

## 10 Truck Manufacturers - General Information (Part A)

### 10.1 Information Provision (1.1)

At the beginning of Part A, each truck manufacturer has to provide the percentage of covered vehicles by their repair information. All manufacturers have covered 100% of their vehicle fleet produced within the last 10 years.

The second question deals with the used medium to provide repair information. The majority has chosen a paper-based concept. As shown in Fig. 10-1, few manufacturers use CD/DVD's or Internet.

The last question of this paragraph refers to the information policy concerning the authorised dealer network. The majority provides information on paper to their own network.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.1.1	% covered veh. last 10 years	100	100	100	100	100	appr. 100	100
1.1.2	% inform. available internet	0	0	100	40	30	appr. 50	0
1.1.3	% inform. available CD/DVD	0	90	0	85	30	0	100
1.1.4	% inform. available paper	0-100 <sup>5</sup>	40	100	40	70	100	10
1.1.7	medium provided to auth. dealer	Paper, Internet, Laptop	Paper, CD, DVD	Internet	all forms	CD, Paper, Internet	Paper	CD/DVD

Fig. 10-1: Information Provision<sup>7</sup>

### 10.2 Diagnostic Tools (1.2)

At the beginning of this paragraph the manufacturers have to give the price for the most costly diagnostic tools. The tools from DAF (EUR 12.500,-), MAN (EUR 14.000,-) and Mercedes (EUR 14.474,- to EUR 17.222,-) are the most expensive. The figures for the other manufacturers can be drawn from Fig. 10-2. The costs to buy the most costly diagnostic tool from the other manufacturers vary in a range from EUR 3.283,- to EUR 7.290,-.

Apart from reading the fault code memory, the most expensive diagnosis tool offered by the manufacturers usually also provides profound repair information. Therefore, a higher price in comparison to the standard tool, which predominantly only provides fault code reading, is

<sup>7</sup> DAF: 0% for diagnostics; Renault: 100 % of technical repair information on paper; 30 % for Internet/CD is spare part information.

inevitable. The prices of the brand dependent standard diagnosis tools correspond to the prices of independent tool manufacturers.

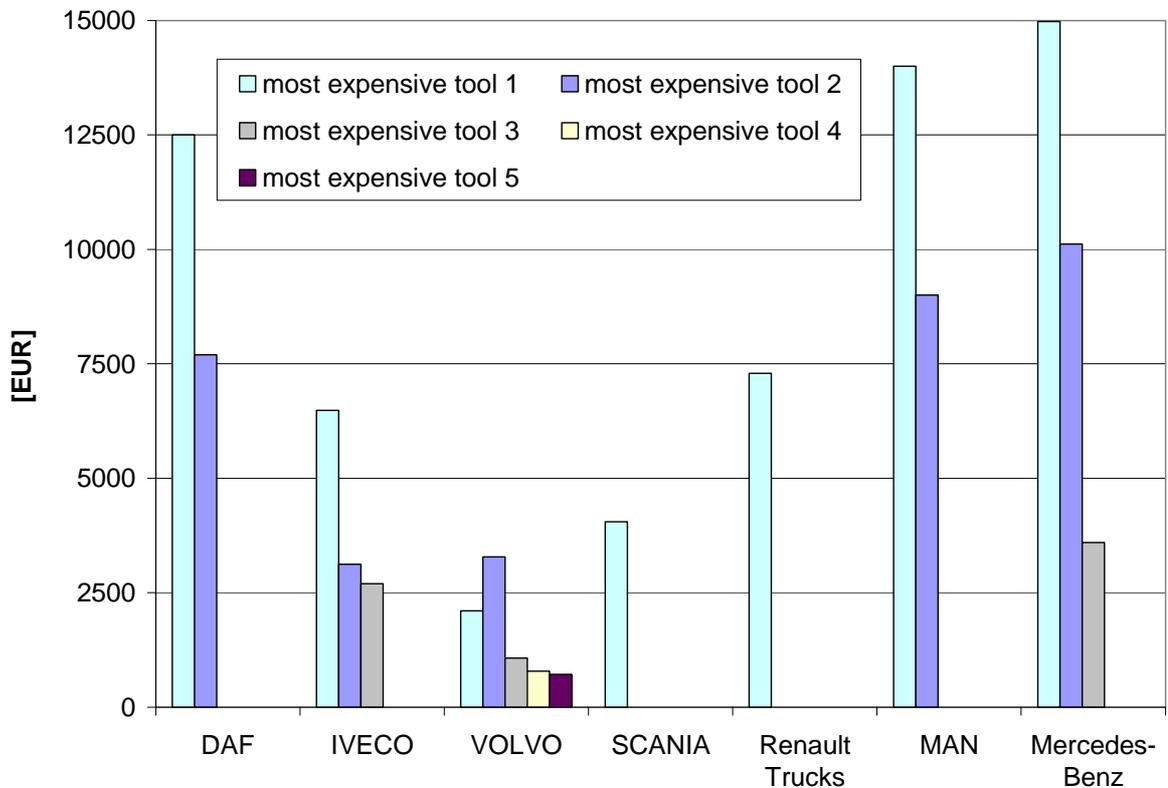


Fig. 10-2: Five most costly diagnosis tools

All manufacturers offer the diagnostic tools for the same price to independent operators in comparison to their own network (Fig. 10-3).

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.2.2	same price ind op/auth op	yes	yes	yes	yes	yes	yes	yes
1.2.5	diff. in deliv. betw. ind/auth op.	no	yes	no	no	no	no	no
1.2.6	special finance models	no	no	no	yes	yes	no	yes
1.2.7	tools available from other prod./sources	no	no	yes	no	no	no	no

Fig. 10-3: Policy of distributing diagnosis tools

The manufactures indicate a delivery period between 8 and 83 days for their diagnostic tools. Only DAF has not been able to give a figure, because their authorised supplier does not have the tools on stock and therefore the delivery period depends on its lead time (Fig. 10-4).

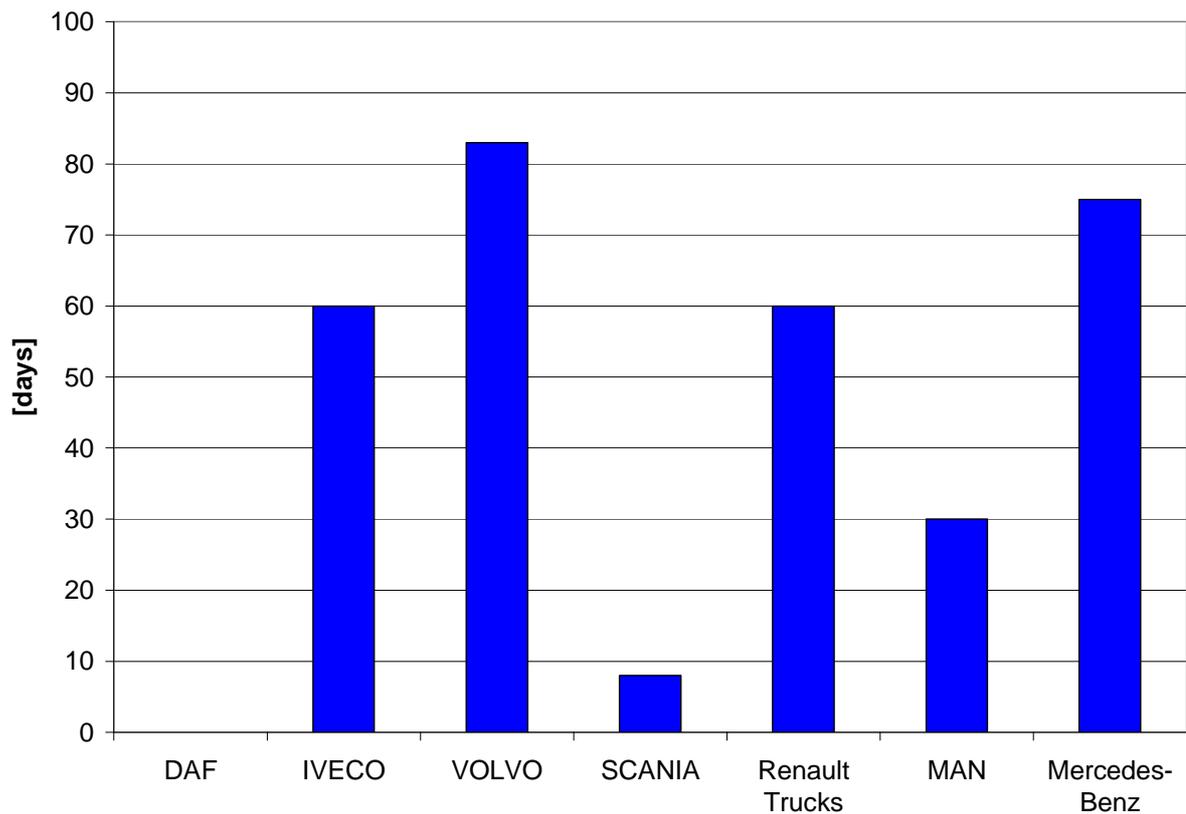


Fig. 10-4: Delivery period for diagnosis tools

Apart from Iveco, only minor differences exist between the delivery period for authorised workshops and independent operators (Fig. 10-3). Unfortunately, Iveco does not provide any further explanations.

Independent operators, who want to purchase a Scania diagnostic tool, require professional experience and for safety reasons, Scania also demands the relevant training. Also Volvo asks for special training. A first time subscriber needs to attend training courses before access is granted. The intervals between such training courses depend on the demand by candidate-subscribers. As demand is currently rather limited, it can take up to 45 days before a training course is available. In the calculation of the relevant delivery period, those 45 days have been included as a matter of caution. Once an independent operator has obtained the initial training and has become a user of the diagnostic tool, updates are made available within 7 working days. All other manufacturers correspond, that there is no specific condition that independent operators have to fulfil.

Three brands offer special financing models to purchase diagnosis tools. Independent operators can either buy or rent the Mercedes/Smart diagnosis hardware. For authorised repairers, only renting of this hardware equipment is offered. Renault offers a long-term rental concept. Scania's diagnostic tool, which is continuously updated, is only available as a subscription. The tool consists of hardware, software and a key device. The key device is only for lease (Fig. 10-3).

Only for Volvo the diagnostic tools are also available from other producers. But Volvo has explained, that they do not have any specific information on these tools and that they are not able to confirm the extent, to which they can be used for.

The contact points of the manufacturers concerning diagnosis tools can be drawn from the appendix.

### 10.3 ECU Operations (1.3)

As already mentioned in the part dealing with passenger vehicles, an ordinary vehicle is equipped with over 80 ECU's. In this paragraph of the questionnaire the truck manufacturers have been asked, if independent operators are able to execute the already mentioned operations (see passenger vehicle part). The answers can be drawn from Fig. 10-5.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.3.1	poss. for ind.op to update software/reprog.	no	yes	no	no	no	no	yes
1.3.2	can ind. op. carry out variant coding	no	yes	yes	yes	no	no	yes
1.3.3	can ind. op. carry out initialisation/reinit.	no	yes	yes	no	no	no	yes
1.3.4	can ind. op. carry out pass-through prog.	no	no	yes	no	no	no	no
1.3.5	can ind. op. reset security systems	no	no	no	no	no	no	no

Fig. 10-5: Possible ECU operations

In case of affirming the relevant operation, the vehicle manufacturers have to name the needed tool/software and their prices. Due to the variability of the provided answers, each manufacturer is treated separately.

#### 10.3.1 DAF

Independent operators cannot execute ECU operations with trucks from DAF.

#### 10.3.2 Iveco

Apart from resetting the security system, it is possible for independent operators to execute the required ECU operations for Iveco trucks. The facility Pass-Through Programming is not provided.

Iveco offers the tools E.A.SY (EUR 6.480,-) or E.A.SY LIGHT (EUR 3.125,-). For the relevant software the independent operators have to pay between EUR 1.500,- annually.

### **10.3.3 Volvo**

Independent operators can only execute variant coding and reinitialisation procedures for Volvo trucks. The facility Pass-Through Programming is provided. The price for the needed tool for both operations is EUR 2.100,- annual and no relevant software exists.

### **10.3.4 Scania**

Apart from variant coding, independent operators are not able to execute any of the required ECU operations. The price for the needed tool is EUR 13.684,- and includes the software. Furthermore, the facility Pass-Through Programming does not exist.

To perform variant coding, independent operators have to pay EUR 4.050,- including the needed software.

### **10.3.5 Renault Trucks**

Independent operators cannot execute ECU operations with trucks from Renault.

### **10.3.6 MAN**

Independent operators cannot execute ECU operations with trucks from MAN.

### **10.3.7 Mercedes**

Apart from resetting the security system, it is possible for independent operators to execute the required ECU operations for Mercedes trucks. The facility Pass-Through Programming is not provided.

