrated measurement
	TEXT	No	String	comment or description
	FORMAT	No	NUM	numerical data only
			ALPHA	string data (default)
	LOWLIM1	No	same as measurement	set point min. 1
	HIGHLIM1	No		set point max. 1
	LOWLIM2	No		set point min. 2
	HIGHLIM2	No		set point max. 2
	LOWLIM3	No		set point min. 3
	HIGHLIM3	No		set point max. 3
	LOWLIM4	No		set point min. 4
	HIGHLIM4	No		set point max. 4
	LIMIT_SOURCE	Nein	Origin of limit: P, M, D	P = Plaque, M = Manufacturer, D = Default
	NOMINAL	No		target for e.g. adjustment
	LOWDISP	No		display range limit min
	HIGHDISP	No		display range limit max
	NOMINALDISP	No		display range target value
	IMAGE	No	GIF, JPEG	graphic format
	TRIGGER	No		Trigger signal
	TRIGGER_EDGE	No	POS, NEG	Trigger slope
	REF_VALUE	No		Reference value
	COUPLING	No	AC, DC	Coupling
	DATE	No		Date
	TIME	No		ZTime
	RESOLUTION	No	time in s	Resolution in seconds
	ADDRESS	No	Hexadecimal value	Controller address
	CLASS	No	C,B2,B1,A	Error class OBD
	STANDARD	No	ISO_15031 or SAE_J1939	
	AFI	No	Error code	SAE_J1939 and ISO_15031
	AFI_TEXT	No	Errorstring	SAE_J1939 and ISO_1503
	OC	No		SAE_J1939 and ISO_1503
	CM	No		SAE_J1939 and ISO_1503

Values

Measurement as integer or generally as floating point value (e.g. 1.593E3).

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Next level

none

XML DTD

```


<!ELEMENT VALUE                (#PCDATA) >
<!ATTLIST VALUE  TYPE          (MAX | MIN | AVG | DELTA | DISP | PERM | INTERM |
                                ABS | RMS | POTENTIAL | PENDING | CONFIRMED_ACTIVE
                                | PREVIOUSLY_ACTIVE | NOX_EXCEPTION) "AVG"
                                UNIT          CDATA #IMPLIED
                                DIGITS       CDATA #IMPLIED
                                DISPDIGITS   CDATA #IMPLIED
                                RESULT       (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7) "0"
                                SOURCE       CDATA "MEASURED"
                                SOURCE_LOC   CDATA #IMPLIED
                                FORMAT       (NUM | ALPHA) "ALPHA"
                                TEXT         CDATA #IMPLIED
                                LOWLIM1     CDATA #IMPLIED
                                LOWLIM2     CDATA #IMPLIED
                                LOWLIM3     CDATA #IMPLIED
                                LOWLIM4     CDATA #IMPLIED
                                HIGHLIM1    CDATA #IMPLIED
                                HIGHLIM2    CDATA #IMPLIED
                                HIGHLIM3    CDATA #IMPLIED
                                HIGHLIM4    CDATA #IMPLIED
                                LIMIT_SOURCE (P | M | D) "D"
                                NOMINAL     CDATA #IMPLIED
                                LOWDISP     CDATA #IMPLIED
                                HIGHDISP    CDATA #IMPLIED
                                NOMINALDISP CDATA #IMPLIED
                                CALIBRATED  (0 | 1) "1"
                                IMAGE       (GIF | JPEG | PNG | SVG) #IMPLIED
                                REF         CDATA #IMPLIED
                                REF_LOC     CDATA #IMPLIED
                                TRIGGER     CDATA #IMPLIED
                                TRIGGER_EDGE CDATA #IMPLIED
                                REF_VALUE   CDATA #IMPLIED
                                COUPLING    (AC | DC) #IMPLIED
                                DATE        CDATA #IMPLIED
                                TIME        CDATA #IMPLIED
                                RESOLUTION  CDATA #IMPLIED
                                ADDRESS     CDATA #IMPLIED
                                CLASS       (C | B2 | B1 | A) "A"
                                STANDARD    (ISO_15031 | SAE_J1939) "ISO_15031"
                                FMI         CDATA #IMPLIED
                                FMI_TEXT    CDATA #IMPLIED
                                OC          CDATA #IMPLIED
                                CM          CDATA #IMPLIED
  
```

3.34 Key word MEAS_ROW

Series of measurement

Attributes

Key word	Attribute	Required	Values	Explanation
MEAS_ROW				some measurements as array

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OBJECT	Yes	See chapter 3.41	what is measured
COUNT	Yes	Integer 0-16000	number of n-pairs in array

Values

none

Next level

VALUE (required)

ARRAY (required)

XML DTD

```
<!ELEMENT MEAS_ROW (VALUE, ARRAY) >
<!ATTLIST MEAS_ROW OBJECT CDATA #REQUIRED
COUNT CDATA #REQUIRED>
```

3.35 Key word ARRAY

Array of measurement values

Attributes

none

Values

measurement pairs, format x1:y1:z1, x2:y2:z2, ...

