EA02022

BOOK 2 OF 2

FORD RESPONSE TO ODI DATED 12/6/02

ATTACHMENT J-1 AND J-2

J-1

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 12 mai 1998
19-21, Boulevard Royal
L-2910 Luxembourg
Tél. 478-1 - Télécopieur 241817 - Télex 1465 CITAIR LU

RÉFÉRENCE : N° E13*79R00*79R01*0042*00

ANNEXE : Documentation technique

E 13

Communication concernant [1]
Communication concerning [1]

- [redacted]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

d'un type de véhicule en ce qui concerne l'équipement de direction,
en application du règlement N° 79
of a vehicle type with regard to steering equipment pursuant to Regulation N° 79

N° d'homologation:
Approval N°: E13*79R00*79R01*0042*00

Marque d'homologation:
Approval mark: E13 79R-01 0042

1. Marque de fabrique ou de commerce du véhicule:
Trade name or mark of the vehicle: Ford

2. Type du véhicule:
Vehicle type: 70J11-DW-B79

Dénomination(s) commerciale(s):
Commercial description(s): DBW, DFW, DAW, DNW

Versions:
Versions: sedan (3dr, 4dr, 5dr), wagon 5dr
left or right hand drive

3. Nom et adresse du constructeur:
Manufacturer's name and address: Ford-Werke Aktiengesellschaft
D-50725 Köln

4. Le cas échéant, nom et adresse de son mandataire:
If applicable, name and address of manufacturer's representative: EUROMOTOR Norbert Grass & Company
B.P. 1606
L-1016 Luxembourg

E002-822 1374

5.	Description sommaire de l'équipement de direction: Brief description of the steering equipment:	
5.1	Type d'équipement de direction: Type of steering equipment:	rack and pinion steering
5.2.	Commande de direction: Steering control:	circular steering wheel
5.3	Transmission de direction: Steering transmission:	mechanical linkage
5.4	Roues directrices: Steered wheels:	2, at front axle
5.5	Source d'énergie: Energy source:	muscular power with power assistance through oil pump
6.	Résultats des essais: Effort à la commande de direction nécessaire pour inscrire le véhicule dans un cercle de 12 m de rayon ou de 20 m de rayon dans le cas d'un défaut de fonctionnement: Results of Tests: Steering effort required to achieve a turning circle of 12 metres radius or 20 metres with a fault:	
6.1	Dans des conditions normales: Under normal conditions:	left manoevre: 2,44 daN right manoevre: 3,08 daN
6.2	Après défaillance de l'équipement spécial: After failure of special equipment:	left manoevre: 8,78 daN right manoevre: 9,66 daN
7.	Véhicule présenté à l'homologation, le: Vehicle submitted for approval on:	06.04.1998
8.	Autorité désignée: Assigned authority:	Société Nationale de Contrôle Technique - Homologations L-5201 Sandweiler
	Service Technique chargé des essais: Technical service responsible for conducting approval test:	TÜV Rheinland Luxemburg GmbH Centre Commercial "Le 2000" Z.I. L-3378 Livange
9.	Date du procès-verbal délivré par ce service: Date of report issued by that service:	21.04.1998
10.	Numéro du procès-verbal délivré par ce service: Number of test report issued by that service:	97LG0209-00
11.	L'homologation est: Approval:	granted
12.	Emplacement de la marque d'homologation sur le véhicule: Position of approval mark on the vehicle:	nearby the manufacturer's plate

J.

13. **Fait à:**
Place: Luxembourg

14. **Date:**
Date: 12 mai 1998

15. **Signature:**
Signature: Pour le Ministre des Transports

Paul SCHMIT
Commissaire du Gouvernement

16. **Une liste des documents du dossier d'homologation déposé auprès des services administratifs qui ont délivré l'homologation qui figure en annexe à cette communication peut être obtenue sur demande.**
Annexed to this communication is a list of documents in the approval files deposited at the administrative services having delivered the approval and which can be obtained upon request.

voir "INDEX DU DOSSIER DE RECEPTION" ci-joint
see "INDEX TO TYPE-APPROVAL REPORT"

Modifications faisant l'objet de la présente extension
Modifications of this extension

not applicable

Note explicative et récapitulative des extensions réalisées
Explanatory and recapitulatory note of delivered extensions

not applicable

[0] Biffer ce qui ne convient pas
Strike out what does not apply

./.

EN82-022 1378

[redacted]

INDEX DU DOSSIER D'HOMOLOGATION
INDEX TO TYPE-APPROVAL REPORT

	Marque (raison sociale du constructeur): **Make (trade name of manufacturer):**	Ford
	Type: **Type:**	70/311-DW-R79
	Numéro d'homologation ECE: **ECE type-approval number:**	E13*79R00*79R01*0042*00
1.	**Procès-verbal d'essai:** **Test report:**	97LG0269-00
	- Technical report: - Information about vehicle type:	Page 1 to 3 Appendix 1.A - Page 4 & 5 Appendix 1.B - Page 6 &7
2.	**Dossier du constructeur:** **Report of manufacturer:**	98AB-05601 X
	- Information document: - Attachment to item 1.1.	Page 1, 2, 3, 4, 5, 6 Drw. N° HL-99AG-0-308, HL-99AG-0-303, HL-99AG-0-306, HL-99AG-0-309 Attachment 1 - Page 1
	- Attachment to item 6.6. & 6.6.3. - Attachment to item 7.1., 7.2.3.1., 7.2.4. & 7.2.5.	Drw. N° G98AB-106-AA - Page 1, 2 Drw. N° G98AB-106-AA - Page 3
3.	**Autres documents remis:** **Other documents enclosed:**	not applicable
4.	**Date de délivrance de l'homologation initiale:** **Date of issue of initial type-approval:**	12.05.1998
5.	**Date de la dernière délivrance de pages révisées:** **Date of last issue of revised pages:**	not applicable
6.	**Date de la dernière délivrance d'une homologation révisée:** **Date of last extension:**	not applicable

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 12 mai 1998
79-21, Boulevard Royal
L-2910 LUXEMBOURG
Tél. 478-1 - Télécopieur 261817 - Télex 1445 CITAIR LU

RÉFÉRENCE : No e13*70/311*92/62*0042*00

ANNEXES : Documentation technique

Communication concernant [1]: - [redacted]
communication concerning [1]: -
- l'extension de la réception
- extension of type-approval
- le refus de la réception
- refusal of type-approval
- le retrait de la réception
- withdrawal of type-approval

d'un type de véhicule/composant/entité technique séparée [2] au vertu de la directive 70/311/CEE, telle qu'elle a été modifiée en dernier lieu par la directive 92/62/CEE.

of a type of : vehicle/component/separate technical unit [2] with regard to Directive 70/311/EEC, as last amended by Directive 92/62/EEC.

Numéro de réception
Type-approval number: e13*70/311*92/62*0042*00

SECTION I
SECTION I

0.	Généralités General	
0.1.	Marque (raison sociale du constructeur): Make (trade name of manufacturer):	Ford
0.2.	Type et description commerciale: Type and commercial description(s):	type: 70/311-DFW-B79 commercial description: DBW, DFW, DAW, DNW versions: sedan (3dr, 4dr, 5dr), wagon 5dr left or right hand drive
0.3.	Moyens d'identification du type, s'ils figurent sur le véhicule/composant/entité technique séparée [2][3]: Means of identification of type if marked on the vehicle/component/separate technical unit [2][3]:	not applicable
0.3.1.	Emplacement de ce marquage: Location of that marking:	not applicable

0.4.	Catégorie de véhicule (2): Category of vehicle (2):	M_1
0.5.	Nom et adresse du constructeur du véhicule de base: Name and address of manufacturer:	Ford Werke Aktiengesellschaft D-50725 Köln
	Nom et adresse du constructeur responsable de l'exécution de la dernière étape de construction du véhicule: Name and address of manufacturer responsible for the final stage of construction of the vehicle:	Ford Werke Aktiengesellschaft D-50725 Köln
0.8.	Adresse(s) des installations de montage: Address(es) of assembly plant(s):	Ford Werke Aktiengesellschaft D-66740 Saarlouis Ford España S.A. E-46002 Valencia

