Steffen Lehndorff

WORKING TIME AND OPERATING HOURS IN THE EUROPEAN AUTOMOTIVE INDUSTRY

Wissenschaftszentrum Nordrhein-Westfalen
Institut Arbeit und Technik
Abteilung Arbeitsmarkt

Dr. Steffen Lehndorff

Munscheidstraße 14
45886 Gelsenkirchen

Tel.: +49-209/1707-146
Fax.: +49-209/1707-124
E-Mail: lehndorf@iatge.de
WWW: http://iat-info.iatge.de

Working time and operating hours in the European automotive industry

Executive Summary

This report presents the findings of a written survey of working-time organisation in the European automotive industry. With the support of the European Metalworkers' Federation, works councils or trade union branches in 38 bodywork and assembly plants in ten countries were questioned about the duration of working time and operating hours and the organisation of shift systems for the reference year 1998. The survey carries on from an investigation on the same subject carried out by the IAT at the beginning of the 1990s and draws attention to a number of important changes.

1. In the course of the 1990s, following the end of the recession, there was a clear shift of emphasis in automobile production from two to three-shift operation. As a result, average operating hours in assembly plants have lengthened considerably.
2. The extension of night working is clearly no longer a controversial issue in the European automotive industry. As far as so-called "unsocial working hours" are concerned, the focus of attention has shifted to the extension of weekend working. Although regular weekend work is still the exception for the vast majority of the workforce, a gradual, step-by-step advance in the number of weekend shifts cannot be ignored. Germany is no exception to this trend.
3. Until the current upheaval in working-time policy in France, working-time reductions played an ever diminishing role in Europe during the 1990s. For this reason, working times in German assembly plants are still some of the shortest in the European automotive industry. At the same time, German car plants have some of the longest operating hours.
4. Particularly in countries such as Germany, Belgium and now France, where working times are relatively short, companies are making considerable efforts to differentiate shift systems and to extend and flexibilise operating hours by introducing variable elements into their shift systems. Of all the European countries, the flexibilisation of working-time organisation is furthest advanced in the German automotive industry.
5. Employee representative bodies participate in much of the decision-making on flexible working-time arrangements, although there is no doubt that the influence of employers is the dominant one in drive to increase flexibility. The more trade unions and other representative bodies press for working-time reductions, the more they feel induced or even forced to develop for themselves the "working-time know-how" they require to influence working-time policy in the workplace.

Because of the competitive pressure that is being transmitted all the way down to individual plant level, trade unions and works councils in all European countries have been obliged to make concessions, in some cases considerable ones, on the flexibilisation of working time and the extension of operating hours into the weekend. The competition between plants operates in all directions, not only from south to north, but also from north to south and from west to east.

Contents

Introduction

This report presents the findings of a written survey on working-time organisation in the European automotive industry. With the support of the European Metalworkers' Federation, works councils and trade union branches in bodywork and assembly plants were questioned about the duration of working time and operating hours and

the organisation of shift systems in the reference year 1998. The report is based on detailed information from 38 automobile plants in ten countries.[1]

This present survey follows on from an investigation on the same subject that we carried out at the beginning of the 1990s.[2] The earlier project was based primarily on expert interviews conducted in the workplace and focused on the European and Japanese volume car producers; it was subsequently extended to the USA. The reference years for the first survey, 1990 and 1991, were, like 1998, boom years for car producers, with high capacity utilisation. As a result, comparison of working-time organisation in these two years will not be distorted by the effects of recession.

The starting point for the first investigation was the observation that established routines in the organisation of working time in automobile plants were increasingly being called into question. For decades, two-shift operation had been the standard shift system for European bodywork and assembly plants, a system organised on the basis of the 40-hour and 5-day week. With very few exceptions, operating times of around 80 hours per week were the norm for automobile plants. Since production was usually halted for three or four weeks in the course of the year, annual operating times were between 3700 and 3800 hours. By the end of the 1980s, a trend towards the decoupling of working time and operating hours had become established in European plants. The forces driving this change were many and various.

- Firstly, the capital intensity of car production was increasing in leaps and bounds, due largely to major advances in automation in bodywork plants (pressing plants, body shell production), which was pushing pushed longer machine utilisation times right to the top of the agenda.
- The second factor was working-time reductions. At the beginning of the 1980s, the psychological barrier of the 40-hour week had already been broken in many European countries. In contrast to the period when the industry had changed over from the 48 to the 40-hour week, a transition that was largely completed in the 1960s, further reductions in operating hours were now no longer acceptable to many manufacturers because of the considerably higher investment costs they were now having to bear.
- The immediate impetus for the search for new shift systems came from the evolution of demand in the automotive industry, which exceeded all earlier expectations and plans. One way of reacting would have been permanently to increase production capacity. However, further expansion would have increased fixed costs still further; this was to be avoided. The extension of operating hours now seemed to be an appropriate way of dealing with the capacity problem in many automobile plants.
- A further factor was the incipient change in the site structures of the major car assemblers in Europe. Despite modernisation programmes, the old "brownfield" plants were being slimmed down as whole departments moved out, while new plants were being built on "greenfield" sites. The new

[1] The survey was conducted with the support of the Hans-Böckler-Stiftung, to whom heartfelt thanks are due. We are also grateful to the works councils and trade union branch officials who took the trouble to fill in the questionnaire, which was not such a simple task!

[2] Lehndorff, Steffen/Bosch, Gerhard (1993): Autos bauen zu jeder Zeit? Arbeits- und Betriebszeiten in der europäischen und japanischen Automobilindustrie. Berlin

"greenfield" plants not only had new assembly lines but also, in many cases, new shift systems as well.

– Finally, the increasingly intense competition with the Japanese automotive industry was focusing attention on the working-time organisation as a significant competitive factor. The apparently traditional temporal structures in which assembly plants in the Far East operated in fact provided the flexible framework for an extremely efficient system of work organisation. The connection between working time and work organisation became an important topic of debate in Europe as well.

Within a few years, between 1987 and 1992, working-time systems in European bodywork and assembly plants had changed considerably. The classic two-shift system had been supplemented by three-shift systems and working-time systems with extended shifts. True, the two-shift system was far from being a discontinued model, for reasons we will return to later in this report. Nevertheless, by 1992, one in five cars produced in the EU was being made in a factory with a new shift system.

One of the findings of our first survey was that relatively short working times were not in any way associated with short operating hours. It was evident, particularly in countries such as Germany and Belgium, that short working times could even provide the impetus for changes in shift systems that led to longer operating hours. All in all, we expected there to be a lengthy period of experimentation with new working-time systems in the European automotive industry.

In the period since our first survey, the European automotive industry first experienced a profound crisis and then a revival, both of which were accompanied by far-reaching rationalisation and restructuring programmes. Thus the end of this turbulent decade seemed to be the right moment to look again at working time and operating hours. What had been the effects on working-time organisation of the major changes in the automotive industry, the intensification of international competition, the processes of concentration, the sharp fluctuations in economic circumstances and the extensive programmes of technical and organisational rationalisation? We were particularly concerned in our follow-up study with the following aspects.

1. How had the *duration* of working time and operating hours changed at the end of the 1990s compared with the beginning of the decade?
2. Has the shift away from two-shift operation towards a greater diversity of systems, already apparent in the early 1990s, gathered pace? What are the dominant *shift systems* in European bodywork and assembly plants today?
3. What are the sources of temporal *flexibility* in the automotive industry today, and what changed in this respect in the course of the 1990s?

In contrast to our first investigation, we confined ourselves this time to a written survey. Consequently, it is not possible here to undertake a more extensive analysis of the links between working time and work organisation. Our main objective in this report is to *describe* the changes in working-time organisation in car assembly plants; this description is based on a considerably broader sample than our first survey. Our first investigation was based on a survey of 26 automobile plants in seven countries;

the present report is based on a sample of 38 plants in ten countries.[3] Of the countries covered in the previous report (Belgium, France, Germany, Italy, the Netherlands, Spain and Great Britain), Great Britain is not represented at all this time, while only one Italian plant is included. However, plants in the Czech Republic, Finland, Portugal and Sweden are included for the first time. All the major car manufacturers are represented. In total, our sample covers far more than half of all European bodywork and assembly plants (Table 1).

In order to make the data for the individual establishments comparable, uniform criteria had to be laid down for the collection and processing of the data. The data gathered related to the working times and operating hours of production workers in the body shell construction and final assembly areas. The working times and operating hours then had to be defined in a standardised way in order that the calculations could be effected. For this reason, the data presented in the following sections, particularly those on working times, may differ in many cases from those calculated by trade unions in the individual countries. The definitions used here are largely identical with those used in our first survey.[4] All calculations were carried out on the basis of annual hours in order to make comparisons possible. Three categories of working time and two categories of operating hours are identified.

Table 1: Automobile plants included in the sample (no. of plants operated by individual manufacturers or marques in each country)

	B	CZ	SF	F	D	I	NL	P	SP	S
Volkswagen	1				1			1***	1	
Seat									1	
Skoda		1								
Audi					1					
Opel	1				1			1	1	
Saab			1*							1
Ford	1				1			1	1	
Volvo	1						1**			1
DaimlerChrysler					2				1	
PSA				2				1	2	
Renault				1				1	1	
Nissan									1	
Fiat						1			1	
BMW					2					
Toyota								1		
Daewoo		1								

*Production to order for Saab and Porsche
**Volvo/Mitsubishi joint venture
*** VW/Ford joint venture until 1999

[3] Questionnaires were also returned from a few component plants. These were used to provide supplementary information for the present report.
[4] A few small changes have been taken into account in the comparisons, so that only figures based on standardised definitions are presented.

Standard working time is defined as paid attendance time. In some countries, in some companies or for some categories of employee, this is the same as contractual working time. In most cases, however, attendance time is longer than contractual and paid working time. In calculating standard working time, no account was taken of whether there are also unpaid breaks or of how long the paid breaks are. Nor is any account taken of whether working time is interrupted by breaks or whether the breaks are placed at the end of each shift, so that many employees can be expected to leave the plant early. Comparison is impossible unless all these peculiarities are ignored. Thus the standardised measure adopted is paid working time including all paid breaks. Holiday entitlement as well as statutory public holidays are included in the calculation of standard annual working times. In those plants in which holiday entitlement rises with seniority, the average holiday entitlement for that plant was used for the purposes of calculation, in so far as data were available.

Net working time is the standard working time minus all paid breaks. In the case of net working time, it does not matter whether these breaks are collective breaks, with production coming to a halt, or short breaks for individual employees or small groups, during which production continues. Calculating net working time makes it possible to compare paid working times minus all breaks, irrespective of how these times relate to the various country or establishment-specific definitions of contractual working time.

Actual working time is an approximation for the average volume of time actually worked in 1998. This includes in particular collective overtime (especially in the form of special shifts), in so far as this was not offset by subsequent free shifts or bridging days. Short-time working and other peculiarities, such as the number of movable holidays that fell on weekends in 1998, are also taken into account.

It was not possible to take account of average periods of absence, due to sickness for example, which are usually included in estimates of actual working time. To that extent, the actual working time is in fact only an approximation for standard working time in 1998 based on net working time.

Standard operating hours are calculated on the basis of the standard daily working time, minus all regular scheduled production stoppages.[5] Thus even with the same standard working times, standard operating hours may be different, depending on whether or not production continues during breaks (or part of breaks). Standard annual operating hours are calculated on the basis of the number of shifts per day and per week, minus plant closures over the course of the year. Additional shifts (e.g. at weekends) worked by crews on fixed-term contracts are also included in the calculation.

[5] It would also be conceivable, by analogy with the various forms of working time, to make a distinction between standard and net operating hours. However, this would not be sensible, since operating hours are intended to indicate the timeframe within which production is scheduled. If machines or production lines are at a standstill, it is irrelevant whether employees are on a break at that time or are not in the factory at all. For this reason, firms also define operating hours as the time within which production is scheduled to take place (i.e. regardless of unscheduled stoppages). Since we made a distinction between net and standard operating hours in our first survey, we have recalculated the standard operating hours for the relevant plants from the years 1990 or 1991 for the purpose of comparing operating hours in the present report.

Actual operating hours are calculated on this basis, in the same way as actual working time. It would also be conceivable, in calculating operating hours, to take account of all those periods during operating hours in which capacity is not fully utilized. This may be particularly relevant in the case of night shifts, weekend working or those plants that do not shut down completely during the summer. We will report on the data available to us on this point separately, but we consider the data as a whole to be insufficiently accurate or reliable to incorporate them into the comparisons of operating hours.

The data on working time and operating hours from all the automobile plants included in our survey, broken down into these five categories, are brought together in the data summary (Tables A-F, see appendix).[6] The following figures and tables single out particular extracts from this data summary. All data for 1998 are based on the completed questionnaires and on supplementary information provided by telephone. The comparative data for 1990/91 are taken from our first survey (Lehndorff/Bosch 1993).

The report is divided into the following sections. We begin by examining some of the important differences between working times in different countries and assembly plants and point to the changes that have taken place since 1990/91 (1). We then describe the main shift systems now in use in the automotive industry in Continental Europe and examine the changes that have taken place in working-time organisation since the early 1990s with respect to night shifts, weekend working and flexibility (2). This section is followed by a comparison of the operating hours made available by these working-time systems, following which we present the national and company-specific profiles that have emerged out of the trend towards the decoupling of working time and operating hours (3). The changes and trend thus revealed are then summarised by way of conclusion (4).

1 Working times

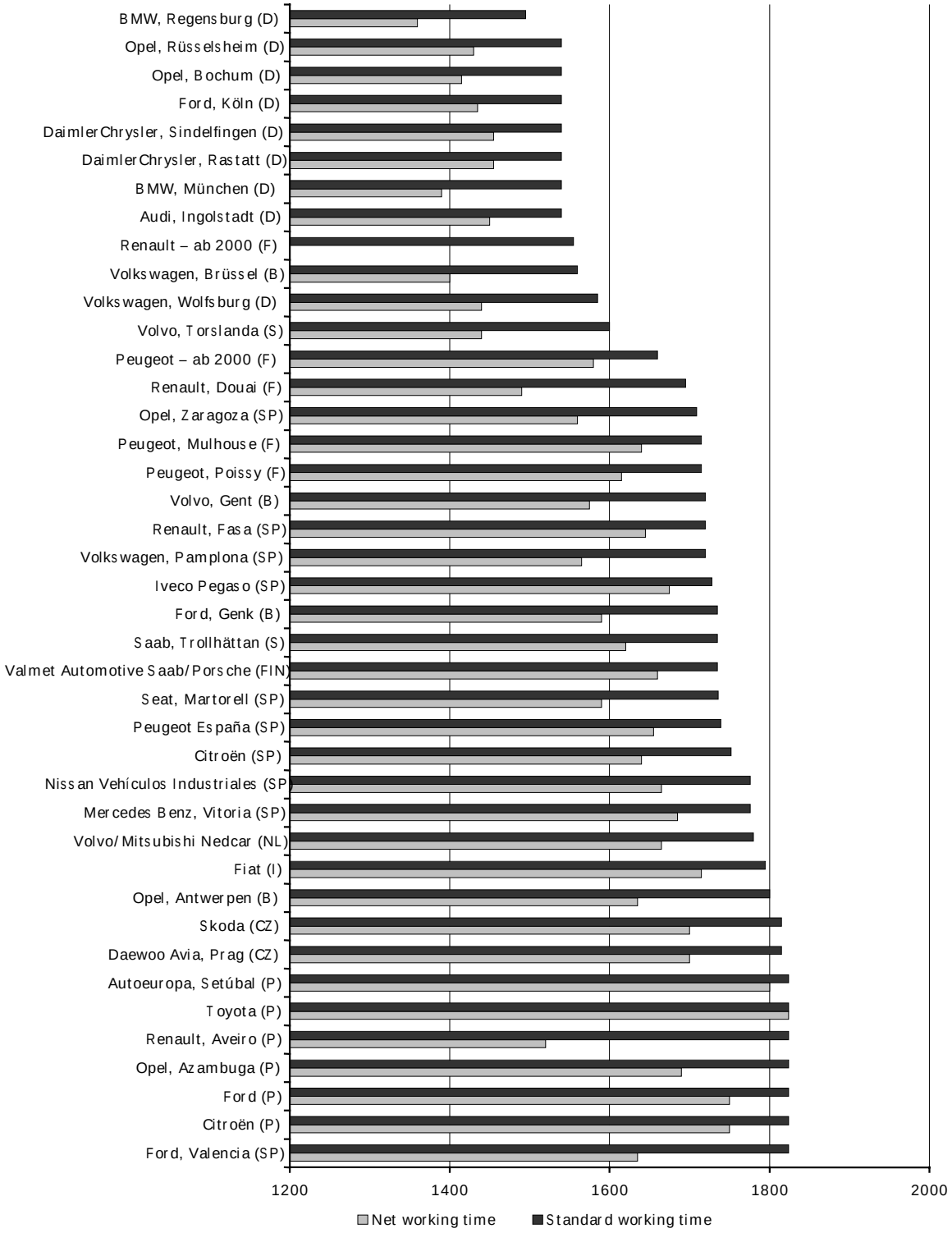
1.1 Standard working times

Standard working times in European automobile plants vary considerably. They range from 1495 hours (BMW Regensburg) to 1824 hours at Ford Valencia and a number of Portuguese plants. The range of variation is even greater in the case of net working times, which vary from 1360 hours (also BMW Regensburg) to 1824 hours at Toyota's Portuguese plant, where the contractual working time includes no paid breaks. The ranking of working times - classified by standard working times but including net working times - is shown in Figure 1. Thus some assembly workers in certain southern European plants work more than 300 hours a year longer than their counterparts in Germany, and if breaks are taken into account then the difference rises to around 450 hours.[7]

[6] The calculation process for each plant can be reconstructed with the aid of the evaluation sheets that will be found in the appendix to the present report. Minor errors cannot be completely excluded, one of the reasons being that the information provided in the completed questionnaires is not always sufficiently precise and consistent. Thus for some of the calculations, plausible assumptions were made which, if inaccurate, would not significantly distort the overall result.

[7] The numbers for Belgium in all figures and tables relate to 1999.

Figure 1: Working times in European car assembly plants, 1998 (hours per year)



Source: IAT survey on working time and operating hours in the European automotive industry

Only in around one quarter of the plants in our sample are standard working times shorter than 1700 hours. Thus in the great majority of European automobile plants they are at a level corresponding to a 37 to 39-hour week, assuming that holiday entitlement is between four and five weeks. The differences cannot be explained solely by the collectively agreed weekly working times but also by the different break arrangements, the length of the annual holiday entitlement and the number of statutory public holidays.

As far as the country rankings are concerned, there is no doubt about the top and bottom positions. Car workers in Germany work the shortest hours, while their counterparts in Portugal work the longest hours. In general, German automobile plants work a 35-hour week, although the length of the working week varies above and below[8] this figure in individual plants. In Portugal, on the other hand, the 40-hour week was not introduced until the 1990s and remains generally unchallenged. Working time in the Czech plants has to date slipped only slightly below the 40-hour mark. The French, Spanish and Italian plants are grouped together in the middle of the range, with relatively little difference between them. The wide dispersion of working times in the four Belgian and two Swedish plants is striking. This reflects the fact that, in these two countries, working times in the automotive industry are in some cases more strongly influenced by establishment-level negotiations than by industry-wide collective agreements.