Mercedes offers a tool for EUR 3.600,- (Poland EUR 4.140,-; Denmark EUR 3.960,-) and a tool for EUR 10.116,- (Poland EUR 11.128,-; Denmark EUR 11.634,-) to execute ECU operations. For the relevant software the independent operators have to pay between EUR 1.704,- (Netherlands + Germany) and EUR 2.000,- (Denmark) annually.

## **10.4 Special Tools (1.4)**

In order to clarify, at what price the free operators have to purchase special tools to enable an appropriate repair, the truck manufacturers have also been asked to deliver specific information on the workshop equipment in use (excluding diagnosis tools). At first, the truck manufacturers had to name the five most used special tools over EUR 150,-, their prices and the frequency of use (assuming that a garage services 100 vehicles per month).

Due to the fact, that only few manufacturers have been able to estimate the frequency of use of their special tools, only the absolute costs of the tools can be compared. Some manufacturers provide an analysis of the five most used special tools in each country.

Sometimes these tools have different prices in the countries in scope for the questionnaire. In order to enable an objective analysis, Fig. 10-6 contents all listed prices for the five most used special tools for these manufacturers (Renault, MAN, Mercedes).

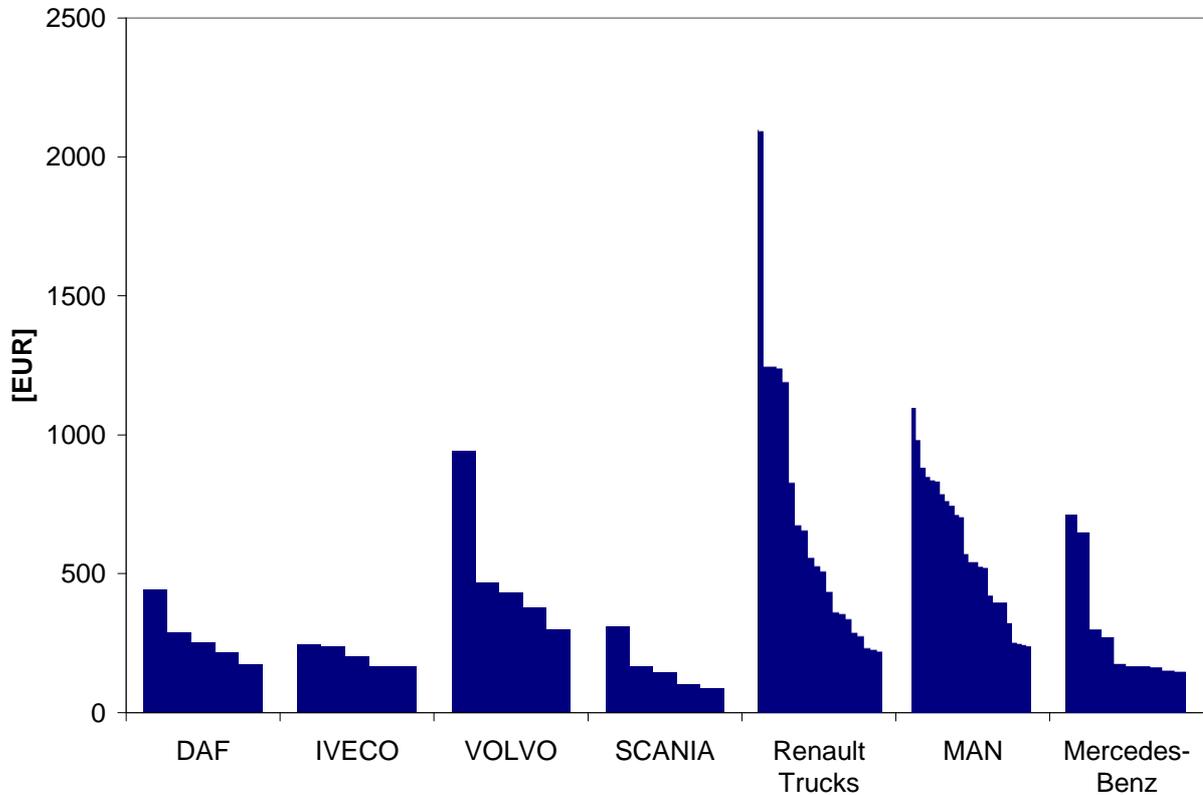


Fig. 10-6: Prices for five most used tools (over EUR 150,-)<sup>8</sup>

The truck manufacturers also mainly enumerate releasing and lifting tools, gauges, removers, alignment kits or tensioning devices. The majority of the mentioned tools vary in a price range from EUR 150,- to EUR 500,-. Above average are the following special tools (the prices are enumerated for the country with the highest prices):

- Volvo: pressure gauge for EUR 942,-
- Renault: crimping toolbox for EUR 834,20,- (Italy), tester (not explained) for EUR 1.241,- (Italy), battery tester for EUR 2.098,- (Italy), no special tools can be purchased in Poland
- MAN: torque multiplier for EUR 976,- (Poland), pressing tool for EUR 713,- (Poland), hydraulic pressure pump for EUR 1.098,- (Poland)

<sup>8</sup> Renault, MAN and Mercedes provide country-specific analysis. For these manufacturers, the diagram does not only content the prices for five special tools, but also for all enumerated prices for a special tool.

- Mercedes: socket box (testing electrical components & systems) for EUR 750,61 (Poland EUR 684,18)

Furthermore, the truck manufacturers have to name the five most expensive special tools, their prices and the frequency of use, again assuming that a garage services 100 vehicles per month. The prices of these five tools for each manufacturer can be drawn from Fig. 10-7.

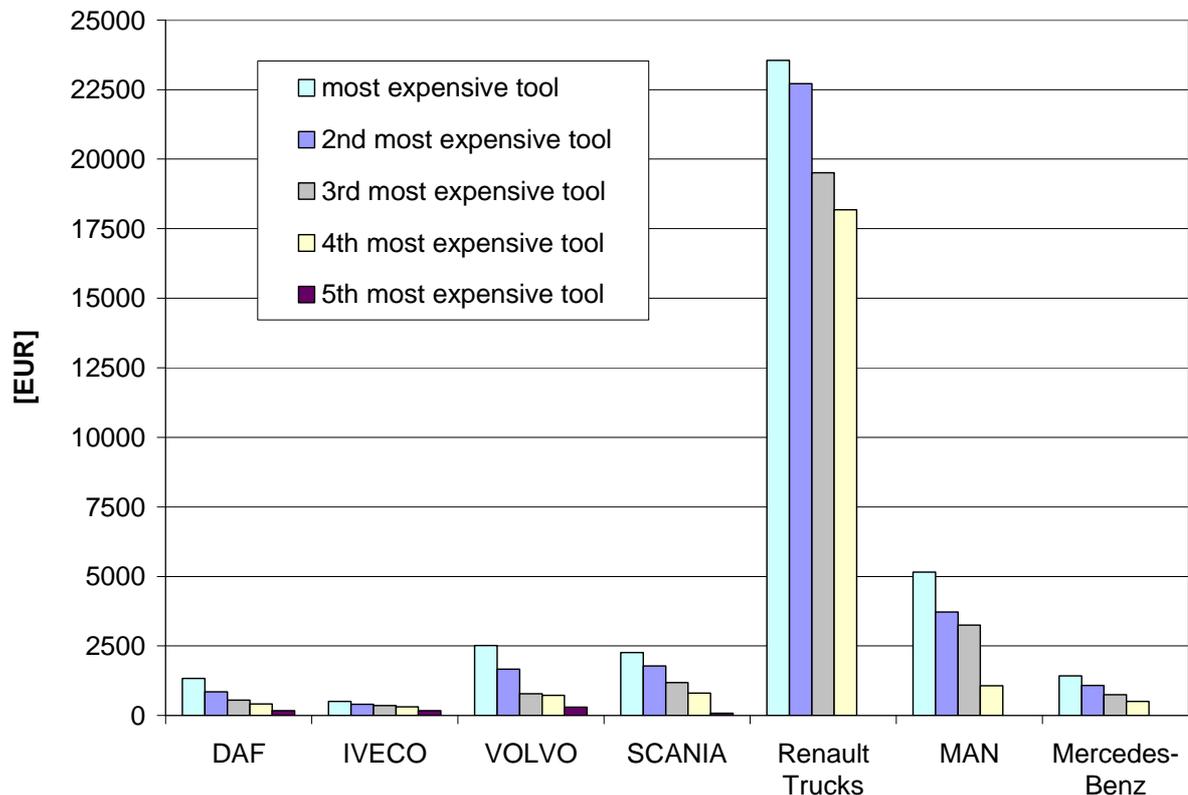


Fig. 10-7: Prices for the five most expensive special tools <sup>9</sup>

It is obvious, that the tools from Renault Trucks are outstanding. The most expensive tool is a “Front Axle Tester” for EUR 23.553,17 in Italy. In the Netherlands the independent operators only have to pay EUR 12.507,59 for the same tool. The “Hoist adjusting tool” can be purchased in Italy for EUR 22.713,60 and in France for EUR 9.352,66. This discrepancy concerning the prices in different countries is also valid for the other three most expensive tools.

At the end of this paragraph the truck manufacturers have been asked, if they provide special financing models like leasing for their special tools. All manufacturers negate this question.

<sup>9</sup> Renault, MAN and Mercedes provide country-specific analysis. For these manufacturers, the diagram contents the prices for the country, where independent operators have to pay most for the special tool in scope.

### 10.5 Actualisation of Information (1.5)

This paragraph deals with the information policy of the truck manufacturers. It is a prerequisite, that free operators get information on common faults, recall campaigns or technical bulletins (refer to updates of and supplements to the existing workshop manuals), because otherwise safety related problems of a specific vehicle cannot be adequately considered to secure customers' security. Furthermore, the free operators cannot keep pace with the authorised dealers, if they do not have access to the latest spare part numbers, on information on modified parts or information on software updates. Fig. 10-8 shows, that no truck manufacturer delivers the same information to independent operators than to its authorised network.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.5.1	get ind. op. same inf. on common faults	yes	yes	yes	yes	yes	yes	yes
1.5.1.2	get ind. op. inf. at same time	no	no	yes	yes	no	yes	no
1.5.2	get ind. op. same inf. on recall campaigns	yes	no	no	no	no	no	yes
1.5.2.2	get ind. op. inf. at same time	no	n/a	n/a	n/a	n/a	n/a	no
1.5.3	get ind. op. same techn. bulletins	yes	no	yes	yes	yes	no	yes
1.5.3.2	get ind. op. inf. at same time	no	n/a	yes	yes	no	n/a	no
1.5.4	get ind. op. same inf. on mod. parts	yes	no	yes	yes	yes	yes	yes
1.5.4.2	get ind. op. inf. at same time	no	n/a	yes	yes	yes	yes	yes
1.5.5	provide inf. on updates sparepart numbers	yes	yes	yes	yes	yes	yes	yes
1.5.5.2	get ind. op. inf. at same time	no	yes	n/a	yes	yes	yes	yes
1.5.6	get ind. op. same inf. on software updates	yes	yes	yes	yes	yes	yes	yes
1.5.6.2	get ind. op. inf. at same time	no	yes	yes	yes	yes	no	yes
1.5.7	provide hotline support on techn. quest.	no	yes	yes	yes	yes	yes	yes
1.5.7.1	get ind. op. the same inf.	n/a	no	yes	no	no	yes	yes

Fig. 10-8: Actualisation of information

Due to the variability of the provided answers, each truck manufacturer is treated separately.

### 10.5.1 DAF

According to DAF's reply, they only had a few enquiries from independent operators requesting to provide them with technical information. Based on the relatively low numbers of the requests to receive technical information, DAF has not invested in specific software or IT-interfaces that will enable independent operators to have access to the technical information they may require by means of an Internet portal, CD's or DVD's. DAF has established a central DAF Dealer Systems Helpdesk instead that will provide this information in paper format or, upon request, as a digital PDF-file. DAF's national sales subsidiaries in the EU are instructed to refer the relevant requests to the DAF Dealer Systems Helpdesk.

The central DAF Dealer Systems Helpdesk will, on the request of independent repairers, provide these with the full scope of technical information that DAF has made available to its authorised service dealers. The information will have the form of DAF's regular service documentation (Technical Information Bulletins, Maintenance Manuals, Workshop Manuals, Fluids and Lubricants Manuals, Special Tools Manuals, System Binders and Component Binders) for authorised dealers. The information may also be provided in part as a fax message, e-mail or CD containing the PDF-files with the specific pages of these documents that relate to the question received.

According to DAF, the format of the information can further be printouts of the computer screens generated by the DAF Service Rapido and DAF Parts Rapido software DAF has made available to its authorised repairers on a monthly license fee basis. To make this software available to independent operators in a similar manner as for authorised DAF service dealers, it would, according to DAF's statement, require investments that are not reasonably economically justifiable, considering the current low demand from independent operators. Furthermore, DAF is of the opinion, that independent operators are not prepared to pay the relevant monthly license fee, in view of the in general relatively low number of repair jobs on DAF vehicles in their workshops. The DAF Dealer Systems Helpdesk will however enable independent operators to have access to printouts of the same computer screen pages as authorised DAF service dealers, this on an ad hoc basis and without the need to commit to regular license payments.

