

7 Passenger Car Manufacturers - Internet-based Information System (Part B1)

7.1 Registration and Access (1.1 – 1.4)

To obtain access to a manufacturer's Internet-based information system, the user must complete an electronic registration application. The user must be an independent operator as defined in the BER and his registered office has to be within the European Union.

As shown in Tab. 7-1 most of the car manufacturers have implemented a link to their technical information website on their standard customer website. Only a few do not offer such a link (BMW, Volvo and Opel). Since standard search engines like Google or Yahoo do not list these websites, the user has to know the correct URL (e.g. <https://opel-tis.eur.gm.com/imtportal>) to get access to technical repair information.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
registration from standard website	no	yes	yes	no	no	yes	yes	yes

Tab. 7-1: Registration Process (1.1.3)

Since the registration process is done electronically, access to technical repair information is granted instantly. Only BMW (3 - 4 days) and Volvo (max. 2 days) need several days to complete the registration process (see Fig. 7-1). In the case of BMW and Ford the independent operator also have to pay an advance payment of EUR 50,-, which is used to pay for the information units. The user may top up this credit by payment of multiples of EUR 50,- (BMW) or in multiples of EUR 10,- with a minimum top-up of EUR 50,- (Ford).

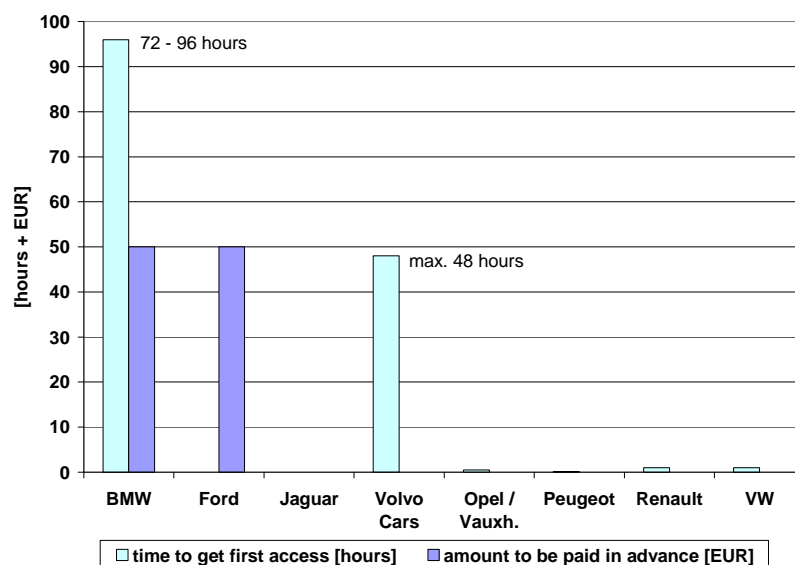


Fig. 7-1: First Access: Timing and Advance Payments (1.1.1 + 1.2.2)

Different cost models are offered (see Tab. 7-2). Nearly all manufacturers offer access to technical repair information on a subscription base respectively by access time. There are a variety of other different cost models. These “other payments” are explained in chapter 7.1.1.

	* BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
pay per view	yes	no	no	no	no	no	no	no
payment by accesstime	yes	yes	yes	yes	yes	yes	yes	no
payment by job	no	no	no	no	no	no	no	no
pay per DTC	yes	no	no	no	no	no	no	no
subscription	yes	yes	yes	yes	yes	yes	yes	no
other payments	yes	no	yes	yes	yes	yes	yes	yes

Tab. 7-2: Cost Models (1.3.1 – 1.3.6)

DTC: Diagnostic Trouble Code

*: only for communication with DIS (Diagnostic Information System)

In general, payment is made by credit card, which is possible for all manufacturers. Credit card payment is a common and accepted method and therefore sufficient for independent operators. BMW (Germany only) and Jaguar also offer a payment by direct debit. Peugeot sends an invoice, which can be paid by bank transfer or cheque.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
bank transfer	no	no	no	no	no	yes	no	no
credit card	yes	yes	yes	yes	yes	yes	yes	yes
debit	yes	no	no	no	no	no	no	no
other	no	no	no	no	no	yes	no	no
special discounts	yes	no	no	no	no	no	no	yes

Tab. 7-3: Method of Payment (1.4)

BMW and Volkswagen provide special discounts. Whereas BMW offers a reduced rate of 50% only to educational establishments, Volkswagen has a special rebate system with discounts from 10 – 30 % dependent on the ordered quantity:

- from EUR 200,- - 349,-: 10%
- from EUR 350,- - 499,-: 15%
- from EUR 500,- - 999,-: 20%
- from EUR 1.000,-: 30%.

A subscription of technical information is possible for different time periods and of course for different prices. Fig. 7-2 gives an overview of the minimum prices with regard to the minimum subscription period and also to the costs for a period of one month. If a subscription on a one-month basis is not possible (BMW and Ford) the annual fees are divided by 12. The minimum prices to purchase technical repair information represent an important figure for an independent repairer. These prices differ from EUR 8,- for Jaguar and Renault, to EUR 83,- for Volvo and EUR 180,- for BMW. The prices shown for BMW are only basic access fees; whereas each information unit is charged separately (see 7.1.1.1). Volkswagen does not offer a subscription of the complete technical information for all of their models. Instead of this a subscription of different topics or documents is offered (see 7.1.1.8). If a repair shop is searching for technical information for a single repair the long minimum subscription period of BMW is not satisfactory. It might be possible to cancel the BMW's contract of subscription after one quarter, but even this period is quite long. A one-hour (Renault) or one day subscription (Jaguar, Opel, Peugeot) should be preferred. On a one month basis Ford and Jaguar offer the lowest prices.

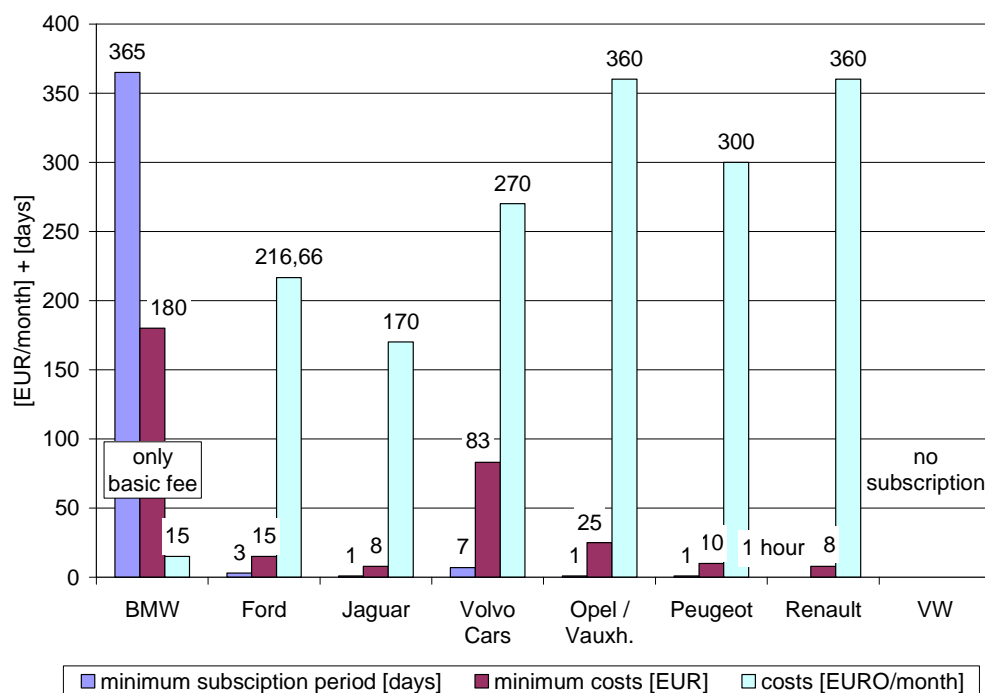


Fig. 7-2: Subscription of Technical Information (1.3.5)
(costs per month & minimum subscription period)

7.1.1 Other Payments

7.1.1.1 BMW

For the use of the BMW Online Service System (OSS), the user shall pay the following amounts, subjected to the date of receipt of the registration application:

- Registration application received during the 1st quarter: EUR 180,-
- Registration application received during the 2nd quarter: EUR 150,-
- Registration application received during the 3rd quarter: EUR 100,-
- Registration application received during the 4th quarter: EUR 50,-

If a registration is terminated during a current quarter, fees paid in advance for subsequent quarters will be refunded on a pro-rata basis. Information units are not included in the fee and must be purchased in a separate procedure. The following payments shall be payable by the user for use of the service:

- Within the Technical Information System (TIS), the Commercial Service Data (KSD) and wheel/tyre combinations: Per page called up EUR 0,40. This does not apply, however, for pages designed to permit the selection of data, such as vehicle identification or navigating through to the relevant documents. These pages may be called up free of charge.
- Within the Trouble Code Inquiry (Pcode): Per successful inquiry EUR 0,20.
- Within the Diagnostic Information System (DIS display and communication): Per six-minute period or part thereof (period between logging on and logging off) EUR 3,00.
- Within the "Technical Helpdesk" module, EUR 25,- must be paid for each enquiry. An enquiry always relates to a single technical problem on a single vehicle. If there are two or more technical problems on a vehicle, and if enquiries relating to them are necessary or desired, then two or more chargeable enquiries must be submitted. The same applies to a problem on more than one vehicle. BMW answers the enquiries by e-mail or telephone. If a user needs to submit a subsequent enquiry relating to a technical problem on a specific customer vehicle, this can be done free of charge using a facility made available by the BMW technical advisor, provided it has not been possible to solve the problem on the basis of the response to the first enquiry. It is assumed that a problem has been solved if it has not recurred for a period of six months after repair.
- No current charges for the use of ASAP (After-sales Assistance Portal), but BMW reserves the right to demand EUR 60,- per quarter in the future

7.1.1.2 Ford

Access to all Technical information will be 'time limited' to 72 hours (3 days) for the selected information packages. The selected information packages are applicable to a provided VIN (Vehicle Identification Number). Alternatively, an annual subscription can be purchased.

Package Content (Transaction)	Charges [EUR]
Mechanical Repairs (Repair procedures, Diagnostics, Specifications etc; including body mechanicals; excluding body repairs)	15,-
Wiring Diagrams (including full auxiliary data)	15,-
Routine Maintenance (schedules, intervals, procedures)	8,-
Body Repairs	15,-
Access to all the information in the packages listed above (1 year)	2.600,-

Tab. 7-4: Charges of Information Packages (Ford)

Calls to the technical Hotline are charged by 'transaction' i.e. the time of the telephone call and research. Per 'minute of transaction time' charges are between EUR 1,- and 2,- (depending on the hotline centre). Based on experience with current dealers, average 'transaction' duration is approximately 20 minutes.

7.1.1.3 Jaguar

Jaguar offers options to subscribe for 1 day, 1 month or 1 year and choose 1 model and 1 model year, 1 model and all model years or all models and all model year. The possibility to choose different time periods and different models is favourable for independent operators.

Subscription Model	1 day [EUR]	1 month [EUR]	1 year [EUR]
1 model, 1 model year	8,-	42,-	170,-
1 model, all model years	14,-	70,-	346,-
all models, all model years	28,-	170,-	990,-

Tab. 7-5: Subscription Model (Jaguar)

7.1.1.4 Volvo

Volvo offers options to subscribe for 1 week, 1 month or 1 year for all models.

Subscription Model	1 week [EUR]	1 month [EUR]	1 year [EUR]
all models	83,-	270,-	2.200,-

Tab. 7-6: Subscription Model (Volvo)

7.1.1.5 Opel

Opel offers options to subscribe for 1 day, 1 week, 1 month or a half year for all models. The possibility to choose different time periods is favourable for independent operators.

Subscription Model	1 day [EUR]	1 week [EUR]	1 month [EUR]	180 days [EUR]
All models	25,-	150,-	360,-	1.800,-

Tab. 7-7: Subscription Model (Opel)

7.1.1.6 Peugeot

Peugeot offers options to subscribe for 1 hour, 6 hours, 1 day, 1 week, 1 month or 1 year for all models. The possibility to choose different time periods is favourable for independent operators.

Subscription Model	1 hour [EUR]	6 hour [EUR]	1 day [EUR]	1 week [EUR]	1 month [EUR]	1 year [EUR]
all models	10,-	15,-	20,-	90,-	300,-	2.500,-

Tab. 7-8: Subscription Model (Peugeot)

7.1.1.7 Renault

Renault offers two different packages. Package 1 with all technical documentation available on the website and package 2 with all technical documentation available on the website except for wiring diagrams. Again, the possibility to choose different time periods and different content is favourable for independent operators.