SECTION II
SECTION II

1.	Renseignements complémentaires (si nécessaire): Additional information (where applicable):	see appendix
2.	Autorité délégués : Assigned authority :	Société Nationale de Contrôle Technique-Homologations L-3201 Bandwiller
	Service technique responsable de l'exécution des essais: Technical service responsible for carrying out the tests:	TÜV Rheinland Luxemburg GmbH Centre Commercial "Le 2000" Z.I. L-3378 Livange
3.	Date du procès-verbal d'essai: Date of test report:	21.04.1998
4.	Numéro du procès-verbal d'essai: Number of test report:	97LG0209-00
5.	Remarques (le cas échéant): Remarks (if any):	see appendix

6. Lieu:
Place: Luxembourg

7. Date:
Date: 12 mai 1998

8. Signature:
Signature: Pour le Ministre des Transports

Paul SCHMIT
Commissaire du Gouvernement

9. L'index du dossier de réception déposé auprès des autorités compétentes, qui peut être obtenu sur demande, est joint.
The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

voir "INDEX DU DOSSIER DE RECEPTION" ci-joint
see "INDEX TO TYPE-APPROVAL REPORT"

Appendice
Appendix
à la fiche de réception d'un type de véhicule N°
to EEC type-approval certificate N°
concernant la réception par type d'un véhicule selon la directive 70/311/CEE
concerning the type-approval of a vehicle with regard to Directive 70/311/EEC
amendée en dernier lieu par la directive 92/62/CEE
as last amended by Directive 92/62/EEC

1. Renseignements complémentaires
Additional information

Type d'équipement de direction:
Type of steering equipment: rack and pinion steering

Commande de direction
Steering control: circular steering wheel

Transmission de direction:
Steering transmission: mechanical linkage

Roues directrices:
Steered wheels: 2, at front axle

Source d'énergie:
Energy source: muscular power with power assistance through oil pump

/...

Performances du freinage: indication du numéro d'homologation accordé conformément à la directive 71/320/CEE et indication de l'état du véhicule lors des essais: en charge / à vide [6].
Braking performances: statement of the component type-approval number granted in accordance with directive 71/320/EEC and information concerning the state of the vehicle during tests: either laden or unladen [6].

not applicable

5. Remarques:
Remarks: valid for both right and left hand drive

(par exemple également valable pour véhicules à conduite à gauche et conduite à droite)
(e.g. valid for both left-hand drive and right-hand drive vehicles).

Modifications faisant l'objet de la présente extension
Modifications of this extension

not applicable

Notes explicatives et récapitulatives des extensions réalisées
Explanatory and recapitulatory note of delivered extensions

not applicable

[6] Biffer la mention inutile
[6] Delete as appropriate
[8] Si les moyens d'identification du type contiennent des caractères n'intervenant pas la description des types de véhicule, de composant ou d'entité technique couverts par la présente fiche de renseignements, il importe de les indiquer dans la documentation au moyen du symbole "?" (par exemple ABC??1237?).
[8] If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this information document/type-approval certificate, such characters shall be represented in documentation by the symbol: "?" (e.g. ABC??1237?).
[9] Telle que définie à l'annexe II A de la directive 70/156/CEE.
[9] As defined in annex II A to directive 70/156/EEC.

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 12 mai 1998
19-21, Boulevard Royal
L-2910 LUXEMBOURG
Tél. 478-1 - Télécopieur 241817 - Télex 1465 CTVA1B LU

REFERENCE : No e13*70/311*92/62*0042*00

ANNEXE :

INDEX DU DOSSIER DE RÉCEPTION
INDEX TO TYPE-APPROVAL REPORT

Marque (raison sociale du constructeur):
Make (trade name of manufacturer): Ford

Type:
Type: 70/311-DW-B70

Numéro de réception CEE :
EEC type-approval number : e13*70/311*92/62*0042*00

1. Procès-verbal d'essai :
Test report :

- Technical report:	Page 1 to 3
- Information about vehicle type:	Appendix LA - Page 4 & 5 Appendix LB - Page 6 &7

2. Dossier du constructeur :
Report of manufacturer : 98AB-05601 X

- Information document:	Page 1, 2, 3, 4, 5, 6
- Attachment to item 1.1.	Drw. N° HL-99AG-0-300, HL-99AG-0-303, HL-99AG-0-306, HL-99AG-0-309
- Attachment to item 6.6. & 6.6.3.	Attachment 1 - Page 1
- Attachment to item 7.1., 7.2.3.1., 7.2.4. & 7.2.5.	Drw. N° 098AB-106-AA - Page 1, 2 Drw. N° 098AB-106-AA - Page 3

3. Autres documents annexés :
Other documents annexed : not applicable

4. Date de délivrance de la réception initiale :
Date of issue of initial type-approval : 12.05.1998

5. Date de la dernière délivrance de pages révisées :
Date of last issue of revised pages : not applicable

6. Date de la dernière délivrance d'une fiche de réception révisée :
Date of last extension : not applicable

TECHNICAL REPORT

according to the Council Directive on the approximation of the laws of the
Member States relating to

Steering equipment
for motor vehicles and their trailers

70/311/EEC	**dated:**	**June 08,1970**
amended by		
92/62/EEC	**dated:**	**July 02, 1992**

and
according to ECE-Regulation

Uniform provisions concerning the approval vehicles with regard to steering equipment

ECE-R 79	**dated:**	**December 1, 1988**
amended by		
Amend. 01, Suppl. 00, Corr. 02	**dated:**	**August 14, 1996**

Previously granted		
EC type-approval	:	–
ECE approval		–

Structure of report:

1. Tested object(s) and general test information
2. Test minutes
3. Remark concerning tested object(s)
4. Appendices
5. Statement of conformity

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

1. Tested object(s) and general test information

1.1. Tested object(s) : see VCA Job Number 97/98 2200

1.2. General test information

1.2.1. Order issued by (if different from manufacturer) : not applicable

1.2.2. Test object / test vehicle received on : not applicable

1.2.3. Test date : 6 April 1998

1.2.4. Test site : Dunton/GB

1.2.5. Remark : The results of the test refer exclusively to the object(s) mentioned under point 1.1 of this report.

2. Test minutes

2.1. Test facilities : The test facilities / measurement equipment used were in compliance with the test requirements.

2.2. Test results see VCA Job Number 97/98 2200

3. Remark concerning tested object(s): All versions of the vehicle type as stated in the information document are covered by the tested vehicle version(s) and tested object(s) respectively.

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E13*79R00*79R01*0042*00

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

4. Appendices

LA Information about the vehicle type according to the communication concerning the EC type-approval.

LB Information about the vehicle type according to the communication concerning the ECE certificate.

0 List of modifications : not applicable

Information document : 98AB-05601 X

5. Statement of conformity

The type referred to above complies with the requirements mentioned on page 1.

The technical report comprises - including appendix[ces] LA, LB - pages 1 to 7 and shall not be reproduced partially without the written approval of the testing laboratory.

21.04.1998
ku

Dipl.-Ing. Kurtz

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

Appendix LA

Information about the vehicle type according to the communication concerning the EC type-approval.

Section I

0	General	
0.1	Make (trade name of manufacturer)	: FORD
0.2	Vehicle type	: 70/311-DW-R79
	- version(s)	: DBW, DFW, DAW, DNW sedan (3dr, 4dr, 5dr), wagon 5dr (left hand drive or right hand drive)
0.3	Means of identification of type if marked on the vehicle	: not applicable
0.3.1	Location of that marking	: not applicable
0.4	Category of the vehicle	: M1
0.5	Name and address of the manufacturer	: Ford-Werke Aktiengesellschaft D-50725 Köln
	Name and address of the manufacturer responsible for the final stage of construction	: see above
	Name and address of the manufacturer's authorised representative	: not applicable
0.8	Address of assembly plant(s)	: Ford-Werke Aktiengesellschaft 66740 Saarlouis Germany Ford España S.A. 46002 Valencia Spain

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E13*79R00*79R01*0042*00

Section II

1. Additional informations (where applicable) : see Addendum

3. Date of technical report : 21 April 1998

Addendum to EC type-approval certificate

1. Additional Information

Type of steering equipment	: rack and pinion steering
Steering control	: circular steering wheel
Steering transmission	: mechanical linkage
Steered wheels	: 2, at front axle
Energy source	: muscular power with power assistance through oil pump
Braking performance	: statement of the component type-approval number granted in accordance with directive 71/320/EEC and information concerning the state of the vehicle during tests: laden/unladen not applicable

5. Remarks : valid for both right and left hand drive

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

Appendix LB

Information about the vehicle type according to the communication concerning the ECE approval.