In conclusion, DAF offers the required information, but their information system only allows providing information to independent operators upon request. Furthermore, DAF does not have a hotline support on technical questions.

### 10.5.2 Iveco

According to Iveco, they have not yet structured their information provision according to the needs of independent operators. The authorised operators are linked with Iveco via "qualitative standard requirements", which encourage a "subscription" of the technical information. Iveco does not give a hint, if this system is also offered to independent

operators. Although Iveco declares to deliver information on common faults, updated spare part numbers and software updates, the information media is not mentioned.

At present, Iveco does not provide a hotline support. In the future, they intend to run a hotline on spare parts.

### **10.5.3 Volvo**

Apart from information on recall campaigns, Volvo delivers all the required information. Furthermore, they undertake a hotline support on technical questions.

### **10.5.4 Scania**

Apart from information on recall campaigns, Scania delivers all the required information, if the user has subscribed to the information system. According to Scania, information on recall campaigns is sent directly to their end customers and is based on unique chassis information. Scania is of the opinion that new vehicles are not sold by independent operators and therefore information on recall campaigns is not relevant.

Scania undertakes a hotline support on technical questions, but independent operators do not get the same information as the authorised network.

### **10.5.5 Renault**

Renault provides information on common faults to independent operators, but not at the same time as authorised workshops. The information on recall campaigns will be sent to independent operators, when the authorised operators duly implement the technical solution. The same is valid for technical bulletins.

Renault undertakes a hotline support on technical questions, but independent operators do not get the same information as the authorised network.

### **10.5.6 MAN**

According to MAN, they provide information on common faults, but the process to inform independent operators at the same time as authorised workshops is still in progress. Concerning recall campaigns, only authorised partners are informed. The same is valid for technical bulletins.

Information on software updates exist for independent operators, but due to “security adjustments” (know-how information) they are not provided at the same time as authorised workshops. All other required information is accessible for independent operators.

### 10.5.7 Mercedes

According to Mercedes the independent operators get information on common faults, recall campaigns and technical bulletins but not at the same time as authorised dealers. Between the monthly updates of the information system, very urgent information is distributed to the authorised network separately (e.g. via mail). Independent operators will receive the same information with the next monthly update of the information system.

All other available information is forwarded by Mercedes to the independent operators in the same form and at the same time as for authorised operators and the hotline support also exists for both parties.

### 10.6 Training Information (1.6)

This chapter deals with the provided training programmes to study further the involved staff at the workshop. The questionnaire mainly asks for the information medium and for price differences between authorised workshops and independent operators (Fig. 10-9).

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.6.1	provide remote training progr.	no	yes	yes	yes	yes	yes	yes
1.6.1.1	get ind. op. the same inf.	n/a	yes	yes	yes	yes	yes	yes
1.6.1.2	ind. op. pay same price	n/a	yes	yes	yes	yes	yes	yes
1.6.2	provide classroom training	yes	yes	yes	yes	yes	yes	yes
1.6.2.1	can ind. op. participate in same lessons	yes	yes	yes	yes	yes	yes	yes
1.6.2.2	ind. op. pay same price	yes	yes	yes	yes	yes	yes	yes
1.6.3	access to exterior train.	yes	yes	yes	yes	yes	yes	yes
1.6.3.1	price in EUR per day for external training on engine management	440		150 - 200		120 - 185	385	

Fig. 10-9: Training information

All manufacturers provide the same classroom training for independent operators at the same price as for authorised operators. Apart from DAF, they also offer remote training programmes on CD/DVD or via Internet.

In all relevant countries, except France for Volvo, independent operators can participate in the same lessons as authorised operators. In France, Volvo has outsourced the training of independent operators to a training institution. Separate in-house training is offered to the authorised network. In all other countries Volvo carries out training directly.

Furthermore, it has been asked, if independent operators also have access to training carried out by authorised repairers or external training institutions, in case of not provided by the manufacturer itself. All manufacturers agree, that all independent operators have access to exterior training.

Finally, the manufacturers have to give the price for a training unit on engine management provided by an authorised repairer or an external training institution. Mercedes explains, that they do not offer training units on engine management up to now. Iveco and Scania have not given a price for this unit. The provided prices from the other manufacturers sometimes vary from country to country. For these manufacturers, Fig. 10-9 contents the lowest and the highest price. The given prices of all manufacturers are all in a similar range.

### 10.7 Price Discounts and Rebates for Authorised Repairers (1.7)

The questionnaire has asked for discounts and rebates for authorised repairers, because this could be a possibility to bypass the Block Exemption Regulation. Manufacturers may charge independent operators and authorised dealers the same price for technical information and afterwards they could refund an amount to authorised dealers. In this way manufacturers could pretend to follow the Block Exemption Regulation.

Although MAN has answered in the questionnaire not to offer special price discounts and rebates for authorised repairers, but the attached extract of a MAN service contract diverges from this answer. As official MAN service contractor, a workshop can get a price reduction of 38,40% on all special tools and a price reduction of 60,00% for all spare parts and repair manuals. According to the provided answers, the other manufacturers do not offer price discounts and rebates for authorised repairers (Fig. 10-10).

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
1.7.1	special price discounts for auth. rep.	no	no	no	no	no	no	no

Fig. 10-10: Price discounts and rebates for authorised repairers

### 10.8 Information for Diagnostic Tool Manufacturers (2)

In this paragraph it has been asked for the arrangements enabling diagnostic tool manufacturers to produce devices with the same functions as manufacturers' tools.

#### 10.8.1 Information Provision (2.1)

This section of the questionnaire deals with the information policy for diagnostic tool manufacturers. Fig. 10-11 shows the percentage of covered vehicles produced within the last 10 years, for which the manufacturers provide special information for tool manufacturers. All truck manufacturers do not deliver special information to diagnostic tool manufacturers.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
2.1.1	% veh. prov. spec. inf. for tool manuf.	0	0	0	0	0	0	0
2.1.3	are there inf. packages	n/a	no	n/a	no	no	no	no
2.1.6	get ind. diagn.toolmanuf. inf. at same time	n/a	no	n/a	no	no	no	no
2.1.8	inf. provision to diagntoolman. distrib. by centr. ent.	n/a	no	n/a	no	no	no	no
2.1.8.1	has entity mandate to dec. which inf. will be prov.	n/a	no	n/a	n/a	n/a	no	n/a
2.1.9	prov. techn. support for tool manuf.	n/a	no	n/a	no	no	no	no

Fig. 10-11: Information provision to diagnostic tool manufacturers

DAF explains, that they have not yet developed a general policy on what specific information they will provide to independent tool manufacturers. According to DAF, they will deal with the requests from these parties on their individual merits, when these requests will in fact be received. DAF is still in the process of reviewing the only request they have so far received from an independent parts manufacturer.

According to a statement from Volvo, they almost have no experience with demands from diagnostic tool manufacturers. To their knowledge, they have received no more than one or two general requests since the New Block Exemption Regulation came into force. In these instances, Volvo has offered to provide the same information made available to the authorised repairers and the independent operators. Volvo explains to await further experience with this type of requests in order to decide on any definitive approach in this matter.

All other truck manufacturers have not delivered any further explanations, why they do not provide special information to independent diagnostic tool manufacturers.

For the questions dealing with the price for independent diagnostic tool manufacturers (2.1.4 and 2.1.5), some vehicle manufacturers indicate the price of the information relevant for independent repairers. These answers are not useful in this chapter.

## 10.8.2 Test and Diagnosis information (2.2)

In this chapter of the questionnaire the truck manufacturers have been asked, if they provide information enabling tool manufacturers to install test procedures for specific trucks in their tools. The indispensable information has already been explained in the chapter dealing with passenger cars.

Only Iveco and MAN have answered these questions, although they do not offer special information for diagnostic tool manufacturers. This means, that these manufacturers deliver these information together with their “regular” information to independent operators.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
2.2.1	prov. descriptions of test procedures (steps)	n/a	no	n/a	no	no	yes	no
2.2.2	prov. test parameters	n/a	no	n/a	no	no	yes	no
2.2.3	prov. connection details incl. MIN/MAX values	n/a	yes	n/a	no	no	yes	no
2.2.4	prov. values expected under certain driv. cond.	n/a	yes	n/a	no	no	yes	no
2.2.4.1	if yes: provide failure mode values for scenarios	n/a	yes	n/a	n/a	n/a	no	n/a
2.2.5	electric. values in static/dynamic states	n/a	yes	n/a	no	no	yes	no
2.2.5.1	if yes : provide failure mode values for scenarios	n/a	yes	n/a	n/a	n/a	yes	n/a
2.2.6	prov. failure mode diagn. seq. incl. fault trees etc	n/a	yes	n/a	no	no	yes	no
2.2.7	prov. inf. on ECU and component init.	n/a	yes	n/a	no	no	yes	no

Fig. 10-12: Information on diagnosis to diagnostic tool manufacturers

Apart from descriptions of test procedures and test parameters, all other DAF information can be purchased from authorised dealers or the “DAF Dealer Systems helpdesk”.

Except failure mode values, MAN provides all the required information together with the information for independent operators.

### 10.8.3 Communication Protocol Information (2.3)

According to the New Block Exemption Regulation, it must be possible for independent operators to check all electronic vehicle components. It is a prerequisite, that independent diagnostic tool manufacturers get information comparable to ISO 15031 for all electronic vehicle components. The questionnaire asks for the necessary protocol information to manufacture a brand independent diagnostic tool (Fig. 10-13).

Only MAN provides some protocol information within the information for independent operators. They deliver information on fault code reading, resetting the service light and details of the diagnostic connector.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
2.3.1	prov. any add. protocol not covered by ISO 15031	n/a	no	n/a	no	no	no	no
2.3.2	prov. inf. on fault code reading/interpretation	n/a	no	n/a	no	no	yes	no
2.3.3	prov. live data parameter incl scale inf.	n/a	no	n/a	no	no	no	no
2.3.4	prov. inf. on funct. tests incl device act./control	n/a	no	n/a	no	no	no	no
2.3.5	prov. details how to obtain component/status inf.	n/a	no	n/a	no	no	no	no
2.3.6	prov. inf. on reset./adapt. learns/variant coding	n/a	no	n/a	no	no	no	no
2.3.7	prov. inf. on ECU identification & variant coding	n/a	no	n/a	no	no	no	no
2.3.8	prov. access to sec. codes req. for rep.funct.	n/a	no	n/a	no	no	no	no
2.3.9	prov. inf. how to re-set service lights	n/a	no	n/a	no	no	yes	no
2.3.10	prov. inf. on diagn. connector details	n/a	no	n/a	no	no	yes	no
2.3.11	prov. inf. for unambiguous veh. identification	n/a	no	n/a	no	no	no	no

Fig. 10-13: Communication protocol information

### 10.9 Arrangements relevant for Publishers

The New Block Exemption Regulation calls for the supply of fair and indiscriminate information to the independent operators as well as for independent publishers. Fig. 6-15 shows the percentage of covered trucks produced within the last 10 years, for which the manufacturers provide special information for publishers. Iveco and Scania do not offer special information for publishers. For these manufacturers, the information must be therefore provided together with the information relevant for the other independent operators.

According to DAF, they have not yet developed a general policy on what specific information they will provide to publishers. DAF will deal with the requests from these parties on their individual merits, when these requests will in fact be received.

The other truck manufacturers (Volvo, Renault, MAN and Mercedes) have covered 100% of the vehicles produced within the last 10 years by their information relevant for publishers.