1.2 Net working times and actual working times

The importance of establishment-level bargaining is reflected even more clearly in net working times, since one of the Belgian and one of the Swedish plants (VW and Volvo respectively) have some of the shortest working times in Europe. The example of the German plants is instructive here. The total length of short paid breaks over the year as a whole ranges between 85 hours in the two DaimlerChrysler plants included in our sample to around 150 hours at BMW's Munich plant and VW's Wolfsburg plant. This reveals the strong pressure being exerted by management in some companies as they seek to extend working time "internally", as it were, by reducing the length of paid breaks. As a result of the downward pressure that has been exerted in recent years, the average annual duration of paid breaks in German assembly plants is still above average, but the gap between Germany and the other countries has narrowed considerably (Table H in the data summary, see appendix).

In contrast, the difference between net working times and actual working times is generally less marked (cf. Table F in the data summary, see appendix). The difference is usually attributable to collective overtime, and in particular to Saturday shifts. In most cases, such overtime accounts for no more than 50 hours' work per year, although in some plants it is significantly higher than 5% of the standard working time (e.g. VW Wolfsburg and Audi Ingolstandt, with around 120 hours, and Seat, with 100 hours per head per year). In general, however, our second survey confirms what we found in our first investigation, namely that overtime in the automotive industry is more prevalent in the so-called indirect areas, such as maintenance, than in production.

[8] The reasons for these variations are explained below in the section on flexibility.

Only in a small number of plants were actual working times lower than net working times. There was little short-time working in 1998, a boom year for car manufacturers. The major exceptions in this respect are the Belgian plants, where short-time working has traditionally played an important role as a flexibility tool (see below).

Table 2: Shorter working times for certain categories of employee

	Car manufacturer	Employee category, working time
B	Opel Ford Volvo Volkswagen	Permanent night shift: 1575 instead of 1800 hrs/year (std.working time) Permanent night shift: 1455 instead of 1735hrs/year (std. working time) Weekend crew (maintenance): 28hrs/week Weekend crew (from 1999): 32hrs/week
CZ	Skoda Daewoo	Individual working-time agreement (health reasons) Night shift, weekend shift
F	Peugeot Renault	Night shift 36.5 hrs/week.; weekend shift 28 hrs/week.
D	Audi DaimlerChrysler Rastatt VW Wolfsburg	Night shift Weekend shift, pressing plant (scheduled) Permanent night shift
P	Renault	Weekend shift 2x12
SP	Ford Seat Peugeot Renault Iveco	Night shift shortened by 30 minutes because of overlapping Night shift Night shift 20 minutes shorter Night shift 34.75 hours/week; weekend shift Night shift 20 minute break in addition
S	Saab Volvo	Three-shift system 36 hours/week; night shift 34 hours/week; weekend shift 30 hours/week Evening shift 28 hours/week

Source: IAT survey on working time and operating hours in the European automotive industry

1.3 Shorter working times for certain categories of employee

In a number of plants, shorter working times has been agreed for certain groups of employees (Table 2). In most cases, these are night-shift workers (particularly in Belgium and Spain). Increasing use is being made of separate weekend crews, whose working times are often significantly shorter. Such weekend shift systems have been used for maintenance work for a long time, particularly in Belgium and France, but they are gradually being extended to production departments as well (we will return to this subject later).

1.4 Working-time reductions

During the 1990s, it proved difficult to push through working-time reductions, one of the key objectives of the European trade unions, in anything other than small steps, if at all (Table 3). The only exceptions are the German plants and VW's Brussels plant, where the 35-hour week was agreed (at VW in Germany, the 28.8-hour week was agreed as part of the now celebrated job safeguarding agreement), together with

Renault's Portuguese plant, where working time was reduced from 42.5 to 40 hours per week. These agreements were concluded in the period up to 1995. In the second half of the 1990s, VW's Belgian plant was the only one where a major working-time reduction was achieved, with the 35-hour week being introduced step by step as part of a job safeguarding agreement. In many plants, working-time reductions throughout the 1990s were confined to cuts of less than one hour week or to small increases in holiday entitlement. In a few cases, so-called "effective" working-time reductions were also agreed; under the terms of some of these agreements, paid breaks were moved to the end of the shift, allowing employees to leave work earlier.

In one plant, Opel's Antwerp facility, contractual working time was actually increased. The two-shift system with ten-hour shifts and Saturday working, which had been introduced in 1988, was abandoned at the beginning of 1999 and replaced by a three-shift system. In order to avoid the pay cuts that management was planning, an increase in working time was agreed.

Table 3: Reductions in contractual working time since 1990

	Car manufacturer	Contractual working-time reductions
B	Volkswagen Opel Other manufacturers	To 35-hour week Working-time increase yes*
CZ	Skoda Daewoo	40 -> 39.5 hours/week for shift workers (1992) 40 -> 39.5 hours/week (1991)
SF	Both plants	No
F	Renault PSA	from 39 -> 38h 10' no
D	All manufacturers Volkswagen	stepwise from 37.5 -> 35 hours/week to 28.8 hours/week with provision for temporary increases
I	Fiat	no *
NL	NedCar	No
P	Opel Ford Citroën Renault Toyota Autoeuropa	in two stages by 20'/week (1994, 1995) yes* yes* 42.5 -> 40 hours/week (1995) yes* no
SP	Volkswagen Seat Opel Ford DaimlerChrysler Peugeot Citroën Renault Nissan	yes* no 2 days more holiday no yes* no 8 hours/year x 2 (1992, 1993) by 13 hours/year by 25 hours/year

	Iveco	no
S	Both plants	yes*

* Incomplete data
Source: IAT survey on working time and operating hours in the European automotive industry

This differentiated evolution of contractual working time can also be seen in standard working times and net working times in those plants that were also included in our first survey (Figure 2 and Table G in the data summary, see appendix). The range of working times in the European automotive industry, which had widened further in the first half of the 1990s following the introduction of the 35-hour week in Germany, scarcely narrowed at all in the second half of the decade except in a few isolated cases such as VW's Brussels plant.

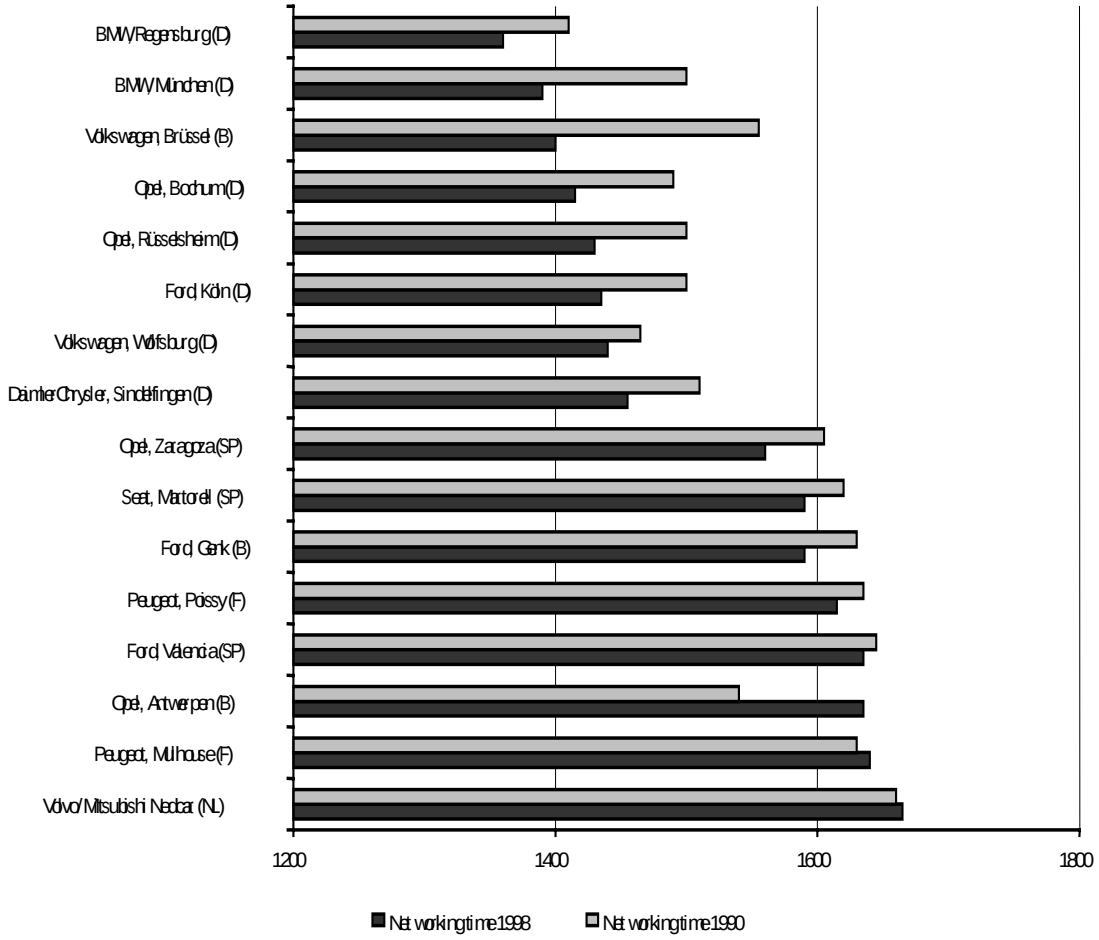
However, the reduction in working time currently being implemented in France means that this situation will now change. In anticipation of the reduction in statutory working time to 35 hours per week, collective agreements on the introduction of the 35-hour week were concluded in the two French car manufacturers in our sample, as they were in many other French companies. As a result, standard working times will fall to between 1550 and 1650 hours a year.

A number of company agreements concluded in Spanish assembly plants for the years 1990 and 2000 also led to cuts in working time. At around 6 hours per year on average, however, these reductions are very limited in scope.[9]

All the working time reductions that have been agreed since the mid-1990s offer manufacturers further scope for extending and flexibilising operating hours. However, it would be wrong to conclude from this that working-time reductions are a cause of working time flexibilisation. Firstly, it should be remembered that in most cases the actual cut in working time was very small. Secondly, even among the other plants mentioned below, there are a number of cases in which working time has been flexibilised even without a reduction in working time.[10] It

Figure 2: Net working times, 1990/91 and 1998 (hours/year)

[9] European Industrial Relations Review 307, August 1999: 19-21
[10] This is particularly evident in Great Britain, which could not unfortunately be included in our survey. Thus at Rover in 1999, it is true that the reduction in contractual working time for production workers from 37 to 35 hours per week was accompanied by the introduction of more flexible working hours. At Peugeot and Vauxhall, on the other hand, variable annual working hours were introduced without any reduction in contractual working time. Cf. Labour Research, February 1999: 17 f.



Source: IAT survey on working time and operating hours in the European automotive industry; Lehndorff, Steffen/Bosch, Gerhard (1993): Autos bauen zu jeder Zeit? Arbeits- und Betriebszeiten in der europäischen und japanischen Automobilindustrie. Berlin

is more likely that working-time reductions serve as a bargaining counter that can be exchanged for greater flexibility, or that they provide the impetus for flexibilisation. The flexibilisation of operating hours and working time will be examined in greater detail below.

2 The principal shift systems in the automotive industry

At the time of our first survey, there were 13 major automobile plants in Western Europe that no longer used the traditional two-shift system (Table 4). As already noted, the combined output of these plants accounted for barely 20% of total production in the European automotive industry. At that time, experimentation with new shift systems was still in its infancy, and when the recession of the early 1990s began to bite some of these plants reverted to two-shift operation, albeit in some cases temporarily. Furthermore, as we observed at the time, the benefits of the new working-time systems for car manufacturers were still a matter of controversy among management experts.

It is now clear, however, that the introduction of new shift systems was hardly a nine-days' wonder. Three-shift systems in particular are now much more widely used in the European automotive industry. Nevertheless, two-shift operation is still the industry's mainstay.[11]

Table 4: Assembly plants with new shift systems at the beginning of the 1990s

Shift system	**Plant**	**Year (or period) of introduction**
Three-shift system (alternating shifts)	Fiat Cassino Rover Longbridge	1988 1990
Three-shift system (permanent night shift)	VW Brussels Opel Saragossa Opel Bochum Seat Pamplona Ford Genk Renault Flins	1987 1988 1990-1993 1992-1993 1993 1993
Two-shift systems with extended shifts (8.5 – 10 hours) Monday to Friday	NedCar BMW Munich Peugeot Poissy	1988 1991 1991-1993
Two-shift systems with extended shifts (8.5 – 10 hours) Monday to Friday and 11th shift on Saturday	BMW Regensburg GM Antwerp	1988 1988

Source: Lehndorff, Steffen / Bosch, Gerhard (1993): Autos bauen zu jeder Zeit? Arbeits- und Betriebszeiten in der europäischen und japanischen Automobilindustrie. Berlin

2.1 Two-shift operation as the basic shift system

Some two fifths of the automobile plants covered by this survey operate some form of two-shift system.[12] We concluded from our first survey that two-shift systems were by no means a "discontinued model" in the automotive industry. There are a number of reasons why two-shift systems are likely to continue to play an important role in car production.

- Car assembly is a labour-intensive process; consequently, the cost-optimal operating time is shorter in final assembly than in the highly automated bodywork and paint shops.
- Two-shift systems leave sufficient time for maintenance and repairs.
- Two-shift systems are very flexible, not least because the shifts can be extended when the planned output target is to be increased or it becomes necessary to catch up on backlogs; the Japanese transplants in Europe make particular use of this flexibility.

[11] It is still the case that only a few small plants, particularly those specialising in pickups and delivery vans, operate a single day shift; cf. data summary, Table 1, in appendix.

[12] The share of assembly plants in the European automotive industry running two-shift systems must in fact be somewhat higher, since some of the manufacturers that operate large numbers of plants with two-shift systems, particularly Fiat, are represented only patchily in our survey.

– As the example of the Japanese car manufacturers shows once more, two-shift operation facilitates the management of work processes with the aim of complying fully with the schedules laid down; in other words, it is less fragile than shift systems with very long daily and weekly operating hours.
– Last but not least, the surplus capacity that exists in the automotive industry means that not all manufacturers are able to operate (all) their plants at full capacity.

As already mentioned in the introduction, our second survey did not include any supplementary expert interviews. At this point, therefore, we must confine ourselves to a very cautious assessment. There is some evidence that the assessments we made at the time of our first survey are not out of date. However, some of them may well be of less consequence than they were a few years ago. For example, the data from some plants could be interpreted as suggesting that, in those plants at least, daily maintenance routines have been reorganised in such a way as largely to avoid capacity restrictions during the night shift (see below). Moreover, some manufacturers take account of the higher capital intensity in bodywork shops by establishing different shift systems for the body and paint shops, on the one hand, and final assembly, on the other (Table 5). It can reasonably be assumed that this can also be used to control the final assembly schedule via the sorting buffer.

Table 5: Automobile plants with differentiated shift systems

Country	Plant	Shift system in final assembly	Shift system in body construction
B	Volvo Ghent	Two-shift operation	Three-shift operation (permanent night shift
CZ	Skoda	Model A2: Two-shift operation Model A4: Three-shift operation	Three-shift operation; extra weekend shifts from time to time (2 x 10 hrs) on the A4 line (four months in 1998). Parts of the body shop operate a “21:6“ system
F	Peugeot Mulhouse	Two-shift operation	Three-shift operation (in component production as well)
D	Ford Cologne	Two-shift operation	Three-shift operation
	DaimlerChrysler Sindelfingen	Two-shift operation	Three-shift operation (permanent night shift)
SP	Ford Valencia	Two-shift operation	Three-shift operation

Source: IAT survey on working time and operating hours in the European automotive industry

Thus in certain circumstances the technical and business management arguments in favour of two-shift operation carry somewhat less weight than they did at the beginning of the 1990s. However, the decisive factor in the continuing importance of the two-shift system is its flexibility. For this reason, it can continue to be regarded as the basic model of working-time organisation in the automotive industry, which can be replaced by new shift systems, in many cases only temporarily or for certain products, depending on capacity requirements. What is evident is that, for manufacturers, two-shift operation provides not a permanently acceptable but rather a minimum level of capacity utilisation. This is apparent from the strong trend towards new shift systems.

2.2 New shift systems

The importance of new shift systems for car production in Europe increased considerably in the course of the 1990s (Table 6). About half of the body and assembly plants included in the current survey operate three-shift systems. Even if this may not be fully representative of the European automotive industry as a whole, it can be assumed, on the basis of these plants’ greater capacity, that most cars in Europe now come from factories operating a three-shift system. Clearly, in view of the further increases in the capital intensity of car production and the intense international pressure to reduce costs in the industry’s boom years, manufacturers are reluctant to sanction additional investment in technical capacity unless the existing capacity is already being utilised more intensively by extending operating hours.

Table 6 : Automobile plants (final assembly) with new shift systems at the end of the 1990s

Shift system		**Plants**
Three-shift system(alternating shifts) Monday to Friday	B	VW Brussels*
	CZ	Skoda (Model A4)
	D	VW Wolfsburg (1999)
	NL	NedCar
	P	Renault Aveiro Opel Azambuga
	SP	Seat Martorell Opel Saragossa Citroen DaimlerChrysler Vitoria VW Pamplona
Three-shift system (permanent night shift) Monday to Friday	B	Opel Antwerp Ford Genk
	D	Opel Bochum Opel Rüsselsheim** Audi Ingolstadt
	SP	Renault Fasa (at times)
Three-shift system (alternating shifts) Monday to Saturday	I	Fiat Melfi
Variable shift system with six early, five late and and two night shifts per week (incl. early shift on Saturday)	D	DaimlerChrysler Rastatt
Two-shift system with extended shifts (8.6 hours) Monday to Friday	D	BMW Munich
Two-shift system with extended shfits (9 hours) Monday to Friday and 11th shift on Saturday	D	BMW Regensburg

*Since 1999, the three-shift system has been supplemented by weekend crews ** For four months in 1998 on the Vectra line

Source: IAT survey on working time and operating hours in the European automotive industry

Particularly in comparison with that presented in Table 4, the synopsis shown in Table 6 reveals several pronounced trends.