1	Trade name or mark of the vehicle	: FORD
2	Vehicle type	: 70/311-DW-R79
3	Name and address of the manufacturer	: Ford-Werke Aktiengesellschaft D-50725 Köln
4	Name and address of the manufacturer's authorised representative	: EUROMOTOR Norbert Graas & Company Postfach 1606 L-1016 Luxemburg
5	Brief description of the steering equipment	
5.1	Type of steering equipment	: rack and pinion steering
5.2	Steering control	: circular steering wheel
5.3	Steering transmission	: mechanical linkage
5.4	Steered wheels	: 2, at front axle
5.5	Energy source	: muscular power with power assistance through oil pump

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

6	Results of tests. Steering effort required to achieve a turning circle of 12 metres radius or 20 metres with a fault :	
6.1	Under normal conditions	: Left manoevre : 2,44 daN Right manoevre : 3,06 daN
6.2	After failure of special equipment	: Left manoevre : 8,78 daN Right manoevre : 9,66 daN
7	Vehicle submitted for approval on	: 6 April 1998
9	Date of technical report issued by that service	: 21 April 1998
12	Position of approval mark on vehicle	: Near by the VIN-plate

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

FORD

EC TA-No.	**: e13*70/311*92/62*????*00**
Information Folder No.	**:98AB-05601 X**
Type	**: 70/311-DW-R79**

INFORMATION FOLDER

In accordance with Annex I of Council Directive 70/156/EEC relating to EEC-Type-approval of a vehicle type and with regard to the

Steering effort

(Directive 70/311/EEC as last amended by Directive 92/62/EEC)

ECE79

e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

Société Nationale de Contrôle Technique-Homologations
L-5201 SANDWEILER (Luxembourg)

New or modified data is marked with "@" !

VEHICLE CERTIFICATION AGENCY
VCA
NATIONAL TYPE APPROVAL

E982-022 1300

EC TA-No. : e13*70/311*92/62*????*00
Information Folder No. :98AB-85601 X
Type : 70/311-DW-R79

Index to Information Folder

EC TA-No. : e13*70/311*92/62*????*00
Information Folder No. :98AB-05601 X
Type : 70/311-DW-R79

Information Document

0.	GENERAL	
0.1.	Make (trade name of manufacturer):	FORD
0.2.	Type and general commercial description(s):	70/311-DW-R79 3/4/5 Door Sedan (DBW/DAW/DFW) 5 Door Wagon (DNW)
0.3.	to 0.3.1. :	N/A
0.4.	Category of vehicle (c):	M1
0.5.	Name and address of manufacturer:	Ford Werke Aktiengesellschaft 50725 Köln Germany
0.5.a.	Manufacturer's representative	Ford España S.A. Paseo de La Castellana 135 28046 Madrid, Spain Ford Motor Company Ltd. Brentwood (Essex), CM13 3BW England
0.5.b.	Location of the ECE-approval-mark on the vehicle	Near by the VIN-plate
0.8.	Address(es) of assembly plant(s):	Ford-Werke Aktiengesellschaft 66740 Saarlouis Germany Ford Espana S.A. 46002 Valencia Spain

EC TA-No. : e13*70/311*92/62*????*00
Information Folder No. :98AB-05601 X
Type : 70/311-DW-R79

1.	GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE (All components may be used alternatively, if use is not restricted as indicated)	
1.1.	Photographs and/or drawings of a representative vehicle:	See attachment
1.3.	Number of axles and wheels:	2 axles, 4 wheels
1.3.1.	Number and position of axles with double wheels:	N/A
1.3.2.	Number and position of steered axles:	1 - FRONT
1.3.3.	Powered axles (number, position, interconnection):	front
1.8.	Hand of drive:	Left hand drive or right hand drive
2.	MASSES AND DIMENSIONS (e) (in kg and mm) (refer to drawing where applicable)	
2.1.	Wheel base(s) (fully loaded) (f):	2615mm - all variants
2.3.1.	Track of each steered axle (i):	1484 to 1494mm
2.4.	Range of vehicle dimensions (overall)	
2.4.1.	For chassis without bodywork	
2.4.1.1.	Length (j):	N/A
2.4.1.2.	Width (k):	N/A
2.4.1.4.	Front overhang (m):	N/A
2.4.1.5.	Rear overhang (n):	N/A
2.4.2.	For chassis with bodywork	
2.4.2.1.	Length (j):	4150mm 3/5 Dr; 4362mm; 4438mm Wagon.
2.4.2.2.	Width (k):	1998mm with mirrors; 1732mm without mirrors

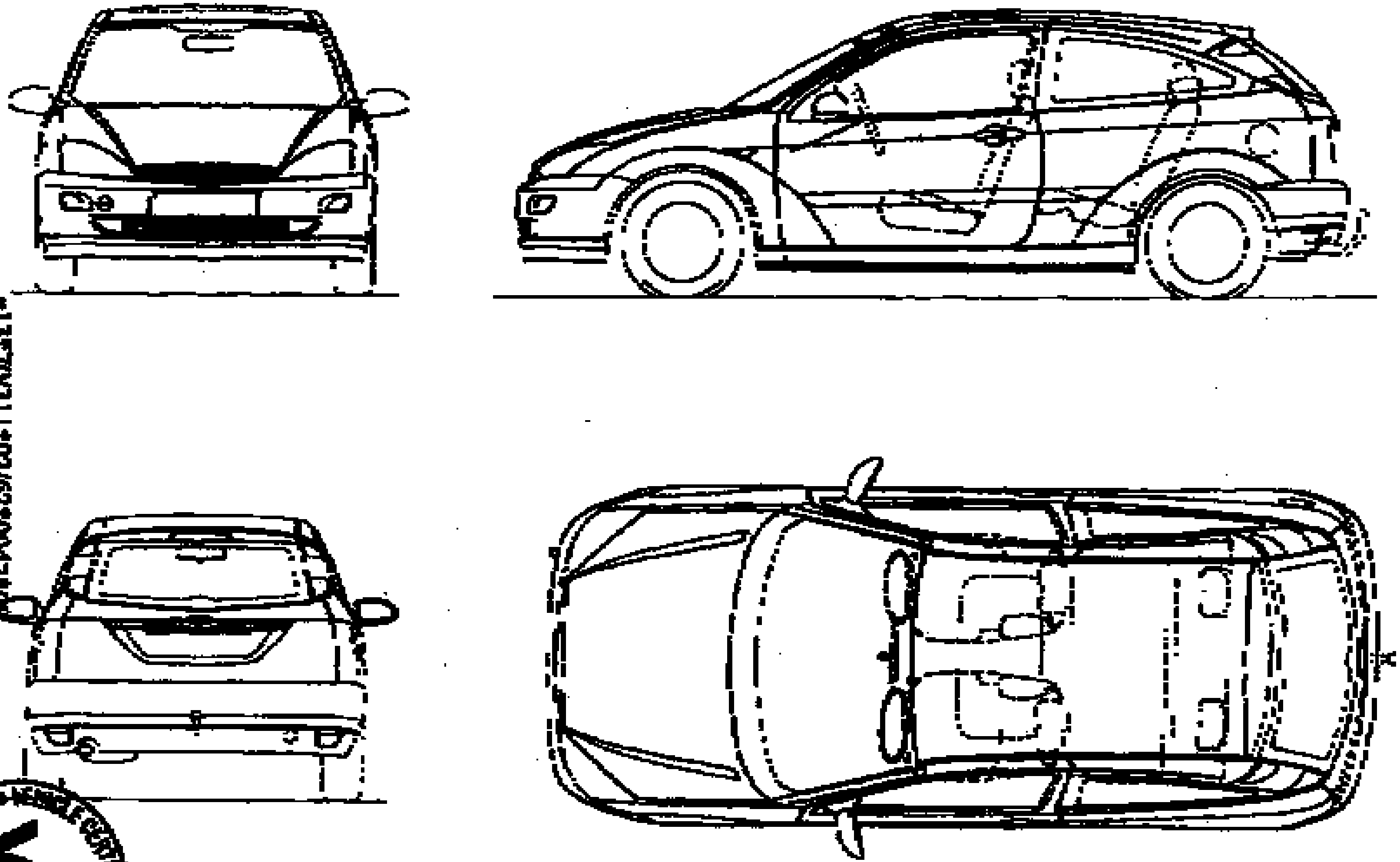
EC TA-No. : e13*70/311*92/62*????*00
Information Folder No. :98AB-05601 X
Type : 70/311-DW-R79