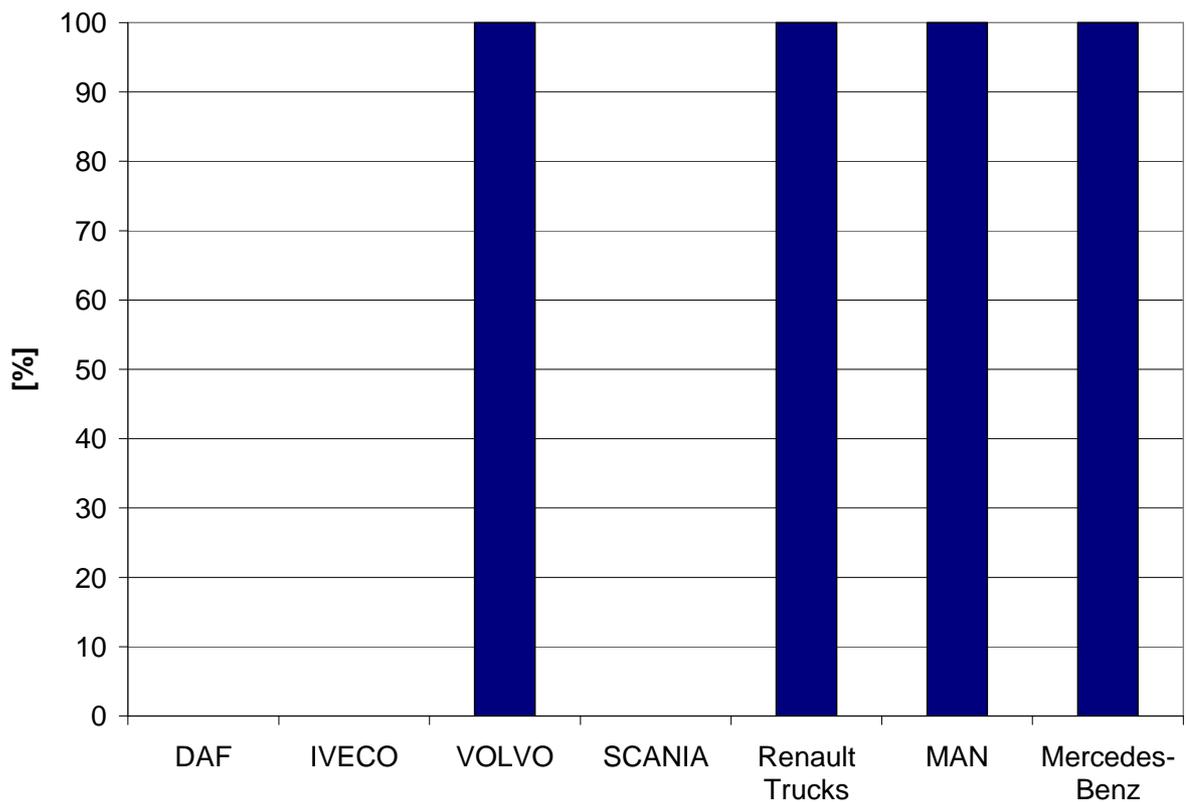


Fig. 10-14: Covered vehicles with specific information for publishers

In the questionnaire, the vehicle manufacturers have to give insight in their information policy concerning publishers (Fig. 6-16). The truck manufacturers, which provide special information for publishers are marked in yellow colour.

Most of the vehicle manufacturers providing special information for publishers use the Internet, Papers or CD's/DVD's as distribution media.

		DAF	IVECO	VOLVO	SCANIA	Renault Trucks	MAN	Mercedes-Benz
3.1.2	used information media			Paper, Internet		CD, Paper	Paper, Internet	DVD <sup>8</sup>
3.1.3	information packages	n/a	no	yes	no	no	yes	yes
3.1.6	prov. techn. support for publishers	n/a	no	yes	no	no	no	no
3.1.6.1	has entity mandate to dec. which inf. will be prov.	n/a	no	yes	n/a	n/a	n/a	n/a

Fig. 10-15: Information provision for publishers<sup>10</sup>

<sup>10</sup> In Poland Mercedes only offers papers and CD's to publishers

It is important for the publishers, that they are able to purchase the relevant information as reasonable packages. Only Volvo, MAN and Mercedes provide these packages.

According to Volvo, packages can be ordered, although there are no ready-made information packages. However, information can be obtained separately for one or more repair operations. Whenever such a request is made, Volvo will send a printout of the relevant information that is available to the publisher.

MAN has only mentioned, that they offer “brochures and Internet” as packages for publishers. Mercedes has individual prices according to the needed data content and published exemplars.

Another important item is the date, when publishers get the information for a new truck. Most of the manufacturers have answered, that the information is available one month before or at the same time as start of sales (manufacturers, which provide special information for publishers are marked in yellow colour). The exact figures can be drawn from Fig. 6-17. In this short period, it is rather impossible for publishers to produce an appropriate documentation.

<b>3.1.5</b>	<b>Date of information provision</b>
<b>DAF</b>	
<b>IVECO</b>	
<b>VOLVO</b>	1 month before start of sales
<b>SCANIA</b>	
<b>RENAULT</b>	1 month before start of sales
<b>MAN</b>	
<b>MERCEDES</b>	1-2 months before start of sales

Fig. 10-16: Date of information provision for publishers

The last part of this paragraph deals with the question, if the vehicle manufacturers provide technical support for publishers. Only Volvo offers this service. This hotline also has the mandate to decide, which information can be provided or not (considering intellectual property rights).

### **10.9.1 Price of information (3.1.4)**

To be able to compare, how much publishers have to pay for information, the questionnaire asks for the prices for the complete information for a mid-size vehicle relevant for 1000 published exemplars of a documentation. Due to the importance of this question, the answers are treated in a separate paragraph.

**10.9.1.1 DAF**

DAF does not deliver special information to publishers.

**10.9.1.2 Iveco**

Iveco does not deliver special information to publishers.

**10.9.1.3 Volvo**

Volvo points out, that the publishers will most likely prefer the Internet-based "Impact system" compared to a print-out version with the same information. According to Volvo, it can be expected, that publishers require a lot of information, which would make a paper version more expensive than the electronic information (Volvo charges EUR 100,- euro per demand plus EUR 1,- per page).

**10.9.1.4 Scania**

Scania does not deliver special information to publishers. According to Scania, the price would be quoted on request.

**10.9.1.5 Renault**

Renault provides the following price scheme, which is not comprehensible:

1000 driving & maintenance notices:	EUR 5.460,-
1000 time hours schedule book:	EUR 3.555,-
CD spare parts catalogue consult:	EUR 3.460,-

## 11 Truck Manufacturers - Internet-based Information System (Part B1)

### 11.1 General Remarks

The assessment of MAN covers all countries, in which the importer is a subsidiary of MAN. In Ireland and the Netherlands the importers are privately owned companies and therefore MAN's reply does not cover this countries. The website only consists of a spare part and special tools catalogue. For technical repair information only an overview of available paper information is provided.

### 11.2 Registration and Access (1.1 – 1.4)

To get 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.

Three Truck manufacturers have introduced an Internet-based technical information system so far. DaimlerChrysler is working on such a system. Only the MAN repair information website can be reached by a link on the standard website. Since standard search engines like Google or Yahoo do not list these websites, the user has to know the correct URL to get access to technical repair information.

	MAN	Scania	Volvo Trucks
registration from standard website	yes	no	no

Tab. 11-1: Registration Process (1.1.3)

From a technical point of view an electronic registration process could grant access to the website's content immediately. In spite of that and also in contrast to many car manufacturers, the truck manufacturers need several days to complete the registration process (see Fig. 11-1). In the case of Volvo, access is only granted if the user has participated in an Impact training course. The intervals between such training courses depend on the demand of candidate subscribers. As demand is currently rather limited, it can take up to 45 days before a training course is available. For that reason an independent operator who wants to subscribe to the Volvo information system has to wait nearly 3 months. In addition the total amount for the technical information has to be paid in advance (EUR 4115,-).

To register for the Scania website an initial non-recurring fee of EUR 60,- has to be paid.

Different cost models are offered (see Tab. 11-2). Scania and Volvo Trucks offer access to technical repair information on a subscription base. MAN uses a pay by access time model.

The use of the MAN Partner Net - After-sales is free of charge. There are no registration costs. The use of WEB MANTIS (spare parts and tools), incurs the costs. There is a daily flat-rate charge for the use of WEB MANTIS. This means that when the user logs in for the first time within a single day an amount of EUR 8,10 is charged for the use of WEB MANTIS. Once this charge is paid access is granted for using WEB MANTIS on the respective day.

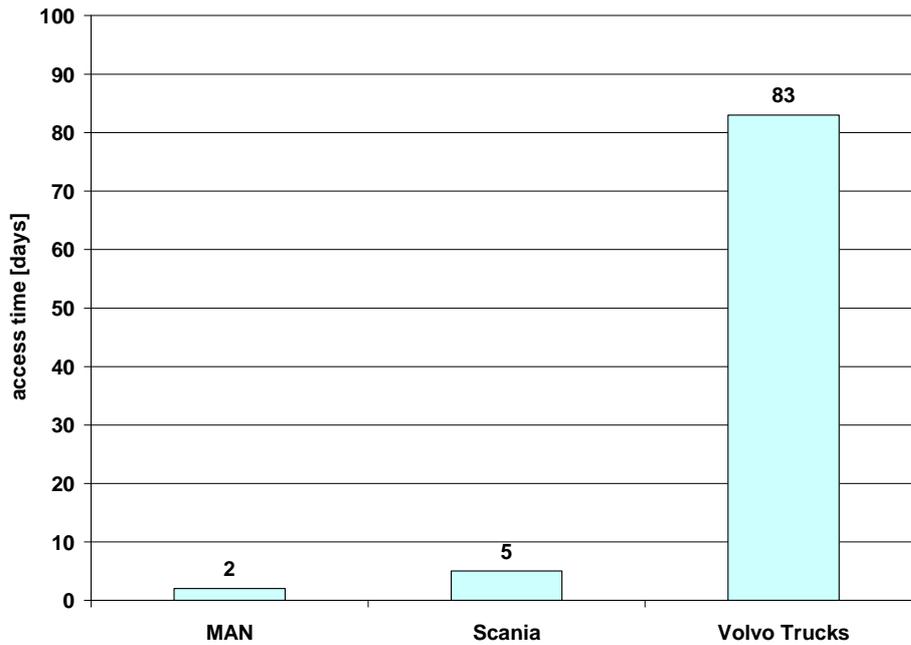


Fig. 11-1: First Access: Timing [days] (1.1.1)

	MAN	Scania	Volvo Trucks
pay per view	no	no	no
payment by accesstime	yes	no	no
payment by job	no	no	no
pay per DTC	no	no	no
subscription	no	yes	yes
other payments	no	no	no

Tab. 11-2: Cost Models (1.3.1 – 1.3.6)  
DTC: Diagnostic Trouble Code

Payment could be done on several ways. For MAN a credit card is needed and for Volvo payment is done by bank transfer or debit. Scania grants access after payment with e.g. credit card, invoice or cash. Scania has no vertical price control but a price list valid between factory and the national distributor. There are no special discounts.

	MAN	Scania	Volvo Trucks
bank transfer	no	yes	yes
credit card	yes	yes	no
debit	no	no	yes
other	no	yes	no
special discounts	no	no	no

Tab. 11-3: Method of Payment (1.4)

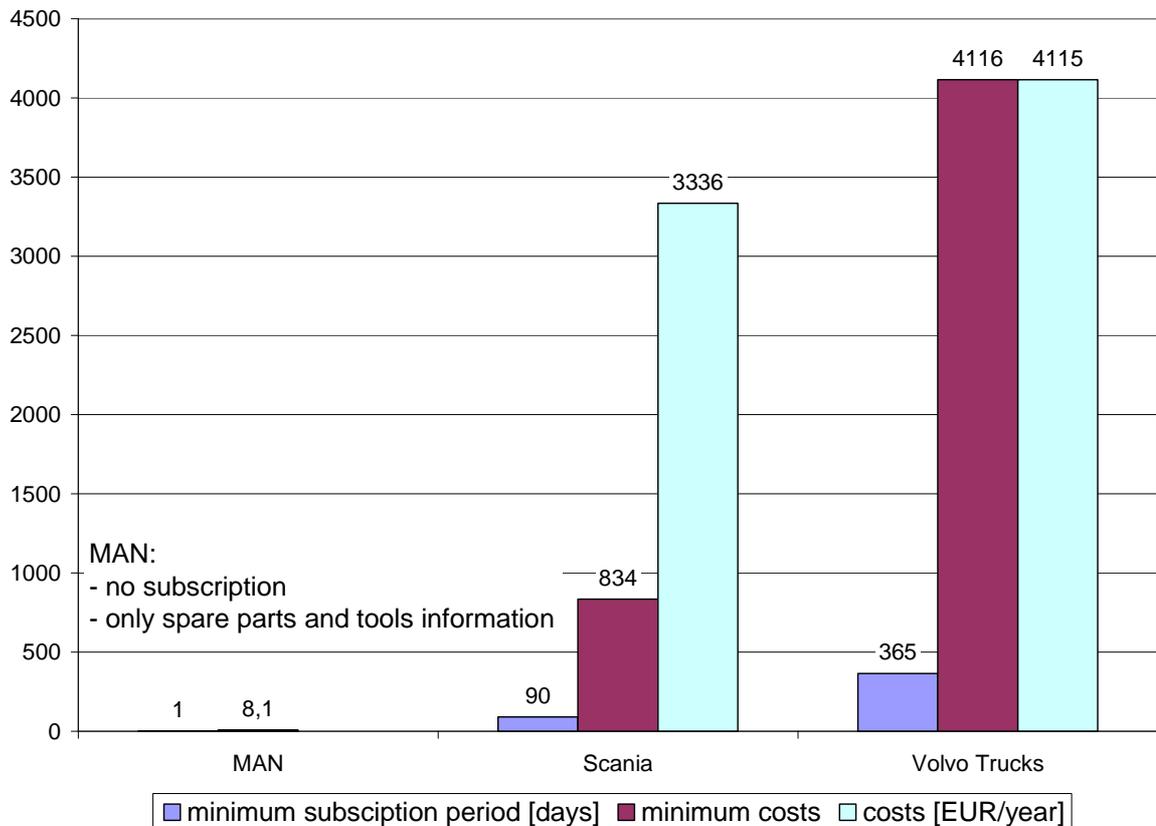


Fig. 11-2: Subscription of Technical Information (1.3.5)  
(costs per month & minimum subscription period)

Scania and Volvo offer a subscription of technical repair information. The minimum subscription period differs from 3 months for Scania to one year for Volvo. These periods are quite long compared to the demand of an independent operator to subscribe for a short period. In the passenger car sector these periods differ from 1 hour to one year. Fig. 11-2 gives an overview on the minimum costs with regard to the minimum subscription period and the costs for a period of one year. Due to the minimum subscription period of 3 months the minimum prices for Scania are EUR 834,- compared to EUR 4.115,- for Volvo (EUR 4.000,- annual + EUR 115,- annual and registered user). Also the one-year costs are about 20 % less costly for Scania. MAN does not offer a subscription of technical repair information. Only spare part and tool information are available on the website for a daily flat-rate charge of EUR 8,10.