Subscription Model	1 hour [EUR]	1 day [EUR]	1 week [EUR]	1 month [EUR]	1 year [EUR]
Package 1 / Package 2	15,- / 8,-	30,- / 15,-	110,- / 55,-	360,- / 180,-	3.000,- / 1.500,-

Tab. 7-9: Subscription Model (Renault)

7.1.1.8 Volkswagen

The prices for the Volkswagen system depend on the number and type of documents, for which an independent operator has taken out a subscription. The prices of a document are displayed on the document properties page. Each document is a complete package with all information for a specific system (prices between EUR 4,60 and 107,40), but also contains cross-references to other documentations. If a single chapter is offered separately, then each referred reference chapter has to be purchased in addition. The system is a very inflexible model with few purchase options.

Examples:

Technical Information Automatic Gearbox:	EUR 18,40
Technical Information 4-Cylinder Diesel Engine:	EUR 18,40
Maintenance Information VW Passat:	EUR 18,40
Wiring Diagrams for all models:	EUR 107,40

7.2 Users (1.5)

The numbers of users, which are registered for a web based information system, vary very widely. VW and Ford already show a very large number of users whereas only a few users use the Volvo and Opel system. The number of website logins also shows significant differences. Volkswagen and Volvo do not measure this figure. Due to these figures it may be assumed that especially the Opel system does not give sufficient information to independent operators for acceptable conditions.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
no. registered users	449	1025	484	30	4	245	278	2148
website logins/month	750	222	620	n/a	1	< 104	100	n/a

Tab. 7-10: Number of registered users and website logins per month (1.5)

7.3 Hard- and Software Requirements (1.7)

Tab. 7-11 gives an overview of the hard- and software requirements for the different information systems. The hardware requirements represent the "state-of-the-art" without any uncommon specifications. The necessary software is limited to conventional web browsers (Internet Explorer x.x [IE] or Netscape 4.7 [NS]) and an Acrobat Reader for PDF documents. Sometimes the user has to adjust the settings of his web browser in order to access and use the website. In addition some special plug-ins are needed, which are all free of charge and could directly be downloaded from the website.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
min. processor [MHz]	300	no min.	66	133	500	66	66	266
min. RAM [MB]	64	32	32	64	128	128	32	32
min. display resolution	1024 x 768	800 x 600	1024 x 768	800 x 600	800 x 600	800 x 600	800 x 600	800 x 600
needed software	IE 5.5	Web Browser	IE 5.5	IE 6+	IE 5.0	IE 5.0	IE 5.0+	IE 5.0
needed software	NS 4.7x		Acrobat Reader V4	Acrobat Reader	Windows 2000 OS		NS 4.7x	Acrobat Reader
special plug-ins	yes	yes	no	no	yes	yes	yes	yes
if yes: how many	1	1			2	2	1	1
if yes: at what cost	0	0			0	0	0	0

Tab. 7-11: Hard- and Software Requirements (1.7)

7.4 Information Scope

7.4.1 Covered Vehicles and Update Periods (1.6)

For BMW, Jaguar, Volvo (wiring on paper only), Opel and Volkswagen technical repair information is available for all models produced within the last 10 years. For Ford (90 %) Peugeot (75 %) and Renault (50 %) only a portion of this information is available via Internet. Ford, Peugeot and Renault provide other information on paper (Ford and Peugeot) or on paper plus CD (Renault). These additional media have to be purchased separately.

Information updates were made instantly (Ford, Jaguar, Renault) or within periods of 2 - 3 months, which represents a reasonable period of time.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
covered vehicles last 10 years [%]	100	90	100	97	100	75	50	100
update periods	2 month	1 day	1 day	2 month	3 month	3 month	1 day	3 month

Tab. 7-12: Covered vehicles and update periods (1.6)

7.4.2 Languages (1.8)

The websites are offered in several different languages. All manufacturers offer their technical information in Dutch, English, French, German, Italian and Spanish and also, with the exception for Jaguar, in Portuguese and Swedish.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
czech	no	yes	no	no	yes	yes	yes	yes
danish	no	yes	no	no	yes	yes	no	yes
dutch	yes	yes	yes	yes	yes	yes	yes	yes
english	yes	yes	yes	yes	yes	yes	yes	yes
estonian	no	no	no	no	no	no	no	no
finnish	no	yes	no	yes	yes	yes	no	yes
french	yes	yes	yes	yes	yes	yes	yes	yes
german	yes	yes	yes	yes	yes	yes	yes	yes
greek	yes	yes	no	no	yes	yes	yes	yes
hungarian	no	yes	no	no	yes	yes	yes	yes
italian	yes	yes	yes	yes	yes	yes	yes	yes
latvian	no	no	no	no	no	no	no	no
lithuanian	no	no	no	no	no	no	no	no
norwegian	no	yes	no	no	yes	yes	no	no
polish	no	yes	no	no	yes	yes	yes	yes
portuguese	yes	yes	no	yes	yes	yes	yes	yes
romanian	no	no	no	no	no	no	no	no
slovenian	no	no	no	no	no	yes	yes	no
spanish	yes	yes	yes	yes	yes	yes	yes	yes
swedish	yes	yes	no	yes	yes	yes	yes	yes
other	no	yes	no	no	yes	yes	yes	no

Tab. 7-13: Languages (1.8)

Estonian, Latvian, Lithuanian and Romanian are not supported. Some manufacturers offer additional languages like Turkish (Ford, Opel, Renault and Peugeot), Russian (Ford, Renault and Peugeot), Japanese (Ford, Renault) and Chinese (Peugeot).

7.4.3 Vehicle Identification (2.1)

Since vehicles are delivered in different configurations and variants, so it is absolutely necessary to be able to precisely identify a given vehicle in order to obtain the correct and relevant technical information. Therefore vehicle identification is a very important requirement. Such identification could be performed by different means. The best and easiest method to automatically identify a vehicle is by using its vehicle identification number (VIN). The VIN consists of 17 characters:

- Character 1-3: World Manufacturer Code
- Character 4-9: Vehicle Features (e.g. model, body style, engine type, ...)
- Character 10: Model Year
- Character 11: Production Plant
- Character 12-17: Sequential Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
W	O	L	O	V	B	P	3	5	3	1	0	4	2	5	6	6

Tab. 7-14: Vehicle Identification Number (VIN)

Example Opel Omega B, Model 2003: WOLOVBP3531042566

Identification by VIN is only possible for BMW, Ford, Volvo and VW, but it does not return any results on the Ford website (Ford Focus 1.8l 12/98; VIN: WFOAXXGCDAWA19792; Message: Unable to Locate Information for the Vehicle Data). Whereas Opel did not specify that an identification by VIN is possible, this feature is implemented on the website, but does not work either (error message: VIN is not interpretable).

A second method to identify a vehicle is by using a selective list with several attributes (model, model year, engine, transmission, body style). Since this is the only way to identify a vehicle, which is not in the workshop and therefore the vehicle identification number (VIN) is not known, this feature is also absolutely necessary. All manufacturers provide this method of identification.

To find the necessary technical information it is necessary to identify all original parts and their respective part numbers. Ford, Jaguar and Volkswagen do not provide such an unambiguous identification. Regarding Ford, the identification is the same as for authorised repairers. The Jaguar selection is only made by model and model year. For Volkswagen the

identification is well defined, but only the required original equipment or special tools are displayed without any part numbers.

BMW also provides a diagnosis interface from its website to a vehicle in the workshop by a PC/laptop and the appropriate supplementary hardware. With the so called DIS Diagnosis System the vehicle identification can also be performed by communication with the car via OBD2 interface or OBD interface, using data the vehicle sends back to the application.

In some European countries the registration plate number precisely defines vehicles. On the Ford website a vehicle identification by the registration plate number is also possible for these countries (Finland, Norway, Sweden, Denmark, GB, Ireland, Spain, Portugal, Netherlands and Italy).

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
by VIN	yes	yes	no	yes	no	no	no	yes
by selective list	yes	yes	yes	yes	yes	yes	yes	yes
by other	yes	yes	no	no	no	no	no	no
identification of original parts (incl. part no.)	yes	no	no	yes	yes	yes	yes	no

Tab. 7-15: Vehicle Identification (2.1)

7.4.4 Information Search (2.2 – 2.3)

To receive the necessary technical information different search criteria should be provided. In this context the most important criteria are search by systems (provided by all manufacturers) and search by components (only BMW, Ford, Volvo, Opel). An efficient way usually is a full text search. BMW, Jaguar, Volvo and Opel provide such a feature. But different manufacturers use different terms for their systems and components and therefore a target-oriented full text search may be difficult and the user may not get the desired information.

Search by symptoms is a useful option to identify faulty components. Any manufacturer, except for BMW, offers this option, Ford and Jaguar provide a symptom chart for each system, which fulfils the requirements of an independent repair shop.

In addition BMW also provides a search by document number, title and type of document, but these features are of minor use.

In order to receive the necessary documents, the title and a short description of the content of the document are necessary. A document title is provided by all manufacturers whereas a

description is only available on the Volvo, Peugeot and Volkswagen website. If the user wants to print these documents and file them for a later use a creation date or version number is useful to ensure the validity of the documents.

BMW displays a document number (e.g. RA 123456), which can also be used as a search criterion.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
Trouble Codes (DTC)	yes	no	no	yes	yes	no	no	no
symptoms	(yes)	(yes)	(yes)	no	no	no	no	no
systems	yes	yes	yes	yes	yes	yes	yes	yes
components	yes	yes	no	yes	yes	no	no	no
OE numbers	yes	no	no	yes	no	yes	no	no
special tool names	yes	no	no	yes	yes	no	yes	no
warning indication	no	no	no	yes	no	no	no	no
full text search	yes	no	yes	yes	yes	no	no	no
other	yes	no	no	no	no	no	no	no

Tab. 7-16: Search Criteria (2.2)

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
title	yes	yes	yes	yes	yes	yes	yes	yes
short description	no	no	no	yes	no	yes	no	yes
creation date/version	no	no	yes	no	no	yes	no	yes
other	yes	no	no	no	no	no	no	no

Tab. 7-17: Display of Search Results (2.3)

7.4.5 Content (2.4)

Tab. 7-18 describes the scope of general technical repair information. For some manufacturers (Ford, Opel, Peugeot) hydraulic and pneumatic wiring are missing. Especially for fault investigations this information might be necessary in some cases, but not as

important as electrical wiring. Volvo provides these electrical diagrams on paper. Here, the price for a typical wiring diagram is EUR 45,- – 50,-.

For some models of Renault, parts of the technical information are available on paper only. This includes information on settings, operating fuels, tightening torques, body repair information, DTC identification and electrical wiring. Only for the latest Laguna and Megane models information is completely available via Internet.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
functional descriptions	yes	yes	yes	yes	yes	yes	yes	yes
fitting / removal procedures	yes	yes	yes	yes	yes	yes	yes	yes
work plans / job times	yes	no	no	no	no	yes	no	yes
electrical wiring	yes	yes	yes	(yes)	yes	yes	yes	yes
hydraulic wiring	yes	no	yes	no	no	no	yes	yes
pneumatic wiring	yes	no	yes	no	no	no	yes	yes
emission related information	yes	yes	yes	yes	yes	yes	yes	yes
body repair information	yes	yes	yes	yes	yes	yes	yes	yes
welding instructions	yes	yes	yes	yes	yes	yes	yes	yes
pickup points	yes	yes	yes	yes	yes	yes	yes	yes
tightening torque figures	yes	yes	yes	yes	yes	yes	yes	yes
axle settings	yes	yes	yes	yes	yes	yes	yes	yes
brake clearance	yes	yes	yes	yes	yes	yes	yes	yes
operating fuels	yes	no	yes	yes	yes	yes	yes	yes
wheel-tire combinations	yes	yes	yes	yes	yes	no	yes	yes

Tab. 7-18: Information content – general information (2.4.1)

Usually the customer asks for price information before a repair job is performed. For a realistic estimation job times are necessary. Information on job times is not required as such by the BER, but BMW, Peugeot and VW provide these figures as an asset.