1. Three-shift systems are now a much more widely used device for increasing operating hours than two-shift systems with extended shifts. BMW is the only car producer in Europe that retains such systems at its Munich and Regensburg plants (the latter also has an 11th shift on Saturdays). In view of the fact that BMW played a pioneering role in the development of new shift systems in the automotive industry, its retention of two-shift systems cannot be taken as an argument against the efficiency of the new forms of work organisation from the company's point of view. Nevertheless, it remains a fact that the other car manufacturers prefer three-shift systems as a means of extending operating hours. Two of the five plants that were using two-shift systems with extended shifts at the beginning of the 1990s (Opel Antwerp and Nedcar) have gone over in the meantime to three-shift operation. Peugeot Poissy reverted some years ago to a two-shift system. Nevertheless, quite apart from BMW, regular shifts of more than eight hours' duration have by no means disappeared from the assembly shop. Thus at Peugeot's Poissy plant and in the two Swedish assembly plants, some of the shifts are longer than 8.5 hours. However, these long shifts are used not to extend operating hours but rather to shorten the late shift on Friday, or even to remove it from regular working time altogether. At the same time, they create additional scope for flexibility. At Autoeuropa in Portugal, the late shift can be extended on a temporary basis to ten hours.
2. Contrary to the expectation we expressed in our first survey, permanent night shifts have not become any more important than the classic alternating shift pattern as a means of organising three-shift systems. Although workers may not generally be too keen on changing over from two to three-shift operation, alternating shift patterns are obviously as widespread now in long established plants operating three-shift systems as permanent night shifts used to extend two-shift systems.
3. In some cases, both variants of the three-shift system have been introduced as possible options or for clearly defined periods of time. Thus in all three of Renault's body and assembly plants in France there is provision for going over to three-shift operation if necessary.[13] At Opel's Rüsselheim plant, a three-shift system was introduced in 1998, but only on the Vectra line and then only for a certain period of time. Such a model-specific differentiation of shift systems has also been introduced at Skoda, among others. The alternating shift system at DaimlerChrysler's Rastatt plant provides particular opportunities for variations to which we will return later in this section.
4. The Fiat plant at Melfi in southern Italy stands out by virtue of its three-shift system that runs from Monday to Saturday. This must be the only body and assembly plant in Europe that operates 18 eight-hour shifts per week. The plant has an alternating shift system with a three-week shift cycle in which each shift crew works six shifts a week for two weeks and three shifts in the third week. Individual working time is averaged out to the contractual norm by granting occasional free shifts.

[13] Hancké, Bob (1998): Industrial restructuring and industrial relations in the European car industry. Report commissioned by the European Metalworkers' Federation. Berlin (Ms.)

This plant is the most prominent example of a trend that we will examine in greater detail in the next section, namely the gradual inclusion of the weekend into regular working time.

2.3 The inclusion of the weekend as regular working time

Despite the five-day week, Saturday working has traditionally played an important role in the automotive industry because it provides room for extra shifts (on the early shift). Furthermore, the weekend is frequently used for maintenance and repair work. Over the last decade, however, initial attempts were made gradually to reclaim Saturday, and in some cases Sunday as well, for regular production.

In three body and assembly plants (Fiat Melfi, BMW Regensburg and DaimlerChrysler Rastatt), Saturday is a permanent part of the shift system. In the two German plants, it is true, Saturday working is confined only to the early shift, but it is noticeable that two German car manufacturers, in addition to Fiat, are playing a pioneering role in reincorporating Saturday into standard working time.

Another German manufacturer – Volkswagen - has recently gone one step further and introduced a separate weekend shift at its Brussels plant. In addition to the three-shift system that operates from Monday to Friday, two weekend crews work alternate shifts with an average working time of 32 hours per week. These weekend shifts, which do not operate at full capacity, increase operating time to about 6000 hours per year. Weekend crews have also been working for some time at Peugeot's Mulhouse plant.

Although such developments are still the exception in body and assembly plants, the incorporation of the weekend into regular working time is significantly further advanced in the highly automated pressing and component plants upstream of the final assembly process (Table 7).

Table 7: Component plants with weekend shifts

Country/plant		S/GE/B*	Weekend shifts
A	BMW Steyr	GM	Production in 11, 15 and 17-shift systems; Saturday included in 11 and 17-shift system**
F	Renault Cléon	GM	Three-shift operation supplemented at time by weekend crew (24 or 29 hrs/week on fixed-term contracts)
D	BMW Landshut	K	Production in 15, 17 and 20 shift-systems***; Saturday included in 17-shift system
	BMW Berlin	K****	17-shift system
	DaimlerChrysler Untertürkheim	GM	Foundry with weekend shift Fri 8hrs / Sat 10hrs / Sun- Mon 10 hrs (35 hrs paid)
	DaimlerChrysler Berlin	GM	Weekend shift Fri 8hrs / Sat 10hrs / Sun-Mon 10hrs (35 hrs paid)
	DaimlerChrysler Hamburg	K	Occasional part-time weekend shift
P	Renault Aveiro		Automated production in body and assembly plant (*„ligne carteres“*) with 2x12 hrs weekend shifts
S P	Seat Martorell	P	18-shift system
	Opel Zaragoza	P	17-shift system
	Citroën	P	Weekend partially incorporated into shift system
	Renault Vehiculos Industriales		Automated production in body and assembly plant with four-shift operation incl. Saturdays
	Renault Fasa		Automatic production in body and assembly plant with additional weekend shift (28 hrs)

* Pressing plant / Gearbox or engine plant / Plant for other components
**Working time in the 11-shift system 37 hrs, in the 15-shift system 36 hrs, in the 17 shift-system 34.5 hrs ***20- shift system, 6 hours each shift, individual working time 30 hrs/week ****Motor bicycle assembly with separate shift system (15 or 18 shifts per week depending on season)
Source: IAT survey on working time and operating hours in the European automotive industry

Weekend work in the pressing, engine and gearbox plants and in other component factories is frequently confined to certain particularly capital-intensive where production is highly automated. As a result, the number of employees doing regular weekend work is not necessarily very high. For the majority of employees in the more labour-intensive areas of car factories, the weekend is generally still protected. It is noticeable that some car manufacturers seeking to incorporate weekend working into their regular production schedules tend to make use of separate weekend crews (as Ford, for example, recently did when introducing seven-day working at the Saarlouis pressing plant). These weekend crews are sometimes hired on fixed-term contracts, or they may be agency workers, as at Peugeot for example. This underscores the cyclical nature of some weekend working. Despite these necessary qualifications and distinctions, there are unmistakable signs that the weekend is very gradually, step by step, becoming part of standard working time and operating hours.

Furthermore, the flexibilisation of shift systems has been accompanied in some plants by the introduction of Saturday working, which in many cases no longer attracts premiums. These Saturday working arrangements will be examined in greater detail in the next section.

2.4 Flexibility

We begin this section by outlining the use of standard flexibility instruments before going on to describe more recent trends in the flexibilisation of shift systems. We identify various means of adjusting operating hours to fluctuations in orders.

- The standard form of flexibility leaves the shift system unchanged. When necessary, operating hours are simply extended by increasing working time (e.g. extra shifts) or reduced by temporarily cutting working time (short time).
- This simple form of flexibility is being supplemented in more and more automobile plants by measures such as varying the length of the annual shutdown or temporarily extending the late shift. Such measures leave the shift system itself unchanged.
- Finally, shift systems can be reorganised in such a way as to create opportunities for varying daily working times and operating hours or weekly working and operating days over the course of one or more years (" working-time corridor"). In such systems, the contractual working time is achieved only as an average of the hours worked over a longer, pre-defined period.

For some years now, these last two forms of flexibility have often been introduced in conjunction with either job safeguarding agreements or working-time reductions. However, we turn first to the classic form of flexibility.

2.4.1 Overtime and short time

Overtime continues to be the most frequently used instrument for varying working time and operating hours. Only in a small number of European automobile factories does collective overtime, particularly Saturday shifts, amount to more than 5% of standard working time. As the data from the individual plants show, this overtime normally attracts premiums (cf. data summary, Table J, in appendix). Most plants reported that extra shifts are put on only in accordance with the provisions of plant-level agreements.

In most automobile plants, with the exception of those in Portugal, employees are able to choose between cash payments and time off in lieu when it comes to compensation for overtime worked. In some plants, working-time accounts have been set up as a means of accumulating the time credits accruing through overtime. The survey does not allow us to ascertain the share of workers actually opting for time off in lieu as against those choosing cash payments.

In some plants, it is standard practice to put on extra shifts on Saturdays without the payment of premiums when so-called "bridging days" can be created as a result. At Ford's Cologne plant, a plant safeguarding agreement stipulates that overtime (i.e. extra shifts on Saturdays) of up to 70 hours per year can be credited without premiums to working-time accounts, to be offset subsequently by time off in lieu. Any overtime exceeding that level is remunerated financially and attracts the normal premiums.

In the two Swedish plants and at Peugeot's Poissy plant, the shift length exceeds eight hours, so that the late shift on Fridays can be either shortened (Saab) or dispensed with altogether (Volvo, Peugeot). In these two-shift systems, contractual working time is achieved over a two-week shift cycle. This arrangement makes it possible to put on extra shifts on Friday afternoons. When capacity utilisation is at extremely high levels, the two-shift system can even be supplemented by two extra shifts per week without it being necessary to put on the particularly unpopular Saturday late shift.

Short-time working, the classic counterpart of overtime, was virtually non-existent in the boom year of 1998. As might be expected, Belgium was the only exception. Under Belgian labour market legislation, the procedures for initiating short-time working are very simple, whereas overtime has to be offset by time off in lieu and also attracts a premium that has to be paid in cash. The collective agreement in the engineering industry stipulates an equalisation period of six months for the time credits accruing from overtime. This combination of circumstances means that, if in doubt, car manufacturers tend to stipulate longer regular operating hours for their Belgian plants, which can be reduced through short-time working in the event of there being surplus capacity.[14] However, agreements restricting the extensive use of short-time working, or at least making it more expensive, have been concluded in the four Belgian assembly plants.

2.4.2 Additional flexibility instruments

A number of additional instruments can be used to extend or vary operating hours while leaving the shift system otherwise unchanged (Table K in data summary, see appendix) .

1. In most plants, annual operating hours can be extended by reducing or dispensing with the annual shutdown. It is true that this practice is somewhat unusual on the Iberian peninsula, but the examples of the VW, Opel and DaimlerChrysler plants in Spain show that individual companies are in the process of transferring to southern Europe the experiences of their central

[14] Only at VW's Brussels plant has there been no short-time working for a long time.

European factories, with their variable shutdown periods. DaimlerChrysler in Germany long ago dispensed with the summer closure of its plants, although manning levels are reduced for a few weeks in the summer and capacity is reduced by about 50%. There are similar practices at Audi Ingolstadt (75% of usual capacity) and Ford Cologne (single-shift production one week before and after the annual shutdown).

2. Varying the number of operating days per year by converting individual into collective free shifts (or vice versa) is also an instrument whose use is largely confined to central Europe. The possibility also exists in Spain, at least in theory, since the number and scheduling of operating days is traditionally agreed for each year at establishment level. In Portugal, however, the basic conditions for such variations are not in place, since free shifts cannot generally arise unless the eight-hour day (or some other daily working time which leads to a higher weekly working time than the one contractually stipulated) is retained when working-time reductions are introduced. Thus adherence to the 40-hour week in Portugal is associated with the retention of traditional, relatively rigid shift systems.
3. Another potential source of flexibility is to continue production throughout breaks. However, few plants systematically exploit this possibility. In many cases, it is used, if at all, only to overcome bottlenecks. Individual plants that in our first survey reported continuous production even during breaks have since distanced themselves from this practice.
4. A further possibility in two-shift systems is temporarily to increase shift length. This possibility is exploited in a number of plants, for example Volvo's Belgian plant. In the Autoeuropa minivan plant in Portugal, the late shift can be extended to 10 hours. The plant agreement stipulates that time off in lieu must be granted within two weeks.
5. A fifth possibility is to grant collective free shifts that have to be offset at a later date by working extra shifts. An agreement of this kind was concluded in 1997 at Opel's Bochum plant. At Nedcar in the Netherlands, there has been provision since 1999 for up to six collective free shifts; in this way, time credits accrue to the company that can be carried over into the following year. Employees then work off their time debts on four Saturdays. These variations have to be agreed with workforce representatives and at least 28 days' notice has to be given. At DaimlerChrysler in Sindelfingen, up to six days' time credits (including the period between Christmas and the New Year) accrue to the company each year because of plant shutdowns. These credits have to be worked off through additional Saturday shifts put on when demand is high or new models are about to enter production.

Additional sources of flexibility are provided by variable shift systems, which to date have been introduced mainly in Germany. Following the current working-time reduction, they can be expected to appear in future in French plants as well.

2.4.3 Variable shift systems in Germany and France

In many automobile plants in *Germany*, shift systems have been reorganised in such a way that working time and operating hours can periodically be adjusted to demand. All changes in working times and operating hours are subject to plant-level agreements and are introduced for periods of several months or one year. At BMW,

the opportunities for flexibility relate more to individual working times and are intended primarily to increase manning levels when new models are about to go into production. At VW, DaimlerChrysler and Opel, on the other hand, the emphasis is on collective variations in working time and operating hours. The distinctive feature of the arrangements at VW is that a separate company agreement has been concluded that allows for the periodic reduction or extension of regular working time but without any provision for the subsequent adjustment of working time to the contractually agreed 35 or 28.8-hour week. In variable shift systems, overtime is generally defined in such a way that, in terms of duration and scheduling, any overtime worked has to lie outside the agreed range of variation for working time and operating hours in order to attract premium payments.

The most important characteristics of the variable shift systems introduced in German automobile plants are outlined below.

- VW Wolfsburg: working time may vary in length between 28.8 and 38.8 hours per week. The duration of working time and the shift system are laid down from time to time in plant-level agreements. A further source of flexibility lies in the fact that overtime (Monday to Friday) does not attract premiums until the 35-hour week has been reached. On this basis, a working time of 28.8 hours per week was agreed for Wolfsburg in 1998 (4 x 7.2 hours), supplemented by compulsory overtime on the fifth day. This produces a working week of 36 hours within the framework of a two-shift system with a permanent nightshift.[15] Since 1999, the plant has operated a three-shift system with a classic alternating shift pattern. The scheduled working days for shift crews are Monday to Thursday. Since workers have every tenth week off, the average weekly working time over the ten-week cycle is 28.8 hours. For the three-year Friday shifts, "compulsory overtime" was agreed, so that the average weekly working time over the ten-week cycle rises to 36 hours. When capacity requirements fall, agreement has to be reached firstly on dispensing with these Friday shifts.
- Opel Rüsselheim: depending on capacity requirements, working time can be distributed over four or five days of the week ("working-time corridor"), although any changes to working time must be announced two weeks in advance. As a result, working time for production workers ranges between 31 and 38.7 hours per week. Their working time must be averaged out to the contractual 35-hour week within one year. Should this not be possible, for example for operational reasons, then the averaging out must take place "at the next possible date".
- DaimlerChrysler Rastatt : under the shift arrangements in place, each of the three shift crews regularly works six early shifts (including Saturdays), five late shifts and two night shifts (Thursday and Friday). The number of night shifts can be increased to up to 4 in a week and 13 in a year. Free night and Saturday shifts are awarded within a period of two years in order to pay off the time credits thus accumulated; these free shifts may be either collective or individual. The shift schedule is agreed every quarter by management and the works council.

[15] Because of this particular characteristic, our comparisons give a longer standard working time for Wolfsburg than for the other German automobile plants.

– BMW Regensburg: the design of the shift system means that the workforce accumulates time debts. The contractual working time is 35 hours per week, whereas the shift schedule is designed in such a way that an average of only 33 hours per week are worked over the course of the three-week shift cycle. One hour is first deducted from the difference as a flat-rate bonus for Saturday working.[16] By agreement, the remaining hour's difference per week adds up to 45 hours over the year, which are worked off in five so-called "equalisation shifts". Two of these additional shifts are used for further training, to which there is an individual entitlement. A further two shifts may be scheduled on Saturdays without the payment of any premium. The scheduling of the remaining shift is agreed by individual workers and their supervisor.
– BMW Munich: the design of this two-shift system, with a shift length of 8 hours and 35 minutes (plus an unpaid meal break) and a four-day week for individual workers, also means that actual weekly working time is less than 35 hours. As a result, time credits of half an hour a week accrue to the company on a systematic basis, and employees have to pay off their time debts by working occasional "equalisation shifts". Some of these shifts (four in three years) may be scheduled on Saturdays without the payment of premiums. They may also be saved up for several years in order to provide the increased manning levels required when new models go into production.

Some of these flexible shift systems were introduced as parts of so-called job or plant safeguarding agreements.

In *France*, as is clear from the company agreements concluded in 1999 at the two major car producers, individual working time is being flexibilised by the introduction of annual working times and individual free shifts. However, shift systems themselves are being retained in their present forms. Nevertheless, the agreements concluded at PSA and Renault provide for the possibility of new, more flexible shift systems, which have to be agreed at establishment level if required.[17] in both companies, working time is calculated on an annual basis; the differences between the hours actually worked and the contractual working time are entered in working-time accounts. There are different arrangements for individual and collective working-time accounts. The volume of collective time credits is limited (the limits are more generous at Peugeot than at Renault), while individuals in both companies are able to accumulate very large volumes of credits. Both company agreements offer the option of introducing seasonally fluctuating operating hours at establishment level – an establishment agreement has to be concluded. At Peugeot standard working time can be extended for this purpose to six days per week. In this event, a 2% premium over and above the alternating shift rate has to be paid for Saturday work.

The main objectives of the flexibility instruments outlined here are as follows. Measures such as varying plant shutdowns or continuing production during breaks, which leave the shift system itself untouched, are used mainly to deal with temporary bottlenecks or to extend annual operating hours. At the same time, they increase seasonal flexibility. If the shift systems are also flexibilised, as has been happening

[16] For this reason, our calculations are based on a standard weekly working time of 34 hours for the BMW Regensburg plant.
[17] There is no space here to examine in detail the very different agreements concluded at the two companies.

for several years in Germany in particular, seasonal flexibility is further increased and flexibility extended over the entire product cycle.

Clearly, working-time organisation increases in complexity as each of these flexibilisation measures is introduced. The planning and management of manpower assignment becomes increasingly difficult and demanding. Flexibility has its price – for employees and firms.