### 11.3 Users (1.5)

MAN counts approx. 400 users of their website with 768 logins per month. For Volvo only one user is listed and Scania did not give any figures. Volvo remarked that at the date of the reply, due to the obligation of attending an Impact training course (see 11.2; access conditions), no independent users have actually subscribed to the website. The number indicated is the number of demands for a subscription received since October 2003 and that are now being processed. As already mentioned before, it is hardly understandable and not acceptable from an operator's point of view why the subscription takes such a long time. Due to these figures it may be assumed that only the MAN system gives useful spare part and tool information to independent operators for acceptable conditions.

	MAN	Scania	Volvo Trucks
<b>no. registered users</b>	ca. 400		1
<b>website logins/month</b>	768		(not applicable - permanent internet connection)

Tab. 11-4: Number of registered users and website logins per month (1.5)

### 11.4 Hard- and Software Requirements (1.7)

Tab. 7-11 gives an overview on 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]). Sometimes the user has to adjust the settings of his web browser in order to access and use the website.

	MAN	Scania	Volvo Trucks
min. processor [MHz]	233	300	200
min. RAM [MB]	64	500	64
min. display resolution	800 x 600	1024 x 768	1024 x 768
needed software	IE 5.5	IE	IE 5.x
needed software	Flash plug in		ICA Client
special plug-ins	yes	no	no
if yes: how many	1		
if yes: at what cost	0		

Tab. 11-5: Hard- and Software Requirements (1.7)

For Volvo two different clients have to be installed for getting access to the system. The installation process is complicated and exhaustive. At the end it was not possible to get access to the system. Since Volvo is the only manufacturer who needs a separate installation to get access to an Internet system, it is difficult to understand why such a complex procedure is needed.

## 11.5 Information Scope

### 11.5.1 Covered Vehicles and Update Periods (1.6)

Volvo is the only manufacturer whose system covers 100 % of the vehicles, which were produced within the last 10 years. For Scania only 40 % of these trucks are available (other on paper and CD/DVD). MAN only provides spare part and special tools information via Internet. The update periods are within a reasonable amount of time for all manufacturers.

	MAN	Scania	Volvo Trucks
covered vehicles last 10 years [%]	only parts	40	100
update periods [month]	monthly	weekly	1,5

Tab. 11-6: Covered vehicles and update periods (1.6)

### 11.5.2 Languages (1.8)

The websites are offered in several different languages. MAN only offers their technical information in German and English. For Scania and Volvo all major European languages are available, but all languages of smaller countries are missing. Especially the languages provided by MAN are not satisfying, although the implementation of further languages is under progress.

	MAN	Scania	Volvo Trucks
czech	no	no	no
danish	no	no	no
dutch	no	yes	yes
english	yes	yes	yes
estonian	no	no	no
finnish	no	yes	yes
french	no	yes	yes
german	yes	yes	yes
greek	no	no	no
hungarian	no	no	no
italian	no	yes	yes
latvian	no	no	no
lithuanian	no	no	no
norwegian	no	no	no
polish	no	yes	no
portuguese	no	yes	yes
romanian	no	no	no
slovenian	no	no	no
spanish	no	yes	yes
swedish	no	yes	yes
other	no	no	no

Tab. 11-7: Languages (1.8)

### 11.5.3 Vehicle Identification (2.1)

Since vehicles are delivered in different configurations and variants it is absolutely necessary to be able to precisely identify a given vehicle in order to obtain the correct and relevant technical information. Especially in the commercial vehicle sector an enormous number of variants exist. Scania for example has a theoretical possibility to build approx. 8 billion different variants of trucks, based on a modular system and approx. 90 % of the production is unique. Therefore adequate vehicle identification is a very important requirement, perhaps even more important than in the passenger car sector. Such identification could be performed by different means. The 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	D	B	9	5	4	0	3	2	1	K	2	3	5	6	9	9

Tab. 11-8: Vehicle Identification Number (VIN)  
Example MB Actros

Identification by VIN is only possible for Volvo Trucks and within the spare part identification of MAN. For Scania no automatic vehicle identification is available.

	MAN	Scania	Volvo Trucks
by VIN	yes	no	yes
by selective list	yes	yes	yes
by other	no	no	no
identification of original parts (incl. part no.)	yes	yes	yes

Tab. 11-9: Vehicle Identification (2.1)

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. Every manufacturer provides this method of identification and also an unambiguous identification of original parts.

#### 11.5.4 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 manufacturers) and search by components (only Volvo). An efficient way is usually a full text search. Scania provides such a feature. Since the different manufacturers use different terms for their systems and components 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. No manufacturer offers this option.

	MAN	Scania	Volvo Trucks
<b>Trouble Codes (DTC)</b>	no	no	yes
<b>symptoms</b>	no	no	no
<b>systems</b>	yes	yes	yes
<b>components</b>	no	no	yes
<b>OE numbers</b>	no	no	yes
<b>special tool names</b>	no	yes	no
<b>warning indication</b>	no	no	no
<b>full text search</b>	no	yes	no
<b>other</b>	no	no	no

Tab. 11-10: Search Criteria (2.2)

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 (MAN only spare parts list available) whereas a description is only available on the Volvo website. If the user wants to print these documents and file them for later use, a creation date or version number is useful to ensure the validity of the documents. Only Scania provides this information.

	MAN	Scania	Volvo Trucks
<b>title</b>	n/a	yes	yes
<b>short description</b>	n/a	no	yes
<b>creation date/version</b>	n/a	yes	no
<b>other</b>	n/a	no	no

Tab. 11-11: Display of Search Results (2.3)

### 11.5.5 Content (2.4)

Tab. 7-18 describes the scope of general technical repair information. For Volvo operating fuels and information on wheel/tyre combinations are missing, which are important for repair shops. The MAN website only consists of a spare part and special tools catalogue.

	MAN	Scania	Volvo Trucks
<b>functional descriptions</b>	n/a	yes	yes
<b>fitting / removal procedures</b>	n/a	yes	yes
<b>work plans / job times</b>	n/a	no	no
<b>electrical wiring</b>	n/a	yes	yes
<b>hydraulic wiring</b>	n/a	yes	yes
<b>pneumatic wiring</b>	n/a	yes	yes
<b>emission related information</b>	n/a	yes	yes
<b>body repair information</b>	n/a	yes	yes
<b>welding instructions</b>	n/a	no	yes
<b>pickup points</b>	n/a	yes	yes
<b>tightening torque figures</b>	n/a	yes	yes
<b>axle settings</b>	n/a	yes	yes
<b>brake clearance</b>	n/a	yes	yes
<b>operating fuels</b>	n/a	yes	no
<b>wheel-tyre combinations</b>	n/a	yes	no

Tab. 11-12: Information content – general information (2.4.1)

Usually the customer asks for price information before a repair job is performed. For a realistic estimation, information on job times is useful. Since this information is not required, as such by the BER, it is not on any website. Volvo is planning to integrate work plans and job times in the near future.

Servicing is one of the main jobs independent garages are working on. Therefore the information described in Tab. 7-19 is very important. Scania and Volvo provide sufficient service information.

	MAN	Scania	Volvo Trucks
<b>service intervals</b>	n/a	yes	yes
<b>service instructions</b>	n/a	yes	yes

Tab. 11-13: Information content – service information (2.4.2)

For a target-oriented fault identification and repair and in order to produce multi-brand scan tools, diagnostic information is required. Volvo does not provide information on ECU software versions, whereas Scania does not provide any information on test values under certain conditions. Both are important for diagnostic tool manufacturers.

	MAN	Scania	Volvo Trucks
<b>location diagnostic connector</b>	n/a	yes	yes
<b>DTC meanings</b>	n/a	yes	yes
<b>information on ECU software versions</b>	n/a	yes	no
<b>test procedures</b>	n/a	yes	yes
<b>test parameters</b>	n/a	yes	yes
<b>test values under certain conditions</b>	n/a	no	yes

Tab. 11-14: Information content – diagnosis information (2.4.3)

In order to be able to buy the correct spare parts to complete a 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.

Volvo and MAN provide all necessary information. For Scania spare part information is provided on a separate CD.

	MAN	Scania	Volvo Trucks
<b>spare part numbers</b>	yes	(yes)	yes
<b>spare part list for given vehicle</b>	yes	(yes)	yes
<b>graphical spare parts identification</b>	no	(yes)	yes

Tab. 11-15: 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 Volvo website no tool information is available.

	MAN	Scania	Volvo Trucks
<b>special tool list for given vehicle</b>	yes	yes	no
<b>description of intended use for each tool</b>	yes	yes	no

Tab. 11-16: Information content – special tools (2.4.5)

## 11.6 Differences between authorised and independent operators (1.9 + 4)

Based on the answers in the respective questionnaires Tab. 7-23 describes the differences in 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 for 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 that are based on different information systems (Internet or CD/DVD) are neglected.

Only MAN named differences, which are explained in detail as follows:

1. Registration Conditions
  - a. Authorised repairers get the registration via Internet-Certificate, independent repairers via Internet (reduced version).
2. Registration Costs
  - a. Authorised repairers free / independent repairers pay little.
3. Cost Models
  - a. Extranet for authorised repairers lump sum payment/independent workshops have to pay per day.
7. Languages
  - a. Under progress.
8. Vehicle Identification
  - a. Authorised repairers have ClientCheck, which independent repairers do not have.
9. Search Criteria
  - a. Authorised repairers have ClientCheck; independent repairers only have information from certificate of registration.
10. Display of Search Results
  - a. Internet = reduced version to Extranet (contracted workshops).
11. Service Information
  - a. Internet does not have the full version of model range.
12. Test and Diagnosis Information
  - a. Internet does not show all possibilities.

	MAN	Scania	Volvo Trucks
registration conditions	yes	no	no
registration costs	yes	no	no
cost models	yes	no	no
covered vehicles / update periods	no	no	no
hard- / software requirements	no	no	no
languages	yes	no	no
vehicle identification	yes	no	no
search criteria	yes	no	no
display of search results	yes	no	no
information structure	yes	no	no
scope general repair info	no	no	no
scope service info	yes	no	no
test and diagnosis info	yes	no	no
spare parts info	no	no	no
special tools info	no	no	no

Tab. 11-17: Differences in the conditions and systems for authorised and independent operators

## 11.7 The Usability of the Information Systems

### 11.7.1 MAN

The MAN website only consists of a spare part and special tools catalogue. Their VIN number or a selective list identifies different truck models. For each model all spare parts of a certain vehicle system are displayed and all necessary information can be found quickly. For technical repair information only an overview of available paper information is provided.

### **11.7.2 Scania**

The website is divided into different main chapters. After choosing one main chapter, the user defines the truck by a selective list. Each main chapter consists of several documents, which are structured without any reproducible logic. Each document is a PDF version of paper based repair manual for a certain vehicle system. Due to the unclear structure of the main chapters it is more extensive to find the relevant documents, but all information was found within a reasonable amount of time.

The website also only contains information, which could be viewed free of charge and without any registration (bodywork information, accessories).

### **11.7.3 Volvo Trucks**

The after-sales standard website does not contain any information on what terms access is granted. For information how to subscribe to the technical information system Impact, the Volvo account manager should be contacted (no contact information displayed). To access the information content of the website the user needs to download an ECS software (approx. 7,5 MB) and an ICA client. After installing the ECS software a secure connection to the Volvo network is established. Although our IT department was in contact with Volvo several times it was not possible to get access to Impact.

## 12 Truck Manufacturers - CD/DVD based Information System (Part B2)

### 12.1 General Remarks

Renault only publishes spare part information on a CD. The main technical information is provided on paper. Therefore no further assessment has been made in the following chapters.