Next level

none

XML DTD

```
<!ELEMENT ARRAY (#PCDATA) >
```

3.36 Key word DIAGRAM

Diagramm

Attributes

Key word	Attribute	Required	Values	Explanation
DIAGRAM				mehrere Meßgrößen als Array
	OBJECT	YES	See chapter 3.41	what is measured
	VERSUS	NO	Reference value	For XY diagrams


Values

none

Next level

TITLE (required) Diagram identifier

GRAPH (required) curve progression

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XML DTD

```

<!ELEMENT DIAGRAM                (TITLE, GRAPH+) >
<!ATTLIST DIAGRAM                OBJECT          CDATA          #REQUIRED
                                VERSUS          CDATA          #IMPLIED >

```

3.37 Key word GRAPH

One curve progression

Attributes

Key word	Attribute	Required	Values	Explanation
GRAPH				One curve progression
	COUNT	YES	Integer	Number of points
	NO	NO	Integer	Number of curve

Values

none

Next level

TITLE (optional) name of curve

X_AXIS (required) X-Axis

Y_AXIS (optional) Y-Axis

Z_AXIS (optional) Z-Axis

ARRAY (required) an array with values

XML DTD

```

<!ELEMENT GRAPH                (TITLE?, X_AXIS, Y_AXIS, Z_AXIS?, ARRAY) >
<!ATTLIST GRAPH                COUNT          CDATA          #REQUIRED
                                NO            CDATA          #IMPLIED >

```

3.38 Key word X_AXIS, Y_AXIS, Z_AXIS

Diagram axis

Attributes


Key word	Attribute	Required	Values	Explanation
X_AXIS				One axis
	OBJECT	YES	See chapter 3.41	what is measured
	CURSOS_POS1	NO	Integer	Cursor 1 Position (X)
	CURSOS_POS2	NO	Integer	Cursor 2 Position (X)
	CURSOS_VAL1	NO	Measurement value	Cursor 1 Value
	CURSOS_VAL2	NO	Measurement value	Cursor 2 Value

Values

none

Next level

none


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XML DTD

```


<!ELEMENT X_AXIS          (TITLE?, VALUE) >
<!ATTLIST X_AXIS          OBJECT          CDATA          #REQUIRED
                           CURSOR_POS1    CDATA          #IMPLIED
                           CURSOR_POS2    CDATA          #IMPLIED
                           CURSOR_VAL1    CDATA          #IMPLIED
                           CURSOR_VAL2    CDATA          #IMPLIED >

```


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3.39 Attribute UNIT

Description	UNIT	allowed values
acceleration in m/s ²	m/s2	Numerical
binary data	bin.base64	ascii string
bool	1	0=false, 1=true
date: day.month.year	Date	DD.MM.YYYY
speed in 1/min	rpm	Numerical
pressure in Bar	bar	Numerical
pressure in Pascal	Pa	Numerical
pressure in psi	psi	Numerical
frequency in Hz	Hz	Numerical
speed in m/s	m/s	Numerical
speed in km/h	km/h	Numerical
speed in m/h	mph	Numerical
mass in pounds	lbs	Numerical
mass in kg	kg	Numerical
mass flow in g/s	g/s	Numerical
capacity	Ah	Numerical
if unit is missing (default no unit)	1	1
force in Newton	N	Numerical
length in Meter	m	Numerical
Length in kilometer	km	Numerical
Length in miles	miles	Numerical
length in inches decimal	inch	Numerical
length in inches fractional	finch	Format "a b/c d/e"
plane	m2	Numerical
power	W	Numerical
lighting	Lux	Numerical
Parts per Million	ppm	Numerical
per cent	%	Numerical
sound	dB	Numerical
second	s	Numerical
voltage	V	Numerical
current	A	Numerical
temperature in degrees Celsius	degC	Numerical
temperature in Grad Fahrenheit	degF	Numerical
temperature in Kelvin	K	Numerical
blurring	1/m	Numerical
volume in m ³	m3	Numerical
volume per cent	%Vol	Numerical
volume ppm	ppmVol	Numerical
volume flow m ³ /h	m3/h	Numerical
fuel consumption	l/100km	Numerical
resistance	Ohm	Numerical
time hour, minute, second	Time	hh:mm:ss
date and time	DateTime	DD.MM.YYYY hh:mm:ss
ignition point in degrees camshaft	degCS	Numerical
torque	Nm	Numerical
angle in degrees:minutes:seconds (°:':")	deg60	DDD:MM:SS
angle in decimal degrees	deg	Numerical

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Note: If TYPE=DISP you can use any unit (even those not mentioned) for display. Example: oil volume in m3, if TYPE=DISP also in litre or gallon.

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3.40 Attributes for measurements

Usage:

- A – Wheel alignment
- B – Brake
- C – Car measurement
- F – Safety check
- G – Gas/Emission
- L – Light
- N – Noise
- O – Oil management
- S – Side slip
- U – Suspension
- V – Visual Inspection
- W – Wheel balancing
- D – Diagnostic

3.40.1 General Attributes

Values	Unit	Description	Usage
EXPIRATION_DATE	Date		all
NOTES			all
IDENTNUMBER	1	for parts	all
IMAGE	bin.base64		all
PERMISSION			All



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3.40.2 Exhaust gas test

Values	Unit	Description	Usage
ACCEL_TIME	s		G
CLEANING_GAS_BLAST		number of cleaning gas blasts	G
CLEANING_SPEED	rpm	speed for cleaning	G
CO	%Vol		G, D
CO2	%Vol		G, D
COUNT		number of faults (OBD)	G
COVRAI	%Vol		G
COVRAI2	%Vol		G
CUTOFF_SPEED	rpm		G
DEFECTS_NO6	Bool	Faults found, but not repaired	G
DWELL_ANGLE	Deg		G
DWELL_RATIO	%		G
FAULT_MEMORY			G
GAS		Final result	G
GASTEMP	degC, degF K	Temperature in degrees Celsius Temperature in degrees Fahrenheit Temperature in Kelvin	G
HC	ppmVol		G, D
HOLD_TIME	s		G
MI_CONTROL	Bool	Malfunction indicator activation	G
MI_STATE	Bool	Malfunction indicator state	G
MI_VISUAL_INSPECTION	Bool	Visual inspection of malfunction indicator lamp	G
IDLE_SPEED	rpm		G
IGN_POINT	degCS		G
LAMBDA	1		G, D
NOX	ppmVol		G, D
O2	%Vol		G, D
OBD_CTRL	Bool	Functional check of OBD	G
OILTEMP	degC degF K	Temperature in degrees Celsius Temperature in degrees Fahrenheit Temperature in Kelvin	G, D
OPACITY	1/m		G
PERFORMED_TEST		Test performed	G
REPAIRED_DEFECTS_NO5	Bool	Repaired faults	G
SMOKE		Final result	G
SPEED	rpm		G
SUPPORTED_TESTS		Supported Tests (OBD)	G
TROUBLE_CODE		OBD	G
VISUAL_INSPECTION	Bool		G
WAIT_TIME	min	Wait time for catalyser conditioning	G
WATERTEMP	degC degF K	Temperature in degrees Celsius Temperature in degrees Fahrenheit Temperature in Kelvin	G