Servicing is one of the main jobs independent garages are working in. Therefore the information described in Tab. 7-19 is quite necessary and important. Ford does not provide any service information and for Jaguar necessary instructions are also missing. The Renault service information is only available on paper.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
service intervals	yes	no	yes	yes	yes	yes	(yes)	yes
service instructions	yes	no	yes	yes	yes	yes	(yes)	yes
resetting maintaince indicator	yes	no	no	yes	yes	yes	no	yes

Tab. 7-19: Information content – service information (2.4.2)

For a target-oriented fault identification and repair diagnostic information is also required. Peugeot does not provide any diagnosis information; only the location of the diagnostic connector (OBD plug) can be found. On the Jaguar website DTC meanings are only provided for the XJ-Series, but not for XK, S-Type and X-Type. Information on ECU software versions is also not available for Jaguar, Volvo and Ford, who also do not deliver an interpretation on diagnostic trouble codes (DTC). A lack in test procedures, parameters and values do not have the same relevance (Peugeot), but is important especially for diagnostic tool manufacturers.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
location diagnostic connector	yes	yes	yes	yes	yes	yes	yes	yes
DTC meanings	yes	no	(yes)	yes	yes	no	yes	yes
information on ECU software versions	yes	no	no	no	yes	no	yes	yes
test procedures	yes	yes	yes	yes	yes	no	yes	yes
test parameters	yes	yes	yes	yes	yes	no	yes	yes
test values under certain conditions	yes	yes	yes	yes	yes	no	yes	yes

Tab. 7-20: Information content – diagnosis information (2.4.3)

In order to be able to buy the correct spare parts for a given repair OE spare part numbers and spare part lists are necessary. To purchase aftermarket spare parts the OE spare part number is also required and a cross-reference table selects the aftermarket parts. BMW and Ford provide spare part information on a separate website where an extra registration is needed. This registration is free of charge, but BMW reserves the right to demand payment. At present, use is free of charge within the scope of a trial operation. The date, as of which a charge will be made, will be announced by BMW over the portal. The charge will amount to approx. EUR 60,- per quarter. Opel, Renault and Volkswagen provide spare part information

on a separate CD-ROM for additional costs. Opel's service centre was asked for the price of a CD and replied that the CD is available for franchised partners only. For Jaguar spare part information could not be found.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
spare part numbers	yes	yes	no	yes	(yes)	yes	(yes)	(yes)
spare part list for given vehicle	yes	yes	no	yes	(yes)	yes	(yes)	(yes)
graphical spare parts identification	yes	yes	no	yes	(yes)	yes	(yes)	(yes)

Tab. 7-21: Information content – spare parts (2.4.4)

A special tool list for a given vehicle is necessary to know, which tools are needed and to decide whether a repair can be performed economically in an independent workshop. Some manufacturers do not provide such a list, but it is sufficient if the necessary special tools are named in the repair manuals. These manufacturers were also marked with “yes”. On the Ford website no tool lists were accessible with German language settings. With any other language the list was displayed.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
special tool list for given vehicle	yes	(yes)	yes	yes	yes	yes	yes	(yes)
description of intended use for each tool	yes	(yes)	yes	yes	yes	yes	yes	(yes)

Tab. 7-22: Information content – special tools (2.4.5)

7.5 Differences between authorised and independent operators (1.9 + 4)

Based on the answers in the respective questionnaires Tab. 7-23 describes the differences of the conditions and the content of the technical information systems between authorised and independent operators. For those manufacturers where currently no web based technical information system is available to the authorised repairers, a comparison between the web system for independent operators and the CD/DVD system for authorised operators is made. Differences in hard- and software requirements, which are based on different information systems (Internet or CD/DVD) are neglected.

	BMW	Ford	Jaguar	Volvo Cars	Opel / Vauxh.	Peugeot	Renault	VW
registration conditions	yes	yes	yes	yes	yes	yes	yes	yes
registration costs	yes	yes	no	yes	yes	no	yes	no
cost models	yes	yes	yes	yes	yes	yes	yes	yes
covered vehicles / update periods	yes	no	no	no	no	no	no	no
hard- / software requirements	yes	no	no	no	no	no	no	yes
languages	no	no	no	no	no	no	no	no
vehicle identification	no	no	no	no	no	no	no	yes
search criteria	yes	no	no	no	no	no	no	no
display of search results	yes	no	no	no	no	no	no	yes
information structure	no	n/a	no	no	yes	n/a	yes	yes
scope general repair info	no	no	no	no	no	no	no	no
scope service info	no	no	no	no	yes	no	no	no
test and diagnosis info	no	no	no	no	no	yes	no	no
spare parts info	no	no	no	no	no	no	no	no
special tools info	no	no	no	no	no	no	no	no

Tab. 7-23: Differences of the conditions and systems for authorised and independent operators

All other differences are explained in detail as follows:

2. Registration Conditions

a. BMW

The registration of authorised operators is done by execution of the BMW Dealer on BMW Service agreement. Independent operators register individually via the Internet.

b. Ford

Authorised operators are registered within the Ford Intranet (CDS = Company to Dealer Systems). Independent operators register individually via the Internet.

- c. Jaguar
Authorised repairers access via company Extranet. Independent operators register individually via the Internet.
- d. Volvo Cars
Authorised dealers cannot subscribe to iVADIS.
- e. Opel/Vauxhall
Currently there is no web based Technical Information System (TIS) available for Opel/Vauxhall authorised repairers.
- f. Peugeot
The registration of authorised operators is done by execution of Peugeot. Independent operators individually register via the Internet.
- g. Renault
Independent operators can buy an access for a limited time, whereas the authorised repairers have taken out a subscription for one year.
- h. Volkswagen
Authorised operators get automatic access after authorisation. Independent operators register individually via the Internet.

3. Registration Costs

- a. BMW
Besides the audit costs, there are no additional registration costs for authorised operators as the information system is different. Authorised operators get information on CD/DVD systems. The distribution of the information and the gathering of this information is covered by the BMW cost model (BMW to National Sales Company (NSC), NSC to authorised repairer). Costs are allocated to the NSC by the following model:
 - Annual media charge (in 2004 --> EUR 2.400,-) per service outlet, including DIS (Diagnosis Information System), CIP (Coding Individualization Programming), TIS (Technical Information System), KSD (e.g. Flat Rate Units), EPC (Electronic Parts Catalogue), EBA (Mounting Guidelines), SIP (Training), WEP (Workshop Equipment and Planning), Nominal Emission Data, Navigation Software.
Plus 7,50 EUR per retailed Vehicle, plus EUR 15,- per extra CD, plus EUR 30,- per TLF ("Trainer Leitfaden"), plus EUR 3,- per Brochure.
From NSC to authorised operator:
Annual basis fee for the company plus pro-rata per service-outlet (head-quarter, operating site 1, operating site 2, etc.). Prices depends on NSC's:

- Germany (2003):
EUR 2.750 Basis Fee plus pro-rata per operating site depending on VAK (pro-rate asset cost)
- Italy:
Outlet Price Range from EUR 620,- to EUR 2.950,- depending on turnover and outlet number.
Diagnosis CD (DIS, CIP, NAVI) can be sold individually or under annual subscription: Single CD EUR 150,-, Annual subscription EUR 1.000,-, (15% discount for Dealers who have more than one Outlet in the same province).
Service Information Programme CD (SIP):
 - CBT Manager EUR 500,-
 - New Cars EUR 500,-
 - New Engines EUR 150,-
 In case of course package subscription, SIP CD's are included in the package price.
- Denmark: Media cost in EUR per CD
 - ETK (electronic parts catalogue) EUR 60,-
 - KSD (flat rate units) EUR 60,-
 - DIS EUR 60,-
 - CIP EUR 60,-
 - TIS EUR 60,-
 - NAV (Navigation-CD) EUR 60,-
 - WEP (Workshop Equipment and Parts) EUR 60,-
 - SIP included in training fee
 - System Costs EUR 875,-
- France:
 - fixed annual price: EUR 4.000,- (for BMW) and EUR 3.000,- (for MINI)
 - additionally: + x EUR Depending on turnover of BMW original parts, but maximum price is EUR 10.000,-
- Netherlands:
Electronic info package for dealers including software
 - DIS
 - TIS
 - KSD
 - SIP
 - ETK
 - EBA
 - JetStream, PUMA & VERA
 Fixed price per outlet EUR 7.995,-
 Technical Help Desk via 0900 number per minute, EUR 0,51 per minute.

- Great Britain(GB)/Ireland (IR):

Charges from BMW AG:

Cost per Service Outlet (EUR 2.250,-) x No of dealers in ZG = Total Fixed cost

Cost per vehicle (EUR 7,50) x wholesale volume (BMW/MINI) = Wholesale Volume Cost

Reduction in costs per CD issued (EUR 4,- per CD)

Charges to Great Britain / Irish dealer network:

Total fixed cost + Wholesale volume costs = Total charges for media from BMW AG

Total cost from BMW AG - reduction in cost per CD = Total invoice value from BMW AG

Total invoice value from BMW AG + 30% (Overhead for ZG technical support) = total Dealer network charge

Total Dealer Network Charge/Number of dealers/repairers = Charges per dealer/repairer

Other charges to GB/IR dealers/repairers:

Cost per CD issued when automatically issued --> £ 3,-

The after-sale Media Charge in GB/IR includes DIS, TIS, SIP, EBA, CIP, KSD, Navi, etc.

GB Example Based on 2003 Figures:

Charges from BMW AG:

Total Fixed Costs = EUR 991.844,50

Wholesale Volume Costs = EUR 365.625,00

Reduction in costs per CD issued = -EUR 102.968,50

Total Charges from BMW AG = EUR 1.254.501,50

Charges to ZG dealer network:

Total Charges from BMW AG in £ (budget F/Ex rate 2003 £ 1= EUR 1,4295) = £ 840.537,02

Partial Cost recovery for Overhead cost Technical support (excluding salaries) +30%

Total cost invoiced to dealer network = £ 1.092.698

Total Authorised Repairers (Service Outlets) = 153

Total Invoice Value per Service Outlet 2003 = £ 7.141,82

- Poland:

Quarterly Fixed price: EUR 562,50

Additionally: + EUR 4,- per CD/DVD

- b. Ford
Authorised dealers pay a monthly fee. Independent Operators pay 'per view'.
- c. Volvo Cars
Authorised dealers cannot subscribe to iVADIS.
- d. Opel/Vauxhall
Currently there is no web based Technical Information System (TIS) available for Opel/Vauxhall authorised repairer.

4. Cost Models

- a. BMW
See "Registration Costs".
- b. Ford
See "Registration Costs".
- c. Jaguar
Authorised repairers have to pay for all models and all model years. Independent repairers can choose shorter subscription periods and fewer models if required.
- d. Volvo Cars
Authorised dealers cannot subscribe to iVADIS.
- e. Opel/Vauxhall
Currently there is no web based Technical Information System (TIS) available for Opel/Vauxhall authorised repairers.
- f. Peugeot
Independent operators can buy an access for a limited time, whereas the authorised repairers have taken out a subscription for one year.
- g. Renault
Independent operators can buy an access for a limited time, whereas the authorised repairers have taken out a subscription for one year.
- h. Volkswagen
Independent operators pay per document (book or chapter). Authorised operators pay a general monthly fee.
According to the qualitative standards of the service dealer contract, authorised dealers are obliged to participate in active quality monitoring. The authorised dealer has to make investments to fulfil the standard "active quality monitoring". This includes the payment of an information flat rate subscription charge. The authorised service dealer will then receive all technical

information that is available. The independent workshop does not have to purchase the full package of information. These workshops can purchase information according to their specialisation.

5. Covered Vehicles / Update Periods

a. BMW

Information on all covered vehicles available. The periods for information on DVD/CD and OSS can differ approximately a few days in exceptional cases. Usually the data and the update periods are the same.

6. Hard- and Software Requirements

a. BMW

Authorised operators:

- PC -GT1 or DISplus (for diagnosis and programming)
- DIS/CIP DVD for GT1

Other operators:

- PC - Browser - Microsoft Java Virtual Machine (for DIS)
- Cookies accepted
- Java Script enabled
- PCL5 or Postscript printer (for DIS)
- PassThru Tool or EDIC-Card
- Alternatively GT1 plus DIS/CIP DVD for GT1.

Conclusion:

The soft- and hardware requirements for other operators are lower.

b. Volkswagen

Independent operators only need a PC matching the hardware and software requirements. Authorised partners need a complete LAN infrastructure to connect to the server system of the manufacturer. The minimum requirements for the operating system of the client PC connected to the LAN are Win NT, Win 2000 or Win XP/pro.