3 The decoupling of working time and operating hours

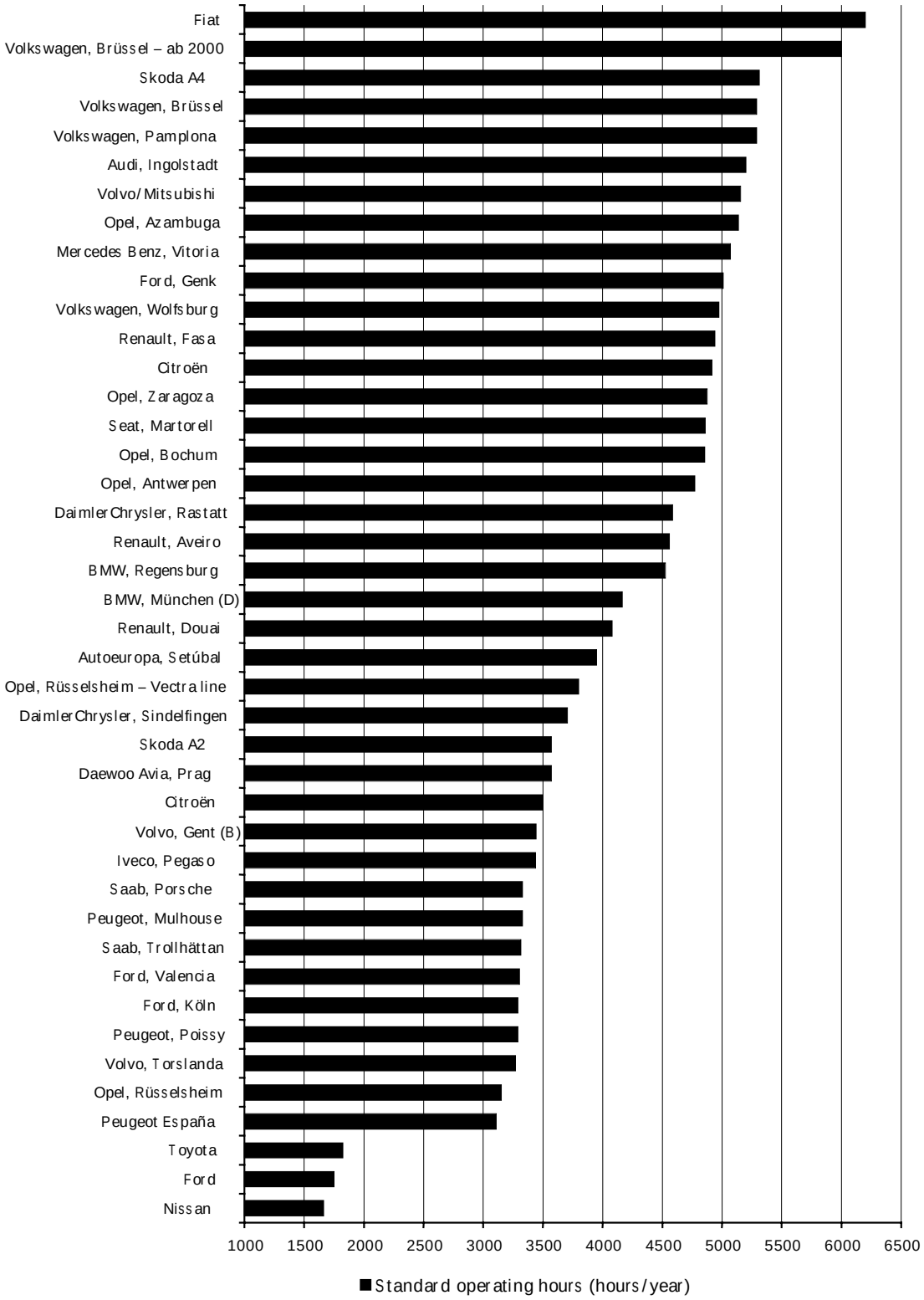
The changes to shift systems described in the previous section have led to a considerable increase in operating hours in a number of automobile plants. In this section, we examine operating hours in greater detail and reveal the characteristic patterns that have emerged as working times and operating hours in the European automotive industry have become decoupled from each other over the past decade.

a. Operating hours

The importance of three-shift operation in car production is reflected in the ranking of body and assembly plants by operating hours (Figure 3).

The particularly long operating hours at Fiat Melfi and VW Brussels (from 1999 onwards) are produced in the first case by the three-shift system that operates for six days a week and in the second case by the addition of two additional weekend crews to the regular three-shift system. Operating times in excess of 4,500 hours per year are achieved by introducing three-shift systems. With its rather particular 11-shift system that produces an operating time of around 4,500 hours per year, BMW Regensburg is located at the crossover point to the plants with two-shift systems, among which those that have retained the eight-hour day have operating times that fall to just under the 4,000-hour mark. Otherwise, the differences in operating hours between plants with two and three-shift system are explained by the remaining organisational characteristics described in the previous section, and in particular by the length of the annual shutdowns.

Figure 3 : Standard operating hours in European car plants, 1998



Source: IAT survey of working time and operating hours in the European automotive industry

As already noted, long operating hours cannot always be utilised at full capacity. This applies particularly to night shifts, part of which is taken up by maintenance work. We did not attempt to adjust standard operating hours for such reductions in

capacity[18], since we did not have reliable data on such capacity reductions for all plants. Table 8 summarises the data available to us.

The increasing importance of new shift systems is also evident from the comparison of operating hours in 1998 with those recorded for the plants included in our 1990/1 survey. These changes, and their most important causes, are shown in Table 9.

Table 8: Capacity reductions during night shifts

	Car manufacturer	Capacity on night shift	Observations
B	VW Brussels	100%	
	Opel Antwerp	50%	
	Ford Genk	100%	Reduced length
CZ	Skoda	100%	
F	Renault Douai	50%	
D	Opel Bochum	50%	
	Opel Rüsselsheim	50%	
	Volkswagen	68%	
	Audi	36%	
I	Fiat Melfi	No data	
NL	Nedcar	100%	
P	Renault Aveiro	45%	
	Opel Azambuga	N data	
SP	Citroën	50%	
	DaimlerChrysler Vitoria	100%	
	Renault Fasa	87%	
	Seat Martorell	95%	
	Volkswagen Pamplona	somewhat reduced	
	Opel Zaragoza	No data	

Source: IAT survey on working times and operating hours in the European automotive industry

Table 9: Standard operating hours 1990 and 1998, hours per year

Country	Company/Plant	1990	1998	Difference	Causes
D	1. Volkswagen Wolfsburg	3380	5300	**1920**	Changeover from two to three-shift operation; shortening of annual shutdown

[18] The Belgian trade union CCMB provided us with a table in which the periods of reduced capacity are included proportionally and shows a so-called “theoretical operating time” for Opel’s Antwerp plant of 4,054 instead of 4,700 hours.

SP	2. Volkswagen Pamplona	3500~	5290	**1800 ~**	1990 two-shift operation, then period of three-shift operation, then return to two-shift operation, now three-shift operation again
NL	3. Volvo / Mitshubishi Nedcar	3755	5155	**1400**	Changeover from two-shift operation with extended shifts to three-shift operation
B	4. Ford Genk	3620	5010	**1390**	Three-shift system since 1993
SP	5. Seat Martorell	3480	4860	**1380**	Old plant in Zona Franca with two-shift operation, new plant in Martorell with three-shift operation
B	6. Volkswagen Brussels (from 1999)	5265	6000+	**750 +**	Supplementation of three-shift operation with weekend shifts
D	7. Opel Rüsselsheim Vectra line	3170	3800	**630**	Third shift for four months
D	8. BMW Munich	3885	4165	**280**	Abolition of annual shutdown
D	9. Ford Cologne	3150	3290	**140**	Shortening of annual shutdown
D	10. Opel Rüsselsheim	3170	3150	**(<100)**	Shift system unchanged
B	11. Volkswagen Brussels	5265	5290	**(<100)**	Shift system unchanged
D	12. DaimlerChrysler Sindelfingen	3650	3705	**(<100)**	Shift system unchanged
D	13. Opel Bochum	4890	4855	**(<100)**	Shift system unchanged
D	14. BMW Regensburg	4610	4525	**(<100)**	Shift system unchanged
F	15. Peugeot Mulhouse	3350	3315	**(<100)**	Shift system unchanged until 1999t
SP	16. Ford Valencia	3300	3305	**(<100)**	Shift system unchanged
SP	17. Opel Zaragoza	5120	4875	**-245**	Continuous production during breaks abolished
B	18. Opel Antwerp	5140	4770	**-370**	Changeover from two-shift operation with long shifts to three-shift operation, but abolition of Saturday shift
F	19. Peugeot Poissy	4015	3275	**-740**	Reversion from two-shift operation with long shifts to standard two-shift system

Sources: IAT survey on working times and operating hours in the European automotive industry; Lehhndorff, Steffen / Bosch, Gerhard (1993): Autos bauen zu jeder Zeit? Arbeits- und Betriebszeiten in der europäischen und japanischen Automobilindustrie. Berlin

The basic point to be made is that the combination of various organisational characteristics of shift systems and plant shutdowns over the course of the year produces a wide range of decoupling patterns as individual working time and operating hours move ever further apart. This is why some of the plants with longer than average working times have short operating hours, while others with relatively short working times have particularly long operating hours. This is an obvious point, but one that needs to be emphasised repeatedly, since the impression is occasionally given that short working times necessarily restrict the utilisation of capital-intensive plant and equipment and therefore have a negative impact on unit costs and competitiveness. In fact the reverse seems to be true: short working times offer firms greater opportunities to adjust operating hours to capacity requirements. We will examine this impression in greater detail by considering the country and company-specific decoupling patterns.

3.2 Decoupling patterns (1): country profiles

The decoupling patterns in those countries for which we have at least a sensible minimum volume of the data required for comparison[19] shed light on the various forms of working-time policy and modes of working-time regulation. They also provide clues as to the car manufacturers' locational policies.

Belgium (Figure 4) has long been a production location for foreign car manufacturers, and since the departure of Renault now has four assembly plants. The decoupling pattern is characteristic of a country in which industry-level collective agreements are very important in general terms but where the main locus of industrial relations in the automotive industry has traditionally been the individual plant. As a result, standard working times are widely dispersed. Irrespective of the length of individual working times, three of the four car manufacturers operate their plants with three-shift systems and consequently have long operating hours. One of the reasons for this is very likely to be found in the particular characteristic of Belgian labour market legislation, already mentioned above, that makes it easier to reduce than to increase operating hours. In the case of Ford, short-time working reached such a level in 1998 that, despite a three-shift system, actual operating hours fell to the level of the standard operating hours in a plant with a two-shift system (Table A in data summary, see appendix). Ford Genk is the sole assembly plant for the Mondeo and therefore has to meet all the flexibility requirements by itself. As far as Opel and VW's locational policies are concerned, it should be noted that both Belgian plants produce popular volume cars that can also be built in other European factories.

Germany (Figure 5) is the opposite of Belgium in terms of working-time regulation. The duration of standard working time conforms almost universally to the contractually agreed 35-hour week. The only exceptions are VW, which has its own company agreement, and BMW Regensburg, where a plant-level agreement concluded when Saturdays were incorporated into the regular shift scheduled has reduced working time to a level that is constantly slightly below the collectively agreed norm. The importance of employee representation in the workplace in

[19] France is not included here, since only three body and assembly plants are covered by the survey. Furthermore, the data for 1998 can provide no more than a snapshot that is already out of date in many regards. The whole system of working-time organisation in France is currently in a state of upheaval. On the one hand, working time is being reduced, on the other, operating hours are currently being extended considerably, for example at the Peugeot plants that produce the 206 model

Germany impacts not so much on the length of working time as on working-time organisation. In view of the general uniformity of working time, the wide dispersion and differentiated nature of operating hours is particularly striking.

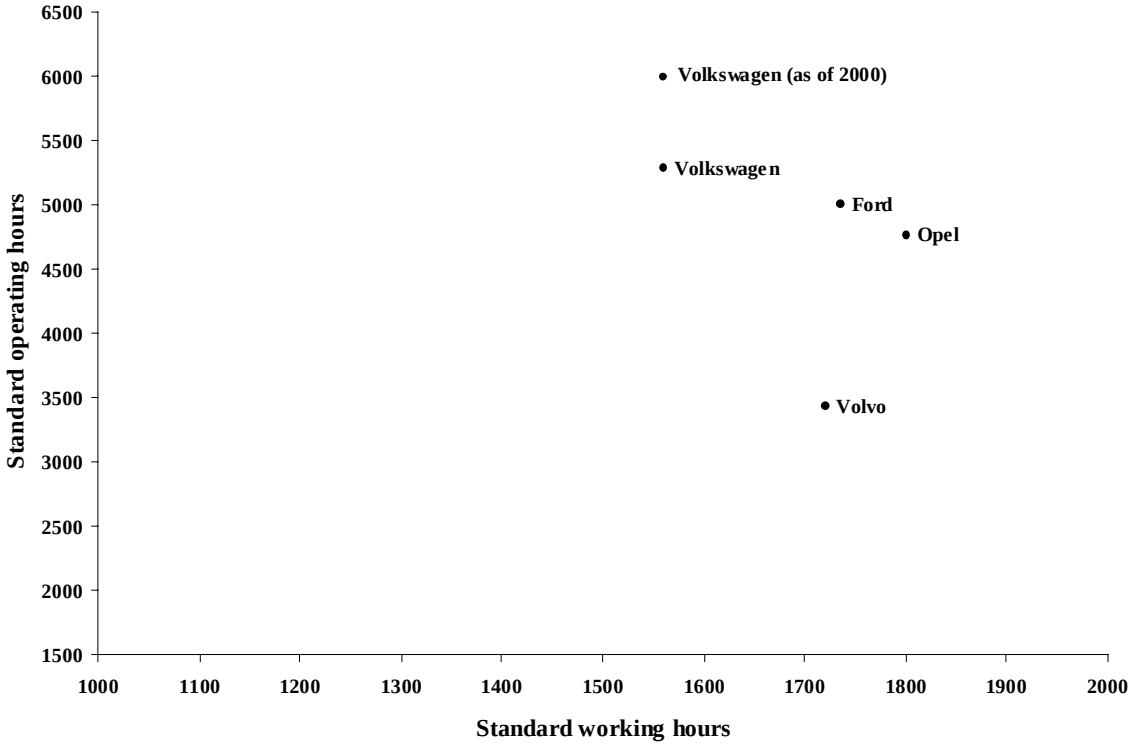
In *Portugal*, on the other hand, collectively agreed weekly working time has been stuck for a long time on the 40-hour mark, from which there are no deviations at plant level either (Figure 6). Under these circumstances, the differences in operating hours - leaving the shift system out of consideration - are attributable largely to the variable length of stoppages during breaks over the course of the day.

In contrast, the country profile for *Spain* (Figure 7) shows considerable differences in working times that are attributable to the more highly developed system of establishment-level bargaining on working time and other employment conditions that has characterised Spanish heavy industry for decades. One interesting feature is that operating hours, though widely dispersed, are concentrated - apart from the single-shift Nissan plant - in two tight clusters representing the two-shift and three-shift plants respectively. This suggests that car manufacturers in this country are only gradually beginning to exploit the range of options that exist for the organisation of operating hours.

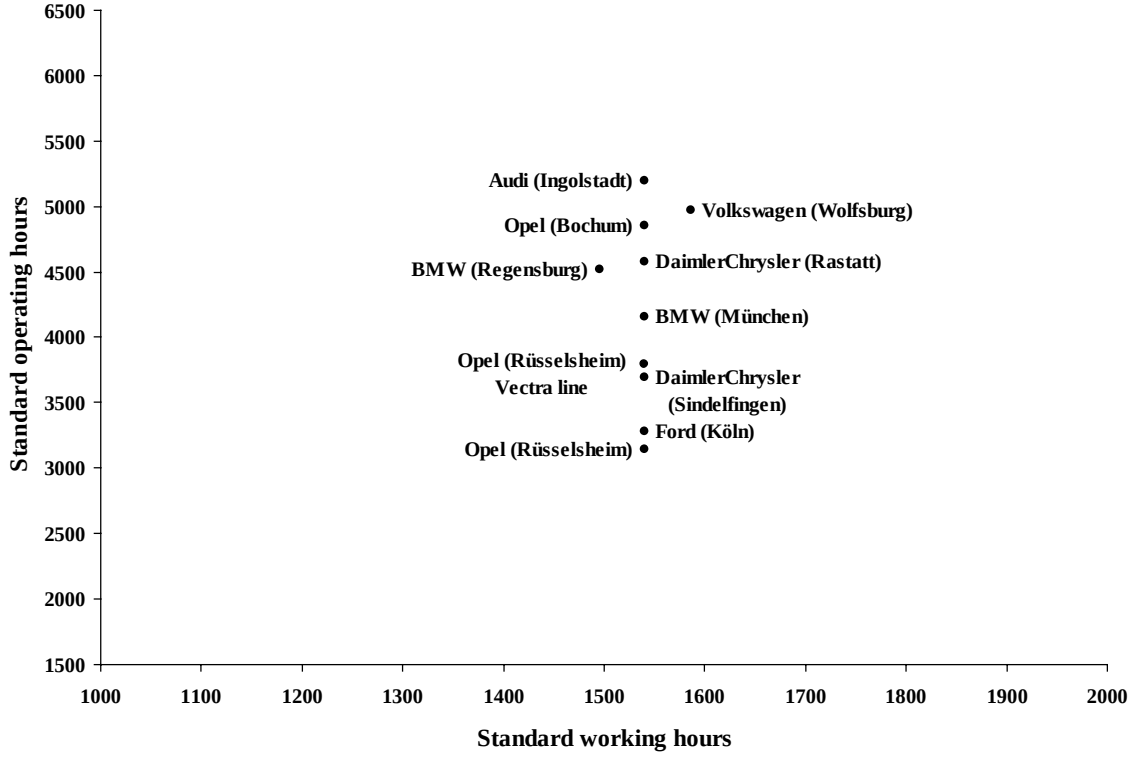
Of the major car-producing countries in Europe represented in our survey, the Spanish and German decoupling profiles for working time and operating hours are the most sharply contrasting. Working time is considerably shorter in Germany than in Spain; it is very standardised in Germany but more sharply differentiated by plant in Spain. The range of operating hours is very similar in both countries (leaving the one single-shift plant out of consideration), but in Spain it is determined almost solely by the shift system, whereas in Germany firms make use of a large number of devices in order to differentiate operating hours. Clearly, the length of working time has no effect on the *length* of operating time. However, the working-time reductions in Germany have clearly opened up scope for the *differentiation* and *flexible organisation* of operating hours.