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3.40.3 Wheel alignment

Values	Unit	Description	Usage
AXLE_OFFSET	m, inch, deg60, deg		A
BALL_POINT_LOCATION	m, inch		A
CAMBER	deg60, deg		A
CAMBER_ADJUST	deg60		A
CAMBER_RAISED	deg60		A
CASTER_10	deg60, deg		A
CASTER_20	deg60, deg		A
CROSS_CAMBER	deg60, deg		A
CROSS_CAMBER_20_INSIDE	deg60		A
CROSS_CAMBER_20_OUTSIDE	deg60		A
CROSS_CAMBER_RAISED	deg60		
CROSS_CASTER	deg60, deg		A
CROSS_INCLUDED_ANGLE	deg60		A
CROSS_SAI	deg60, deg		A
CROSS_TOE	m, inch, deg60		A
CROSS_TOE_CONSTANT	m, inch, deg60		A
CROSS_TOE_OUT_ON_TURNS	deg60		A
CTRL_POINT_WIDTH_LEVEL_CTRL	m, inch		A
INCLUDED_ANGLE_20	deg60, deg		A
INCLUDED_ANGLE	deg60, deg		A
LATERAL_OFFSET	m, inch, deg60, deg		A
MAX_STEER	deg60, deg		A
MAX_STEER_TO_LEFT	deg60		A
MAX_STEER_TO_RIGHT	deg60		A
OFFSET_DEPTH	m, inch		A
RIM_DIAMETER	m, inch		A
RIM_WIDTH	m, inch		A
ROBJECTE_HEIGHT	m, inch, deg60, deg		A
SAI_10	deg60, deg	Steering Axis Inclination	A
SAI_20	deg60, deg		A
SCRUB_RADIUS	m, inch		A
SHOCK_ABSORBER_TRAVEL	m, inch		A
TEST_LOADING	kg		A
THRUST_ANGLE	m, inch, deg60, deg		A
TIRE_DIMENSION	mm/%-inch		A
TIRE_FABRICATOR	1		A
TIRE_PERFORMANCE	m, inch		A
TIRE_PRESSURE	bar, Pa, psi		A
TIRE_TREAD_DEPTH_CENTER	m, inch		A
TIRE_TREAD_DEPTH_INSIDE	m, inch		A
TIRE_TREAD_DEPTH_OUTSIDE	m, inch		A
TOE	m, inch, deg60, deg		A
TOE_ADJUSTMENT	m, inch, deg60		A
TOE_CONSTANT_ADJUSTMENT	m, inch, deg60		A
TOE_CONSTANT_CONTROL	m, inch, deg60		A
TOE_OUT_ON_TURNS_10	deg60, deg		A
TOE_OUT_ON_TURNS_20	deg60, deg		A
TOE_TO_INTERMEDIATE_AXIS	m, inch deg60		A



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Values	Unit	Description	Usage
TOE_TO_THRUST_ANGLE	m, inch, deg60		A
TOTAL_TOE	m, inch, deg60, deg		A
TOTAL_TOE_UNDEPRESSED	m, inch, deg60,		A
TRACK_CURVE	m, inch, deg60, deg		A
TRACK_WIDTH	m, inch, deg60, deg		A
TRACK_WIDTH_DIFFERENCE	m, inch, deg60, deg		A
TURN_TABLE_ANGLE	deg60		A
VEHICLE_LATERAL_INCLINATION	m, inch		A
VEHICLE_LONGITUDINAL_INCLINATION	m, inch		A
WHEEL_BASE	m, inch		A
WHEEL_BASE_DIFFERENCE	m, inch		A
WHEEL_SETBACK	m, inch, deg60, deg		A

3.40.4 Brake test

Values	Unit	Description	Usage
AXLE_WEIGHT_STAT	kg	static	B
AXLE_WEIGHT_DYN	N	dynamic	B
AXLE_WEIGHT_MAX	N		B
BRAKEFORCE	N		B
BRAKEFORCE_MIN_PRESSURE	N		B
BRAKING_RATIO	%	@test weight	B
BRAKING_RATIO_CALC	%	calculated	B
BRAKING_RATIO_CALC_SC	%	calculated for safety check	B
BRAKING_RATIO_MAX	%	@total weight	B
CALC_PRESSURE	Pa		B
DYNAMIC_DIFF	%		B
MIN_PRESSURE	Pa		B
OVALITY	%		B
OVALITY_2	%		B
OVALITY_3	%		B
OVALITY_4	%		B
PEDALFORCE	N		B
PRESSURE_PM	Pa		B
PRESSURE_PZ	Pa		B
ROAD_FRICTION	N		B
SLIP	%		B
SPEED	rpm		B
TOTAL_WEIGHT	N		B
TOTAL_WEIGHT_DYN	N	Dynamic weight	
TOTAL_WEIGHT_MAX	N		B
VISUAL_INSPECTION	Bool		B
WHEEL_WEIGHT_DYN	N	dynamic	B
WHEEL_WEIGHT_STAT	N	static	B
WARM_UP	Bool	Warm up of brake (France)	