7. Vehicle Identification

a. Volkswagen

Direct search mode is only available for authorised repairers. After entering the enquiry, the authorised partner is guided directly to the relevant chapter. This procedure is only available if the entire IT- infrastructure is designed in accordance with the manufacturer's specifications. Independent operators have the available search modes listed above (general search: model, model year, topic; additional in expert search: gearbox code, engine code). After entering the enquiry, the independent operator is guided to the complete information for the request (whole book for the request) and has to make a new search for the relevant chapter (additional access for that document might be required). If the complete information for the requested vehicle has already been accessed, text search (supported by acrobat reader) is available.

8. Search Criteria

a. BMW

DIS:

Users have the same process flow.

TIS Internet:

Vehicle Identification via VIN type in or by E-Series, Model and Year of production.

TIS authorised:

Specific data can be searched w/o specifying with VIN, Model, E-Series or Date of manufacturing.

KSD Internet:

Vehicle identification via Series - model - ID type is required in order to obtain information.

KSD authorised operators:

Search for documents is possible just via series, id-type and/or VIN. Authorised operators can search for documents more global.

9. Display of Search Results

a. BMW

Display of search results is different on the online system, but not the content.

b. Volkswagen

See vehicle identification.

10. Information Structure

a. Opel

Currently there is no web based Technical Information System (TIS) available for Opel/Vauxhall authorised repairers.

b. Renault

The PDF documents for independent operators are split into subgroups in order to ease the search and for shorter download periods.

c. Volkswagen

The Internet information is especially designed for independent operators. The downloads are displayed in PDF format. Authorised operators install special software with all technical information on their local data network (LAN/intranet). Updates are supported by VPN (overnight data transfer).

12. Service Information

a. Opel/Vauxhall

Labour Operation Numbers and Times are omitted from the IMT TIS CD.

13. Test and Diagnosis Information

a. Peugeot

There is no information concerning the diagnosis on the independent repairers website, whereas it exists on the authorised repairers site.

7.6 The Usability of the Information Systems

7.6.1 BMW

BMW provides an extensive and advanced website. All necessary technical information is covered. On the other hand the search possibilities are very limited. Therefore it is very difficult and time consuming to find the necessary piece of information. After a search procedure the list of documents only provides a short title. In many cases the user takes the wrong document. Due to the “pay-per-view” cost model this procedure is also very costly. In addition the information provision is split into two different web portals: BMW Online Service System (OSS) and BMW After-sales Assistance Portal (ASAP), which increases the complexity, but also gives some information free of charge (ASAP).

If a user has identified a certain car, the search result list also contains data of other cars. This increases the difficulty of the whole searching process. Authorised repairers have different vehicle identification and search possibilities and the display of search results is also different. An adoption of these features to the independent operators website might ease the search process and would therefore improve the usability of the website.

7.6.2 Ford

The Ford website is also extensive and advanced, but important documents are missing (service information, DTC meanings, operating fuels). Whereas the search possibilities were also limited, it was easier (compared to BMW) to find the relevant document due to the better structure of the content list.

7.6.3 Jaguar

The structure of information is comparable to the Ford website. In general it is easy to find the relevant documents, which are PDF versions of the paper workshop manuals with additional links and search possibilities. Purchasers are advised that the specification apply to a range of vehicles and not to any specific one. For the specification of a particular vehicle, purchasers should consult their dealer. Since nearly all necessary information should be available this does not cause significant problems.

7.6.4 Volvo Cars

Volvo developed a sophisticated website. The information is well structured. All documents contain links to relevant additional information. All necessary information can be found in a reasonable amount of time. A compatibility test can be performed to check whether the website browser settings are correct. A "text only" button is also available, which reduces the necessary download times for slow network connections.

7.6.5 Opel/Vauxhall

It seems that all above listed technical repair information is on the website. But in terms of usability for an independent workshop it is doubtful whether the operator is able to find the relevant information in a reasonable amount of time. While checking the website several problems occurred:

- Vehicle identification by VIN did not identify the vehicle.
- Vehicle identification by a selective list is not guided. It is possible to define illogical cars. In that case the listed information is very confusing.
- Opel's manufacturer VIN code starts with "WOL..." for every Opel. It was not possible to enter the "O" directly in the identification window. Therefore the code was entered with "copy and paste" from MS Word.
- The free text search did not work satisfying (e.g. the word "OBD" was not found). Occasionally the result list also contained multiple but identical results.

It is assumed that the website contains several problems or errors, which make it very difficult to obtain the required piece of information.

7.6.6 Peugeot

The website is structured by different models and a rudimental list of topics for each model (see Fig. 7-3). The listed items, which are on the lowest information level, do not follow any traceable structure (e.g. Peugeot 406 -> Mechanical -> General, see Fig. 7-4). Apart from the very unclear arrangement of items, it is not clear why some information is displayed for one model but not for another. E.g. "Data tightening torques brakes" is displayed for a Peugeot 406, but not for a Peugeot 307 (see Fig. 7-4 and Fig. 7-5). Other items do not lead to any information (e.g. Peugeot 406 -> Maintenance -> General, see Fig. 7-6).

Apart from the listed topics no additional search features are available. Vehicle identification is only possible by model name, without any additional specification (e. g. model year, engine, transmission, ...). In addition the website looks very simple, the information structure is unclear and it is quite difficult to find the necessary information. It is also not clear whether all specified information is contained for every listed model.

For an independent operator it is very difficult or nearly impossible to find the relevant technical information. Compared to all other websites, the Peugeot and the Renault system represent a poor level and do not satisfy the needs of an independent workshop.

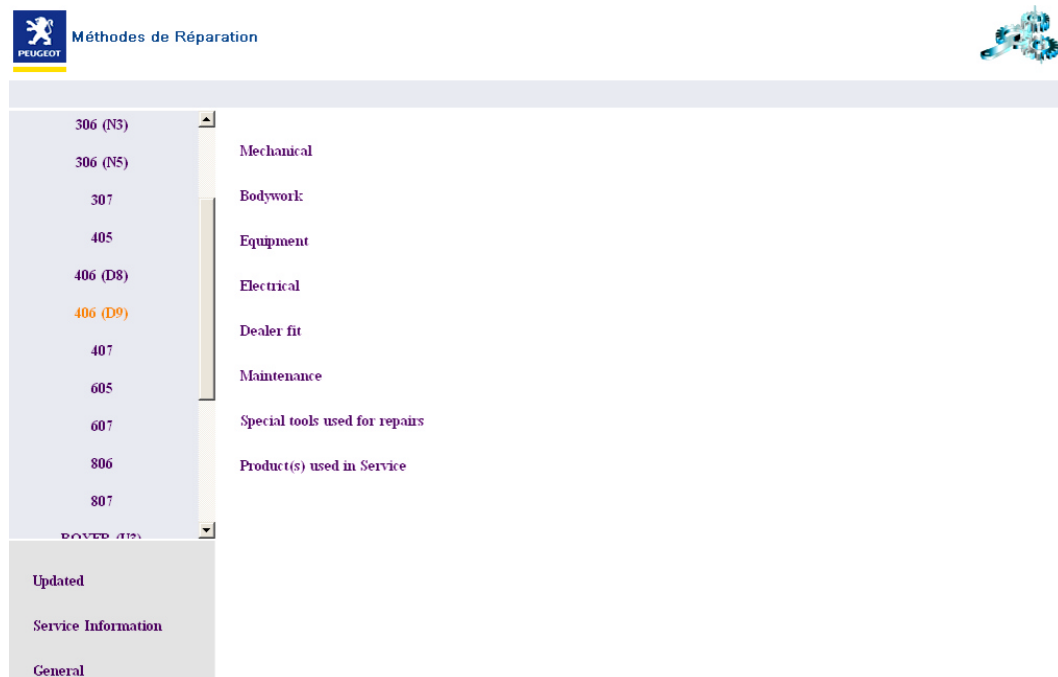


Fig. 7-3: Top Level Peugeot 406 (D9)