2.4.2.4.	Front overhang (m):	842mm - all variants
2.4.2.5.	Rear overhang (n):	693mm 3/5Dr; 905mm 4Dr; 981mm Wagon.
2.8.	Technically permissible maximum laden mass stated by the manufacturer (max. and min.) (y):	1570kg to 1830kg
2.9.	Technically permissible maximum load/mass on each axle:	990kg front; 840kg rear.
6.	SUSPENSION	
6.6.	Tyres and wheels	
6.6.1.	Tyre/wheel combination(s) (For tyres indicate size designation, minimum load-capacity index, minimum speed category symbol; for wheels indicate rim size(s) and off-set(s))	
6.6.1.1.	Axles	)
6.6.1.1.1.	Axle 1:	) See attachment
6.6.1.1.2.	Axle 2:	)
6.6.1.1.3.	to 6.6.1.1.4. :	N/A
6.6.3.	Tyre pressure(s) as recommended by the vehicle manufacturer [kPa]:	See attachment
7.	STEERING	
7.1.	Schematic diagram of steered axle(s) showing steering geometry:	See attachment
7.2.	Transmission and control	
7.2.1.	Type of steering transmission:(specify for front and rear, if applicable):	rack and pinion steering
7.2.2.	Linkage to wheels (including other than mechanical means; specify for front and rear, if applicable:	mechanical

EC TA-No. : e13*70/311*92/62*????*00
Information Folder No. :98AB-05601 X
Type : 70/311-DW-R79

7.2.3.	Method of assistance, if any:	hydraulic
7.2.3.1.	Method and diagram of operation, make(s) and type(s):	See attachment
7.2.4.	Diagram of the steering equipment as a whole, showing the position on the vehicle of the various devices influencing its steering behaviour:	See attachment
7.2.5.	Schematic diagram(s) of the steering control(s):	See attachment
7.3.	Maximum steering angle of the wheels	
7.3.1.	To the right [degrees]; number of turns of the steering wheel (or equivalent data):	20.05° Sedan: 19.81° Wagon No. of turns - 1.445 Ford; 1.452 TRW.
7.3.2.	To the left [degrees]; number of turns of the steering wheel (or equivalent data):	20.05° Sedan: 19.81° Wagon No. of turns - 1.445 Ford: 1.452 TRW