3.40.5 Car measurement

Values	Unit	Description	Usage
HEIGHT	m		C

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LENGTH	m	C
WIDTH	m	C

3.40.6 Coating thickness measurement

Values	Unit	Description	Usage
COATING_THICKNESS	um		C

3.40.7 Oil management

Values	Unit	Description	Usage
DISPENSE	m3	Oil dispense	O
HOSE	1	Hose number	O
PRODUCT	1		O
TANK	1	Tank number	O

3.40.8 Suspension

Values	Unit	Description	Usage
ROAD_HOLDING	%		U
RESONANCE_FREQUENCY	Hz		U
WAY_AMPLITUDE	m		U
WHEEL_DAMPING	%		U
BUILDUP_DAMPING	%		U
DAMPING_INDEX	1		U
WHEEL_WEIGHT_DYN	N		U
AXLE_WEIGHT	N		U

3.40.9 Wheel balancing

Values	Unit	Description	Usage
DIAMETER_ALU	m		W
IMBALANCE_DISPLAY	1 5 10	Display imbalance in 1 gram steps 5 gram steps 10 gram steps	W
IMBALANCE_INIT	g, oz		W
IMBALANCE_INIT_STATIC	g, oz		W
IMBALANCE_RES	g, oz		W
IMBALANCE_RES_MAX	g, oz		W
IMBALANCE_RES_STATIC	g, oz		W
LATERAL_RUNOUT_RIM	m		W
LATERAL_RUNOUT_RIM_MAX	m		W
LATERAL_RUNOUT_TIRE	m		W
NUMBER_SPOKES	Number		W
OFFSET_ALU	m, inch		W
OFFSET_NORMAL	m, inch		W
OPTIMISED	1	1 = true, 0 = false	W
RADIAL_FORCE	N		W
RADIAL_RUNOUT_RIM	m		W



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Values	Unit	Description	Usage
RADIAL_RUNOUT_RIM_MAX	m		W
RADIAL_RUNOUT_TIRE	m		W
RIM_DIAMETER	m, inch	only steel	W
RIM_FABRICATOR	1		W
RIM_OFFSET_DEPTH	m, inch		W
RIM_TYPE			W
RIM_WIDTH	m, inch		W
SPLITTING_WEIGHTS	1	1 = true, 0 = false	W
SPLITTING_WEIGHT_1	g, oz		W
SPLITTING_WEIGHT_2	g, oz		W
TIRE_DIMENSION	mm/%-inch		W
TIRE_FABRICATOR	1		W
TIRE_PERFORMANCE	m, inch		W
TIRE_PRESSURE	bar, Pa, psi		W
TIRE_SEAT_PRESSURE	bar, Pa, psi		W
TIRE_TREAD_DEPTH_CENTER	m, inch		W
TIRE_TREAD_DEPTH_LEFT	m, inch		W
TIRE_TREAD_DEPTH_RIGHT	m, inch		W
USER_ID	1		W
WEIGHT_ALU_HEIGHT	m, inch		W
WEIGHT_ALU_WIDTH	m, inch		W
WEIGHT_HEIGHT	m, inch		W
WEIGHT_PLACE_MODE	1	1=default 2=glued 3=glued, hidden 4=static 5=CTS 6=special	W
WEIGHT_WIDTH	m inch		W
WEIGHT_ANGLE	deg60		W
WHEEL_WEIGHT_TYPE		1 = default 2 = truck type 3 = standard 4 = coated 5 = safety type DC 6 = safety type BMW 7 = glued, standard 8 = glued, chromium-plate	W

3.40.10 Tire check

Values	Unit	Description	Usage
TIRE_TREAD_DEPTH	mm	Tread depth	N
TIRE_PRESSURE	bar	Mature air pressure	N


3.40.11 Noise level

Values	Unit	Description	Usage
BACKGROUND_NOISE	db		N
NOISE_LEVEL	db		N

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3.40.12 Head light test

Values	Unit	Description	Usage
ALIGNMENT	% deg		L
ILLUMINANCE	lx		L

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3.40.13 Safety check (Germany)

Values	Unit	Description	Usage
AXLE_WEIGHT_DYN	kg		F
AXLE_WEIGHT_STAT	kg		F
AXLE_WEIGHT_MAX	N		F
BRAKEFORCE	N		F
BRAKEFORCE_MAX	N		F
BRAKEFORCE_MIN_PRESSURE	Pa		F
BRAKING_RATIO	%		F
BRAKING_RATIO_CALC_SC	%		F
BRAKING_RATIO_MAX	%		F
CALC_PRESSURE	Pa		F
FINISHED	1	examination done (used with wheel brake)	F
MEAN_BRAKING_RATIO_SC	%		F
OTHER_DEFECTS	Bool		F
PRESSURE_PZ	Pa		F
REQUIRED	1	examination required (used with wheel brake)	F
VISUAL_INSPECTION	Bool		F

3.40.14 Visual inspection

Values	Unit	Description	Usage
Number/text string according to national regulation	none		V
STATISTICS	none	counter	V
AAIA_COMPONENTID	None	AAIA Component ID (from Parts Terminology Database)	V
AAIA_MAP_CONDITION	None	Map Condition Description	V

3.40.15 Side slip test

Values	Unit	Description	Usage
TRACK	mm/m		S



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3.40.16 Diagnosis (not yet finished)