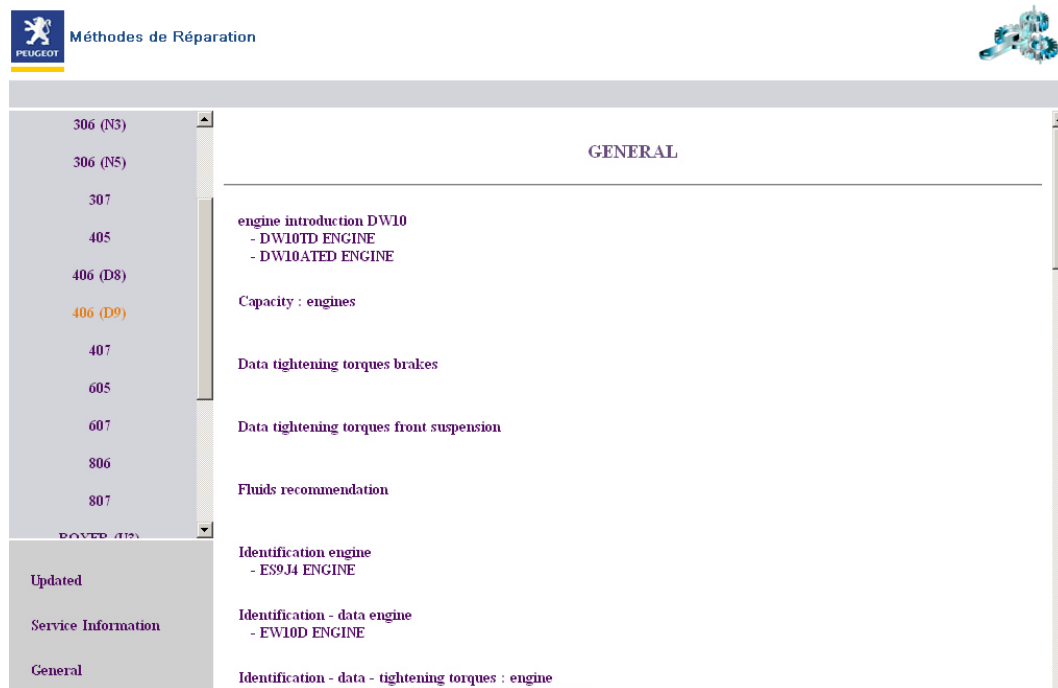


Fig. 7-4: Level: Peugeot 406 (D9) -> Mechanical -> General

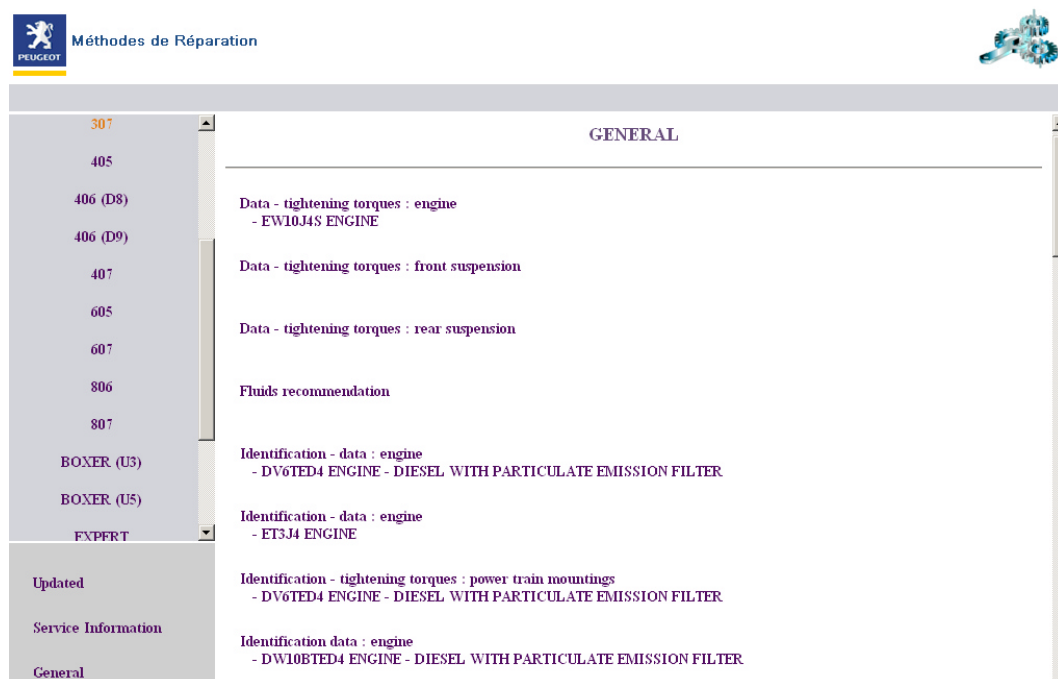


Fig. 7-5: Level: Peugeot 307 -> Mechanical -> General

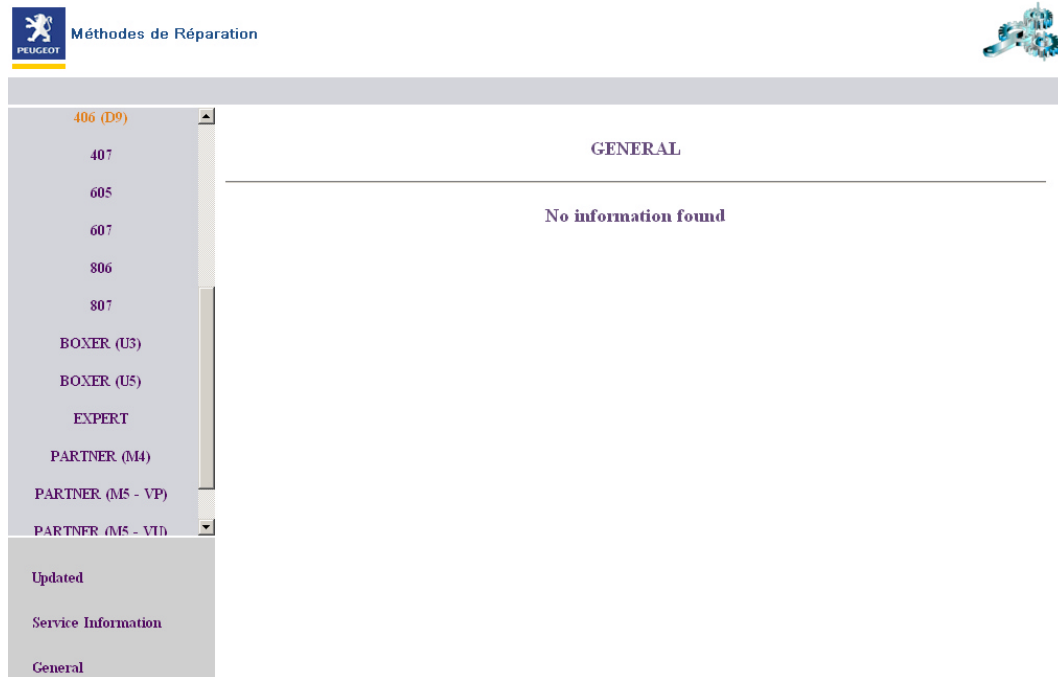
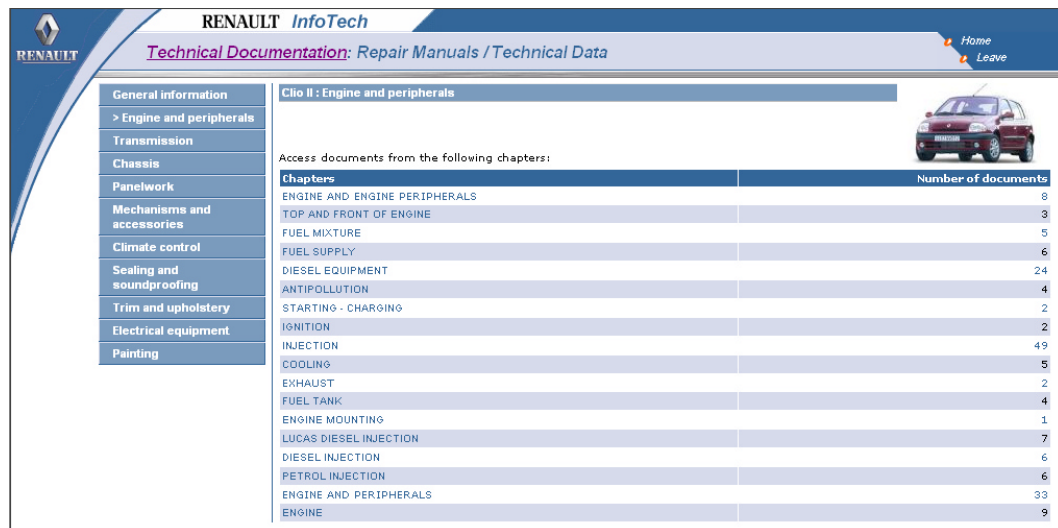


Fig. 7-6: Level: Peugeot 406 (D9) -> Maintenance-> General

7.6.7 Renault

The Renault website contains standard workshop repair manuals, which are digitalised to a PDF file. In order to obtain small files the quality and resolution of the pages are sometimes bad (e.g. wiring diagrams are not readable). The structure looks identical to the workshop manual. Again the listing of the different topics is very confusing. E.g. in the chapters “General information -> Engine and peripherals” (see Fig. 7-7) the terms “ENGINE AND ENGINE PERIPHERALS” and “ENGINE AND PERIPHERALS” are listed as separate chapters. Whereas the first item contains 8 documents, the second one lists 33 documents. The user cannot identify, which chapter is relevant. The topic “ENGINE AND PERIPHERALS” also contains different subchapters with identical names (e.g. “ENGINE REPAIR”, see Fig. 7-8), which all contain different information. The user has to check each document to identify whether it contains the needed information. A content list or a short description of the content is also not given. Furthermore it is not possible to search for specific keywords.

For an independent operator it is very difficult or nearly impossible to find the relevant technical information. Compared to all other websites, the Peugeot and the Renault system represent a poor level and do not satisfy the needs of an independent workshop.



RENAULT InfoTech
 Technical Documentation: Repair Manuals / Technical Data

Home
Leave

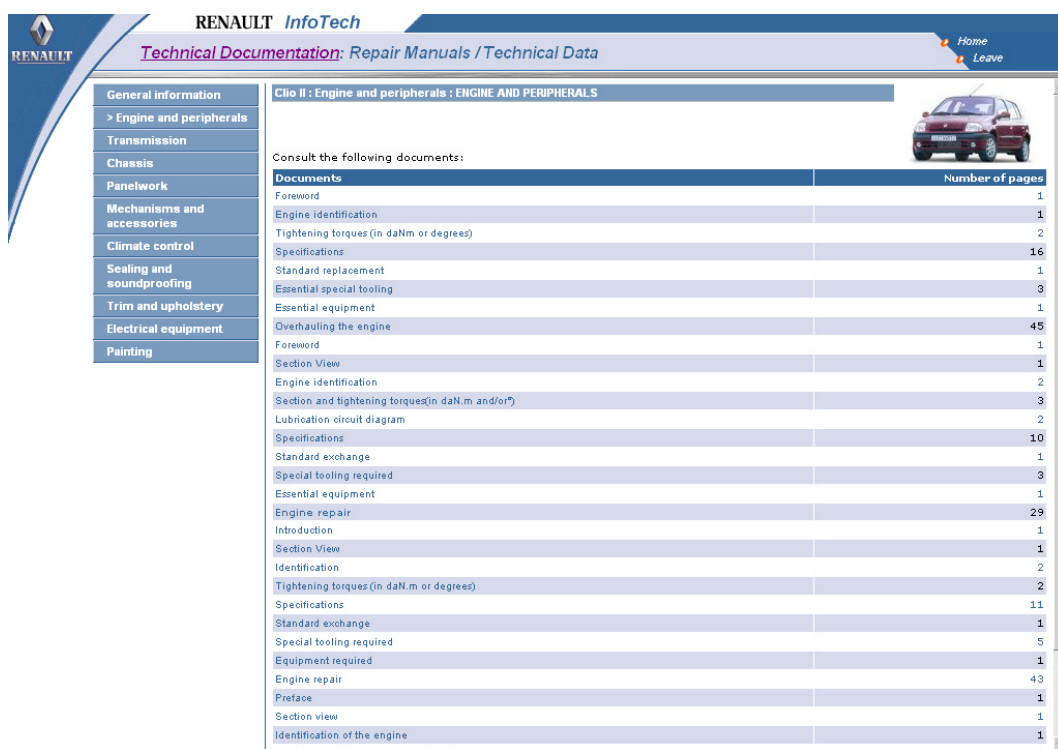
General information
 > Engine and peripherals
 Transmission
 Chassis
 Panelwork
 Mechanisms and accessories
 Climate control
 Sealing and soundproofing
 Trim and upholstery
 Electrical equipment
 Painting

Clio II : Engine and peripherals

Access documents from the following chapters:

Chapters	Number of documents
ENGINE AND ENGINE PERIPHERALS	8
TOP AND FRONT OF ENGINE	3
FUEL MIXTURE	5
FUEL SUPPLY	6
DIESEL EQUIPMENT	24
ANTIPOLLUTION	4
STARTING - CHARGING	2
IGNITION	2
INJECTION	49
COOLING	5
EXHAUST	2
FUEL TANK	4
ENGINE MOUNTING	1
LUCAS DIESEL INJECTION	7
DIESEL INJECTION	6
PETROL INJECTION	6
ENGINE AND PERIPHERALS	33
ENGINE	9

Fig. 7-7: Level: Clio II -> Engine and peripherals



RENAULT InfoTech
 Technical Documentation: Repair Manuals / Technical Data

Home
Leave

General information
 > Engine and peripherals
 Transmission
 Chassis
 Panelwork
 Mechanisms and accessories
 Climate control
 Sealing and soundproofing
 Trim and upholstery
 Electrical equipment
 Painting

Clio II : Engine and peripherals : ENGINE AND PERIPHERALS

Consult the following documents:

Documents	Number of pages
Foreword	1
Engine identification	1
Tightening torques (in daNm or degrees)	2
Specifications	16
Standard replacement	1
Essential special tooling	3
Essential equipment	1
Overhauling the engine	45
Foreword	1
Section View	1
Engine identification	2
Section and tightening torques (in daNm and/or°)	3
Lubrication circuit diagram	2
Specifications	10
Standard exchange	1
Special tooling required	3
Essential equipment	1
Engine repair	29
Introduction	1
Section View	1
Identification	2
Tightening torques (in daNm or degrees)	2
Specifications	11
Standard exchange	1
Special tooling required	5
Equipment required	1
Engine repair	43
Preface	1
Section view	1
Identification of the engine	1

Fig. 7-8: Level: Clio II -> Engine and peripherals -> Engine and peripherals

7.6.8 Volkswagen

The VW website contains all necessary technical information. Vehicles are identified by VIN or by a selective list. As a result all relevant workshop manuals are listed. The user can only buy complete PDF documents (usually between 100 – 200 pages) for certain systems (e.g. engine) and procedures (maintenance). For each document a content list can be displayed

for free. Since the workshop documents are quite large it takes some time to download them and it is also very costly. Some books refer to others, which have to be purchased separately. The documents can be displayed offline, but only if the subscription license is still valid. Another disadvantage is that for each search procedure the vehicle identification process has to be done again. Since the “go back” button of the web browser does not work on the website, it is sometimes time consuming to search for the relevant information.

From an independent operators point of view it would be more economic and comfortable to purchase only the part of information, which is needed for the repair.

8 Passenger Car Manufacturers - CD/DVD based Information System (Part B2)

8.1 General Remarks

The assessment of Smart covers all countries with the exception of Denmark. Smart does not sell any cars in Denmark. DaimlerChrysler (Mercedes + Smart), who has a CD based system in place, is currently pursuing a project aiming at the implementation of an Internet-based system for the provision of technical information in the future.

In contrast to all other countries where paper documentation is sold, Toyota provides a CD based system for the Italian market.

The CD's provided by Opel, Renault and Volkswagen are similar to the Internet-based system. A detailed assessment of these systems is made in chapter 7. Any differences or particularities are named.