Figures 4-7: The decoupling of working time and operating hours: Country profiles

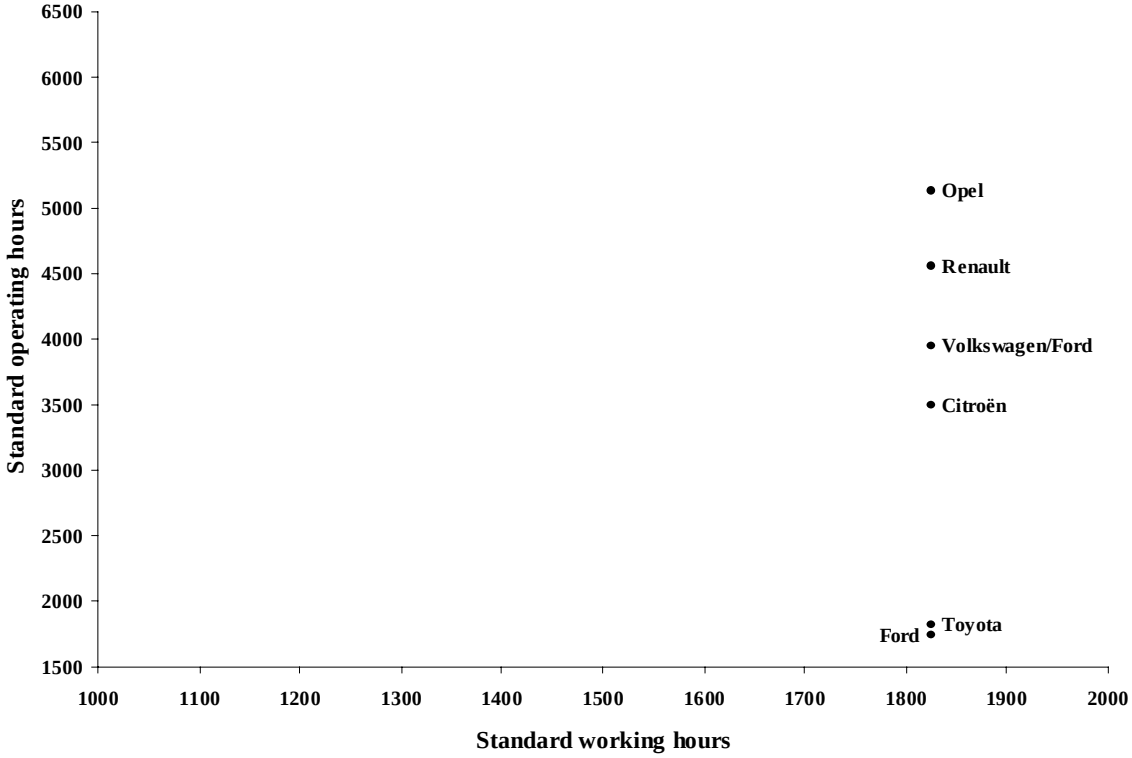
Working time / Operating time 1998 (Belgium)



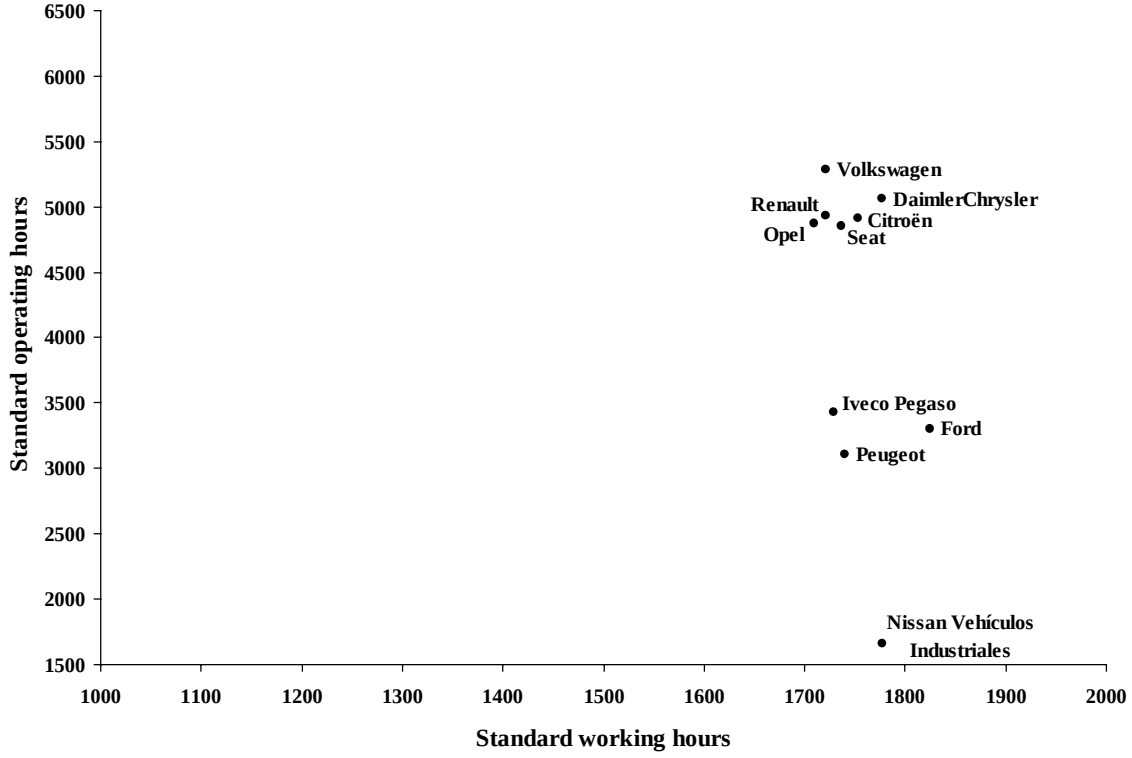
Working time / Operating time 1998 (Germany)



Working time / Operating time 1998 (Portugal)



Working time / Operating time 1998 (Spain)



Source: IAT Survey

3.3 Decoupling patterns (2) : company profiles

The following summary is also confined to those car manufacturers on whom we have at least the minimum volume of data required to draw meaningful conclusions. We have also tried to take account of ownership and shareholding structures in order to obtain a broader picture.

The company profile for the decoupling of working time and operating hours at *Volkswagen* (Figure 8) shows that most VW cars are produced in plants operating a three-shift system. It is true that not all VW's plants are included in the survey, but the missing plants would be unlikely to alter the overall picture if included. The differences in operating hours clearly have nothing to do with the variable length of working times. All in all, the VW profile is that of a car manufacturer whose capacities were heavily utilised in 1998. This reflects both the company's commercial success in the second half of the 1990s and the additional competitive advantage the company enjoys as a result of its high level of capacity utilisation and the consequent reduction in unit capital costs.

In comparison with VW, *Opel's* profile reflects much more clearly the extent to which operating hours are product-dependent (Figure 9). The profile for *Ford*, on the other hand, contrasts sharply with those of the two above-mentioned companies (Figure 10). The predominance of two-shift operation in Ford's European plants was revealed in our first survey. It was clear even in the early 1990s that Ford required longer operating hours in order to satisfy demand but was not necessarily seeking to change over to three-shift operation; rather, it was concentrating on exploiting the advantages of stability and flexibility offered by two-shift operation, as outlined above. Even then, as the sole assembly plant for the Mondeo, the Genk plant was already playing a special role in the group's European operations. Three-shift operation was also introduced recently (too late for inclusion in our survey) at Ford's Saarlouis plant, the production site for the Focus. Against the background of the planned reduction in the number of Ford sites in Europe (integration of Halewood into Jaguar, intended closure of Dagenham), the picture sketched in here may well change considerably over the next few years. The option of introducing a third shift from summer 2000 has already been agreed at Ford's Spanish plant in Valencia.[20]

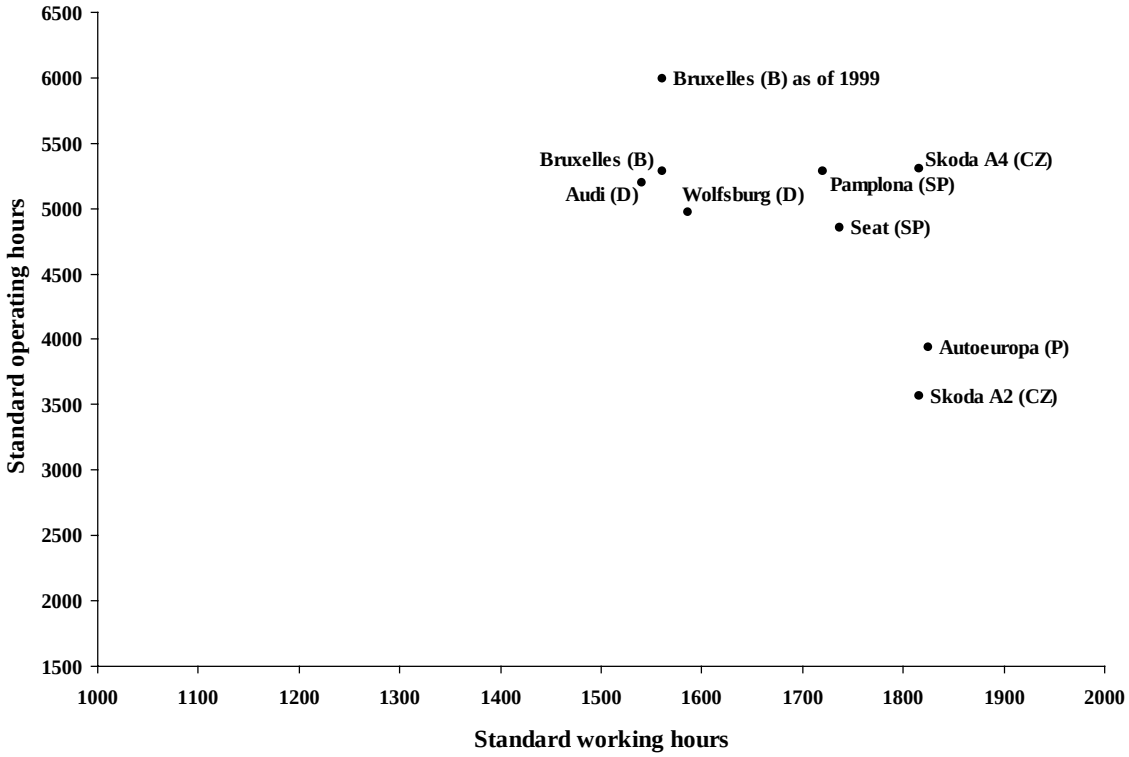
Apart from the Spanish Citroën plant, the profile for *PSA* for 1998 is similar to that of Ford (Figure 11). The strong clustering is explained by the fact that PSA production plants are concentrated in three countries with (in 1998) relatively long working times. However, it should be noted here too that our survey is not complete, particularly in the case of France. Furthermore, as already mentioned, the commercial success of the 206 model is currently giving rise to considerably longer operating hours in some plants.

Finally, the data from the DaimlerChrysler plants included in our survey show that longer operating hours have now acquired considerable importance in this company, even though the vast majority of its cars are still produced at the flagship plant in Sindelfingen, which operates a two-shift system (Figure 12). However, the diagram cannot show the most important thing, namely the extent to which working time and operating hours have been flexibilised in this company's German plants.

[20] European Industrial Relations Review, August 1999: 20

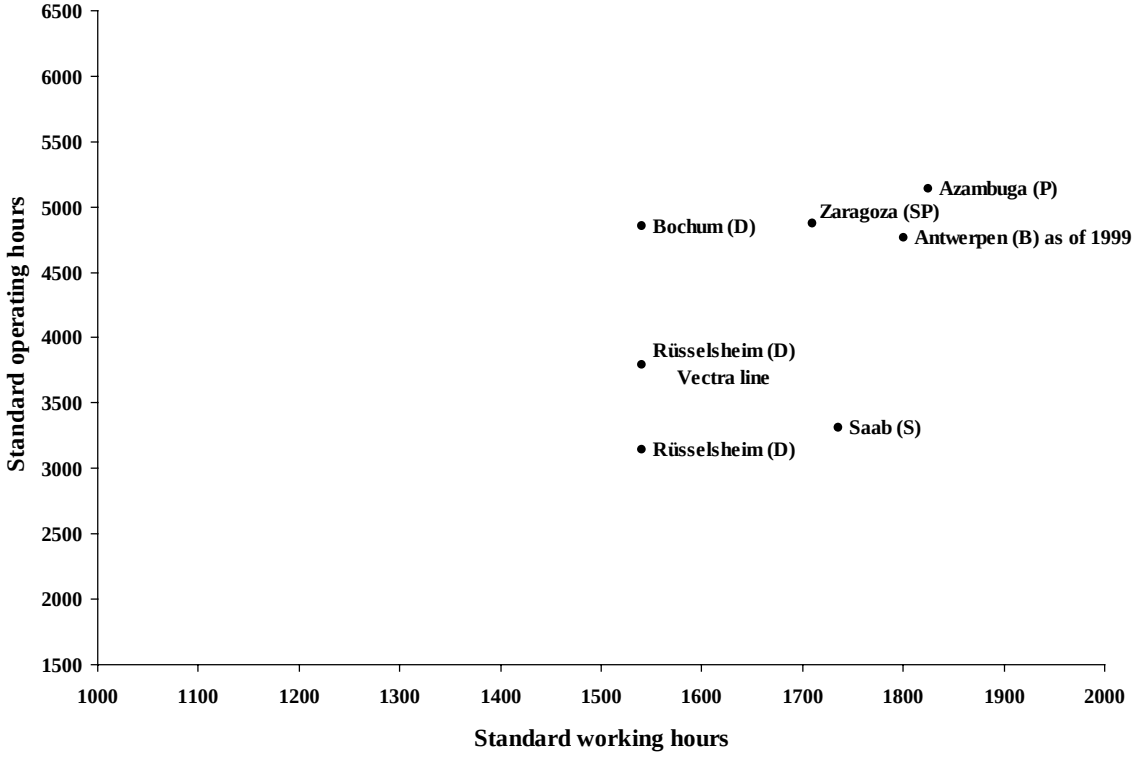
Figures 8-12: The decoupling of working time and operating hours: company profiles

Working time / Operating time 1998 (VW)



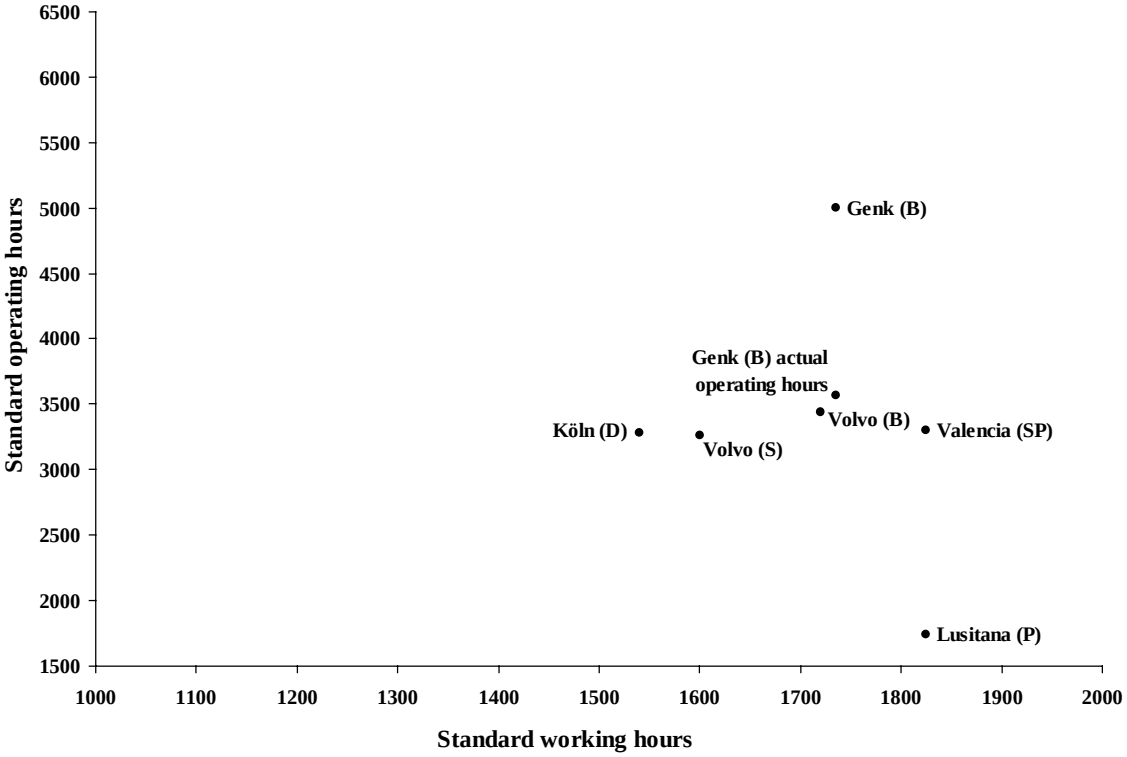
Source: IAT Survey

Working time / Operating time 1998 (GeneralMotors)



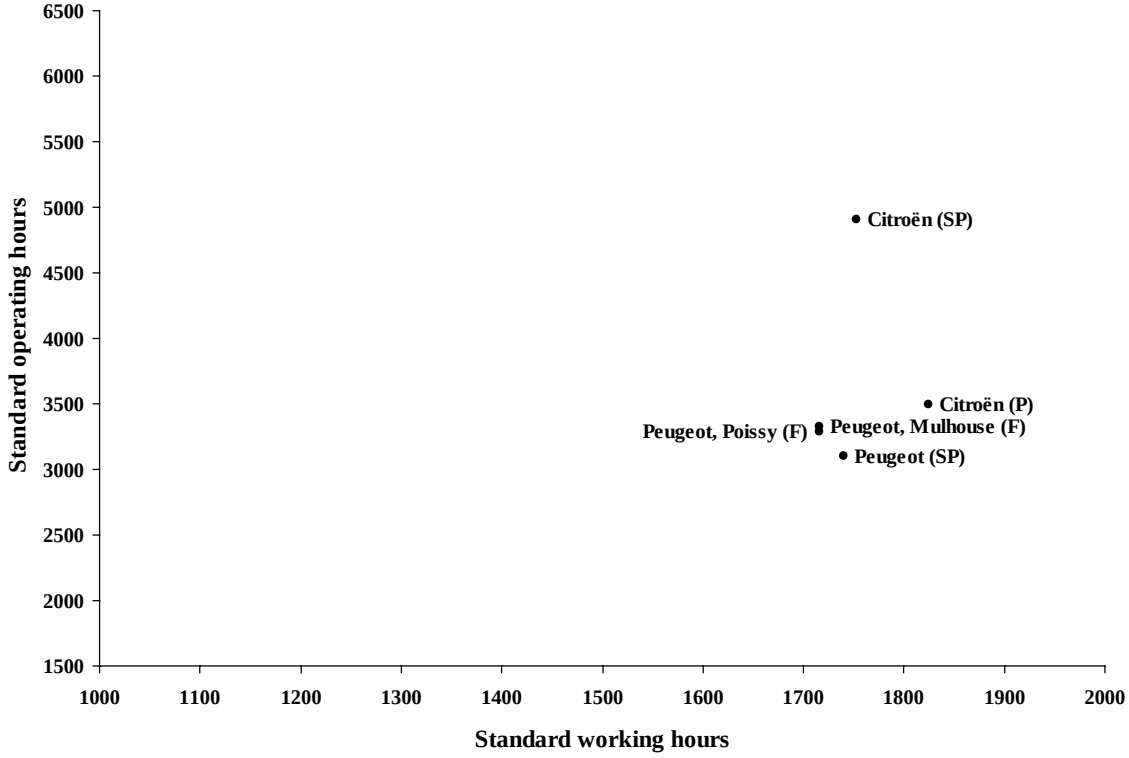
Source: IAT Survey

Working time / Operating time 1998 (Ford)



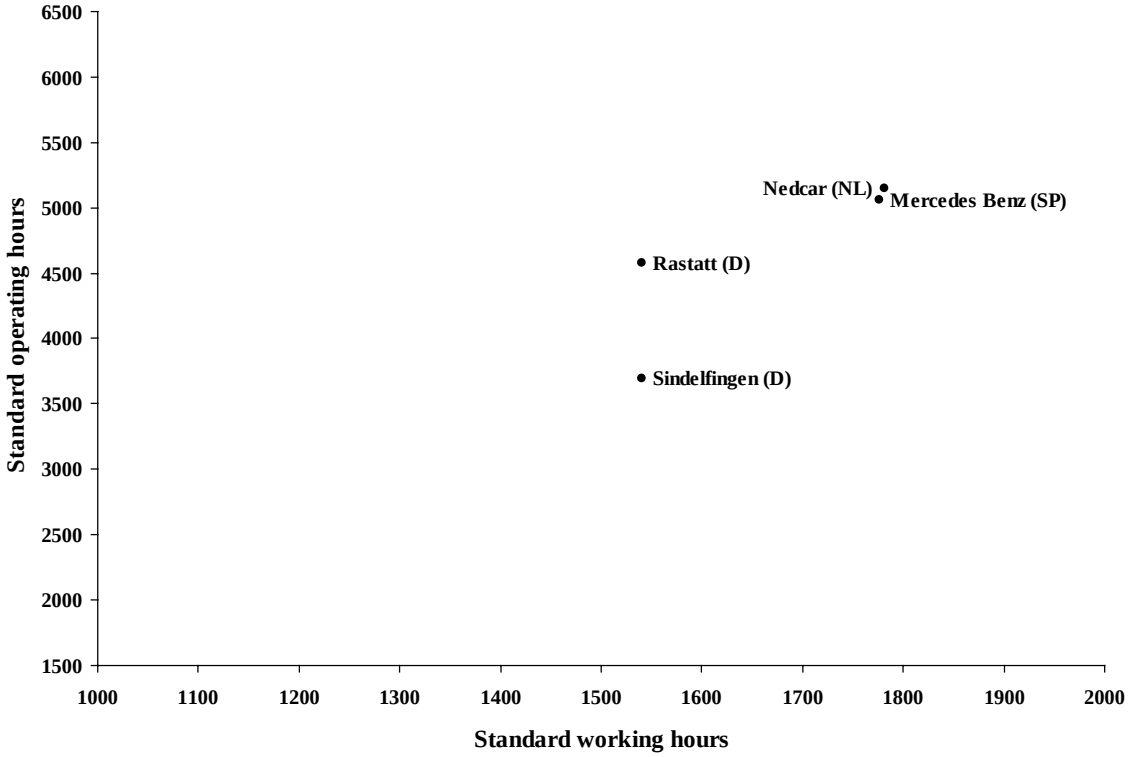
Source: IAT Survey

Working time / Operating time 1998 (PSA)



Source: IAT Survey

Working time / Operating time 1998 (DaimlerChrysler)



Source: IAT Survey

3.4 Prospects

The increasing importance of three-shift operation, which is reflected in the decoupling profiles for working time and operating hours for certain countries and car manufacturers, is closely linked to demand for a company's products. The evolution of sales figures between 1990 and 1998 for the manufacturers represented in our survey sheds some light on this background (Table 10). Many of the increased number of cars now being built relative to 1990 come from newly opened production plants that were generally designed from the outset for shift systems with long operating hours. However, many of them also come from factories that already existed in 1990 (even though some of them have been extensively altered in the meantime).