Values	Unit	Description	Usage
BATTERY	V	battery voltage	D
CONTRIBUTION_PER_CYLINDER	%	Measures each cylinder's contribution to engine output	D
COUNT		number of faults (OBD)	D
CRANKING_CURRENT_PER_CYLINDER	A	Current measured per cylinder while cranking	D
CRANKING_VACUUM_PER_CYLINDER	In. Hg.	Vacuum measured per cylinder while cranking	D
CURRENT	A	Measures current flow	D
CYLINDER_TIME_VARIATIONS	%	Timing Variations per cylinder	D
DELTA_SPEED	RPM	RPM difference	D
DUTY_CYCLE	%	Measures percentage of duty cycle for devices (fuel control solenoids for example)	D
DWELL_ANGLE	deg	Average Dwell measured	D
DWELL_PER_CYLINDER	deg	Dwell measured per cylinder	D
FINAL_SPEED	RPM	Engine RPM after 10 second crank	D
FINAL_VOLTAGE	V	Load voltage after 10 seconds	D
FREQUENCY	Hz		D
HALL_SENSOR	V	signal of hall sensor	D
IGN_PRIM_CHARGE_TIME	ms		D
IGN_PRIM_VOLTAGE	V		D
IGN_SEC_BURN_TIME	ms	Time for spark duration per cylinder	D
IGN_SEC_BURN_VOLTAGE	kV	Voltage measured that sustains ignition during cycle per cylinder	D
IGN_SEC_MIN_VOLTAGE	kV	Minimum kV measured during test sequence per cylinder	D
IGN_SEC_PEEK_VOLTAGE	kV	Voltage required to create spark per cylinder	D
IGNITION_TIMING	deg	Timing of Ignition measurement	D
INITIAL_VOLTAGE	V	Open Circuit Volts	D
MANIFOLD_VACUUM	In. Hg.	Vacuum measured at Intake Manifold vacuum source	D
PEAK_CURRENT	A	Full Field Current	D
PULSE_WIDTH	ms	Measurement in time of an event (fuel injector on-time, for instance)	D
RESISTANCE	Ohms	Measurement of resistance of a circuit or component	D
SOLENOID_DWELL	deg	Measurement of the Fuel Control Solenoid Dwell	D
SPEED	RPM		D
SPEED_DROP_PER_CYLINDER	%	Percentage of total RPM lost when cylinder is disabled – per cylinder	D
TROUBLE_CODE		fault code (OBD)	D
VACUUM_PER_CYLINDER	In.Hg.	Vacuum measured per cylinder while running	D
VOLTAGE_AC	V	General AC Voltage	D
VOLTAGE_DC	V	General DC Voltage	D
WATERTEMP	degC, degF	Coolant temperature	D

3.40.17 OBD Analysis

Values	Unit	Description	Usage
COUNT	-	Number of stored faults	O
MI_STATE	Bool	Malfunction state	O
SUPPLIER	Text		O
CUSTOMER	Text		O
FSD_NAME	Text		O
TROUBLE_CODE	Text		O
ACTUAL_VALUE		Read out value	O
VISUAL_INSPECTION	Bool		O

3.40.18 Sorted by value

Values	Unit	Description	Usage
ALIGNMENT	%, deg		L
AXLE_OFFSET	m, inch, deg60, deg		A
AXLE_WEIGHT_DYN	N		B, U
AXLE_WEIGHT_MAX	N		B, U
AXLE_WEIGHT_STAT	N		B, U
BACKGROUND_NOISE	db		N
BALL_POINT_LOCATION	m, inch		A
BATTERY	V	battery voltage	D
BRAKEFORCE	N		B
BRAKEFORCE_MAX	N		B
BRAKEFORCE_MIN_PRESSURE	Pa		B
BRAKING_RATIO	%	@test weight	B
BRAKING_RATIO_CALC	%	calculated	B
BRAKING_RATIO_CALC_SC	%	calculated for safety check	B
BRAKING_RATIO_MAX	%	@total weight	B
BUILDUP_DAMPING	%		U
CALC_PRESSURE	Pa		B
CAMBER	deg60, deg		A
CAMBER_ADJUST	deg60		A
CAMBER_RAISED	deg60		A
CASTER_10	deg60, deg		A
CASTER_20	deg60, deg		A
CLEANING_GAS_BLAST		number of cleaning gas blasts	G
CLEANING_SPEED	Rpm	speed for cleaning	G
COATING_THICKNESS	um		C
CO	%Vol		G
CO2	%Vol		G
CONTRIBUTION_PER_CYLINDER	%	Measures each cylinder's contribution to engine output	D
COUNT		number of faults (OBD)	G, D
COVRAI	%Vol		G
COVRAI2	%Vol		G
CRANKING_CURRENT_PER_CYLINDER	A	Current measured per cylinder while cranking	D
CRANKING_VACUUM_PER_CYLINDER	In. Hg.	Vacuum measured per cylinder while cranking	D
CROSS_CAMBER	deg60, deg		A
CROSS_CAMBER_20_INSIDE	deg60		A