ORIGINAL

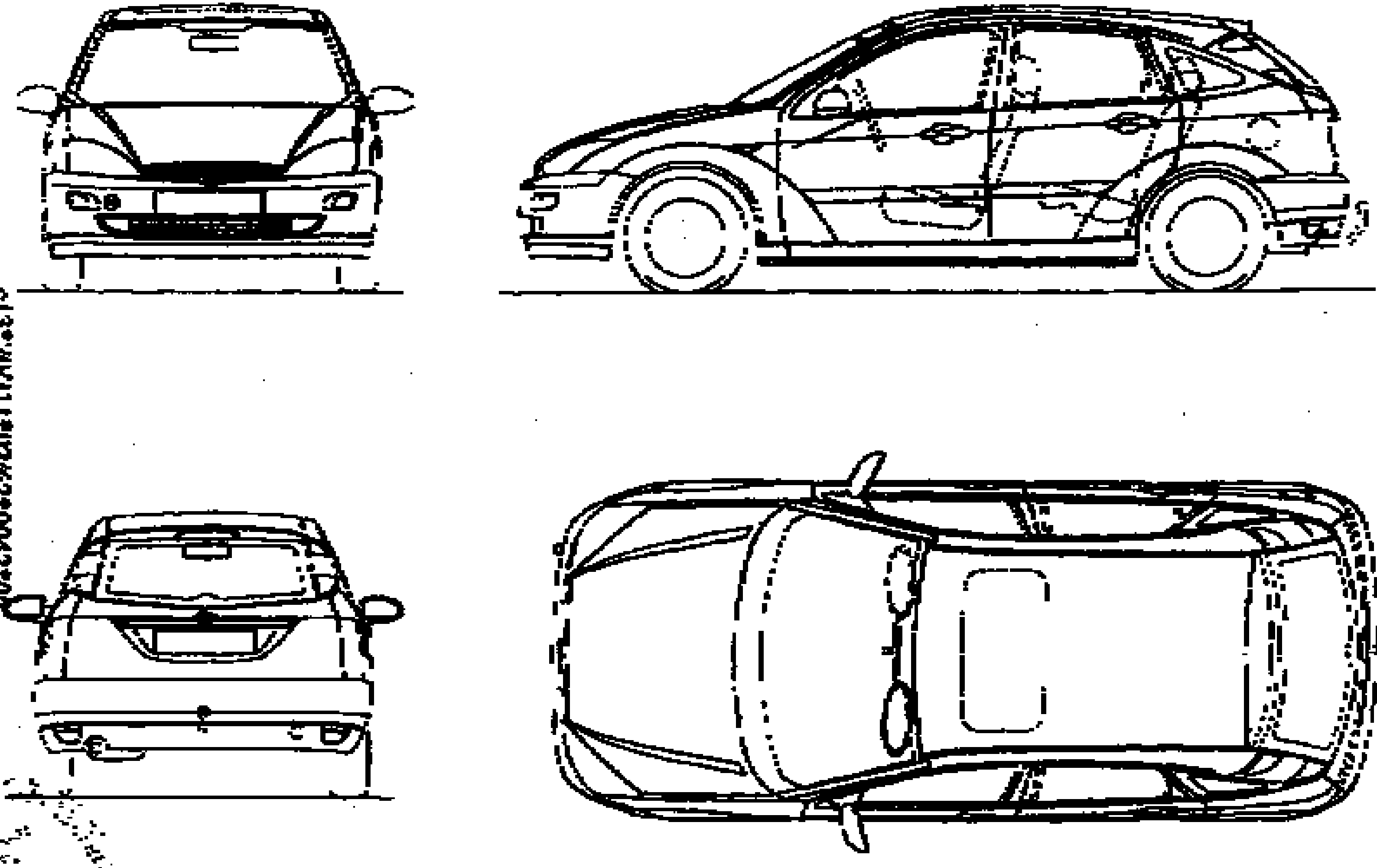


e13*70/311*92/62*0042*00

F11*79K10*79R01*0042*00

VEHICLE CERTIFICATION AGENCY • NATIONAL TYPE APPROVAL

ORIGINAL



e13*KS/11*92/62*0042*00

E13*79R00*79R01*0042*00

SEDAN 5-DOOR

ORIGINAL

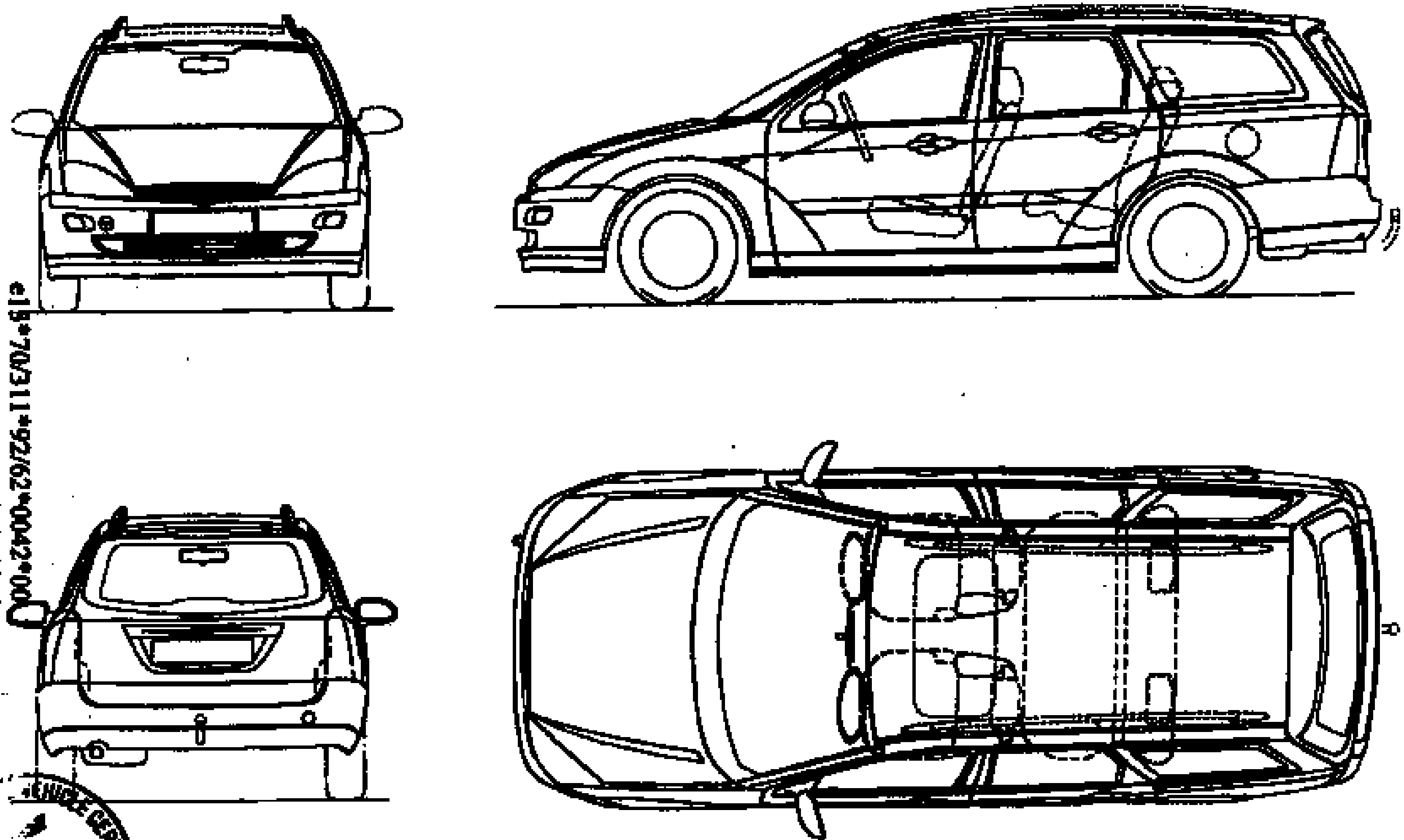
e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00

SEDAN 4-DOOR
TYPE : DFW

HL-99AG-B-396

EN02-022 1398

ORIGINAL



e13*70/311*92/62*0042*00

E13*79R00*79R01*0042*00

Société Nationale de Contrôle Technique-Homologations

L-5201 SANDWEILER (Luxembourg)

VEHICLE CERTIFICATION AGENCY • TYPE APPROVAL

SEDAN ESTATE

HL-99AG-B-389

Annexe 1

C170 Homologation wheel & tyre

Tyre size	Rim	Off-Set	Rolling radii	
175/70 R14	5.5Jx14	47,5 / 43,5	292,2	
185/65 R14	5.5Jx14	47,5 / 43,5	289,3	
195/55 R15	6Jx15	52,5 / 47,5	288,8	
185/60 R15	6Jx15	52,5 / 47,5	290,5	
T135/80 R15	4Jx15	40	282	Spare Unit

Tyre pressure:	half loaden		full loaden	
	front	rear	front	rear
	2.2	2.2	2.5	3.1

Spare Tyre 4.2 bar

Min speed and load index

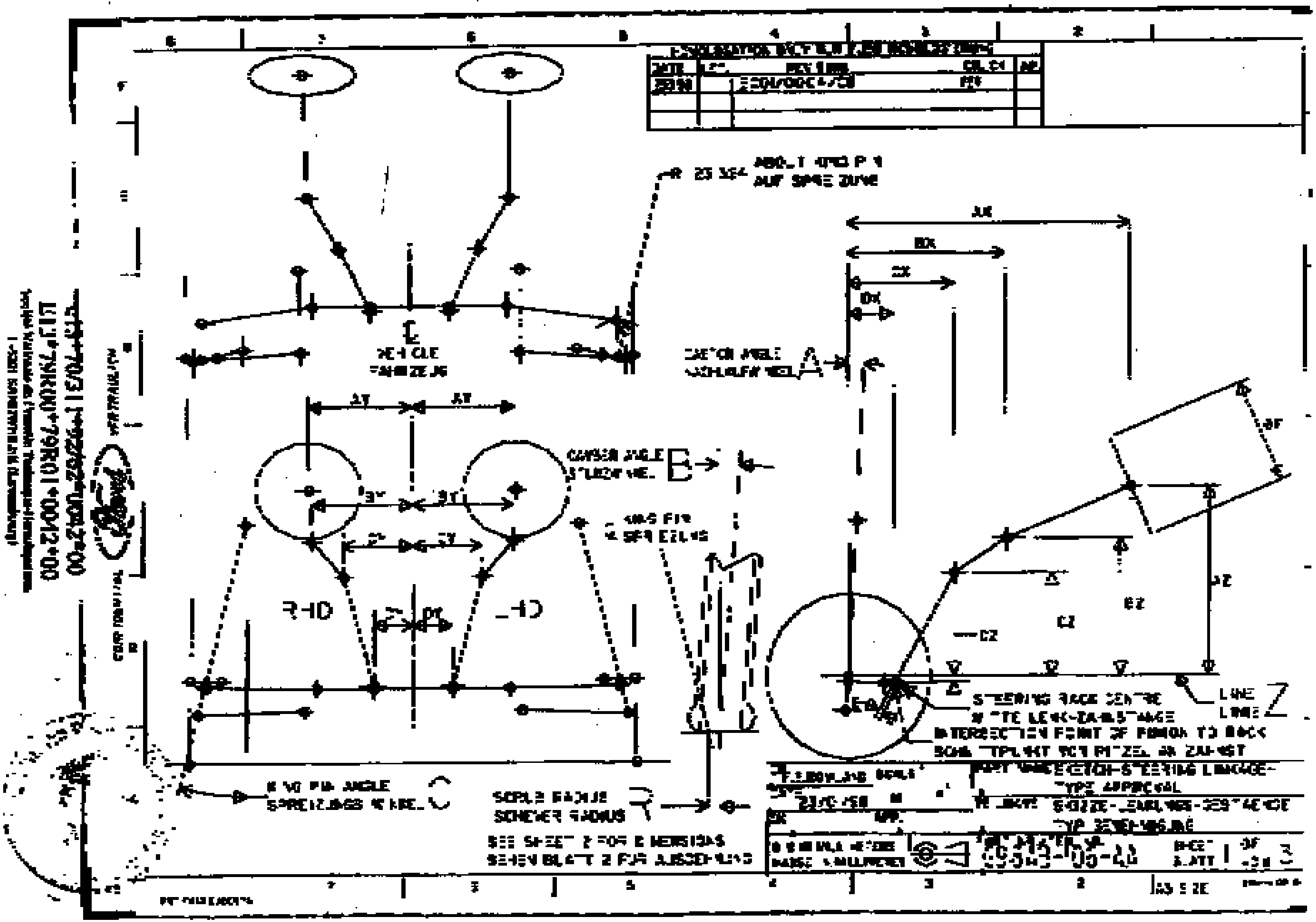
1.4l	H	79
1.6i	T	79
1.8i	H	80
2.0i	V	81

Feb 25, 1998

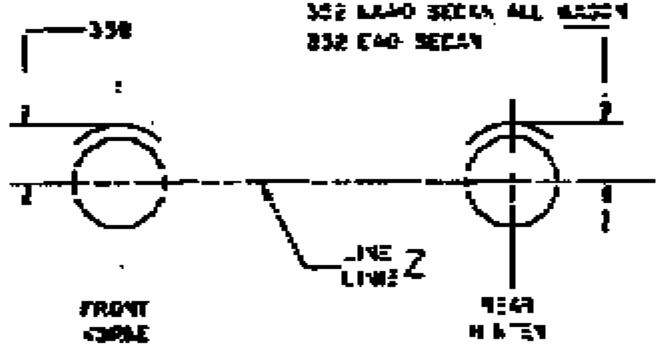
e13*70/311*92/62*0042*00
E13*79R00*79R01*0042*00
Société Nationale de Contrôle Technique-Immatriculation
L-3261 SANDWEILER (Luxembourg)