Nevertheless, it cannot be assumed that there is a mechanical link between the number of units sold or produced and operating hours. Even with comparatively low or unchanged operating hours, considerable increases in output are possible if labour productivity is increased accordingly. Table 11 suggests that the car manufacturers' increased sales are due largely to increases in labour productivity.[21]

Thus the increases in output, which are concentrated among a certain number of the manufacturers, are based both on increases in labour productivity and on the extension of operating hours. The increased capacity made available by longer operating hours supplements and reinforces the dynamic of productivity increases. By means of their working-time policy, the most successful car producers are succeeding not only in raising labour productivity but also in creating a competitive advantage for themselves by increasing *capital* productivity. Thus the competitive advantages created by the most successful car producers in Europe are mutually reinforcing.

Table 10 : Number of cars produced in Europe by manufacturer, 1990, 1998

Manufacturer	1990	1998	Change (%)

[21] The figures used are very crude indicators because they take no account of increases in value, are not adjusted for prices and include the production of goods vehicles (which strongly influences the figures in the case of Sweden in particular). Moreover, they are not broken down for the individual manufacturers. However, they at least give an impression of the productivity increases that were achieved over just three years in the second half of the 1990s.

B	Ford	336,047	337,203	+0.34
	Opel	389,237	300,201	-22.87
	Volkswagen	204,300	180,576	+11.61
	Volvo	83,122	151,891	+82.73
CZ	Skoda	187,181	368,576	+96.91
SF	Valmet-Saab	30,220	31,110	+2.96
F	Peugeot	1,287,920	825,317	-35.92
	Citroën	689,965	541,834	-21.47
	Renault	1,316,930	1,191,080	-9.56
D	BMW	499,823	638,217	+27.69
	Mercedes-Benz (DC)	574,191	850,618	+48.14
	Ford	594,330	556,007	-6.45
	Opel	1,029,955	1,051,162	+2.06
	Volkswagen	1,508,818	1,616,517	+7.13
	Audi	421,378	605,348	+43.66
I	Fiat	1,325,414	1,003,101	-24.31
NL	Volvo*	121,330	242,989	+100.27
P**	Renault	52,681	13,979	-73.46
	Citroën	13,903	27,776	+99.78
	Ford	17,605	10,717	-39.12
	Toyota	10,528	6,440	-38.83
	Opel	24,643	63,102	+156.06
SP	Peugeot	141,398	133,936	-5.27
	Citroën	113,541	116,685	+2.76
	Renault	253,866	458,547	+80.62
	Ford	325,890	296,173	-9.11
	Seat	323,900	432,254	+33.45
	Volkswagen	143,392	311,136	+116.98
	Opel	377,314	453,420	+20.17
S	Saab	87,356	124,867	+42.94
	Volvo	248,497	243,438	-2.03

* 1998: Volvo + Mitsubishi
** All motor vehicles
Source: Verband der Automobilindustrie: Das Auto international in Zahlen, 1992 edition; International Auto Statistics, 1999 edition. Frankfurt; own calculations

Table 11: Changes in the number of employees and in turnover per employee in automobile production, 1995 to 1998 (%)*

	Number of employees	**Sales per employee**

B	-5.6	+27.2
CZ (1995-1997)	+1.1	+81.8
SF	-2.2	+16.0
F	-1.3	+25.1
D	+6.7	+27.4
I	+8.0	+24.5
P	+/-0	+74.6
SP	+8.1	+17.3
S	+37.1	+/-0

*The figures refer to motor vehicle production as a whole, i.e. including goods vehicles (Manufacture and assembly of motor vehicles and engines, NACE 34.1). The figures are not adjusted for prices.
Source: Verband der Automobilindustrie: International Auto Statistics, 1999 edition. Frankfurt; own calculations

Against this background, the plant closures by Renault (Belgium) and Ford (planned in Great Britain) are likely to have major repercussions. Those car producers whose problems with surplus capacity in Europe are particularly evident are concentrating their production in fewer plants. This increases the likelihood that operating hours will be extended in some of the remaining plants as soon as demand for certain models picks up again. The smaller the number of assembly plants, the greater the burden of flexibility each one has to bear.

4 Summary

The 1998 survey of shift systems and working times and operating hours and the comparison with the findings of our survey conducted at the beginning of the 1990s reveal a number of significant changes.

1. Working-time reductions are currently playing only a minor role in the European automotive industry – with the important and very topical exception of France. Independent efforts by the trade unions to push through further working-time reductions have had virtually no impact on the working-time statistics since the implementation of the 35-hour week in Germany and a few isolated reductions at establishment level.
2. Working-time reality in automobile plants is now characterised much more by flexibilisation than by reduction. However, the link between the reduction and flexibilisation of working time cannot be ignored. In most European automobile plants, flexibility is still achieved mainly by means of instruments such as extra shifts and, increasingly, by varying the length of annual shutdowns, which do not affect the shift system itself. However, in plants where working time is relatively short, companies are making particularly strenuous efforts to differentiate shift systems and to extend and flexibilise operating hours by incorporating flexible organisational elements into the shift systems themselves. There have been impressive efforts in this direction in Germany over the past few years, and currently in France as well. However,

this should not be misunderstood as a mechanical connection, as the following findings show.

3. Over the course of the 1990s, once the recession had ended, there was a clear shift of emphasis in automobile production from two to three-shift operation. As a result, average operating hours in automobile plants have lengthened considerably. Car manufacturers that have been able considerably to increase the number of units produced have done so through increases in labour productivity as well as through longer operating hours, which have been introduced both in new “greenfield” production plants and in old “brownfield” factories.
4. Three-shift operation is clearly playing the key role in the extension of operating hours. Two-shift systems with extended shifts have not become the dominant shift pattern and in some cases have even been withdrawn.
5. The dominant position that three-shift systems achieved in the 1990s suggests that the notion of “capacity” has been implicitly redefined in body and assembly plants. Clearly, there is a prevailing view among car manufacturers that a car plant cannot operate at full capacity unless a three-shift system is established. Operating several plants simultaneously on a permanent two-shift system is clearly regarded as unacceptable. The tendency seems to be that two-shift operation is acceptable only in periods of weak demand. This increases the risk of plant closures in the event of falling demand.
6. In so far as our survey permits such statements, the plants with longer operating hours are concentrated in a small number of countries, namely Spain, Germany, Belgium and, with a few reservations, France as well. In the other countries, longer operating hours are confined to one or two plants. Nevertheless, company-specific characteristics are ultimately more important than country-specific characteristics. Companies that require longer operating hours modify their shift systems in those plants that produce the models for which demand is particularly strong at any given time. Manufacturers' locational strategies are much more important for decisions on shift systems and operating hours than national working-time regulations or collectively agreed working times, for example. However, most high-volume models are produced at several plants in Europe. For this reason, the readiness of local trade unions and other employee representative bodies to accede to companies' demands for night or weekend working plays an important role in determining corporate vocational strategies.
7. In view of the trend towards three-shift operation in automobile production, the extension of night work is obviously no longer a controversial issue in the European automotive industry. It can reasonably be assumed, in contrast to the situation in the late 1980s, that companies requiring increased capacity scarcely need to bother themselves with fundamental political disputes, such as those over the possible health risks of night work, but are concerned primarily with economic cost-benefit calculations, which of course take account of the premiums to be paid for night and alternating shift work.
8. As far as so-called "unsocial working hours" are concerned, the focus of attention today must be the expansion of weekend working. The trend towards extending operating hours into the weekend will inevitably strengthen as three-shift operation comes to dominate the industry. However, contrary to some of the sensationalist reports that have been put about, the dam has not yet burst. Regular weekend working is still the exception rather than the rule in automobile production. On the other hand, regular weekend working is

relatively common in certain particularly capital-intensive areas on the "periphery" of body and assembly plants. Even here, it does not necessarily apply to the majority of the workforce, but there is no doubt that weekend shifts are gradually gaining ground step by step. In many cases, separate weekend shift crews are recruited. Germany is no exception to this trend.

9. Nor should any false conclusions be drawn from a few sensationalist reports on the flexibilisation of working time. The data provided by plants for the purposes of our survey give a very clear picture: in most cases, employee representative bodies in the workplace participate in the decision-making on flexible working-time arrangements, from extra shifts to variable shift systems. Of course, company management is unquestionably the dominant influence on the flexibilisation of working time. And yet this flexibilisation has been the object of workplace bargaining processes precisely when it has been achieved by trading shorter working time for greater flexibility. To put it simply: the more strongly trade unions and other employee representative bodies have pressed for working-time reductions, the more they have been induced or even forced to develop the “working-time know-how” they require to influence working-time policy in the workplace.

These observations underline the importance of agreement among the trade unions active in the European automotive industry on common minimum standards for the organisation of working time and the importance of practical efforts to ensure compliance with those standards. However, they also show that there is a need to be clear about the effects of competition between production sites. Trade unions in countries such as Germany and France, in which working time has been or is being sharply reduced, have been forced to make concessions, in some cases far-reaching ones, on the flexibilisation of working time because of the competitive pressure that is being transmitted all the way down to individual plant level. However, this will have repercussions on those countries in which working time has been reduced only slightly, if at all. It is true that most employees in these countries still work in working-time systems in which working times are stable and predictable. Yet it would illusory to believe that these countries will avoid the “bitter cup” of flexibilisation if attempts to reduce working time are abandoned. Competition between production plants works in all directions, from North to South and from West to East. Companies such as DaimlerChrysler and Volkswagen are today gathering experiences with flexible shift systems, particularly in Germany, that they will apply tomorrow in Spain if required. For this reason, trade unions and employee representative bodies throughout the European automotive industry would be well-advised to develop their own “working-time know-how”.

Annex: Data

Table A: Working time and operating time, 1998 (h/year) [*]

		Working hours			Operating hours	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**
BEL	20. Ford Genk	1735	1590	1110	5010	3570
BEL	*21. Ford Genk night shift workers*	*1455*	*1325*	*925*	-	-
BEL	22. Opel Antwerpen (all details for 1999)	1800	1635	1635	4770	4770
BEL	*23. Opel Antwerpen night shift workers*	*1575*	*1410*	*1410*	-	-
BEL	24. Volkswagen Bruxelles	1560	1400	1400	5290	5290
BEL	25. Volkswagen Bruxelles (ab 1999)	1560	1400	1400	6000+	
BEL	26. Volvo Gent	1720	1575	1555	3445	3400
BEL	*27. Volvo Gent body shop*	*1720*	*1575*	*1555*	*5175*	*5155*
CZE	28. Daewoo Avia Praha	1815	1700	1715	3570	3585
CZE	29. Skoda (A 2)	1815	1700	1700	3570	3645
CZE	30. Skoda (A 4)	1815	1700	1700	5315	5450
CZE	*31. Skoda body shop*	*1815*	*1700*	*1700*	*5315*	*5765*
FIN	32. Valmet Automotive Saab / Porsche	1735	1660	1675	3330	3130
FRA	33. Renault Douai	1695	1490	1530	4080	4150
FRA	34. Peugeot Poissy	1715	1615	1635	3290	3300

[*] Standard working time = paid attendance time
Net working time = standard working time minus paid breaks
Actual working time = net working time corrected for overtime, short time working
Standard operating time = operating time based on standard working time correted for regular interruptions of production
Actual operating time = standard operating time corrected for overtime, short time working

FRA	35. Peugeot Mulhouse	1715	1640	1750	3330	3485
FRA	*36. Peugeot Mulhouse body shop*	*1740*	*1665*	*1750*	*5000*	*5150*
FRA	37. Peugeot (from 2000)	1660	1580			
FRA	38. Renault (from 2000)	1555				
GER	39. Volkswagen Wolfsburg	1585	1440	1560	4975	5570
GER	40. Opel Rüsselsheim	1540	1430	1490	3150	3200
GER	41. Opel Rüsselsheim Vectra line	1540	1430	1490	3800	3800
GER	42. Opel Bochum	1540	1415	1435	4855	4915
GER	43. Ford Köln	1540	1435	1510	3290	3435
GER	*44. Ford Köln body shop*	*1540*	*1435*	*1510*	*4835*	*5330*
GER	45. DaimlerChrysler Sindelfingen	1540	1455	1470	3705	3735
GER	*46. DC Sindelfingen body shop*	*1540*	*1455*	*1470*	*5050*	*5090*
GER	47. DaimlerChrysler Rastatt	1540	1455	1440	4585	4605
GER	48. BMW München	1540	1390	1405	4165	4280
GER	49. BMW Regensburg	1495	1360	1380	4525	4560
GER	*50. BMW Regensburg body shop*	*1495*	*1360*	*1380*	*4110*	*4200*
GER	51. Audi Ingolstadt	1540	1450	1570	5200	5430
ITA	52. Fiat Melfi	1795	1715	1715	6200	6200
ITA	53. Fiat (usual system)	1750 ~	1605 ~	-	3590 ~	-
NED	54. Volvo / Mitshubishi Nedcar	1780	1665	1650	5155	5110

POR	55. Toyota	1824	1824	1824 (+?)	1824	1824 (+?)
POR	56. Renault Aveiro	1824	1520	1525	4560	4580
POR	57. Opel Azambuga	1824	1690	1740	5140	5295
POR	58. Ford Lusitana	1824	1750	1750 (+?)	1750	1750 (+?)
POR	59. Citroën Lusitania	1824	1750	1750	3500	3500
POR	60. Autoeuropa, Setubal	1824	1800	1800	3950	3950
SPA	61. Volkswagen Pamplona	1720	1565	1565	5290	4645 (?)
SPA	62. Seat Martorell	1736	1590	1690	4860	5160
SPA	*63. Seat Martorell press shop*	*1736*	*1590*	*1590*	*5900*	*5900*
SPA	64. Renault Fasa	1720	1645	1670	4940	5000 ~
SPA	*65. Renault Fasa night shift workers*	*1545*	*1470*	*1470*	-	-
SPA	66. Peugeot España	1739	1655	1655	3110	3110
SPA	67. Opel Zaragoza	1709	1560	1580	4875	4930
SPA	*68. Opel Zaragoza press shop*	*1709*	*1560*	*1580*	*5585*	*5585*
SPA	69. Nissan Vehículos Industriales	1776	1665	1665	1665	1665
SPA	70. Iveco Pegaso	1728	1675	1715	3440	3520
SPA	71. Ford Valencia	1824	1635	1610	3305	3260
SPA	*72. Ford Valencia body shop*	*1824*	*1635*	*1610*	*4850*	*4780*
SPA	73. Mercedes Benz Vitoria	1776	1685	1740	5070	5220
SPA	*74. Mercedes Benz Vitoria, body shop*	*1776*	*1520*	*1570*	*4560*	*4700*
SPA	75. Citroën Citroën Hispania, Vigo	1752	1640	1660	4915	4990
SWE	76. Volvo Torslanda	1600	1440	1440	3270	3270
SWE	*77. Volvo Torslanda body shop*	*1765*	*1605*	*1605*	*3610*	*3610*

SWE	78. Saab Trollhättan	1735	1620	1690	3315	3450

Table B: Working time and operating time, 1998 (ranking by standard working time)

BEL	*1. Ford Genk night shift workers*	***1455***	*1325*	*925*	-	-
GER	2. BMW Regensburg	**1495**	1360	1380	4525	4560
GER	3. Opel Rüsselsheim	**1540**	1430	1490	3150	3200
GER	4. Ford Köln	**1540**	1435	1510	3290	3435
GER	5. DaimlerChrysler Sindelfingen	**1540**	1455	1470	3705	3735
GER	6. DaimlerChrysler Rastatt	**1540**	1455	1440	4585	4605
GER	7. BMW München	**1540**	1390	1405	4165	4280
GER	8. Audi Ingolstadt	**1540**	1450	1570	5200	5430
SPA	*9. Renault Fasa night shift workers*	***1545***	*1470*	*1470*	-	-
FRA	79. Renault (from 2000)	**1555**				
BEL	10. Volkswagen Bruxelles	**1560**	1400	1400	5290	5290
BEL	*11. Opel Antwerpen night shift workers*	***1575***	*1410*	*1410*	-	-
GER	12. Volkswagen Wolfsburg	**1585**	1440	1560	4975	5570
SWE	13. Volvo Torslanda	**1600**	1440	1440	3270	3270
FRA	14. Peugeot (from 2000)	**1660**	1580			
FRA	15. Renault Douai	**1695**	1490	1530	4080	4150
SPA	16. Opel Zaragoza	**1709**	1560	1580	4875	4930
FRA	17. Peugeot Poissy	**1715**	1615	1635	3290	3300
FRA	80. Peugeot Mulhouse	**1715**	1640	1750	3330	3485