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Values	Unit	Description	Usage
CROSS_CAMBER_20_OUTSIDE	deg60		A
CROSS_CAMBER_RAISED	deg60		
CROSS_CASTER	deg60, deg		A
CROSS_INCLUDED_ANGLE	deg60		A
CROSS_SAI	deg60		A
	deg		
CROSS_TOE	m, inch, deg60		A
CROSS_TOE_CONSTANT	m, inch, deg60		A
CROSS_TOE_OUT_ON_TURNS	deg60		A
CTRL_POINT_WIDTH_LEVEL_CTRL	m, inch		A
CUSTOMER			O
CURRENT	A	Measures current flow	D
CUTOFF_SPEED	rpm		G
CYLINDER_TIME_VARIATIONS	%	Timing Variations per cylinder	D
DAMPING_INDEX	%		U
DEFECTS_NO6	Bool		G
DELTA_SPEED	RPM	RPM difference	D
DIAMETER_ALU	m		W
DISPENSE	m3	Oil dispense	O
DUTY_CYCLE	%	Measures percentage of duty cycle for devices (fuel control solenoids for example)	D
DWELL_ANGLE	deg	Average Dwell measured	D
DWELL_PER_CYLINDER	deg	Dwell measured per cylinder	D
DWELL_RATIO	%		G
DYNAMIC_DIFF	%		B
FAULT_MEMORY			G
FINAL_SPEED	RPM	Engine RPM after 10 second crank	D
FINAL_VOLTAGE	V	Load voltage after 10 seconds	D
FINISHED	1	examination done (used with wheel brake)	F
FREQUENCY	Hz		D
FSD_NAME			O
GAS			G
GASTEMP	degC, degF, K		G
HALL_SENSOR	V	signal of hall sensor	D
HC	ppmVol		G
HEIGHT	m		C
HOLD_TIME	s		G
HOSE	1	Hose number	O
IDLE_SPEED	rpm		G
IGN_POINT	DegCS		G
IGN_PRIM_CHARGE_TIME	ms		D
IGN_PRIM_VOLTAGE	V		D
IGN_SEC_BURN_TIME	ms	Time for spark duration per cylinder	D
IGN_SEC_BURN_VOLTAGE	kV	Voltage measured that sustains ignition during cycle per cylinder	D
IGN_SEC_MIN_VOLTAGE	kV	Minimum kV measured during test sequence per cylinder	D
IGN_SEC_PEEK_VOLTAGE	kV	Voltage required to create spark per cylinder	D
IGNITION_TIMING	deg	Timing of Ignition measurement	D
ILLUMINANCE	lx		L



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Values	Unit	Description	Usage
IMBALANCE_DISPLAY	1 5 10	Display imbalance in 1 gram steps 5 gram steps 10 gram steps	W
IMBALANCE_INIT	g, oz		W
IMBALANCE_INIT_STATIC	g, oz		W
IMBALANCE_RES	g, oz		W
IMBALANCE_RES_MAX	g, oz		W
IMBALANCE_RES_STATIC	g, oz		W
INCLUDED_ANGLE	deg60, deg		A
INITIAL_VOLTAGE	V	Open Circuit Volts	D
LAMBDA	1		G
LATERAL_ANGLE	deg		L
LATERAL_OFFSET	m, inch, deg60, deg		A
LATERAL_RUNOUT_RIM	m		W
LATERAL_RUNOUT_RIM_MAX	m		W
LATERAL_RUNOUT_TIRE	m		W
LENGTH	m		C
MANIFOLD_VACUUM	In. Hg.	Vacuum measured at Intake Manifold vacuum source	D
MAX_STEER	deg60, deg		A
MAX_STEER_TO_LEFT	deg60		A
MAX_STEER_TO_RIGHT	deg60		A
MEAN_BRAKING_RATIO_SC	%		
MI_CONTROL	Bool	Malfunction indicator activation	G
MI_STATE	Bool	Malfunction indicator state	G
MI_VISUAL_INSPECTION	Bool	Visual inspection of malfunction indicator lamp	G
MIN_PRESSURE	Pa		B
NOISE_LEVEL	db		N
NOTES			alle
NOX	ppmVol		G
NUMBER_SPOKES	Zahl		W
O2	%Vol		G
OBD_CTRL	Bool	Functional check of OBD	G
OFFSET_ALU	m, inch		W
OFFSET_DEPTH	m, inch		A
OFFSET_NORMAL	m, inch		W
OILTEMP	degC, degF, K		G
OPACITY	1/m		G
OPENING_PRESS	Pa		G
OPTIMISED	1	1 = true, 0 = false	W
OTHER_DEFECTS	Bool		F
OVALITY	%		B
OVALITY_2	%		B
OVALITY_3	%		B
OVALITY_4	%		B
PEAK_CURRENT	A	Full Field Current	D
PEDALFORCE	N		B
PERFORMED_TEST		Test performed	G
REPAIRED_DEFECTS_NO5	Bool	Repaired faults	G
PERMISSION			G



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Values	Unit	Description	Usage
PRESSURE_PM	Pa		B
PRESSURE_PZ	Pa		B
PRODUCT	1		O
PROPAN	ppmVol		G
PULSE_WIDTH	ms	Measurement in time of an event (fuel injector on-time, for instance)	D
RADIAL_FORCE	N		W
RADIAL_RUNOUT_RIM	m		W
RADIAL_RUNOUT_RIM_MAX	m		W
RADIAL_RUNOUT_TIRE	m		W
REPAIRED_DEFECTS_NO5	Bool	Repaired faults	G
REQUIRED	1	examination required (used with wheel brake)	F
RESISTANCE	Ohm	resistance (circuit, component)	D
RESONANCE_FREQUENCY	Hz		U
RIM_DIAMETER	m inch	only steel	W, A
RIM_FABRICATOR	1		W
RIM_OFFSET_DEPTH	m, inch		W
RIM_TYPE			W
RIM_WIDTH	m, inch		W, A
ROAD_FRICTION	N		B
ROAD_HOLDING	%		U
ROBJECTE_HEIGHT	m, inch, deg60, deg		A
SAI_10	deg60, deg	Steering Axis Inclination	A
SAI_20	deg60, deg		A
SCRUB_RADIUS	m, inch		A
SHOCK_ABSORBER_TRAVEL	m, inch		A
SLIP	%		B
SMOKE		Final result	G
SOLENOID_DWELL	deg	Measurement of the Fuel Control Solenoid Dwell	D
SPEED	rpm		B;G
SPEED_DROP_PER_CYLINDER	%	Percentage of total RPM lost when cylinder is disabled – per cylinder	D
SPLITTING_WEIGHTS	1	1 = true, 0 = false	W
SPLITTING_WEIGHT_1	g, oz		W
SPLITTING_WEIGHT_2	g, oz		W
START_DELIVERY	degCS		G
STATISTICS			V
SUMMARY			G,B,A
SUPPLIER			O
SUPPORTED_TESTS		Supported Tests (OBD)	G
TANK	1	Tank number	O
TEST_LOADING	Kg		A
THRUST_ANGLE	m, inch, deg60, deg		A
TIRE_DIMENSION	mm/%-inch		W, A
TIRE_FABRICATOR	1		W, A
TIRE_PERFORMANCE	m inch		W, A
TIRE_PRESSURE	bar, Pa, psi		W, A
TIRE_SEAT_PRESSURE	bar, Pa, psi		W