### 12.2 Access (1.1 – 1.4)

CD/DVD based Information Systems are provided by Iveco, Mercedes and Scania. Iveco offers packages with information on a single model; the available media are exactly the same for authorised repairers and for independent operators. Scania and Mercedes offer a CD package with technical information for all models.

	Iveco	Mercedes	Scania
<b>package all models</b>	no	yes	yes
<b>package single model</b>	yes	no	no
<b>package with specific system for all models</b>	no	no	no
<b>other</b>	no	yes	no

Tab. 12-1: Available information packages (1.1)

Analogous to the offer to authorised repairers various information packages are offered by Mercedes:

- Passenger car package (passenger cars, off-road vehicle, transporters)
- Commercial vehicles  
(transporters, commercial vehicles, Unimog, MB-trac, busses)
- Passenger cars / Off-Road vehicles
- Trucks
- Transporters
- Unimog / MB-trac

Since CD/DVD based systems are less flexible than Internet-based ones, the variety of options is small. The need to purchase a package for all models does only fulfil the

requirements of large repair shops or repair shops, which are specialised on specific brands. The requirement of independent repairers is a flexible system with a possibility to purchase small information units.

The costs for a one-year subscription are described in Fig. 12-1. The Scania price is EUR 5.000,-, which is quite high and even higher than the price for a one-year subscription to the Internet system (EUR 3.336,-, see chapter 11). For a one-time delivery the minimum subscription time is 3 months, which equals to EUR 1.250,-.

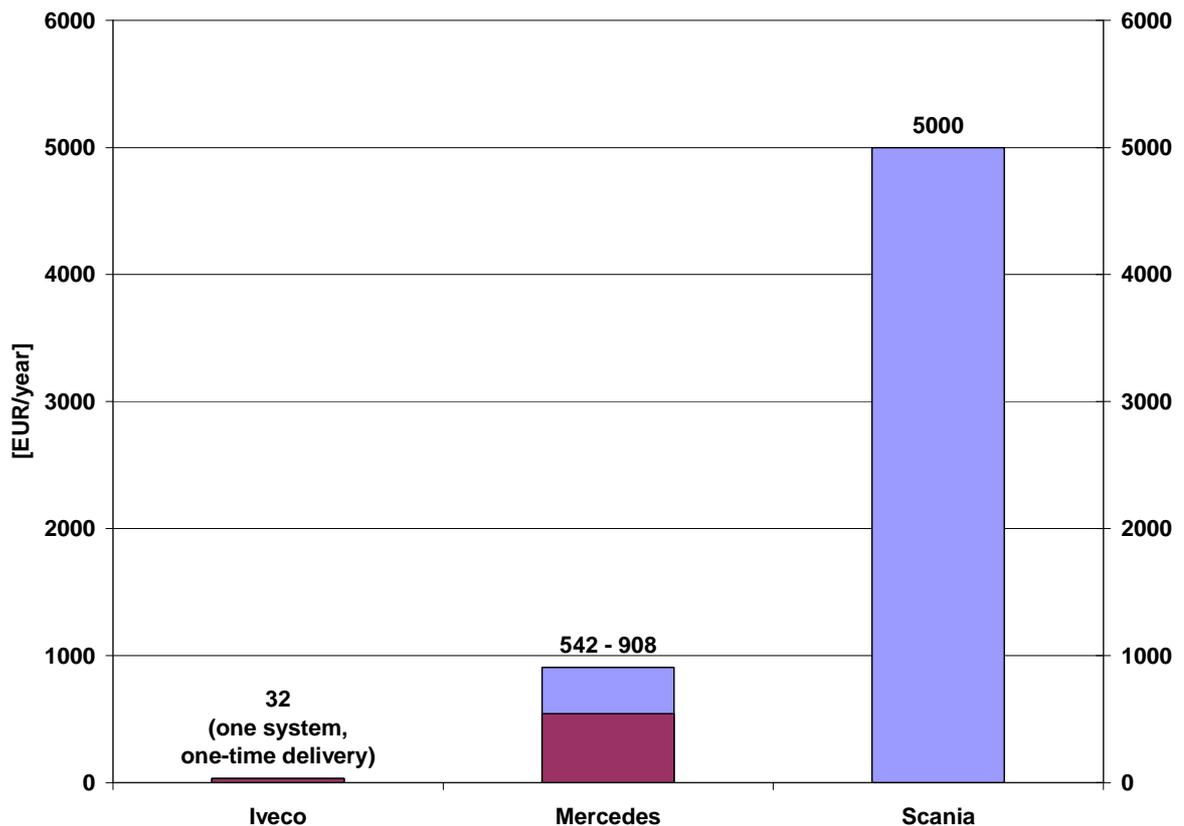


Fig. 12-1: Costs Information Packages for a One-year Subscription (1.1)

Mercedes has different prices for each country, which differ from EUR 542,- to 908,- (DK: 623,-; F: 590,-; GER & NL: 542,-; UK & IRE 568,-; I: 600,-; PL: 908,-). Again, the largest prices have to be paid in Poland. Since there are no other purchase options, the price for a one-time delivery is identical to the one-year subscription.

Iveco provides a CD with technical repair information on a single vehicle system for a price of EUR 32,- per system.

The delivery time for each manufacturer is approximately 7 days (Scania: 5 - 10 days). Only for Mercedes, inside of Germany the CD's are delivered within 5 days. The minimum

subscription period is 12 months for Mercedes (cancellation time: 3 months) and 3 months for Scania.

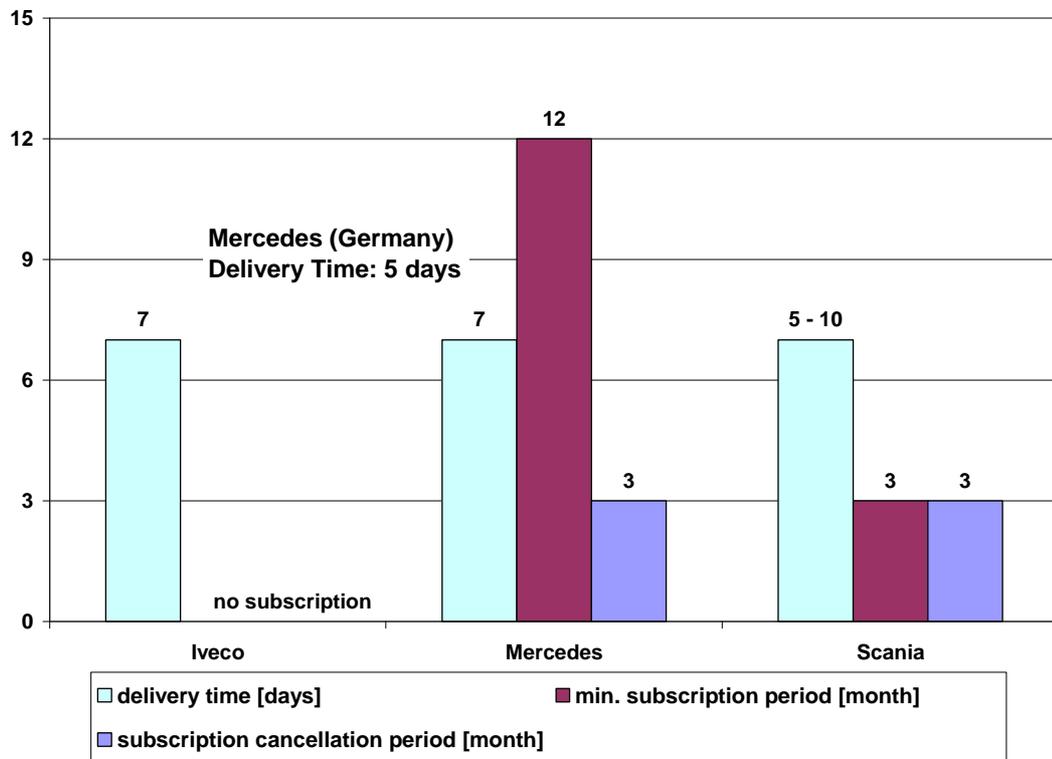


Fig. 12-2: Delivery Time, Minimum Subscription Period and Subscription Cancellation (1.2)

Payment could be done on several ways. For Iveco payment is possible by bank transfer or credit card; Mercedes payment is done by debit (France: by cheque). Scania grants access after payment with e.g. credit card, invoice or cash. Scania has no vertical price control but a price list valid between factory and the national distributor. There are no special discounts.

	Iveco	Mercedes	Scania
bank transfer	yes	no	yes
credit card	yes	no	yes
debit	no	yes	no
other	no	no	yes
special discounts	no	no	no

Tab. 12-2: Method of Payment (1.3)

The local authorised dealer network distributes Iveco's CD packages. For Mercedes this information is provided directly by the manufacturer (except for Ireland where the distribution is provided by the General Distributor), whereas Scania uses both methods

	Iveco	Mercedes	Scania
<b>directly by manufacturer</b>	no	yes	yes
<b>by local authorised dealers</b>	yes	no	yes
<b>by any other organisation</b>	no	no	no

Tab. 12-3: Distribution of technical information (1.4)

### 12.3 Users (1.5)

The Mercedes and Scania technical information is purchased by more than 100 users, which represent significant numbers, but two third of the registered Mercedes users are from Germany. All other countries are between 1 (DK and Italy) and 13 (United Kingdom) registrations. Iveco does not count any users.

	Iveco	Mercedes	Scania
<b>number of users per year</b>	0	150	105

Tab. 12-4: Number of users (1.5)

### 12.4 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 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. Iveco did not provide any information on display resolution and disk space.

	Iveco	Mercedes	Scania
<b>min. processor [MHz]</b>	90	200	300
<b>min. RAM [MB]</b>	23 (Ram)	64	64
<b>min. display resolution</b>		1024 x 768	1024 x 768
<b>min. display resolution</b>		768	768
<b>min. disk space [MB]</b>		6000	8000
<b>needed software</b>	Acrobat Reader		IE
<b>special plug-ins</b>	no	no	no

Tab. 12-5: Hard- and software requirements (1.6)

## 12.5 Information Scope

### 12.5.1 Covered Vehicles and Update Periods (1.2.2.3 + 1.2.2.5)

For Mercedes technical repair information is available for all models produced within the last 10 years. With Iveco (90 %) and Scania (85 %) only a portion of technical repair information is published on CD; all other information is on paper (Scania and Iveco) or Internet (Scania).

During a subscription update CD's are sent 4 times annual for Scania and 11 times annual for Mercedes. Since Iveco does not offer a subscription of technical repair information, no update figures were given.

	Iveco	Mercedes	Scania
<b>covered vehicles last 10 years [%]</b>	90	100	85
<b>updates per year</b>		11	4

Tab. 12-6: Covered vehicles and update periods (1.2.2)

### 12.5.2 Languages (1.7)

Also the CD's are offered in several different languages. All manufacturers offer their technical information in Dutch, English, Finnish, French, German, Italian, Portuguese, Spanish and Swedish. Mercedes remarks that for all languages except German, English, French, Spanish and Italian only parts of the information is translated.

	Iveco	Mercedes	Scania
<b>czech</b>	<b>no</b>	yes	<b>no</b>
<b>danish</b>	yes	yes	<b>no</b>
<b>dutch</b>	yes	yes	yes
<b>english</b>	yes	yes	yes
<b>estonian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>finnish</b>	yes	yes	yes
<b>french</b>	yes	yes	yes
<b>german</b>	yes	yes	yes
<b>greek</b>	<b>no</b>	yes	<b>no</b>
<b>hungarian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>italian</b>	yes	yes	yes
<b>latvian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>lithuanian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>norwegian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>polish</b>	<b>no</b>	yes	yes
<b>portuguese</b>	yes	yes	yes
<b>romanian</b>	<b>no</b>	yes	<b>no</b>
<b>slovenian</b>	<b>no</b>	<b>no</b>	<b>no</b>
<b>spanish</b>	yes	yes	yes
<b>swedish</b>	yes	yes	yes
<b>other</b>	<b>no</b>	<b>no</b>	<b>no</b>

Tab. 12-7: Languages (1.7)

### 12.5.3 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). All listed manufacturers provide identification by a selective list. The Iveco CD consists of a single PDF file with a complete repair manual. Automatic vehicle identification by VIN is not possible, but the VIN code is explained and the user is able to identify the vehicle manually. With the different methods of vehicle identification also all original parts can be identified.

	Iveco	Mercedes	Scania
<b>by VIN</b>	(no)	yes	yes
<b>by selective list</b>	yes	yes	yes
<b>by other</b>	no	no	no
<b>identification of original parts (incl. part no.)</b>	yes	yes	yes

Tab. 12-8: Vehicle Identification (2.1)

### 12.5.4 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 and search by components (both provided by all manufacturers). Some manufacturers offer additional features like a full-text search (Mercedes and Scania). The Iveco documentation consists of a single PDF file. With a PDF full text search, different search criteria are available.