BEL	18. Volvo Gent	**1720**	1575	1555	3445	3400
SPA	19. Volkswagen Pamplona	**1720**	1565	1565	5290	4645 (?)
SPA	20. Renault Fasa	**1720**	1645	1670	4940	5000 ~
SPA	21. Iveco Pegaso	**1728**	1675	1715	3440	3520
BEL	22. Ford Genk	**1735**	1590	1110	5010	3570
FIN	23. Valmet Automotive Saab / Porsche	**1735**	1660	1675	3330	3130
SWE	24. Saab Trollhättan	**1735**	1620	1690	3315	3450
SPA	25. Seat Martorell	**1736**	1590	1690	4860	5160
SPA	26. Peugeot España	**1739**	1655	1655	3110	3110
FRA	*81. Peugeot Mulhouse body shop*	***1740***	*1665*	*1750*	*5000*	*5150*
ITA	27. Fiat (usual system)	**1750 ~**	1605 ~	-	3590 ~	-
SPA	28. Citroën Citroën Hispania, Vigo	**1752**	1640	1660	4915	4990
SWE	*29. Volvo Torslanda body shop*	***1765***	*1605*	*1605*	*3610*	*3610*
SPA	30. Nissan Vehículos Industriales	**1776**	1665	1665	1665	1665
SPA	31. Mercedes Benz Vitoria	**1776**	1685	1740	5070	5220
SPA	*32. Mercedes Benz Vitoria, body shop*	***1776***	*1520*	*1570*	*4560*	*4700*
NED	33. Volvo / Mitshubishi Nedcar	**1780**	1665	1650	5155	5110
ITA	34. Fiat Melfi	**1795**	1715	1715	6200	6200
BEL	35. Opel Antwerpen	**1800**	1635	1635	4770	4770
CZE	36. Daewoo Avia Praha	**1815**	1700	1715	3570	3585
CZE	37. Skoda (A 2)	**1815**	1700	1700	3570	3645
CZE	38. Skoda (A 4)	**1815**	1700	1700	5315	5450

POR	39. Toyota	**1824**	1824	1824 (+?)	1824	1824 (+?)
POR	40. Renault Aveiro	**1824**	1520	1525	4560	4580
POR	41. Opel Azambuga	**1824**	1690	1740	5140	5295
POR	42. Ford Lusitana	**1824**	1750	1750 (+?)	1750	1750 (+?)
POR	43. Citroën Lusitania	**1824**	1750	1750	3500	3500
POR	44. Autoeuropa, Setubal	**1824**	1800	1800	3950	3950
SPA	45. Ford Valencia	**1824**	1635	1610	3305	3260
		Working hours			**Operating hours**	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**

Table C: Working time and operating time, 1998 (ranking by net working time)

		Working hours			**Operating hours**	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**
BEL	*1. Ford Genk night shift workers*	*1455*	***1325***	*925*	-	-
GER	2. BMW Regensburg	1495	**1360**	1380	4525	4560
GER	3. BMW München	1540	**1390**	1405	4165	4280
BEL	4. Volkswagen Bruxelles	1560	**1400**	1400	5290	5290
BEL	*5. Opel Antwerpen night shift workers*	*1575*	***1410***	*1410*	-	-
GER	6. Opel Bochum	1540	**1415**	1435	4855	4915
GER	7. Opel Rüsselsheim	1540	**1430**	1490	3150	3200
GER	8. Volkswagen Wolfsburg	1585	**1440**	1560	4975	5570
SWE	9. Volvo Torslanda	1600	**1440**	1440	3270	3270
GER	10. Audi Ingolstadt	1540	**1450**	1570	5200	5430
GER	11. DaimlerChrysler Sindelfingen	1540	**1455**	1470	3705	3735

GER	12. DaimlerChrysler Rastatt	1540	**1455**	1440	4585	4605
SPA	*13. Renault Fasa night shift workers*	*1545*	***1470***	*1470*	-	-
FRA	14. Renault Douai	1695	**1490**	1530	4080	4150
POR	15. Renault Aveiro	1824	**1520**	1525	4560	4580
SPA	*16. Mercedes Benz Vitoria, body shop*	*1776*	***1520***	*1570*	*4560*	*4700*
SPA	17. Opel Zaragoza	1709	**1560**	1580	4875	4930
SPA	18. Volkswagen Pamplona	1720	**1565**	1565	5290	4645 (?)
BEL	19. Volvo Gent	1720	**1575**	1555	3445	3400
FRA	20. Peugeot (from 2000)	1660	**1580**			
BEL	21. Ford Genk	1735	**1590**	1110	5010	3570
SPA	22. Seat Martorell	1736	**1590**	1690	4860	5160
ITA	23. Fiat (usual system)	1750 ~	**1605 ~**	-	3590 ~	-
SWE	*24. Volvo Torslanda body shop*	*1765*	***1605***	*1605*	*3610*	*3610*
FRA	25. Peugeot Poissy	1715	**1615**	1635	3290	3300
SWE	26. Saab Trollhättan	1735	**1620**	1690	3315	3450
BEL	27. Opel Antwerpen	1800	**1635**	1635	4770	4770
SPA	28. Ford Valencia	1824	**1635**	1610	3305	3260
SPA	29. Citroën Citroën Hispania, Vigo	1752	**1640**	1660	4915	4990
FRA	30. Peugeot Mulhouse	1715	**1640**	1750	3330	3485
SPA	31. Renault Fasa	1720	**1645**	1670	4940	5000 ~
SPA	32. Peugeot España	1739	**1655**	1655	3110	3110
FIN	33. Valmet Automotive Saab / Porsche	1735	**1660**	1675	3330	3130

FRA	*34. Peugeot Mulhouse body shop*	*1740*	***1665***	*1750*	*5000*	*5150*
NED	35. Volvo / Mitshubishi Nedcar	1780	**1665**	1650	5155	5110
SPA	36. Nissan Vehículos Industriales	1776	**1665**	1665	1665	1665
SPA	37. Iveco Pegaso	1728	**1675**	1715	3440	3520
SPA	38. Mercedes Benz Vitoria	1776	**1685**	1740	5070	5220
POR	39. Opel Azambuga	1824	**1690**	1740	5140	5295
CZE	40. Daewoo Avia Praha	1815	**1700**	1715	3570	3585
CZE	41. Skoda (A 2)	1815	**1700**	1700	3570	3645
CZE	42. Skoda (A 4)	1815	**1700**	1700	5315	5450
ITA	43. Fiat Melfi	1795	**1715**	1715	6200	6200
POR	44. Ford Lusitana	1824	**1750**	1750 (+?)	1750	1750 (+?)
POR	45. Citroën Lusitania	1824	**1750**	1750	3500	3500
POR	46. Autoeuropa, Setubal	1824	**1800**	1800	3950	3950
POR	47. Toyota	1824	**1824**	1824 (+?)	1824	1824 (+?)

Table D: Working time and operating time, 1998 (ranking by actual working time)

		Working hours			**Operating hours**	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**
BEL	*1. Ford Genk night shift workers*	*1455*	*1325*	***925***	-	-
BEL	2. Ford Genk	1735	1590	**1110**	5010	3570
GER	3. BMW Regensburg	1495	1360	**1380**	4525	4560
BEL	4. Volkswagen Bruxelles	1560	1400	**1400**	5290	5290
GER	5. BMW München	1540	1390	**1405**	4165	4280

BEL	*6. Opel Antwerpen night shift workers*	*1575*	*1410*	***1410***	-	-
GER	7. Opel Bochum	1540	1415	**1435**	4855	4915
SWE	8. Volvo Torslanda	1600	1440	**1440**	3270	3270
GER	9. DaimlerChrysler Rastatt	1540	1455	**1440**	4585	4605
GER	10. DaimlerChrysler Sindelfingen	1540	1455	**1470**	3705	3735
SPA	*11. Renault Fasa night shift workers*	*1545*	*1470*	***1470***	-	-
GER	12. Opel Rüsselsheim	1540	1430	**1490**	3150	3200
POR	13. Renault Aveiro	1824	1520	**1525**	4560	4580
FRA	14. Renault Douai	1695	1490	**1530**	4080	4150
BEL	15. Volvo Gent	1720	1575	**1555**	3445	3400
GER	16. Volkswagen Wolfsburg	1585	1440	**1560**	4975	5570
SPA	17. Volkswagen Pamplona	1720	1565	**1565**	5290	4645 (?)
GER	18. Audi Ingolstadt	1540	1450	**1570**	5200	5430
SPA	*19. Mercedes Benz Vitoria, body shop*	*1776*	*1520*	***1570***	*4560*	*4700*
SPA	20. Opel Zaragoza	1709	1560	**1580**	4875	4930
SWE	*21. Volvo Torslanda body shop*	*1765*	*1605*	***1605***	*3610*	*3610*
SPA	22. Ford Valencia	1824	1635	**1610**	3305	3260
FRA	23. Peugeot Poissy	1715	1615	**1635**	3290	3300
BEL	24. Opel Antwerpen	1800	1635	**1635**	4770	4770
NED	25. Volvo / Mitshubishi Nedcar	1780	1665	**1650**	5155	5110
SPA	26. Peugeot España	1739	1655	**1655**	3110	3110
SPA	27. Citroën Citroën Hispania, Vigo	1752	1640	**1660**	4915	4990

SPA	28. Nissan Vehículos Industriales	1776	1665	**1665**	1665	1665
SPA	29. Renault Fasa	1720	1645	**1670**	4940	5000 ~
FIN	30. Valmet Automotive Saab / Porsche	1735	1660	**1675**	3330	3130
SPA	31. Seat Martorell	1736	1590	**1690**	4860	5160
SWE	32. Saab Trollhättan	1735	1620	**1690**	3315	3450
CZE	33. Skoda (A 2)	1815	1700	**1700**	3570	3645
CZE	34. Skoda (A 4)	1815	1700	**1700**	5315	5450
SPA	35. Iveco Pegaso	1728	1675	**1715**	3440	3520
CZE	36. Daewoo Avia Praha	1815	1700	**1715**	3570	3585
ITA	37. Fiat Melfi	1795	1715	**1715**	6200	6200
SPA	38. Mercedes Benz Vitoria	1776	1685	**1740**	5070	5220
POR	39. Opel Azambuga	1824	1690	**1740**	5140	5295
FRA	40. Peugeot Mulhouse	1715	1640	**1750**	3330	3485
FRA	*41. Peugeot Mulhouse body shop*	*1740*	*1665*	***1750***	*5000*	*5150*
POR	42. Citroën Lusitania	1824	1750	**1750**	3500	3500
POR	43. Ford Lusitana	1824	1750	**1750 (+?)**	1750	1750 (+?)
POR	44. Autoeuropa, Setubal	1824	1800	**1800**	3950	3950
POR	45. Toyota	1824	1824	**1824 (+?)**	1824	1824 (+?)

Table E: Working time and operating time, 1998 (ranking by standard operating time)

		Working hours			**Operating hours**	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**
ITA	1. Fiat Melfi	1795	1715	1715	**6200**	6200

BEL	2. Volkswagen Bruxelles (ab 1999)	1560	1400	1400	**6000 +**	
SPA	*3. Seat Martorell press shop*	*1736*	*1590*	*1590*	***5900***	*5900*
SPA	*4. Opel Zaragoza press shop*	*1709*	*1560*	*1580*	***5585***	*5585*
CZE	5. Skoda (A 4)	1815	1700	1700	**5315**	5450
CZE	*6. Skoda body shop*	*1815*	*1700*	*1700*	***5315***	*5765*
BEL	7. Volkswagen Bruxelles	1560	1400	1400	**5290**	5290
SPA	8. Volkswagen Pamplona	1720	1565	1565	**5290**	4645 (?)
GER	9. Audi Ingolstadt	1540	1450	1570	**5200**	5430
BEL	*10. Volvo Gent body shop*	*1720*	*1575*	*1555*	***5175***	*5155*
NED	11. Volvo / Mitshubishi Nedcar	1780	1665	1650	**5155**	5110
POR	12. Opel Azambuga	1824	1690	1740	**5140**	5295
SPA	13. Mercedes Benz Vitoria	1776	1685	1740	**5070**	5220
GER	*14. DC Sindelfingen body shop*	*1540*	*1455*	*1470*	***5050***	*5090*
BEL	15. Ford Genk	1735	1590	1110	**5010**	3570
FRA	*16. Peugeot Mulhouse body shop*	*1715*	*1640*	*1750*	***5000***	*5150*
GER	17. Volkswagen Wolfsburg	1585	1440	1560	**4975**	5570
SPA	18. Renault Fasa	1720	1645	1670	**4940**	5000 ~
SPA	19. Citroën Citroën Hispania, Vigo	1752	1640	1660	**4915**	4990
SPA	20. Opel Zaragoza	1709	1560	1580	**4875**	4930
SPA	21. Seat Martorell	1736	1590	1690	**4860**	5160
GER	22. Opel Bochum	1540	1415	1435	**4855**	4915

SPA	*23. Ford Valencia body shop*	*1824*	*1635*	*1610*	***4850***	*4780*
GER	*24. Ford Köln body shop*	*1540*	*1435*	*1510*	***4835***	*5330*
BEL	25. Opel Antwerpen	1800	1635	1635	**4770**	4770
GER	26. DaimlerChrysler Rastatt	1540	1455	1440	**4585**	4605
POR	27. Renault Aveiro	1824	1520	1525	**4560**	4580
SPA	*28. Mercedes Benz Vitoria, body shop*	*1776*	*1520*	*1570*	***4560***	*4700*
GER	29. BMW Regensburg	1495	1360	1380	**4525**	4560
GER	30. BMW München	1540	1390	1405	**4165**	4280
GER	*31. BMW Regensburg body shop*	*1495*	*1360*	*1380*	***4110***	*4200*
FRA	32. Renault Douai	1695	1490	1530	**4080**	4150
POR	33. Autoeuropa, Setubal	1824	1800	1800	**3950**	3950
GER	34. Opel Rüsselsheim Vectra line	1540	1430	1490	**3800**	3800
GER	35. DaimlerChrysler Sindelfingen	1540	1455	1470	**3705**	3735
SWE	*36. Volvo Torslanda body shop*	*1765*	*1605*	*1605*	***3610***	*3610*
ITA	37. Fiat (usual system)	1750 ~	1605 ~	-	**3590 ~**	-
CZE	38. Daewoo Avia Praha	1815	1700	1715	**3570**	3585
CZE	39. Skoda (A 2)	1815	1700	1700	**3570**	3645
POR	40. Citroën Lusitania	1824	1750	1750	**3500**	3500
BEL	41. Volvo Gent	1720	1575	1555	**3445**	3400
SPA	42. Iveco Pegaso	1728	1675	1715	**3440**	3520
FRA	43. Peugeot Mulhouse	1715	1640	1750	**3330**	3485

SWE	44. Saab Trollhättan	1735	1620	1690	**3315**	3450
SPA	45. Ford Valencia	1824	1635	1610	**3305**	3260
FRA	46. Peugeot Poissy	1715	1615	1635	**3290**	3300
GER	47. Ford Köln	1540	1435	1510	**3290**	3435
SWE	48. Volvo Torslanda	1600	1440	1440	**3270**	3270
GER	49. Opel Rüsselsheim	1540	1430	1490	**3150**	3200
SPA	50. Peugeot España	1739	1655	1655	**3110**	3110
POR	51. Toyota	1824	1824	1824 (+?)	**1824**	1824 (+?)
POR	52. Ford Lusitana	1824	1750	1750 (+?)	**1750**	1750 (+?)
SPA	53. Nissan Vehículos Industriales	1776	1665	1665	**1665**	1665

Table F: Working time and operating time, 1998 (ranking by actual operating time)

		Working hours			**Operating hours**	
Ctry.	**Company/Plant**	**Standard**	**Net**	**Actual**	**Standard**	**Actual**
ITA	1. Fiat Melfi	1795	1715	1715	6200	**6200**
SPA	*2. Seat Martorell press shop*	*1736*	*1590*	*1590*	*5900*	***5900***
CZE	*3. Skoda body shop*	*1815*	*1700*	*1700*	*5315*	***5765***
SPA	*4. Opel Zaragoza press shop*	*1709*	*1560*	*1580*	*5585*	***5585***
CZE	5. Skoda (A 4)	1815	1700	1700	5315	**5450**
GER	6. Audi Ingolstadt	1540	1450	1570	5200	**5430**
GER	7. Volkswagen Wolfsburg	1585	1440	1560	4975	**5345**
GER	*8. Ford Köln body shop*	*1540*	*1435*	*1510*	*4835*	***5330***
POR	9. Opel Azambuga	1824	1690	1740	5140	**5295**
BEL	10. Volkswagen Bruxelles	1560	1400	1400	5290	**5290**
SPA	11. Mercedes Benz Vitoria	1776	1685	1740	5070	**5220**
SPA	12. Seat Martorell	1736	1590	1690	4860	**5160**

BEL	*13. Volvo Gent body shop*	*1720*	*1575*	*1555*	*5175*	***5155***
FRA	*14. Peugeot Mulhouse body shop*	*1740*	*1665*	*1750*	*5000*	***5150***
NED	15. Volvo / Mitshubishi Nedcar	1780	1665	1650	5155	**5110**
GER	*16. DC Sindelfingen body shop*	*1540*	*1455*	*1470*	*5050*	***5090***
SPA	17. Renault Fasa	1720	1645	1670	4940	**5000 ~**
SPA	18. Citroën Citroën Hispania, Vigo	1752	1640	1660	4915	**4990**
SPA	19. Opel Zaragoza	1709	1560	1580	4875	**4930**
GER	20. Opel Bochum	1540	1415	1435	4855	**4915**
SPA	*21. Ford Valencia body shop*	*1824*	*1635*	*1610*	*4850*	***4780***
BEL	22. Opel Antwerpen	1800	1635	1635	4770	**4770**
SPA	*23. Mercedes Benz Vitoria, body shop*	*1776*	*1520*	*1570*	*4560*	***4700***
SPA	24. Volkswagen Pamplona	1720	1565	1565	5290	**4645 (?)**
GER	25. DaimlerChrysler Rastatt	1540	1455	1440	4585	**4605**
POR	26. Renault Aveiro	1824	1520	1525	4560	**4580**
GER	27. BMW Regensburg	1495	1360	1380	4525	**4560**
GER	28. BMW München	1540	1390	1405	4165	**4280**
GER	*29. BMW Regensburg body shop*	*1495*	*1360*	*1380*	*4110*	***4200***
FRA	30. Renault Douai	1695	1490	1530	4080	**4150**
POR	31. Autoeuropa, Setubal	1824	1800	1800	3950	**3950**
GER	32. Opel Rüsselsheim Vectra line	1540	1430	1490	3800	**3800**