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Values	Unit	Description	Usage
TIRE_TREAD_DEPTH	mm	Tread depth	N
TIRE_TREAD_DEPTH_CENTER	m, inch		W, A
TIRE_TREAD_DEPTH_INSIDE	m, inch		A
TIRE_TREAD_DEPTH_LEFT	m, inch		W
TIRE_TREAD_DEPTH_OUTSIDE	m, inch		A
TIRE_TREAD_DEPTH_RIGHT	m, inch		W
TOE	m, inch, deg60, deg		A
TOE_ADJUSTMENT	m,		A
TOE_CONSTANT_ADJUSTMENT	m,		A
TOE_CONSTANT_CONTROL	m,		A
TOE_OUT_ON_TURNS_10	deg60, deg		A
TOE_OUT_ON_TURNS_20	deg60, deg		A
TOE_TO_INTERMEDIATE_AXIS	m, inch, deg60		A
TOE_TO_THRUST_ANGLE	m, inch, deg60		A
TOTAL_TOE	m, inch, deg60, deg		A
TOTAL_TOE_UNDEPRESSED	m, inch, deg60		A
TOTAL_WEIGHT	N		B
TOTAL_WEIGHT_MAX	N		B
TRACK	mm/m		S
TRACK_CURVE	m, inch, deg60		A
TRACK_WIDTH	m, inch, deg60, deg		A
TRACK_WIDTH_DIFFERENCE	m, inch, deg60, deg		A
TROUBLE_CODE		OBD	G
TURN_TABLE_ANGLE	deg60		A
USER_ID	1		W
VACUUM_PER_CYLINDER	In.Hg.	Vacuum measured per cylinder while running	D
VEHICLE_LATERAL_INCLINATION	m, inch		A
VEHICLE_LONGITUDINAL_INCLINATION	m, inch		A
VISUAL_INSPECTION	Bool		B;G
VOLTAGE_AC	V	General AC Voltage	D
VOLTAGE_DC	V	General DC Voltage	D
WARM_UP	Bool	Warm up of brake (France)	
WAIT_TIME	min	Wait time for catalyser conditioning	G
WATERTEMP	degC, degF, K		G
WAY_AMPLITUDE	m		U
WEIGHT_ALU_HEIGHT	m, inch		W
WEIGHT_ALU_WIDTH	m, inch		W
WEIGHT_HEIGHT	m, inch		W
WEIGHT_PLACE_MODE	1	1=default 2=glued 3=glued, hidden 4=static 5=CTS 6=special	W
WEIGHT_WIDTH	m, inch		W
WEIGHT_ANGLE	deg60		W
WHEEL_BASE	m, inch		A
WHEEL_BASE_DIFFERENCE	m, inch		A
WHEEL_DAMPING	%		U
WHEEL_SETBACK	m, inch, deg60, deg		A



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Values	Unit	Description	Usage
WHEEL_WEIGHT_DYN	N		B, U
WHEEL_WEIGHT_STAT	N		B, U
WHEEL_WEIGHT_TYPE		1 = default 2 = truck type 3 = standard 4 = coated 5 = safety type DC 6 = safety type BMW 7 = glued, standard 8 = glued, chromium-plate	W
WIDTH	m		C

3.41 Attributes for specific test kinds

Key word	Attribute	Exhaust gas	brake	wheelalignment	head light	side slip	noise level	Visual inspection
RESULT								
	OBJECT	EMISSION	BRAKE	WHEEL_ALIGNMENT	HEAD_LIGHT	SIDE_SLIP	NOISE	VISUAL_INSPECTION
	METHOD	OBD, SMOKE, SMOKE_TURBO, SMOKE_OBD GAS, GAS_OL_CATALYST, GAS_CL_CATALYST GAS_OBD_CATALYST GAS_BIKE, GAS_BIKE_CL_CATALYST	QUICK STANDARD	QUICK STANDARD MANUFACTURER_SPECIFIC ACCIDENT_VEHICLE FOURWD				
SECTION								
	AXLE		1,2,3 ...	1,2,3 ...		1,2,3 ...		
	OBJECT	VISUAL_INSPECTION MIL CONDITIONING FAST_IDLE NATURAL_IDLE CLOSED_LOOP_CTRL GAS_BLASTS OBD_CTRL	FOURWD STANDARD SINGLE	TIRE_INSPECTION VISUAL_INSPECTION RUNOUT_COMPENSATION MEASUREMENT INITIAL_MEASUREMENT FINAL_MEASUREMENT TRACK_CURVE_MEASUREMENT RIDEHEIGHT	LOW_BEAM HIGH_BEAM FOG_BEAM	SIDE_SLIP	SILENCER HORN	VISUAL_INSPECTION
	TYPE	0=Alt., 1/2 base method, 3=replacement, 4=jumping probe, 5=wide band probe, 9=Diesel						
						N/A		N/A
STEP								
	OBJECT	BASE_VALUE DISTURBANCE_ON, DISTURBANCE_OFF SETTLED_ON, SETTLED_OFF TROUBLE_CODES, CONTROLLERS	SERVICE_BRAKE PARKING_BRAKE AUXILARY_BRAKE1 AUXILARY_BRAKE2		VERTICAL_POSITION HORIZONTAL_POSITION			
	NO	1,2,3,...		1,2,3...			1,2,...	
MEAS								
	OBJECT	see chapter 3.40.2	see chapter 3.40.3	see chapter 3.40.5	see chapter 3.40.11	see chapter 0	see chapter 3.40.10	See chapter
	LOC		LEFT, RIGHT	LEFT, RIGHT	LEFT, RIGHT			