In order to receive the necessary documents the title and a short description of the content of the document are necessary. This information is only provided by Mercedes. If the user wants to print these documents and file them for later use, a creation date or version number is useful, to ensure the validity of the documents. This information is not available for Scania.

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

	Iveco	Mercedes	Scania
<b>Trouble Codes (DTC)</b>	yes	yes	no
<b>symptoms</b>	no	no	no
<b>systems</b>	yes	yes	yes
<b>components</b>	yes	yes	yes
<b>OE numbers</b>	yes	yes	yes
<b>special tool names</b>	no	yes	no
<b>warning indication</b>	yes	no	no
<b>full text search</b>	yes	yes	yes
<b>other</b>	no	no	no

Tab. 12-9: Search Criteria (2.2)

	Iveco	Mercedes	Scania
<b>title</b>	yes	yes	yes
<b>short description</b>	n/a	yes	no
<b>creation date/version</b>	n/a	yes	no
<b>other</b>	no	no	no

Tab. 12-10: Display of Search Results (2.3)

### 12.5.5 Content (2.4)

Tab. 12-11 describes the scope of general technical repair information. Especially Mercedes is providing all necessary technical repair information. For Scania only welding information is missing. With the lack of emission related information and body repair information (incl. welding information) Iveco is not providing all types of information, which are relevant for independent workshops.

	Iveco	Mercedes	Scania
<b>functional descriptions</b>	yes	yes	yes
<b>fitting / removal procedures</b>	yes	yes	yes
<b>work plans / job times</b>	yes	yes	no
<b>electrical wiring</b>	yes	yes	yes
<b>hydraulic wiring</b>	yes	yes	yes
<b>pneumactical wiring</b>	yes	yes	yes
<b>emission related information</b>	no	yes	yes
<b>body repair information</b>	no	yes	yes
<b>welding instructions</b>	no	yes	no
<b>pickup points</b>	yes	yes	yes
<b>tightening torque figures</b>	yes	yes	yes
<b>axle settings</b>	yes	yes	yes
<b>brake clearance</b>	yes	yes	yes
<b>operating fuels</b>	yes	yes	yes
<b>wheel-tyre combinations</b>	yes	yes	yes

Tab. 12-11: Information content – general information (2.4.1)

Servicing is one of the main jobs independent garages are working on. Therefore the information described in Tab. 12-12 is quite necessary. All three manufacturers grant access to the respective information.

	Iveco	Mercedes	Scania
<b>service intervals</b>	yes	yes	yes
<b>service instructions</b>	yes	yes	yes

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

For a target-oriented fault identification and repair diagnostic information is required. Scania does not provide testing values, which are of importance especially for diagnostic tool manufacturers.

	Iveco	Mercedes	Scania
<b>location diagnostic connector</b>	yes	yes	yes
<b>DTC meanings</b>	yes	yes	yes
<b>information on ECU software versions</b>	yes	yes	yes
<b>test procedures</b>	yes	yes	yes
<b>test parameters</b>	yes	yes	yes
<b>test values under certain conditions</b>	yes	yes	no

Tab. 12-13: Information content – diagnosis information (2.4.3)

In order to be able to buy the correct spare parts to complete a 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. All three manufacturers give sufficient spare part information.

	Iveco	Mercedes	Scania
<b>spare part numbers</b>	yes	yes	yes
<b>spare part list for given vehicle</b>	yes	yes	yes
<b>graphical spare parts identification</b>	yes	yes	yes

Tab. 12-14: Information content – spare parts (2.4.4)

A special tool list for a given vehicle is useful to decide whether a repair can be performed economically in an independent workshop. Scania does not provide such a list, but the necessary special tools are named in the repair manuals. Therefore Scania was also marked with “yes”.

	Iveco	Mercedes	Scania
<b>special tool list for given vehicle</b>	yes	yes	(yes)
<b>description of intended use for each tool</b>	yes	yes	(yes)

Tab. 12-15: Information content – special tools (2.4.5)

### 12.6 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.

	Iveco	Mercedes	Scania
<b>purchase options</b>	no	yes	yes
<b>payment</b>	no	no	no
<b>hard- / software requirements</b>	no	no	no
<b>languages</b>	no	no	no
<b>vehicle identification</b>	no	no	no
<b>search criteria</b>	no	no	no
<b>display of search results</b>	no	no	no
<b>information structure</b>	no	no	no
<b>scope general repair info</b>	no	no	no
<b>scope service info</b>	no	no	no
<b>test and diagnosis info</b>	no	yes	no
<b>spare parts info</b>	no	no	no
<b>special tools info</b>	no	no	no

Tab. 12-16: Differences in the conditions and systems for authorised and independent operators

Any differences are explained in detail as follows:

1. Purchase Options

a. Mercedes

Only independent repairers can purchase Star Diagnosis (authorised operators can only rent).

b. Scania

MULTI for authorised workshops contains parts information, workshop manual, technical bulletins and job times - MULTI Service for independent operators contains the same as MULTI above except job times - MULTI Parts only contains parts information.

11. Test and Diagnosis Information

a. Mercedes

Restricted access to theft relevant functions/information.

## 12.7 The Usability of the Information Systems

### 12.7.1 Iveco

Iveco provides a CD with a single PDF file, which contains the complete repair manual. Due to the well-defined structure all information can be found within a reasonable amount of time.

### 12.7.2 Mercedes

The system is the same as those for the passenger cars and also identical to the system 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.

### 12.7.3 Scania

The CD contains the same PDF documents as the Internet. The installation process is very time consuming (approx. 1 hour) and requires a lot of disk space. Due to the zipped files on the CD it is not possible to run the information directly from the CD.

After a successful installation it was not possible to get access to the workshop manuals and the technical information (buttons were greyed).

## **13 Truck Manufacturers - Paper based Information System (Part B3)**

### **13.1 General Remarks**

Scania and Iveco also distribute technical repair information on CD. For Volvo the information made available to independent operators are printouts of the Internet-based database. Upon request, independent operators can obtain a package with information on specific repair and maintenance operations. Volvo charges EUR 100,- per request, plus EUR 1,- per printed page, but the information is not delivered before 3 days after payment. Subscription of the paper version is not possible. For both, Iveco and Volvo, a detailed analysis of the systems put in place is made in the respective chapters 11 and 12.

### **13.2 Access (1.1 – 1.5)**

DAF has established a central Dealer Systems Helpdesk that will provide information in paper format or, upon request, as a digital PDF-file. DAF's national sales subsidiaries in the EU are instructed to refer the relevant requests to the DAF Dealer Systems Helpdesk. Based on the relatively low numbers of the requests to receive technical information, DAF has not invested in specific software or IT-interfaces that will enable independent operators to have access to the technical information they may require by means of an Internet portal, CD's or DVD's. The central DAF Dealer Systems Helpdesk will, on the request of independent repairers, provide these with the full scope of technical information that DAF has made available to its authorised service dealers. The information has the form of DAF's regular service documentation (Technical Information Bulletins, Maintenance Manuals, Workshop Manuals, Fluids and Lubricants Manuals, Special Tools Manuals, System Binders and Component Binders) for authorised dealers. The information may also be provided in part as a fax message, e-mail or CD containing the PDF-files with the specific pages of these documents that relate to the question received.

The format of the information can further be printouts of the computer screens, generated by the DAF Service Rapido and DAF Parts Rapido software DAF has made available to its authorised repairers on a monthly license fee basis. To make this software available to independent operators in a similar manner as for authorised DAF service dealers, it would require investments from DAF that are from their point of view not reasonably economically justifiable, considering the current low demand from independent operators. Independent operators may moreover not be prepared to pay the relevant monthly license fee, in view of the in general relatively low number of repair jobs on DAF vehicles in their workshops. The DAF Dealer Systems Helpdesk will however enable independent operators to have access to printouts of the same computer screen pages as authorised DAF service dealers, this on an ad hoc basis and without the need to commit to regular license payments.

The prices charged for documentation such as workshop manuals are the same as charged to authorised DAF service dealers. Tailor-made information, such as faxes of certain pages of the workshop manuals or screen printouts from the DAF service software, is charged on a

cost recovery basis. Assuming payment by the independent operator is not a delaying factor, the information will be provided as soon as it is, considering the nature of the information, practically possible. Faxes with only a few pages will usually be transmitted quickly, documentation such as manuals will have the same delivery time as applies to deliveries to authorised DAF service dealers.

Also MAN provides a paper-on-demand system in Denmark, France, Germany and Poland.

Renault provides packages with technical information for all models and for a specific range:

- Technical information for all models
  - Repair manual EUR 1.320,- annual
  - Time Hours Schedule Book EUR 60,- annual
  - Driving & Maintenance notices EUR 480,- annual
- Technical information for a specific range
  - Repair manual EUR 350,- annual
  - Driving & Maintenance notices EUR 95,- annual
  - Spare Parts Catalogue EUR 114,-  
(available for models produced in series after 2000)

	DAF	MAN	Renault Trucks	Scania
<b>package all models</b>	yes	yes	yes	yes
<b>package single model</b>	yes	yes	yes	no
<b>package with specific system for all models</b>	no	yes	no	no
<b>other</b>	yes	yes	yes	no

Tab. 13-1: Available information packages (1.1)

The costs of the different information packages and options are described in Fig. 13-1. The highest prices have to be paid for MAN with approx. EUR 9.000,- – 10.000,- per model. The DAF information is also quite expensive, but the independent operator has the possibility to only buy portions of information as well (see above). The costs for technical information of all models are in the same range for Renault (EUR 1.800,-) and Scania (EUR 2.000,-).

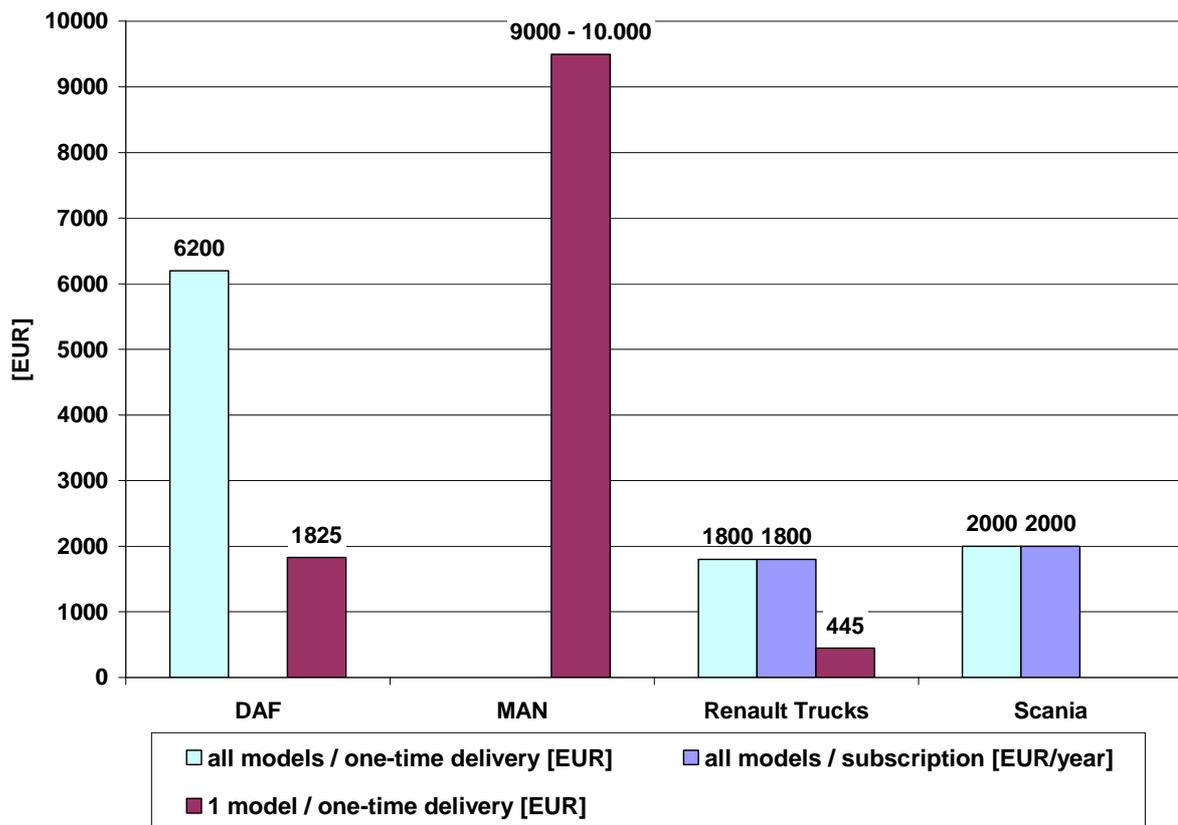


Fig. 13-1: Costs of Information Packages (1.1)

The delivery times are shown in Fig. 13-2. DAF needs 15 minutes - 30 days, depending on the nature of information requested and in stock availability. MAN has different delivery times, which were on demand for Denmark, France, Germany and Poland but hardly acceptable in Italy (5 weeks) and the United Kingdom (3 months). Also the Renault figures are not fulfilling the needs of an independent operator and are with 45 – 55 days far too large. The Scania information is delivered within 5 – 10 days. Since the paper manuals have to be sent per post these figures are acceptable.