8.2 Access (1.1 – 1.4)

In general CD/DVD based systems consist of a package with all technical information for one or all models (see Tab. 8-1). Mercedes, Peugeot and Citroën also offer additional packages.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroën	Toyota (Italy)
package all models	yes	yes	yes	yes	yes	yes	no
package single model	yes	no	no	no	no	yes	yes
package with specific system for all models	no	no	no	no	no	yes	no
other	no	no	yes	no	yes	yes	no

Tab. 8-1: Available information packages (1.1)

- Mercedes
 - Analogous to the offer to authorised repairers various information packages are offered:
 - Passenger car package (passenger cars, off-road vehicles, transporters)
 - Commercial vehicles
(transporters, commercial vehicles, Unimog, MB-trac, busses)
 - Passenger cars / Off-Road vehicles

- Trucks
 - Transporters
 - Unimog / MB-trac
- Peugeot

An independent operator can independently subscribe for different packages.
- Citroën

Citroën offers two different options: LASERTEC CLASSIC is intended for those repairers that want to obtain technical information from time to time. If one wants all the technical documentation and its updates for all vehicles, the LASERTEC EXCLUSIVE offer should be chosen. To be able to consult the Citroën technical documentation, a LASERTEC installation pack (price: EUR 90,-) has to be bought. After installing it, one can look up the Citroën spare parts documentation and work time schedules freely. Then, according to the specific needs, the independent operator can order the technical documents he is interested in on a website. After paying for these documents online, an access key will be assigned to allow local look-up. It is also possible to order update DVD's (price: EUR 40,-) to update the data or to find information concerning new cars.

LASERTEC EXCLUSIVE is intended for those operators who want to receive all the Citroën documentation and its updates (12 DVD's/year; price annual: EUR 1.975,-). Again, the LASERTEC installation pack has to be bought first.

The costs of different information packages are described Fig. 8-1. The largest one-year subscription prices can be found for Fiat/Alfa, Volvo and Peugeot. For Fiat a subscription is possible in Denmark (Subscription establishment EUR 3.356,- + EUR 134,- per month) and Italy (Subscription establishment EUR 2.400,- + EUR 1.100,- annual). Opel, Volvo and Peugeot also provide an Internet-based system. The one-year subscription costs are identical to those for the Internet option.

Volvo is the only manufacturer whose minimum subscription period (2 month) is shorter than one year (also see Fig. 8-2). Therefore the costs for a one-time delivery are significant lower.

Mercedes has different prices for each country, which differ from EUR 967,- to 1.274,- (DK: 1.112,-; F: 1.093,-; GER & NL: 967,-; UK & IRE 1.034,-; I: 1.113,-; PL: 1.274,-). The MCC Smart price of EUR 934,- is for all countries with the exception of Poland where EUR 955,- have to be paid. The total price of EUR 934,- consists of a one-time license price of EUR 115,- plus a annually price for data content and maintenance of EUR 418,-.

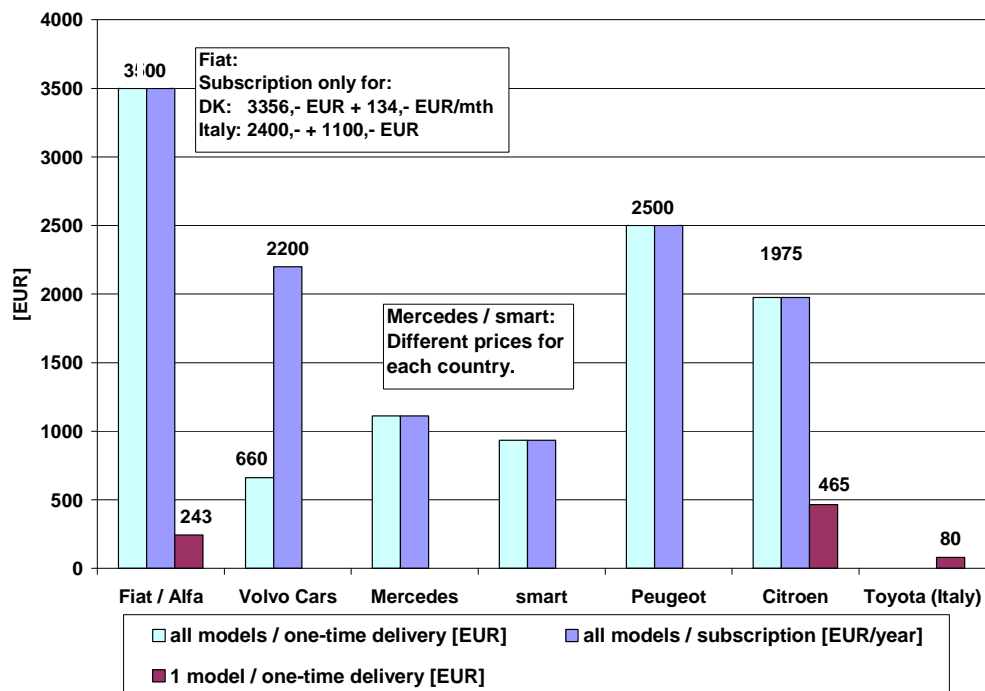


Fig. 8-1: Costs of Information Packages (1.1)

The delivery times for the different CD packages vary from 1 - 7 to 30 days for Fiat and 15 - 45 days for Peugeot. For Fiat and Peugeot it is not reproducible why such large delivery times are needed. If an independent operator has chosen a subscription of technical information the general subscription period is one year.

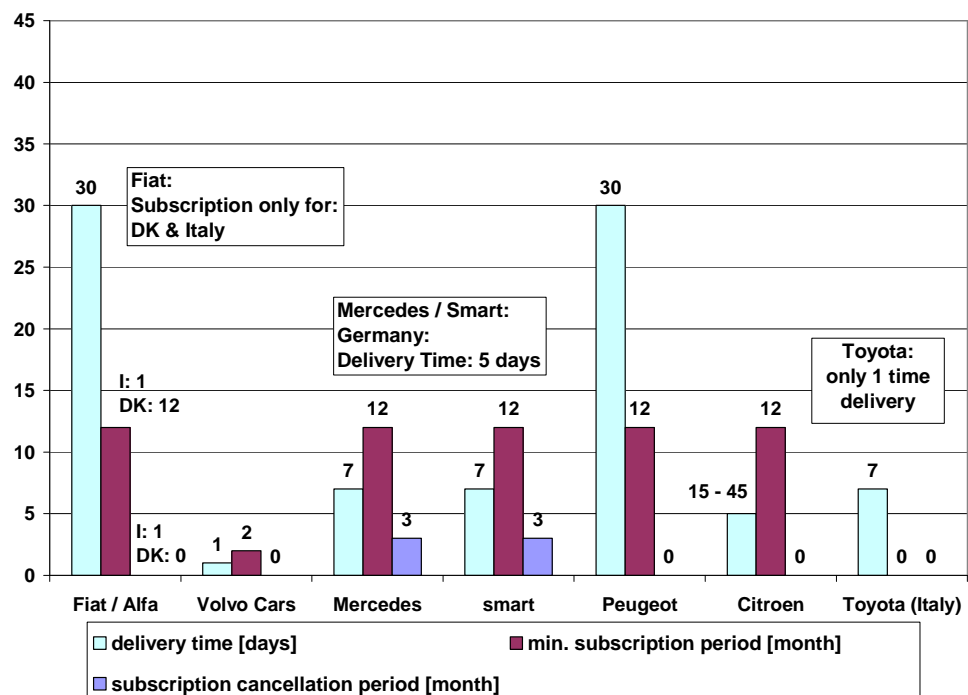


Fig. 8-2: Delivery Time, Minimum Subscription Period and Subscription Cancellation (1.2)

Usually there are not any cancellation periods, only the subscription of Mercedes/Smart repair information has to be cancelled 3 months before end of contract. An independent operator will only subscribe for technical information on a specific brand if the information is needed regularly. Therefore these periods are acceptable.

The required methods of payment, which are shown in Tab. 8-2, represent common procedures. There are no special discounts. Any other methods of payment are named as follows:

Fiat/Alfa:

Credit Card: only UK and Ireland

Cash on delivery (COD): only Denmark, France, Ireland, Italy

Mercedes:

Bank transfer: only Italy, Poland, UK

Debit: without Poland

Smart:

Bank transfer: only Italy, Poland, UK & Ireland

Debit: without Poland

Cheque: only France

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
bank transfer	yes	no	(no)	(no)	yes	no	no
credit card	(no)	yes	no	no	no	yes	yes
debit	no	no	(yes)	(yes)	no	no	no
other	yes	no	no	(no)	yes	no	yes
special discounts	no	no	no	no	no	no	no

Tab. 8-2: Method of Payment (1.3)

Generally the manufacturer directly distributes the information packages. Only Fiat/Alfa, Peugeot and Toyota use their local dealer network for that purpose. Opel (Portica, Germany)

and Volkswagen (arvato logistics services) have contracted external agencies to handle the distribution⁶.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
directly by manufacturer	no	yes	yes	yes	yes	yes	no
by local authorised dealers	yes	no	no	no	yes	no	yes
by any other organisation	no	no	no	no	no	no	no

Tab. 8-3: Distribution of technical information (1.4)

8.3 Users (1.5)

Very few independent operators use the purchasing of technical information on CD/DVD. Since the CD/DVD systems lack the flexibility (pricing, packaging) of an Internet system, the costs are only affordable for repairers who are specialised on certain brands. Even large multi-brand repairers (e.g. Auto-Teile-Unger ATU) who might have sufficient repairs on different brands do not usually buy technical information directly from the manufacturer. Those companies have special contracts with publishers (e.g. Autodata) who provide the necessary technical repair information to them.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
number of users per year	50 (Italy)	less than 10	100	10	95	9	7

Tab. 8-4: Number of users (1.5)

8.4 Hard- and Software Requirements (1.6)

Tab. 8-5 gives an overview on the hard- and software requirements for the different CD/DVD based systems. Again, the hardware requirements represent the “state-of-the-art” without

⁶ The needs of the independent workshops with regard to the distribution of technical information are not totally clear. Within the European Association for Motor Trades and Repairs (CECRA) different opinions exist.

any uncommon specifications. The necessary software is limited to conventional web browsers (Internet Explorer x.x [IE] or Netscape 4.7 [NS]) and an Acrobat Reader for PDF documents. Only the electronic parts catalogues (EPC) of Opel and Toyota require a dongle, which has to be purchased separately.

Toyota did not provide any information on hard- and software requirements for their CD based technical information system in Italy.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
min. processor [MHz]	400	700	200	200	600	500	
min. RAM [MB]	64	128	64	64	128	256	
min. display resolution	800 x 600	800 x 600	1024 x 768	1024 x 768	1024 x 768	1024 x 768	
min. disk space [MB]	1000	9000	6000	6000	600	500	
needed software	IE 5.5	IE 6.0					
needed software							
special plug-ins	yes	no	no	no	no	no	
if yes: how many	2						
if yes: at what cost	0						

Tab. 8-5: Hard- and software requirements (1.6)

8.5 Information Scope

8.5.1 Covered Vehicles and Update Periods (1.2.2.3 + 1.2.2.5)

For Volvo, Mercedes/Smart, Opel and Volkswagen technical repair information is available on CD for all models produced within the last 10 years. Fiat/Alfa (40 %), Peugeot (75 %), Citroën (88 %) and Toyota (80 %) only provide a portion of technical repair information on CD; all other information is on paper.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Opel / Vauxh.	Peugeot	Citroen	Toyota (Italy)	VW
covered vehicles last 10 years [%]	40	100	100	100	100	75	88	80	100
updates per year	DK: 1-6 I: 12	6	11	11	10	10	12	n.a.	6-8

Tab. 8-6: Covered vehicles and update periods (1.2.2)

During a subscription update CD's are sent 6 times annual for Volvo, Volkswagen and Fiat Denmark and 10 – 12 times annual for all other manufacturers. Since Toyota (Italy) and Fiat/Alfa (all countries, except: DK & I) do not offer a subscription of technical repair information, no update figures were given.

8.5.2 Languages (1.7)

The CD's are also offered in several different languages. All manufacturers offer their technical information in Dutch, English, French, German, Italian, Portuguese and Spanish and also with exceptions in Finnish and Swedish (without Alfa) and Greek and Polish (without Volvo).

Mercedes and Smart remark that for all languages except German, English, French, Spanish and Italian only parts of the information are translated. Peugeot and Citroën distribute their information in the listed languages, but the parts catalogue is only available in French, English, Spanish, German and Italy. The Toyota CD is only sold in Italy, which is therefore the only language for Toyota.