VEHICLE CERTIFICATION AGENCY
VCA
NATIONAL TYPE APPROVAL

ER82-622 1400


RHD
LHD
CASTOR ANGLE
CAMBER ANGLE
KING PIN ANGLE
SCRUB RADIUS
SCHEUER RADIUS
STEERING RACK CENTRE
LINE Z
TYPE APPROVAL
SEE SHEET 2 FOR DIMENSIONS
SIEHE BLATT 2 FUR ABMESSUNGEN

STEERING COLUMN CO-ORDINATES		
	RIGHT HAND DRIVE	LEFT HAND DRIVE
AX	930,485	930,485
AY	345,000	345,000
AZ	626,440	626,440
BX	325,545	325,545
BY	325,980	325,980
BZ	494,260	494,260
CX	334,435	334,435
CY	232,540	232,540
CZ	336,890	336,890
CN	15,335	15,335
CY	32,000	138,000
DZ	28,900	28,900
E	7,50	7,50



DIMENSIONS APPLY WHEN BODY IS LOCATED IN RELATION TO LINE Z BY THE STEERING HEIGHT DIMENSIONS SHOWN ABOVE

MASSE GELTEN WENN DIE KAROSSERIE AUFGENOMMEN IST IM VERHAELTNIS ZU LINIE 'Z' BEI DEN OBERKANTEN HOEHEN MASSEN WIE OBEN GEZEIGT.

STEERING WHEEL DIAMETER	
MODEL	DIA
ALL	375

STEERING & FRONT SUSPENSION

C9545-106-A2

SHEET 2

A

B

SCALE

SHEET

C98A3-106-A2

E902-022 1403

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 27 décembre 2001
19-21, Boulevard Royal
L-2910 Luxembourg
Tél 478-1 – Télécopieur 241 817 – Télex 1465 CIVAIR LU

REFERENCE: e13*70/311*1999/7*0042*03

ANNEXES: Documentation technique

Communication concernant: - la réception
Communication concerning: - type-approval
- l'extension de la réception
- extension of type approval
- le refus de la réception
- refusal of type-approval
- le retrait de la réception
- withdrawal of type-approval

d'un type de véhicule / composant / entité technique [1] en vertu de la directive 70/311/CEE, modifiée en dernier lieu par la directive 1999/7/CE,
of a type of vehicle / component / separate technical unit [1] with regard to Directive 70/311/EEC, as last amended by Directive 1999/7/EC.

Numéro d'homologation:
Approval number: e13*70/311*1999/7*0042*03

Motif(s) de l'extension:
Reason for extension:
- Drawings updated;
- Address of one assembly plant;
- Dimensions of the vehicle;
- Vehicle variants added;
- Tyre and wheel sizes added.

SECTION I
SECTION I

0.1.	**Marque (raison sociale du constructeur):** Make (trade name of manufacturer):	FORD
0.2.	**Type:** Type:	70/311-DW-R79
	Version(s)/Variante(s): Version(s)/Variants(s):	DAL DAW, DBL DBW, DFW, DNW, DAX, DBX, DNX
0.3.	**Moyens d'identification du type, s'ils figurent sur le véhicule / composant / entité technique [1] [2]:** Means of identification of type, if marked on the vehicle / component / separate technical unit:	not applicable
0.3.1.	**Emplacement de ce marquage:** Location of that marking:	not applicable
0.4.	**Catégorie du véhicule [3]:** Category of vehicle:	M_1

ER02-822 1484

6.5.	Nom et adresse du constructeur: Name and address of manufacturer:	Ford-Werke Aktiengesellschaft D-50725 Köln
6.7.	En cas de composants et d'entités techniques, emplacement et méthode d'apposition de la marque de réception CE: In the case of components and separate technical units, location and method of the affixing of the EC approval mark:	not applicable
6.8.	Adresse(s) des ateliers: Address(es) of assembly plant(s):	Ford Werke Aktiengesellschaft D-66740 Saarlouis Ford Espana S.A. E-46440 Almussafes, Valencia

[1] Biffer la mention inutile
Delete where not applicable

[2] Si les moyens d'identification du type comportent des caractères non pertinents pour décrire les types de véhicule, de composant ou d'entité technique visés par la présente fiche de réception, ces caractères sont remplacés par le symbole "?" dans la documentation (par exemple: ABC??1237?).
If the means of identification of type contain characters not relevant to describe the vehicle, component or separate technical unit types covered by this certificate, such characters shall be represented in the documentation by the symbol "?" (e.g. ABC??1237?).

[3] Suivant les définitions données à l'annexe II section A de la directive 70/156/CEE
As defined in Annex II A to directive 70/156/EEC

SECTION II
SECTION II

1.	**Renseignements complémentaires (si nécessaire):** Additional information (where applicable):	see addendum
2.	**Autorité délégués :** Assigned authority :	Société Nationale de Certification et d'Homologation Département SNCT-H L-5201 Sandweiler
	Service technique responsable de de l'exécution des essais: Technical service responsible for carrying out the tests:	TÜV Rheinland Luxemburg GmbH Centre Commercial "Le 2000" Z.I. route de Bettembourg L-3378 Livange
3.	**Date du procès -verbal d'essais:** Date of test report:	12.12.2001
4.	**Numéro du procès-verbal d'essais:** Number of test report:	17LN00506-04
5.	**Remarques (le cas échéant):** Remarks (if any):	see addendum
6.	**Lieu:** Place:	Luxembourg
7.	**Date:** Date:	27 décembre 2001
8.	**Signature:** Signature:	**Pour le Ministre des Transports** **Paul SCHMIT** **Commissaire du Gouvernement**
9.	**L'index du dossier de réception déposé auprès des autorités compétentes, qui peut être obtenu sur demande, est joint:** The index to the information package lodged with the approval authority, which may be obtained on request, is attached.	see index to type-approval report

Appendice
Addendum

à la fiche de réception d'un type de véhicule N° e13*70/311*1999/7*0042*03
to EC type-approval certificate N° e13*70/311*1999/7*0042*03
selon la réception par type d'un véhicule selon la directive 70/311/CEE amendée en dernier lieu par la directive 1999/7/CE.
concerning the type-approval of a vehicle with regard to Directive 70/311 as last amended by Directive 1999/7/EC.

1. **Renseignements complémentaires**
Additional information

Type d'équipement de direction: Type of steering:	rack and pinion steering
Commande de direction: Steering control:	circular steering wheel
Transmission de direction: Steering wheels:	mechanical linkage
Roues directrices: Steered wheels:	2 at front axle
Source d'énergie: Energy source:	muscular power with power assistance through oil pump
Efficacité de freinage: Braking performance:	not applicable
Indication du numéro de réception attribué conformément à la directive 71/320/CEE le cas échéant: Statement of the type-approval number granted in accordance with directive 71/320/EEC if applicable:	not applicable
et/ou renseignements concernant l'état du véhicule pendant les essais en charge/à vide [1]: and/or information concerning the state of the vehicle during tests: laden/unladen:	not applicable

2. **Observations:**
Remarks:

(par exemple également valable pour véhicules à conduite à gauche et conduite à droite). (e.g. valid for both left-hand and right-hand drive vehicles).	valid for left- or right-hand driven vehicles

Note explicative et récapitulative des extensions réalisées
Explanatory and recapitulatory note of delivered extensions

Extension I of 18.09.2000	*- Editorial changes;* *- Updating directive;* *- Vehicle weights;* *- Vehicle dimensions;* *- Steering angle and turns;* *- Tyre informations;* *- Vehicle drawings;* *- Steering and suspension drawings;* *- Versions of vehicle type added;* *- Drawing of steering control.*
Extension II of 02.04.2001	*- Editorial changes and corrections;* *- Range of technically permissible laden masses;* *- Tyre dimension added;* *- Commercial description deleted.*
Extension III of 27.12.2001	*- Drawings updated;* *- Address of one assembly plant;* *- Dimensions of the vehicle;* *- Vehicle variants added;* *- Tyre and wheel rims added.*