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Attributes (continued)

key word	Attribute	Suspension	Oil management	wheel balancing	Car measurement	Safety check	Diagnosis	Brake fluid test	Motor test
RESULT									
	OBJECT	SUSPENSION	OIL_MANAGEMENT	WHEELBALANCER	CAR_MEASUREMENT	SAFETY_CHECK	DIAGNOSIS	BRAKE_FLUID	MOTOR_TEST
	METHOD			DYNAMIC STATIC		FIRST_EXAMINATION RE_EXAMINATION			
SECTION									
	AXLE	1,2,3 ...				1,2,3 ...			
	OBJECT	SUSPENSION	OIL	UNBALANCE	INITIAL_MEASUREMENT FINAL_MEASUREMENT	STANDARD VISUAL_INSPECTION OTHER_DEFECTS INNER_WHEEL_BRAKE_CHECK	MEASUREMENT IGNITION TROUBLE_CODES OBD_ANALYSIS	BRAKE_FLUID	FUNCTION_TEST IGNITION MEASUREMENT CIRCUIT
	TYPE			1,2,3,...			PERM, INTERM		
STEP									
	OBJECT					SERVICE_BRAKE PARKING_BRAKE	CYLINDER	N/A	CYLINDER
	NO				no of measurement location		no of cylinder		
MEAS									
	OBJECT	see chapter 0	see chapter 3.40.5	see chapter 3.40.9	see chapter 3.40.5	see chapter 0	See chapter 3.36.15	See chapter	
	LOC	LEFT, RIGHT		INSIDE/OUTSIDE					


3.42 Part 3

key word	Attribute	Tire inspection	Coating thickness measurement
RESULT			
	OBJECT	TIRE_CHECK	COATING_THICKNESS
METHOD			
SECTION			
	AXLE	1,2,3 ...	
	OBJECT	TIRE_INSPECTION	MEASUREMENT
TYPE			
STEP		Not used	measuring point
OBJECT			
	NO		1,2...
MEAS			
	OBJECT	see chapter 3.40.2	see chapter 3.40.2
	LOC	LEFT, RIGHT, INSIDE_LEFT, OUTSIDE_LEFT	

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4.2 The Document Type Definition for asanetwork “awnres.dtd”

The latest, up-to-date DTD is available as download with asanetwork viewer on www.axonet.de.

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5 Annex

5.1 Revision history

5.1.1 Edition 5.1

Chapter 3.33: Renamed FMI to AFI and FMI_TXT to AFI_TEXT

5.1.2 Edition 5.0

Chapter 3.12: added NOT_REGISTERED, VIN1, VIN2, VIN3, NO_EMISSIONCODE.

Chapter 3.15: added LAST_REGISTRATION_DATE.

Chapter 3.17: Attribute values enhanced.

Chapter 3.19: Added new equipment: COATING_THICKNESS_TESTER, TIRE_PRESSURE_TESTER and AIRCONDITION. Added DATA_RELEASE for nominal data (setpoint data).

Chapter 3.33: Enhanced VALUE attribute, removed CONDITION and ERROR.

Chapter 3.41: Added tire inspection and coating thickness measurement

5.1.3 Edition 4.0

Chapter 3.9 WORKSHOP extended with EMAIL

Chapter,3.12 UNIT defined for ODOMETER

Chapter,3.17 added DEMO_MEAS and DEMO_LIMITS

Chapter 0, added more devices

Chapter 3.36ff, DIAGRAM added

Chapter 3.41 updated and enhanced

5.1.4 Edition 3.0

First edition with i•SHOP requirements

Page 10, added more languages

Page 11f, added more tags (including i•SHOP tags)

Page 13f, added more tags (including i•SHOP tags)

Page 22, added more equipment


Page 27, Attribute NO for SECTION added

Page 45, added more tags (including i•SHOP tags)

Page 46, added more tags (including i•SHOP tags)

Page 47, Added OBD chapter

Page 59, Examples removed, link to download added

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5.2 Examples in XML

5.2.1 A general example (overview)

This example show how we can integrate some inspection results into one file.

Fehler! Kein gültiger Dateiname.


5.2.2 Diagram

Excerpt:

```
<DIAGRAM OBJECT="OSZI_DATA" VERSUS="">
  <TITLE>A</TITLE>
  <GRAPH COUNT="724" NO="1">
    <TITLE>Zündkreis A1</TITLE>
    <X_AXIS OBJECT="">
      <VALUE UNIT="°" RESULT="1" SOURCE="HAND" LOWDISP="0" HIGHDISP="720" RESOLUTION="0.95°"/>
    </X_AXIS>
    <Y_AXIS OBJECT="Spannung">
      <VALUE UNIT="V" DIGITS="18" RESULT="1" LOWLIM1="" HIGHLIM1="" LOWDISP="-10" HIGHDISP="50"
        REF="UNKNOWN" TRIGGER="NONE" TRIGGER_EDGE="POS" RESOLUTION="V" />
    </Y_AXIS>
    <ARRAY>0,1.153794925 0.95,-2.450139712...719.005524861878,-1.134348356 </ARRAY>
  </GRAPH>
</DIAGRAM>
```

5.3 Other examples

More examples are available via download from www.axonet.de including the latest DTD and XSD.

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5.4 Notes