Estonian, Latvian, Lithuanian, Romanian (exception Mercedes/Smart) and Slovenian (exception Citroën) are not supported. Hungarian and Norwegian is only available from few manufacturers. In addition Fiat/Alfa and Opel offer Turkish.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
czech	yes	no	yes	no	yes	yes	no
danish	no	no	yes	no	yes	yes	no
dutch	yes	yes	yes	yes	yes	yes	no
english	yes	yes	yes	yes	yes	yes	no
estonian	no	no	no	no	no	no	no
finnish	no	yes	yes	yes	yes	yes	no
french	yes	yes	yes	yes	yes	yes	no
german	yes	yes	yes	yes	yes	yes	no
greek	yes	no	yes	yes	yes	yes	no
hungarian	no	no	no	no	yes	yes	no
italian	yes	yes	yes	yes	yes	yes	yes
latvian	no	no	no	no	no	no	no
lithuanian	no	no	no	no	no	no	no
norwegian	no	no	no	no	yes	yes	no
polish	yes	no	yes	yes	yes	yes	no
portuguese	yes	yes	yes	yes	yes	yes	no
romanian	no	no	yes	yes	no	no	no
slovenian	no	no	no	no	no	yes	no
spanish	yes	yes	yes	yes	yes	yes	no
swedish	no	yes	yes	yes	yes	yes	no
other	yes	no	no	no	no	no	no

Tab. 8-7: Languages (1.7)

8.5.3 Vehicle Identification (2.1)

The necessity to identify a given vehicle can be satisfied by identification via a selective list with several attributes and/or by using the vehicle identification number (VIN). Identification via a selective list is provided by all listed manufacturers, whereas an automatically VIN

resolution is not possible with the CD based systems of Fiat/Alfa and Toyota (Italy). Those two manufacturers are therefore also not able to identify all original parts definitely.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
by VIN	no	yes	yes	yes	yes	yes	no
by selective list	yes	yes	yes	yes	yes	yes	yes
by other	no	no	no	no	no	no	no
identification of original parts (incl. part no.)	no	yes	yes	yes	yes	yes	no

Tab. 8-8: Vehicle Identification (2.1)

8.5.4 Information Search (2.2 – 2.3)

To receive the necessary technical information different search criteria should be provided. In this context the most important criteria are search by systems (provided by all manufacturer without Peugeot and Citroën) and search by components (provided by all manufacturer). Some manufacturers offer additional features like a full-text search (Fiat/Alfa, Volvo, Mercedes/Smart and Toyota Italy) or search by symptoms (Fiat/Alfa and Toyota Italy).

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
Trouble Codes (DTC)	no	yes	yes	yes	no	no	yes
symptoms	yes	no	no	no	no	no	yes
systems	yes	yes	yes	yes	no	no	yes
components	yes	yes	yes	yes	yes	yes	yes
OE numbers	no	yes	yes	yes	yes	yes	no
special tool names	yes	yes	yes	yes	no	no	yes
warning indication	yes	yes	no	yes	no	no	yes
full text search	yes	yes	yes	yes	no	no	yes
other	no	no	no	no	no	no	no

Tab. 8-9: Search Criteria (2.2)

In comparison to the Internet-based systems the display of search results is less important, because the user has not to pay for any additional access periods. But on the other hand it is of course necessary to find the required information in a reasonable amount of time. From that point of view an adequate and informative listing of search results is still relevant.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
title	yes	yes	yes	yes	yes	yes	yes
short description	no	yes	yes	yes	yes	yes	yes
creation date/version	no	no	yes	yes	yes	no	no
other	no	no	no	no	no	no	no

Tab. 8-10: Display of Search Results (2.3)

In order to receive the necessary documents the title and a short description of the content of the documents are necessary. All manufacturers with the exception of Fiat/Alfa, who only gives a title, provide this information. A creation date or version number is not available for Fiat/Alfa, Volvo, Citroën and Toyota (Italy).

8.5.5 Content (2.4)

Tab. 8-11 describes the scope of general technical repair information. Some manufacturers lack important information. Several manufacturers (Ford, Opel, Peugeot) do not provide any hydraulic and pneumatic wiring, whereas electrical wiring for Volvo and Toyota are available on paper only. Peugeot and Citroën do not offer any emission related information. Since this is necessary for emissions tests, the lack of such information is hardly acceptable and in particular operators who offer testing and inspection services rely on this information. For Fiat/Alfa and Toyota welding instructions are missing, which represent important information, especially for body repair shops.

All manufacturers provide sufficient service information, except Peugeot and Toyota who distribute their service information on paper only.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
functional descriptions	yes	yes	yes	yes	yes	yes	yes
fitting / removal procedures	yes	yes	yes	yes	yes	yes	yes
work plans / job times	yes	no	yes	yes	yes	yes	no
electrical wiring	yes	(yes)	yes	yes	yes	yes	(yes)
hydraulic wiring	no	no	yes	yes	no	yes	yes
pneumatic wiring	no	no	yes	yes	no	no	yes
emission related information	yes	yes	yes	yes	no	no	yes
body repair information	yes	yes	yes	yes	yes	yes	yes
welding instructions	no	yes	yes	yes	yes	yes	no
pickup points	yes	yes	yes	yes	yes	yes	yes
tightening torque figures	yes	yes	yes	yes	yes	yes	yes
axle settings	yes	yes	yes	yes	yes	yes	yes
brake clearance	no	yes	yes	yes	yes	yes	yes
operating fuels	yes	yes	yes	yes	yes	yes	no
wheel-tire combinations	yes	yes	yes	yes	no	yes	no

Tab. 8-11: Information content – general information (2.4.1)

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
service intervals	yes	yes	yes	yes	(yes)	yes	(yes)
service instructions	yes	yes	yes	yes	(yes)	yes	(yes)
resetting maintaince indicator	yes	yes	yes	yes	(yes)	yes	yes

Tab. 8-12: Information content – service information (2.4.2)

For a target-oriented fault identification and repair diagnostic information is also required. Peugeot and Citroën do not provide any diagnosis information; only the location of the diagnostic connector (OBD plug) can be found. Especially the interpretation of diagnostic trouble codes (DTC) is necessary when diagnosing a vehicle and important information for scan tool manufacturers. Volvo, Peugeot, Citroën and Toyota also do not deliver any information on ECU software versions.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
location diagnostic connector	yes	yes	yes	yes	yes	yes	yes
DTC meanings	yes	yes	yes	yes	no	no	yes
information on ECU software versions	yes	no	yes	yes	no	no	no
test procedures	yes	yes	yes	yes	no	no	yes
test parameters	yes	yes	yes	yes	no	no	yes
test values under certain conditions	no	yes	yes	yes	no	no	yes

Tab. 8-13: Information content – diagnosis information (2.4.3)

All manufacturers provide sufficient spare part and special tools information. Spare part information is generally distributed on a separate CD.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
spare part numbers	yes	yes	yes	yes	yes	yes	yes
spare part list for given vehicle	yes	yes	yes	yes	yes	yes	yes
graphical spare parts identification	yes	yes	yes	yes	yes	yes	yes

Tab. 8-14: Information content – spare parts (2.4.4)

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
special tool list for given vehicle	yes	yes	yes	yes	yes	yes	yes
description of intended use for each tool	yes	yes	yes	yes	yes	yes	yes

Tab. 8-15: Information content – special tools (2.4.5)

8.6 Differences between authorised and independent operators (1.8 + 4)

Based on the answers in the respective questionnaires Tab. 8-16 describes the differences in the conditions and the content of the technical information systems between authorised and independent operators.

Any differences are explained in detail as follows:

1. Purchase Options

a. Volvo Cars

Authorised dealers cannot purchase per DVD. They have a mandatory annually subscription.

b. Mercedes/Smart

Star Diagnosis hardware can also be purchased via independent repairers (authorised operators can only rent).

c. Peugeot

Independent operators can choose different packages.

d. Citroën

Authorised repairers are obliged to purchase an annual subscription.

e. Volkswagen

Authorised repairers get a new DVD automatically as long as they have a valid contract. Independent operators receive new CD's for the period of 12 months.

2. Payment

a. Volvo Cars

Authorised dealers pay via debit or annually invoices.

b. Opel/Vauxhall

The base prices are the same, However, independent operators are charged handling, delivery and credit card Transaction Fee, whereas for authorised repairers these fees are covered within their agreement.

c. Peugeot

Independent operators pay by cheque or bank transfer; the authorised repairers are directly charged on their account.

d. Citroën

Independent operators pay by credit card; the authorised repairers are directly charged on their account.

e. Volkswagen

Authorised repairers have a fixed monthly fee for the DVD with whole content (all car types, all available documents). Independent operators pay per accessed document (book or chapter).

11. Test and Diagnosis Information

a. Mercedes

Restricted access to theft relevant functions/information.

	Fiat / Alfa	Volvo Cars	Mercedes	smart	Peugeot	Citroen	Toyota (Italy)
purchase options	no	yes	yes	yes	yes	yes	no
payment	no	yes	no	no	yes	yes	no
hard- / software requirements	no	no	no	no	no	no	no
languages	no	no	no	no	no	no	no
vehicle identification	no	no	no	no	no	no	no
search criteria	no	no	no	no	no	no	no
display of search results	no	no	no	no	no	no	no
information structure	no	no	no	no	no	no	no
scope general repair info	no	no	no	no	no	no	no
scope service info	no	no	no	no	no	no	no
test and diagnosis info	no	no	yes	no	no	no	no
spare parts info	no	no	no	no	no	no	no
special tools info	no	no	no	no	no	no	no

Tab. 8-16: Differences in the conditions and systems for authorised and independent operators

8.7 The Usability of the Information Systems

8.7.1 Fiat/Alfa

Fiat provides a separate CD for each model. The information is structured into different topics (technical data – descriptions – fault diagnosis – testing–procedures – electrical equipment), which are subdivided into different vehicle systems (e.g. engine – clutch – gearbox ...). Generally the information was found within a reasonable amount of time. The description of necessary procedures is not sufficient in any case and sometimes graphical descriptions are missing. Some items do not contain any information (message: information not available). The CD contains a good fault analysis by different symptoms.

8.7.2 Mercedes/Smart

The system is the same as for the authorised repairers. Information is structured in a traceable way and the necessary technical information can be found within a reasonable amount of time.

8.7.3 Peugeot

The structure and layout of the CD systems is identical for Peugeot and Citroën. The system looks rudimental. The technical information is displayed in 10 different subgroups. Each subgroup lists different documents for the identified vehicle. The documents are not displayed in any logical arrangement, which makes it quite difficult to find the necessary information.

8.7.4 Citroën

The structure and layout of the CD systems is identical for Peugeot and Citroën. The system looks rudimental. The technical information is displayed in 10 different subgroups. Each subgroup lists different documents for the identified vehicle. The documents are not displayed in any logical arrangement, which makes it quite difficult to find the necessary information.

8.7.5 Toyota

No CD-ROM available for Toyota Italy.

8.7.6 Volvo Cars

No CD-ROM available for Volvo. See Internet system.

9 Passenger Car Manufacturers - Paper based Information System (Part B3)

9.1 General Remarks

Only for Peugeot the service manuals and the flash information are available on paper. Service information is also part of the website, but not on the CD. Due to the restriction on service information a further assessment on the paper information has not been done.

9.2 Access (1.1 – 1.4)

Toyota is the only manufacturer whose technical repair information is available on paper only (except for Italy). All other manufacturers provide paper information in addition to an Internet- (Opel and Renault) or a CD- (Fiat/Alfa and Citroën) based system. Only Fiat distributes older models on paper (= 60 % of the vehicles, which were produced in the last 10 years). All other information is on CD. Therefore the available packages and the prices are also similar to those on CD (see chapter 8.2). Opel provides hardcopy PDF's for individual model repair / technical information extracts by paper fax copy. Independent operators can order a maximum of 15 pages for a price of EUR 15,- plus EUR 0,50 per page requested. The average handling time covered by the Customer Assistance Centre (CAC) consultants is 10 minutes per request.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
package all models	yes	no	no	no
package single model	yes	no	no	(yes)
package with specific system for all models	no	no	no	yes
other	no	yes	yes	yes

Tab. 9-1: Available information packages (1.1)

For Toyota service literature is generally available by functional groups (e.g. chassis, engine, body, wiring ..) or a combination of them. In the United Kingdom data/information is supplied on a request-by-request basis. The information is faxed to the client, following a contact on a dedicated hotline. The level of information supplied will be dependent upon the enquiry, with the minimum of a single page if appropriate. Alternatively if multiple pages are required then this will be supplied. Costs: First Page:(Credit Card): EUR 3,- (Debit Cards): EUR 3,44 - Sheets thereafter: EUR 0,60 per sheet - Alternatively individual Repair/Diagnosis Manuals

may be purchased. In France (average cost EUR 420,- for a mid-size model) and the Netherlands (EUR 501,- per model) packages with single models are also available.