[1] Biffer la mention inutile
Delete where not applicable

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 27 décembre 2001
19-21, Boulevard Royal
L-2910 Luxembourg
Tél 478-1-Télécopieur 241 817 – Télex 1465 CTVAIR LU

REFERENCE: e13*70/311*1999/7*0042*03

ANNEXES: Documentation technique

Index du dossier de réception
Index to type-approval

	Numéro de réception: Approval number:	e13*70/311*1999/7*0042*03
	Révision: Revision:	01
	Marque de fabrique ou de commerce: Trade name or mark:	FORD
	Type: Type:	70/311-DW-R79
1.	**Procès-verbal d'essai** Test report:	N° 17LN00508-04
	- Technical report: - Information about vehicle type EC: - Information about vehicle type ECE: - List of modifications:	Pages 1 to 3; Appendix LA - Pages 4 & 5; Appendix LB - Page 6; Appendix 0 - Page 7.
2.	**Dossier du constructeur:** Report of the manufacturer:	N° 70/311-DW-R79
	- Cover sheet information folder: - Index to information folder: - Information document: - Attachments to information document:	Page 1; Page 2; Pages 3, 4, 5, 6, 7 & 8;
	Attachment to item 1.1.:	Drawing N° HL-2M51-000056-001, HL-2M51-000056-004, HL-2M51-000056-007 & HL-2M51-000056-010, HL-2M5V-000056-001, HL-2M5V-000056-004;
	Attachment to items 7.1. & 7.2.4.:	Drawing N° HL-2M51-040100-001, HL-2M51-040100-002, HL-2M51-040100-003, HL-2M51-040100-004;
	Attachment to items 7.2.3.1. & 7.2.5.:	Drawing N° GM3M3-433-AA-1, HL-2M51-110400-004.
3.	**Autres documents annexés:** Other documents annexed:	not applicable
4.	**Date de délivrance de la réception initiale:** Date of issue of initial type approval:	12.05.1998
5.	**Date de la dernière délivrance de pages révisées:** Date of last issue of revised pages:	08.12.1998
6.	**Date de la dernière délivrance d'une fiche de réception révisée** Date of last extension:	27.12.2001

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 27 décembre 2001
19-21, Boulevard Royal
L-2910 Luxembourg
Tél 478-1 – Télécopieur 241817 – Télex 1465 CIVAIR LU

REFERENCE: E13*79R00*79R01*0042*03

ANNEXES: Documentation technique

E13

Communication concernant: - délivrance d'une homologation
Communication concerning: approval granted
- l'extension d'homologation
approval extended
- le refus d'homologation
approval refused
- le retrait d'homologation
approval withdrawn
- l'arrêt définitif de la production
production definitely discontinued

d'un type de véhicule, en ce qui concerne l'équipement de direction, en application du Règlement N° 79
of a vehicle type with regard to steering equipment pursuant to Regulation N° 79.

	N° d'homologation: *Approval number:*	E13*79R00*79R01*0042*03
	Marque d'homologation: ***Approval mark:***	E13 79R - 01 0042
1.	**Marque de fabrique ou de commerce du véhicule:** Trade name or mark of vehicle:	FORD
2.	**Type du véhicule:** Vehicle type:	70J11-DW-R79
	Version(s): *Version(s):*	DAL DAW, DBL DBW, DFW, DNW, DAX, DBX, DNX *left- or right-hand drive*
3.	**Nom et adresse du constructeur:** Manufacturer's name and address:	Ford-Werke Aktiengesellschaft D-50725 Köln
4.	**Le cas échéant nom et adresse de son mandataire:** If applicable name and address of manufacturer's representative:	not applicable
5.	**Description sommaire de l'équipement de direction:** Brief description of the steering equipment:	
5.1.	**Type d'équipement de direction:** Type of steering equipment:	rack and pinion steering
5.2.	**Commande de direction:** Steering control:	circular steering wheel

5.3.	**Transmission de direction:** Steering transmission:	mechanical linkage
5.4.	**Roues directrices:** Steered wheels:	2, at front axle
5.5.	**Source d'énergie:** Energy source:	muscular power with power assistance through oil pump
6.	**Résultats des essais. Effort à la commande de direction nécessaire pour inscrire le véhicule dans un cercle de 12 m de rayon ou de 20 m de rayon dans le cas d'un défaut de fonctionnement:** Results of tests. Steering effort required to achieve a turning circle of 12 metres or 20 metres radius with a fault:	
6.1.	**Dans des conditions normales:** Under normal conditions:	turning left: 5,9 daN turning right: 6,1 daN
6.2.	**Après défaillance de l'équipement spécial:** After failure of special equipment:	turning left: 15,2 daN turning right: 15,5 daN
7.	**Véhicule présenté à l'homologation le:** Vehicle submitted for approval on:	16.11.2001
8.	***Autorité délégués:*** *Assigned authority:*	*Société Nationale de Certification et d'Homologation* *Département SNCT-H* *L-5201 Sandweiler*
	Service technique chargé des essais d'homologation: Technical service responsible for conducting approval tests:	TÜV Rheinland Luxemburg GmbH Centre Commercial "Le 2000" Z.I. route de Bettembourg L-3378 Livange
9.	**Date du procès-verbal délivré par ce service:** Date of report issued by that service:	12.12.2001
10.	**Numéro du procès-verbal délivré par ce service:** Number of test report issued by that service:	17LN00508-04
11.	**L'homologation est:** Approval:	extended
12.	**Emplacement de la marque d'homologation sur le véhicule:** Position of approval mark on vehicle:	nearby the VIN-plate

13. **Fait à** / Place: Luxembourg

14. **Date:** / Date: 27 décembre 2001

15. **Signature:** / Signature: **Pour le Ministre des Transports**

Paul SCHMIT
Commissaire du Gouvernement

16. **Une liste des documents du dossier d'homologation déposé auprès des services administratifs qui ont délivré l'homologation qui figure en annexe à cette communication peut être obtenue sur demande:**
Annexed to this communication is a list of documents in the approval file deposited at the administrative services having delivered the approval and which can be obtained upon request.

see "INDEX TO TYPE-APPROVAL REPORT" annexed

Modifications faisant l'objet de présente extension
Modifications of this extension:

- *Drawings updated;*
- *Address of one assembly plant;*
- *Dimensions of the vehicle;*
- *Vehicle variants added;*
- *Tyre and wheel sizes added.*

Note explicative et récapitulative des extensions réalisées
Explanatory and recapitulatory note of delivered extensions

Extension I of 18.09.2000

- *Editorial changes;*
- *Updating directive;*
- *Vehicle weights;*
- *Vehicle dimensions;*
- *Steering angle and turns;*
- *Tyre informations;*
- *Vehicle drawings;*
- *Steering and suspension drawings;*
- *Versions of vehicle type added;*
- *Drawing of steering control.*

Extension II of 02.04.2001

- *Editorial changes and corrections;*
- *Range of technically permissible laden masses;*
- *Tyre dimension added;*
- *Commercial description deleted.*

Extension III of 27.12.2001

- *Drawings updated;*
- *Address of one assembly plant;*
- *Dimensions of the vehicle;*
- *Vehicle variants added;*
- *Tyre and wheel sizes added.*

1/ Rayer les mentions inutiles
Strike out what does not apply

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 27 décembre 2001
19-21, Boulevard Royal
L-2910 Luxembourg
Tél 478-1 – Télécopieur 241817 – Télex 1465 CIVAIR LU