Payment could be done in several ways (see Tab. 13-2). For DAF and Renault bank transfer does payment; MAN's payment is done by credit card. Scania grants access after payment with e.g. credit card, invoice or cash. Scania has no vertical price control but a price list valid between factory and the national distributor.

There are no special discounts.

For all manufacturers technical repair information is distributed by themselves and also by the local dealer network. DAF is the only manufacturer who provides information by themselves using the central Dealer Systems Helpdesk.

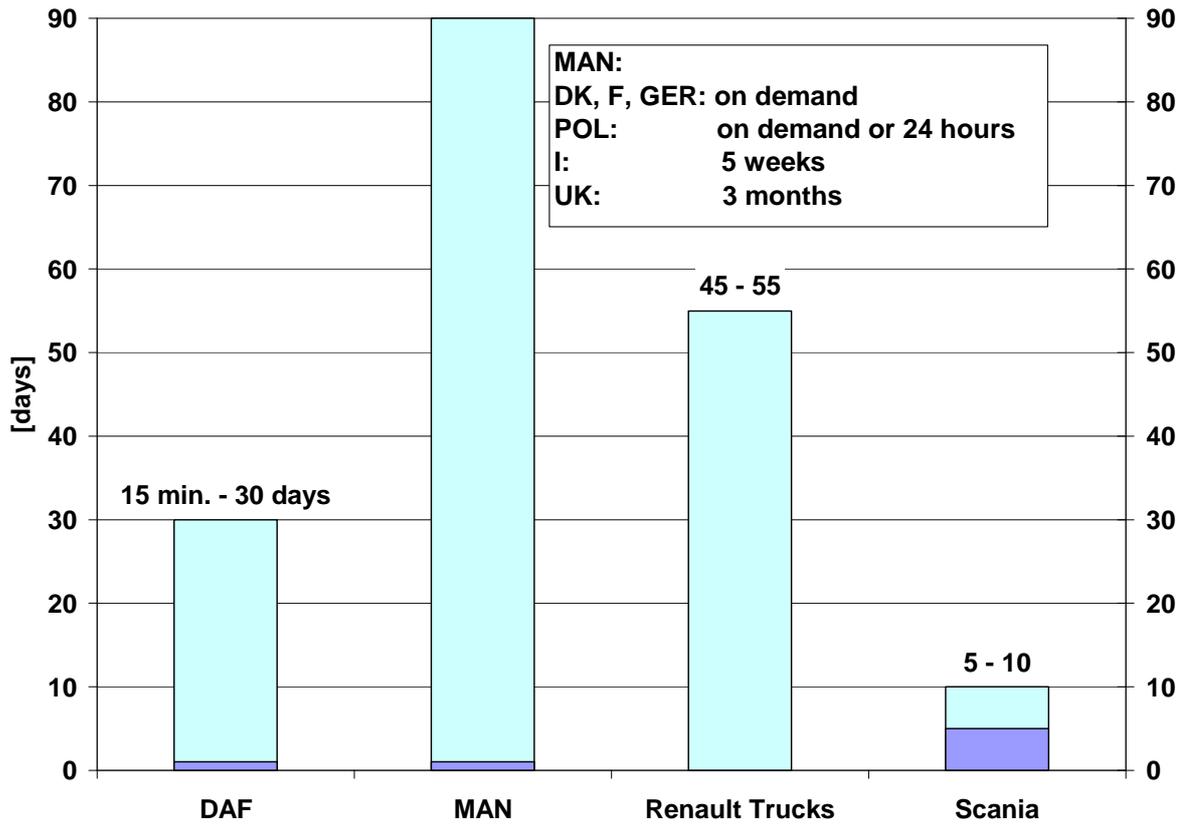


Fig. 13-2: Delivery Time (1.2.1.1)

	DAF	MAN	Renault Trucks	Scania
bank transfer	yes	no	yes	yes
credit card	no	yes	no	yes
debit	no	no	no	no
other payment	no	no	no	yes
special discounts	no	no	no	no

Tab. 13-2: Method of Payment (1.3)

	DAF	MAN	Renault Trucks	Scania
<b>directly by manufacturer</b>	yes	yes	yes	yes
<b>by local authorised dealers</b>	no	yes	yes	yes
<b>by any other organisation</b>	no	no	no	no

Tab. 13-3: Distribution of technical information (1.4)

### 13.3 Users (1.5)

Since the new Automotive Block Exemption came into effect DAF only had a few enquiries from independent operators requesting to provide them with technical information. On the basis of the records there have only been 12 - 15 of these requests throughout the EU. These came from independent repairers with the exception of one request from an independent tool manufacturer. DAF have not received any requests from roadside assistance operators, automobile clubs or from publishers. So far this has not been a significant change to the experience in years prior to the new Automotive Block Exemption.

MAN did not provide any figures and Renault answered that the paper based information has not been requested by independent operators. Only Scania counts a significant number of users.

	DAF	MAN	Renault Trucks	Scania
<b>number of users per year</b>	15	not known	0	> 200

Tab. 13-4: Number of users (1.5)

### 13.4 Information Scope

#### 13.4.1 Covered Vehicles and Update Periods (1.2.2.3 + 1.2.2.5)

Paper based information is available for 100 % of all models produced within the last 10 years. Renault's information is updated permanently and for Scania the update period is 3 months. MAN and DAF send paper printouts on demand and did not name any update periods.

	DAF	MAN	Renault Trucks	Scania
covered vehicles last 10 years [%]	100	100	100	100
updates per year	n/a	n/a	permanent	4

Tab. 13-5: Covered vehicles and update periods (1.2.2)

### 13.4.2 Languages (1.7)

All manufacturers offer their technical information in Dutch, English, French, German, Italian, and Spanish. Except for DAF Finnish, Portuguese and Polish repair manuals are also available. In addition Renault provides Turkish and Russian documents.

	DAF	MAN	Renault Trucks	Scania
czech	no	yes	yes	no
danish	no	yes	yes	no
dutch	yes	yes	yes	yes
english	yes	yes	yes	yes
estonian	no	no	no	no
finnish	no	yes	yes	yes
french	yes	yes	yes	yes
german	yes	yes	yes	yes
greek	no	yes	no	no
hungarian	no	yes	yes	no
italian	yes	yes	yes	yes
latvian	no	no	no	no
lithuanian	no	no	no	no
norwegian	no	yes	no	no
polish	no	yes	yes	yes
portuguese	no	yes	yes	yes
romanian	no	no	no	no
slovenian	no	yes	no	no
spanish	yes	yes	yes	yes
swedish	no	yes	no	yes
other	no	no	yes	no

Tab. 13-6: Languages (1.7)

### 13.4.3 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.

### 13.4.4 Information Search (2.1 + 2.2)

Paper based workshop manuals are divided into different chapters. These chapters represent systems of a vehicle, which are for that reason a main search criterion. A search by components could also be possible by an alphabetical index (not provided); for search by DTC and search by symptoms different charts are needed. Especially a DTC (DAF, MAN and Scania) and a symptom chart (provided by DAF) are important for independent operators.

	DAF	MAN	Renault Trucks	Scania
<b>Trouble Codes (DTC)</b>	yes	yes	no	yes
<b>symptoms</b>	yes	no	no	no
<b>systems</b>	yes	yes	yes	yes
<b>components</b>	no	no	no	no
<b>OE numbers</b>	no	yes	yes	no
<b>special tool names</b>	yes	no	no	yes
<b>warning indication</b>	yes	no	no	no
<b>other</b>	no	no	no	no

Tab. 13-7: Search Criteria (2.2)

### 13.4.5 Content (2.3)

Tab. 13-8 describes the scope of general technical repair information. MAN is lacking important information (emission related information, brake clearance, wheel/tyre combinations), welding instructions are missing for Renault and Scania. Job time information is not required as such by the BER, these figures are provided by Renault as an asset.

	DAF	MAN	Renault Trucks	Scania
<b>functional descriptions</b>	yes	yes	yes	yes
<b>fitting / removal procedures</b>	yes	yes	yes	yes
<b>work plans / job times</b>	no	no	yes	no
<b>electrical wiring</b>	yes	yes	yes	yes
<b>hydraulic wiring</b>	yes	yes	yes	yes
<b>pneumatical wiring</b>	yes	yes	yes	yes
<b>emission related information</b>	yes	no	yes	yes
<b>body repair information</b>	yes	yes	yes	yes
<b>welding instructions</b>	yes	yes	no	no
<b>pickup points</b>	no	yes	no	yes
<b>tightening torque figures</b>	yes	yes	yes	yes
<b>axle settings</b>	yes	yes	yes	yes
<b>brake clearance</b>	yes	no	yes	yes
<b>operating fuels</b>	yes	yes	yes	yes
<b>wheel-tyre combinations</b>	yes	no	yes	yes

Tab. 13-8: Information content – general information (2.3.1)

	DAF	MAN	Renault Trucks	Scania
<b>service intervals</b>	yes	yes	yes	yes
<b>service instructions</b>	yes	no	yes	yes

Tab. 13-9: Information content – service information (2.4.2)

Servicing is one of the main jobs independent garages are working on. Therefore the information described in Tab. 13-9 is quite important. MAN does not provide service instructions, which is against the requirements of an independent operator.

For a target-oriented fault identification and repair diagnostic information is also required. MAN does not provide any diagnosis information on paper. The available information is limited for all manufacturers, which is against the demands of independent workshops and in particular also the needs of independent tool manufacturers are fulfilled inadequately.

	DAF	MAN	Renault Trucks	Scania
<b>location diagnostic connector</b>	yes	no	yes	yes
<b>DTC meanings</b>	yes	no	yes	yes
<b>information on ECU software versions</b>	no	no	no	yes
<b>test procedures</b>	no	no	no	yes
<b>test parameters</b>	yes	no	no	yes
<b>test values under certain conditions</b>	yes	no	no	no

Tab. 13-10: Information content – diagnosis information (2.4.3)

Spare part information is provided by MAN, Scania (CD ROM) and Renault (CD ROM), but for Renault for only a quite high price of EUR 600,- annual. DAF does not satisfy the needs of an independent workshop and also not the requirements of spare parts distributor.

	DAF	MAN	Renault Trucks	Scania
<b>spare part numbers</b>	no	yes	(yes)	(yes)
<b>spare part list for given vehicle</b>	no	yes	(yes)	(yes)
<b>graphical spare parts identification</b>	no	yes	(yes)	(yes)

Fig. 13-3; Information Content – spare parts (2.4.4)

A special tool list for a given vehicle is useful to decide whether a repair can be performed economically in an independent workshop. All manufacturers fulfil this requirement.

	DAF	MAN	Renault Trucks	Scania
<b>special tool list for given vehicle</b>	yes	yes	yes	yes
<b>description of intended use for each tool</b>	yes	yes	yes	yes

Tab. 13-11: Information content – special tools (2.4.5)

### 13.5 Differences between authorised and independent operators (1.7 + 4)

Based on the answers in the respective questionnaires, Tab. 13-12 describes the differences in the conditions and the content of the technical information systems between authorised and independent operators.

	DAF	MAN	Renault Trucks	Scania
<b>purchase options</b>	no	no	no	no
<b>payment</b>	no	yes	no	no
<b>languages</b>	no	no	no	no
<b>vehicle identification</b>	no	no	no	no
<b>search criteria</b>	no	no	no	no
<b>scope general repair info</b>	no	no	no	no
<b>scope service info</b>	no	yes	no	no
<b>test and diagnosis info</b>	no	no	no	no
<b>spare parts info</b>	no	no	no	no
<b>special tools info</b>	no	no	no	no

Tab. 13-12: Differences in the conditions and systems for authorised and independent operators

Only MAN names any differences, which are explained in detail as follows:

2. Payment
  - a. Authorised partners have bank transfer.
7. Service Information
  - a. Service information will not be sent to independent workshops.

## **13.6 The Usability of the Information Systems**

### **13.6.1 DAF**

The information has the form of DAF's regular service information. The structure is logical and due to the tailor-made printouts, such as faxes of certain pages of the workshop manuals or screen printouts from the DAF service software, the user is only able to obtain the information, which is really needed.

No regular repair information is distributed and it depends on the quality of the central Dealer Systems Helpdesk whether the needs of the independent operators are treated sufficiently.

### **13.6.2 MAN**

No paper based information provided.

### **13.6.3 Renault Trucks**

Renault provides different manuals for repair information, spare parts and job times. Due to the good overview of paper documentation, each piece of information can be found within a reasonable amount of time.

### **13.6.4 Scania**

The paper-based manuals are identical to those on the Internet and on CD. Due to the good overview of paper documentation, each piece of information can be found within a reasonable amount of time.