For Citroën technical repair information is on paper for the models AX, ZX, XM and C15 and the electrical wiring for the models AX, ZX, XM, C15, Xantia 1 and Jumper 1. The manuals are published for different vehicle systems (e.g. mechanical, body, electrical, engine repair,...). The documentation is available within the limits of the stock. All other models are published on CD ROM.

The delivery times are shown in Fig. 9-1. Since Opel delivers their information by fax on demand, the reply time is only 10 minutes. For all other manufacturers these periods are quite large and especially for Fiat and Citroën not acceptable.

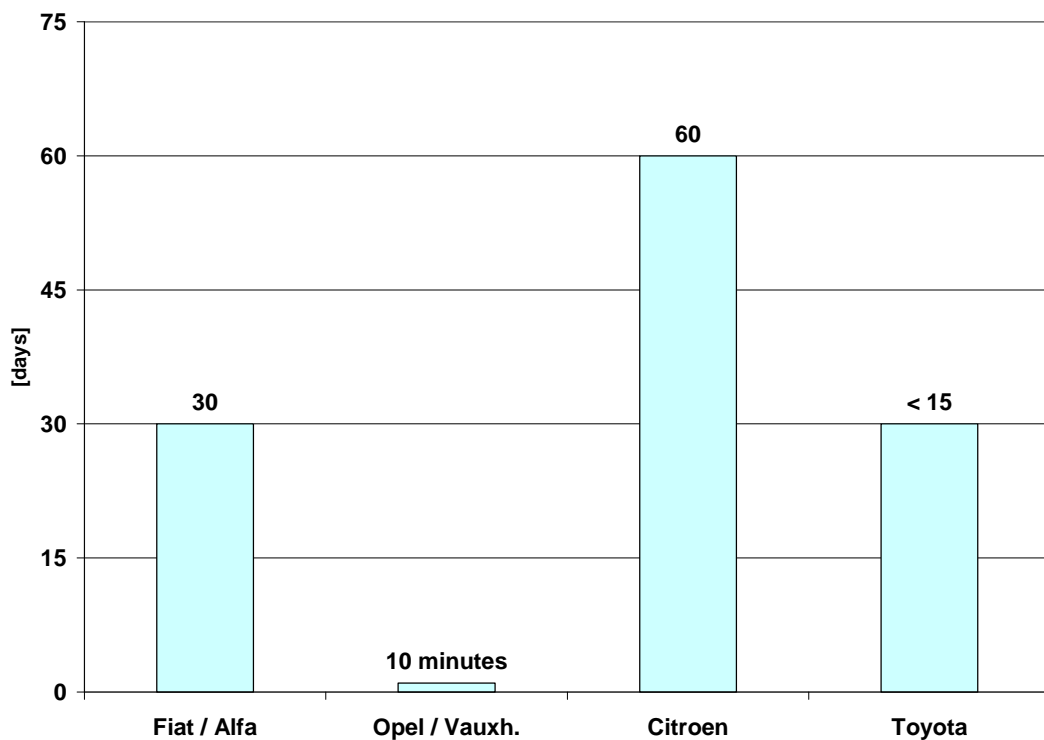


Fig. 9-1: Delivery Time (1.2.1.1)

As shown in Tab. 9-2 there are different methods of payment, which all represent common procedures. For Fiat payment is also done by cash on delivery (DK, F, IRE, I) and for Citroën by cheque. Toyota distributes their information through the local dealer network (see Tab. 9-3). The payment is done at the authorised repairer by cash. There are no special discounts.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
bank transfer	yes	no	no	no
credit card	no	yes	no	no
debit	no	no	no	no
other payment	yes	no	yes	yes
special discounts	no	no	no	no

Tab. 9-2: Method of Payment (1.3)

Usually the manufacturer directly distributes the information packages. Only Fiat/Alfa, and Toyota use their local dealer network for that purpose. The needs of the independent workshops with regard to the distribution of technical information are not totally clear and therefore not assessed.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
directly by manufacturer	no	yes	yes	no
by local authorised dealers	yes	no	no	yes
by any other organisation	no	no	no	no

Tab. 9-3: Distribution of technical information (1.4)

9.3 Users (1.5)

Toyota provides technical repair information on paper only. For that reason only they can name a significant number of users. For all other manufacturers the provision of technical repair information is not relevant. Fiat/Alfa does not keep any central records.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
number of users per year	no central records kept	0	0	<100

Tab. 9-4: Number of users (1.5)

9.4 Information Scope

9.4.1 Covered Vehicles and Update Periods (1.2.2.3 + 1.2.2.5)

Fiat provides 60 % of their technical repair information on paper; 40 % is available on CD. For Citroën most information is provided on CD (88 %), only 12 % of the documents are delivered on paper. For Opel, and Toyota 100 % is available on paper. Opel also offers their documents on CD and via Internet.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
covered vehicles last 10 years [%]	60	100	12	100

Tab. 9-5: Covered vehicles and update periods (1.2.2)

Regular update periods are not named. Usually the information is published with introduction of a new model. Toyota publishes supplements providing information-covering changes in the main repair manual. Based on the Toyota Avensis main repair manual (3.600 pages in total; Vol. 1: 1.740 pages, Vol. 2: 890 pages, Vol. 3: 970) that was published in January 2003, a first supplement (470 pages) was published in February 2003 and a second one (1.200 pages) in September 2003.

9.4.2 Languages (1.7)

Toyota only offers English documents. Since no other information media is available this is obviously against the interests of independent workshops. For all other manufacturers technical repair information is provided at least in Dutch, English, French, German, Italian, Portuguese and Spanish. These manufacturers also provide other information sources with additional languages. Therefore no further assessment is made.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
czech	no	yes	no	no
danish	no	yes	yes	no
dutch	yes	yes	yes	no
english	yes	yes	yes	yes
estonian	no	no	no	no
finnish	no	yes	yes	no
french	yes	yes	yes	no
german	yes	yes	yes	no
greek	no	yes	yes	no
hungarian	no	yes	no	no
italian	yes	yes	yes	no
latvian	no	no	no	no
lithunian	no	no	no	no
norwegian	no	yes	yes	no
polish	no	yes	no	no
portuguese	yes	yes	yes	no
romanian	no	no	no	no
slovenian	no	no	no	no
spanish	yes	yes	yes	no
swedish	no	yes	yes	no
other	no	yes	no	no

Tab. 9-6: Languages (1.7)

9.4.3 Vehicle Identification (2.1)

For paper-based systems identification is only possible by a selective list with several attributes (model, model year, engine, transmission, body style). Since the workshop books are generally structured in that way, all manufacturers provided such an identification method. Toyota also provides automatic vehicle identification on their Electronic Parts Catalogue (EPC).

9.4.4 Information Search (2.2)

Paper based workshop manuals are divided into different chapters. These chapters represent systems of a vehicle and are the first and main search criterion. Toyota and Opel also offer additional search criteria. A search by components is possible by an alphabetical index; but for a search by DTC and a search by symptoms different charts are needed. Especially DTC and symptom charts are important for an independent operator.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
Trouble Codes (DTC)	no	no	no	yes
symptoms	no	yes	no	yes
systems	yes	yes	yes	yes
components	no	yes	no	yes
OE numbers	no	yes	no	no
special tool names	no	yes	no	no
warning indication	no	no	no	yes
other	no	no	no	no

Tab. 9-7: Search Criteria (2.2)

9.4.5 Content (2.3)

Tab. 9-8 describes the scope of general technical repair information. Again, nearly all manufacturers lack pneumatic and hydraulic wiring. Only Citroën, who does not offer any emission related information, shows a significant lack of information. For Fiat welding instructions are missing again, which concerns in particular the requirements of body repairers. Toyota provides job times on their Electronic Parts Catalogue available on CD.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
functional descriptions	yes	yes	yes	yes
fitting / removal procedures	yes	yes	yes	yes
work plans / job times	no	no	yes	(yes)
electrical wiring	yes	yes	yes	yes
hydraulic wiring	no	no	yes	no
pneumatical wiring	no	no	no	no
emission related information	yes	yes	no	yes
body repair information	yes	yes	yes	yes
welding instructions	no	yes	yes	yes
pickup points	yes	yes	yes	yes
tightening torque figures	yes	yes	yes	yes
axle settings	yes	yes	yes	yes
brake clearance	no	yes	yes	yes
operating fuels	yes	yes	yes	yes
wheel-tyre combinations	yes	yes	yes	yes

Tab. 9-8: Information content – general information (2.3.1)

Servicing is one of the main jobs independent garages are working on. Although the provision of service information was affirmed in the questionnaire, no such documents could be found in the Toyota repair documentation. Fiat/Alfa and Citroën do not provide any information on how to reset the maintenance indicator.

For a target-oriented fault identification and repair diagnostic information is also required. Fiat/Alfa does not provide DTC meanings. The lack of test procedures, parameters and values do not have the same relevance, but is especially important for diagnostic tool manufacturers. Only Toyota, whose documentation is available on paper only, is providing all kinds of information.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
service intervals	yes	yes	yes	no
service instructions	yes	yes	yes	no
resetting maintainece indicator	no	yes	no	no

Tab. 9-9: Information content – service information (2.4.2)

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
location diagnostic connector	yes	yes	yes	yes
DTC meanings	no	yes	yes	yes
information on ECU software versions	no	no	no	yes
test procedures	no	yes	yes	yes
test parameters	yes	yes	no	yes
test values under certain conditions	no	yes	no	yes

Tab. 9-10: Information content – diagnosis information (2.4.3)

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
special tool list for given vehicle	yes	yes	no	yes
description of intended use for each tool	yes	yes	yes	yes

Tab. 9-11: Information content – special tools (2.4.5)

Only Opel publishes spare part information on paper. Other manufacturers provide separate CD ROMs (see chapter 8.5.5). Spare part information for Toyota is provided on a third-party website (www.microcatfresh.net) and also by a separate CD ROM.

A special tool list for a given vehicle is useful to decide whether a repair can be performed economically in an independent workshop. Citroën does not provide such a list, but the necessary special tools are named in the repair manuals.

9.5 Differences between authorised and independent operators (1.7 + 4)

Based on the answers in the respective questionnaires Tab. 8-16 describes the differences in the conditions and the content of the technical information systems between authorised and independent operators.

Any differences are explained in detail as follows:

1. Purchase Options

- a. Opel & Vauxhall
Paper information is not provided to Authorised Repairers as they all subscribe to TIS & EPC
- b. Toyota
Independent buying from authorised repairers.

2. Payment

- a. Opel/Vauxhall
see "Purchase Options".
- b. Citroën
Independent operators pay by cheque; the authorised repairers are directly charged from their account.
- c. Toyota
 - i. Denmark
Free
 - ii. France
Independent operators are paying by bank transfer and are paying to authorised repairers.
 - iii. Germany
Authorised repairers pay by debit.
 - iv. Ireland
Payment by authorised repairers is made to Toyota Ireland. Payment by independent repairers is made to authorised repairers.

	Fiat / Alfa	Opel / Vauxh.	Citroen	Toyota
purchase options	no	yes	no	no
payment	no	yes	yes	no
languages	no	no	no	no
vehicle identification	no	no	no	no
search criteria	no	no	no	no
scope general repair info	no	no	no	no
scope service info	no	no	no	no
test and diagnosis info	no	no	no	no
spare parts info	no	no	no	no
special tools info	no	no	no	no

Tab. 9-12: Differences in the conditions and systems for authorised and independent operators (4)

9.6 The Usability of the Information Systems

9.6.1 Fiat/Alfa

No paper information available. See CD system.

9.6.2 Opel/Vauxhall

No paper information available. See CD/Internet system.

9.6.3 Citroën

No paper information available. See CD system.

9.6.4 Toyota

Toyota provides books for models (e.g. Toyota Avensis Repair Manual), vehicle systems (e.g. Manual Transaxle E355, E356 Repair Manual, 1AZ-FSE Engine Repair Manual) and

other topics (Toyota Avensis Repair Manual for Collision Damage; Toyota Avensis Electrical Wiring Diagram; Toyota Special Service Tools). In addition a “New Car Features” manual is provided, which explains the main characteristics of new models, in particular providing a technical explanation of the construction and operation of new mechanisms and new technologies used. All documents are structured in a reproducible manner. For each manual a list of terms and abbreviations is given. Due to the good overview of paper documentation, each piece of information can be found within a reasonable amount of time.