GER	33. DaimlerChrysler Sindelfingen	1540	1455	1470	3705	**3735**
CZE	34. Skoda (A 2)	1815	1700	1700	3570	**3645**
SWE	*35. Volvo Torslanda body shop*	*1765*	*1605*	*1605*	*3610*	***3610***
CZE	36. Daewoo Avia Praha	1815	1700	1715	3570	**3585**
BEL	37. Ford Genk	1735	1590	1110	5010	**3570**
SPA	38. Iveco Pegaso	1728	1675	1715	3440	**3520**
POR	39. Citroën Lusitania	1824	1750	1750	3500	**3500**
FRA	40. Peugeot Mulhouse	1715	1640	1750	3330	**3485**
SWE	41. Saab Trollhättan	1735	1620	1690	3315	**3450**
GER	42. Ford Köln	1540	1435	1510	3290	**3435**
BEL	43. Volvo Gent	1720	1575	1555	3445	**3400**
FRA	44. Peugeot Poissy	1715	1615	1635	3290	**3300**
SWE	45. Volvo Torslanda	1600	1440	1440	3270	**3270**
GER	46. Opel Rüsselsheim	1540	1430	1490	3150	**3200**
FIN	47. Valmet Automotive Saab / Porsche	1735	1660	1675	3330	**3130**
SPA	48. Peugeot España	1739	1655	1655	3110	**3110**
SPA	49. Nissan Vehículos Industriales	1776	1665	1665	1665	**1665**

Table G: Working time and operating time, 1990 (h/year)

		working time		operating time
	plant	standard	net	standard
B	Ford Genk	1775	1630	3620
B	Opel Antwerpen	1680	1540	5140
B	Volkswagen Bruxelles	1695	1555	5265
D	Vollkswagen Wolfsburg	1615	1465	3380
D	BMW München	1630	1500	3885
D	Opel Rüsselsheim	1630	1500	3170
D	Ford Köln	1630	1500	3150
D	DaimlerChrysler Sindelfingen	1630	1510	3650
D	Opel Bochum	1630	1490	4890
D	BMW Regensburg	1550	1410	4610
F	Peugeot Poissy	1725	1635	4015
F	Renault Flins	1710	1600	3310
FRA	Peugeot Mulhouse	1725	1630	3350
NL	Volvo / Mitshubishi Nedcar	1730	1660	3755
SP	Seat	1770	1620	3480
SP	Opel Zaragoza	1725	1605	5120
SP	Ford Valencia	1720	1645	3300

Table H: Breaks

Country	Company	Plant	Breaks (minutes/shift)		Length of shifts (in hours; all breaks included)
			not paid	paid	
B	Volvo	Gent	-	morning 55 late 40 (Fri 50 and 35 resp.)	Mon – Thu morning 8.25 Mon – Thu late 8 Fri morning 7 Fri late 6.75
B	Volkswagen	Bruxelles	-	45	
B	Opel	Antwerpen	-	44	
B	Ford	Genk	-	40 night 35	
CZ	Skoda		-	30 night 40	8 hrs
CZ	Daewoo		-	30	8
SF	Saab, Porsche	Valmet Automotive	25	20	8
F	Peugeot	Poissy	36	20	8.55 hrs
F	Peugeot	Mulhouse	25/45	20	7.7 plus lunch break
D	Ford	Köln	30	31	8 hrs
D	Opel	Bochum	30	37	8
D	Opel	Rüsselsheim	30	23	8

D	BMW	München	30	50	2 x 9.08
D	BMW	Regensburg	30	49	9.5
D	DaimlerChrysler	Sindelfingen	30	∅ 26	morning 9 hrs late 8 hrs Body shop: morning 9 hrs late 7 hrs night 7.5 hrs
D	DaimlerChrysler	Rastatt	30 Sa 20	∅ 27	morning Mon - Fri 8.4 Sat morning 7.9 late 8.4 night 6.7
D	Opel	Bochum			8
D	Audi	Ingolstadt	30	24	8.5 morning 7.5 late 7.5 night
D	Volkswagen	Wolfsburg	30	5,5/h	5.48 - 8 hrs possible. 1998: 8 hrs
I	Fiat	Melfi	-	40 incl. 20 „after end of shift“	7.66 (+ 20‘ „break“ after end of shift)
NL	Volvo/Mitshubishi	Nedcar Born	15	35	8.1
P	Ford	Lusitana	65	-	8.75
P	Toyota		45	-	8.75
P	Citroen	Lusitania	45	20	8 (+ lunch break)

P	Volkswagen (/Ford)	Autoeuropa, Setubal	30	7	07.00 - 15.30 = 8.5 hrs 15.30 - 02.00 = 10.5 hrs
P	Renault	Aveiro	60	20	8
P	Opel	Azambuga	35	-	8
SP	Renault	Vehiculos Industriales	-	15	
SP	Nissan	Vehiculo Industriales	-	30	8
SP	Peugeot		n.a.	23	8.1 h
SP	Ford	Valencia	-	50 night 35	8.25 morning and late 7.5 night
SP	Iveco	Pegaso	-	15	8
SP	Seat	Martorell	20	20	8
SP	Opel	Zaragoza	18	40	8
SP	Citroen	Vigo	35	10	8 hrs
SP	Renault	Fasa	15	20	morning + late: 8 night: 7 Mon - Thu, 8 Fri
SP	DaimlerChrysler	Mercedes Benz Vitoria	n.a.	23	8
SP	Volkswagen	Pamplona	-	40 night 50	8

S	Volvo	Torslanda	morning 42 late 18	42	morning 8.9 late 7.6
S	Saab	Trollhättan	36 (except for Fri afternoon)	30	8.6 morning 8.5 late; Fri late 4.5 Body shop: 8.6 morning, 7.8 late Mon - Fri

Table I: Shift systems in car assembly, 1998

Country	**Company**	**Plant**	**Basic features of shift system**	**Length of shifts (in hours; all breaks included)**
BEL	Volvo	Gent	2 shifts 5 days a week	Mon – Thu morning 8.25 Mon – Thu late 8 Fri morning 7 Fri late 6.75
CZE	Daewoo Avia	Praha	1 shift operation Mon – Fri	
CZE	Skoda	A02	depending on car model: either 2 shifts or 3 shifts, each 5 days a week Mon – Fri A 02: 2 per day 10 per week	8 hrs
CZE	Skoda	A4	A 4: 3 per day 15 per week	8 hrs
FIN	Saab, Porsche	Valmet Automotive	2-shift system with occasional extension of shifts Mon - Fri	8
FRA	Peugeot	Poissy	2 shift system: 2 per day Mon-Thu, 1 Fri, 9 shifts to work in the course of 2 weeks. Extended duration of shifts, thus spare time for extra shifts on Fri afternoon	8.55 hrs

FRA	Peugeot	Mulhouse	2 shift system Mon-Fri 3rd shift (permanent night shift) in some component sectors	7.7 plus lunch break
GER	Ford	Köln	2 shift system Mon - Fri	8 hrs
GER	Opel	Rüsselsheim	2 shift system (+ night shift at bottlenecks) / 4 or 5 days a week (working-time „corridor“)	8
GER	DaimlerChrysler	Sindelfingen	2 shift system, 5 days a week; flexibility: ~ 6 days shutdown period per year used as time bank for extra shifts on Sat.	morning 9 hrs late 8 hrs Body shop: morning 9 hrs late 7 hrs night 7.5 hrs
GER	BMW	München	2 extended (8.58 hour) shifts per day and 10 shifts a week; individual 4 day week; remaining working-time debt of workers registered on working-time accounts and balanced out by occasional extra shifts (5th day either Mon-Fri or Sat); 5 workers share 4 work stations	2 x 9.08
GER	BMW	Regensburg	2 shifts / 9 hrs Mon-Fri, 1 shift /9 hrs Sat = 11 shifts per week; individual shift cycle: 1st week 4 shifts, 2nd week 3 shifts, 3rd week 4 shifts = 99 hrs within 3 weeks	9.5
GER	DaimlerChrysler	Rastatt	1-3 per day 13 per week , including Sat Variable 3-shift-system with 6 morning shifts (incl. Sat), 5 late, 2 night (Wed + Thu) as regular pattern for 3 teams. Number of night shifts may be extended if extra capacity is needed. Recuperation by cancelling of night and Sat shifts within 2 years.	morning Mon - Fri 8.4 Sat morning 7.9 late 8.4 night 6.7
GER	Opel	Bochum	3 shifts: 2 shifts + permanent night shift Mon - Fri	8
GER	Audi	Ingolstadt	3 shifts: 2 shift system + permanent night shift Mon - Fri	8.5 morning 7.5 late 7.5 night

GER	Volkswagen	Wolfsburg	Various shift patterns possible on the basis of the 28.8 hrs week. Shift pattern in assembly in1998: 2 shifts + permanent night shift Mon - Fri. Regular working-time was 8 hrs / 5 days a week (incl. paid and unpaid breaks). Difference to 36 hrs balanced out by occasional days off (for night shift workers as blocks of time off).	5.48 - 8 hrs possible. 1998: 8 hrs
ITA	Fiat	Melfi	3 shift system Mon – Sat 3 weeks shift cycle with 2 weeks / 6 days and 1 week / 3 days worked by each shift group.	3 x 7.66 (+ officially 20' lunch break after the shift), thus creating the contractual 8 hr day
NED	Volvo/Mitshubishi	Nedcar Born	3 shift system Mon - Fri	8.1 hrs (8 hrs, 5', i.e. overlap of shifts)
POR	Ford	Lusitana	day shift operation (= 5 shifts Mon - Fri), fixed schedule (evening and night shifts just for maintenance)	8.75
POR	Toyota		1 shift operation Mon - Fri, fixed schedule	8.75
POR	Citroen	Lusitania	2 shift production Mon - Fri	8 (+ lunch break)
POR	Volkswagen (/Ford)	Autoeuropa, Setubal	2 shift system, Mon - Fri variations of 2nd shift which may be extended up to 10 hrs with time off in lieu within 2 weeks	07.00 - 15.30 = 8.5 hrs 15.30 - 02.00 = 10.5 hrs
POR	Renault	Aveiro	3 shift production Mon - Fri (night shift reduced capacity)	8
POR	Opel	Azambuga	3 shift operation Mon – Fri	8
SPA	Renault	Vehiculos Industriales	1 day shift operation Mon - Fri (4 shift operation (incl. Sat) in mechanical department)	
SPA	Nissan	Vehiculo Industriales	1 shift operation Mon - Fri	8
SPA	Peugeot		2 shift system Mon - Fri	8.1 h

SPA	Ford	Valencia	2 shift system Mon - Fri	8.25 morning and late 7.5 night
SPA	Iveco	Pegaso	2 shift system Mon - Fri	8
SPA	Seat	Martorell	3 shift system Mon – Fri	8
SPA	Opel	Zaragoza	3 shift system Mon – Fr	8
SPA	Citroen		3 shift system Mon – Fri	8 hrs
SPA	Renault	Fasa	3 shifts: 2 shift system + permanent night shift Mon - Fri	15’ lunch break + 20’ paid relief breaks
SPA	DaimlerChrysler	Mercedes Benz Vitoria	3 shift system Mon – Fri	8
SPA	Volkswagen	Pamplona	3 shift system (backwards rotating)	8
SWE	Volvo	Torslanda	2 shifts Mon - Thu (morning shift extended, late shift shortened), 1 shift Fri; 9 shifts to be worked in 2 weeks	morning 8.9 late 7.6
SWE	Saab	Trollhättan	2 shift system Mon - Fri, with shortened late shift on Fri; variable elements since 1996	8.6 morning 8.5 late; Fri late 4.5 Body shop: 8.6 morning, 7.8 late Mon - Fri

Table J: Overtime compensation

Country	**Company**	**Plant**	**From how many hours (per day/week) is a bonus mandatory for overtime?**	**Overtime pay (in % of hourly wage)**	**Compensation**

BEL	Volvo	Gent	Extra shifts	1250 BEF/day	only extra pay
CZE	Daewoo Avia	Praha	1st extra hour	25% Sat, 50% Sun, 100% public holiday	choice between time off or pay
CZE	Skoda		1st hr	25%, Sat/Sun 50%, public holiday 100%	choice between time off or pay
FIN	Saab, Porsche	Valmet Automotive	9th / 40th	50% up to 8 hrs, then 100%	choice between time off or pay
FIN		Partek Sisu	n.A.	n.A.	n.A.
FRA	Peugeot	Poissy	From the 40th hr	40th-47th hr: 25%, following 50%	Only extra pay
FRA	Peugeot	Mulhouse	39th hr	25%	"capitalised working-time account"
GER	Volkswagen	Wolfsburg	From 36th hr on if beyond agreed work schedule	30%	generally only time off
GER	Opel	Rüsselsheim	Beyond 7.75 hrs/day or 38.75 hrs/week	25% 1st – 6th hr, 40% 7th and 8th hr, then 50%	choice between time off or pay
GER	Opel	Bochum	1st hr	n.a.	choice between time off or pay
GER	Ford	Köln	Possibility to extend overtime without bonus up to 70 hrs / year	1st and 2nd hr 25%, following hrs 50%	only time off
GER	DaimlerChrysler	Sindelfingen	1st hr beyond normal working-time	1st – 10th hr / week 25%, from 11th hr on 50%, from 3rd daily hr on 50%	choice between time off or pay
GER	DaimlerChrysler	Rastatt	working-time beyond variations of shift pattern	(collective agreement, see Sindelfingen)	choice between time off or pay
GER	BMW	München	?	25 – 175%	choice between time off or pay

GER	BMW	Regensburg	any difference from shift schedule except those necessary to match contractual working time	1st - 6th hr 25%, then 50%	collective overtime registered in working time accounts; in the case of individual overtime choice between time off or pay (time off chosen by ~ 80% of employees)
GER	Audi	Ingolstadt	1st hr differing from normal working-time	25% 1st-6th hr then 50%	choice between time off or pay
ITA	Fiat	Melfi	?	10% before 10 p.m. 40% after 10 p.m.	?
NED	Volvo/Mitshubishi	Nedcar Born	9th hr	1st 2 hrs: 25% following hrs 41.4% (?) Sat 80%	choice between time off or pay
POR	Toyota		9th hr / 6th day	1st hr +50% 2nd hr + 75% 3rd hr + 100% Sat + 300%	? Extra time off in lieu for 2 extra hrs = 30' and Sat = 2 hrs
POR	Renault	Aveiro	9th hr	50% - 200%	n.a.
POR	Opel	Azambuga	?	n.a.	n.a.
POR	Ford	Lusitana	"according to the law"	dto.	
POR	Citroen	Lusitania	n.a. (9th hr?)	25%	n.a.
POR	Volkswagen (/Ford)	Autoeuropa, Setubal	9th hr	n.a.	n.a.
SPA	Volkswagen	Pamplona	From 9th hr / day and 41st hr / week; Sat always	~ + 43%; flat rate for Sat 12,000-14,000 pts	choice between time off or pay

SPA	Seat	Martorell	From 1736 hrs / year	1st hrs fixed pay of ~ 10,000pts / day; then pay plus day off in lieu; i.e. the 1st 5 Sat are payed (as one day is counted officially as 8 hrs), the rest is paid and compensated by time off in lieu	pay; time off and pay
SPA	Renault	Fasa	Beyond 7.75 hrs / day	c.f. Convenio Colectivo	choice between pay and time off
SPA	Renault	Vehiculos Industriales	?	30% + 1,782 pts/day	only extra pay = most common choice between time off and pay possible
SPA	Peugeot		9th hr	?	choice between time off or pay
SPA	Opel	Zaragoza	As soon as regular daily or weekly working-time is exceeded	individual overtime hrs: 75% extra shifts: 10,500 pts + day off	overtime: choice between pay and time off extra shifts: time off and pay
SPA	Nissan	Vehiculo Industriales	From 9th hr	n.a.	n.a.
SPA	Iveco	Pegaso	Beyond contractual working-time	+ 50%	choice between time off or pay
SPA	Ford	Valencia	Extra days	Flat rates (per hr?): Sat 825 pts, Sun 925 pts, public holidays 1027 pts	choice between extra pay or time off
SPA	DaimlerChrysler	Mercedes Benz Vitoria	from 9th hr	?	choice between time off or pay
SPA	Citroen		n.a.	n.a.	only extra pay
SWE	Volvo	Torslanda	Collective agreement	n.a.	only extra pay choice between time off or pay only time off
SWE	Saab	Trollhättan	c.f. agreement (in Swedish)	n.a.	choice between time off or pay

Table K: Potential use of various flexibility tools

Country	**Company**	**Plant**	**Variation of annual shutdowns**	**Grouping of individual days off into collective downtime days**	**"tag relief"**
BEL	Volvo	Gent	√	√	√ partly
BEL	Opel	Antwerpen	√	n.a.	-
BEL	Volkswagen	Bruxelles	√	n.a.	-
BEL	Ford	Genk	n.a.	n.a.	n.a.
CZE	Daewoo Avia	Praha	-	-	-
CZE	Skoda		√	-	√ sometimes
FIN	Saab, Porsche	Valmet Automotive	-	√	-
FRA	Peugeot	Poissy	-	-	-
FRA	Peugeot	Mulhouse	√ (extension in 1998)	-	-
GER	Volkswagen	Wolfsburg	√	√	√ (possible, but actually not practised in assembly)
GER	Opel	Rüsselsheim	√	√	occasionally at bottlenecks
GER	Opel	Bochum	√	√	√
GER	Ford	Köln	√	√	no
GER	DaimlerChrysler	Sindelfingen	√ (no summer shutdown)	-	√ (in principle, but actually not practiced)

GER	DaimlerChrysler	Rastatt	√ (no shutdown in 1998)	-	-
GER	BMW	München	√	√	possible
GER	BMW	Regensburg	√ (1998: 3 weeks)	-	√ (partly, just for individual relief breaks)
GER	Audi	Ingolstadt	no annual shutdown	√	no
ITA	Fiat	Melfi	n.a.	n.a.	n.a.
NED	Volvo / Mitshubishi	Nedcar Born	-	√ (has to be agreed with works council if more than 1)	-
POR	Toyota		n.a.	n.a.	n.a.
POR	Renault	Aveiro	n.a.	n.a.	n.a.
POR	Opel	Azambuga	n.a.	n.a.	n.a.
POR	Ford	Lusitana	-	n.a.	-
POR	Citroen	Lusitania	n.a.	n.a.	n.a.
POR	Volkswagen (/Ford)	Autoeuropa, Setúbal	n.a.	n.a.	n.a.
SPA	Volkswagen	Pamplona	√ extension	-	√ is “common”; covered by relief men, extra remuneration
SPA	Seat	Martorell	-	-	-
SPA	Renault	Fasa	n.a.	n.a. (presumably 5)	n.a.
SPA	Renault	Vehículos Industriales	n.a.	n.a.	n.a.

SPA	Peugeot		-	-	-
SPA	Opel	Zaragoza	√: The working-time agreement stipulates that 8 out of the contractual 27 annual leave days are individual ones, which gives leeway to the company to vary the duration of shutdown periods	-	-
SPA	Nissan	Vehiculo Industriales	n.a.	n.a.	n.a.
SPA	Iveco	Pegaso	-	-	-
SPA	Ford	Valencia	-	-	√ (started in 1998)
SPA	DaimlerChrysler	Mercedes Benz Vitoria	√	-	√
SPA	Citroen		recuperation	-	-
SWE	Volvo	Torslanda	n.a.	n.a.	n.a.
SWE	Saab	Trollhättan	?	-	n.a.