REFERENCE: E13*79R00*79R01*0042*03

ANNEXES: Documentation technique

Index du dossier d'homologation
Index to type-approval

	Numéro d'homologation: **Approval number:**	E13*79R00*79R01*0042*03
	Révision: **Revision:**	01
	Marque de fabrique ou de commerce: ***Trade name or mark***	*FORD*
	Type: ***Type:***	*70/311-DW-R79*
1.	**Procès-verbal d'essai:** **Test report:**	N° 17LN00506-04
	- Technical report:	Pages 1 to 3;
	- Information about vehicle type EC:	Appendix LA - Pages 4 & 5;
	- Information about vehicle type ECE:	Appendix LB - Page 6;
	- List of modifications:	Appendix 0 - Page 7.
2.	**Dossier du constructeur:** **Report of the manufacturer:**	N° 70/311-DW-R79
	- Cover sheet information folder:	Page 1;
	- Index to information folder:	Page 2;
	- Information document:	Pages 3, 4, 5, 6, 7 & 8;
	- Attachments to information document:	
	Attachment to item 1.1.:	Drawing N° HL-2M51-000056-001, HL-2M51-000056-004, HL-2M51-000056-007 & HL-2M51-000056-010, HL-2M5V-000056-001, HL-2M5V-000056-004;
	Attachment to items 7.1. & 7.2.4.:	Drawing N° HL-2M51-040100-001, HL-2M51-040100-002, HL-2M51-040100-005, HL-2M51-040100-006;
	Attachment to items 7.2.3.1. & 7.2.5.:	Drawing N° GD9841-137-AA-1, HL-2M51-110400-004,
3.	**Autres documents annexés:** **Other documents annexed:**	not applicable
4.	**Date de délivrance de l'homologation initiale:** **Date of issue of initial type approval:**	12.05.1998
5.	**Date de la dernière délivrance de pages révisées:** **Date of last issue of revised pages:**	08.12.1998
6.	**Date de la dernière délivrance d'une homologation révisée** **Date of last extension:**	27.12.2001

ER62-822 1413

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

TECHNICAL REPORT

according to the Council Directive on the approximation of the laws of the Member States relating to

Steering equipment for motor vehicles and their trailers

70/311/EEC	dated:	June 06,1970
amended by		
1999/7/EC	dated:	January 26, 1999

and
according to ECE-Regulation

Uniform provisions concerning the approval vehicles with regard to steering equipment

ECE-R 79	dated:	December 1, 1998
amended by		
Amend. 01, Suppl. 01, Corr. 00	dated:	February 07, 1999

Previously granted		
EC type-approval	:	e13*70/311*1999/7*0042*02
ECE approval		E13*79R00*79R01*0042*02

Structure of report:

1. Tested object(s) and general test information
2. Test minutes
3. Remark concerning tested object(s)
4. Appendices
5. Statement of conformity

TÜV

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

1. Tested object(s) and general test information

1.1.	Tested object(s)	: see VCA Job Number 97/98 2200
1.2.	General test information	
1.2.1.	Order issued by (if different from manufacturer)	: n/a
1.2.2.	Test object / test vehicle received on	: not applicable
1.2.3.	Test date	: 16.11.2001
1.2.4.	Test site	: Cologne
1.2.5.	Remark	: The results of the test refer exclusively to the object(s) mentioned under point 1.1 of this report.

2. Test minutes

2.1.	Test facilities	: The test facilities / measurement equipment used were in compliance with the test requirements.
2.2.	Test results	see Appendix LB, 6.1 / 6.2

3. Remark concerning tested object(s)

: All versions of the vehicle type as stated in the information document are covered by the tested vehicle version(s) and tested object(s) respectively.

TÜV

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

4. Appendices

LA Information about the vehicle type according to the communication concerning the EC type-approval.

LB Information about the vehicle type according to the communication concerning the ECE certificate.

0 List of modifications

Information folder No. : 70/311-DW-R79

5. Statement of conformity

The type referred to above complies with the requirements mentioned on page 1.

The technical report comprises - including appendices LA, LB and 0 - pages 1 to 7 and shall not be reproduced partially without the written approval of the testing laboratory.

12.12.2001
spr

Sprenger

Dipl.-Ing. Sprenger

Information about the vehicle type according to the communication concerning the EC type-approval. **Appendix LA**

Section I

0	General	
0.1	Make (trade name of manufacturer)	: FORD
0.2	Vehicle type	: 70/311-DW-R79
	- version(s)	: DA1, DAW, DB1, DBW, DFW, DNW DAX, DBX, DNX sedan (3dr, 4dr, 5dr), wagon 5dr (left-hand drive or right-hand drive)
0.3	Means of identification of type if marked on the vehicle	: not applicable
0.3.1	Location of that marking	: not applicable
0.4	Category of the vehicle	: M_1
0.5	Name and address of the manufacturer	: Ford-Werke Aktiengesellschaft 50725 Köln Germany
	Name and address of the manufacturer responsible for the final stage of construction	: see above
	Name and address of the manufacturer's authorised representative	: not applicable
0.8	Address of assembly plant(s)	: Ford-Werke Aktiengesellschaft 66740 Saarlouis Germany Ford España S.A. 46440 Almussafes, Valencia Spain

TÜV

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

Section II

1. Additional informations (where applicable) : see Addendum

3. Date of technical report : 12.12.2001

Addendum to EC type-approval certificate

1. Additional information

Type of steering equipment : rack and pinion steering

Steering control : circular steering wheel

Steering transmission : mechanical linkage

Steered wheels : 2, at front axle

Energy source : muscular power with power assistance through oil pump

Braking performance
statement of the component type-approval number granted in accordance with directive 71/320/EEC and information concerning the state of the vehicle during tests: laden/unladen : not applicable

5. Remarks : valid for both right- and left-hand drive

TÜV

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

Information about the vehicle type according to the communication concerning the ECE approval. Appendix LB

1	Trade name or mark of the vehicle	: FORD
2	Vehicle type	: 70/311-DW-R79
3	Name and address of the manufacturer	: Ford-Werke Aktiengesellschaft 50725 Köln Germany
4	Name and address of the manufacturer's authorised representative	: not applicable
5	Brief description of the steering equipment	
5.1	Type of steering- equipment	: rack and pinion steering
5.2	Steering control	: circular steering wheel
5.3	Steering transmission	: mechanical linkage
5.4	Steered wheels	: 2, at front axle
5.5	Energy source	: muscular power with power assistance through oil pump
6	Results of tests (Steering effort required to achieve a turning circle of 12 metres radius or 20 metres with a fault)	
6.1	Under normal conditions	: Left manoevre : 5,9 daN Right manoevre : 6,1 daN
6.2	After failure of special equipment	: Left manoevre : 15,2 daN Right manoevre : 15,5 daN
7	Vehicle submitted for approval on	: 16.11.2001
9	Date of technical report issued by that service	: 12.12.2001
12	Position of approval mark on vehicle	: Near by the VIN-plate

E982-822 1419

Vehicle type : 70/311-DW-R79
Manufacturer : Ford

List of modifications

Appendix 0

Correction of : —

Modification of : Update of drawings

Address of assembly plant of Valencia (Spain)

Dimensions of vehicle (range):
- length
- front overhang
- rear overhang

Addition of : Vehicle variants DA1 and DB1

Tyre and wheel size:
- 205/55R16 on 6Jx16H2 with offset 52,5;
- 215/40R17 on 7Jx17H2 with offset 49,0

Deletion of : —

EC TA-No.	**:e13*70/311*1999/7*8042*03**
ECE TA-No.	**:E13*79R00*79R01*8042*03**
Information Folder No.	**:70/311-DW-R79**

INFORMATION FOLDER

in accordance with Annex I of Council Directive 70/156/EEC relating to EEC-Type-approval of a vehicle type and with regard to the

Steering effort

(Directive 70/311/EEC as last amended by Directive 1999/7/EC & Regulation ECE-R 79.01)

EC TA-No.	**:e13*70/311*1999/7*0042*03**
ECE TA-No.	**:E13*79R00*79R01*0042*03**
Information Folder No.	**:70/311-DW-R79**

Index to Information Folder

EC TA-No. :e13*70/311*1999/7*0042*03
ECE TA-No. :E13*79R00*79R01*0042*03
Information Folder No. :70/311-DW-R79

0.	**GENERAL**	
0.1.	Make (trade name of manufacturer):	FORD
0.2.	Type:	70/311-DW-R79 DA1, DAW, DAX, DB1, DBW, DBX, DFW, DNW, DNX @
0.3.	Means of identification of type, if marked on the vehicle:	Not applicable
0.3.1.	Location of that marking:	Not applicable
0.4.	Category of vehicle:	M1
0.5.	Name and address of manufacturer:	Ford-Werke Aktiengesellschaft 50725 Koeln Germany
0.5.a.	Manufacturer's representative	Not applicable
0.5.b.	Location of the ECE-approval-mark on the vehicle	Near by VIN-plate
0.8.	Address(es) of assembly plant(s):	Ford Espana S.A. 46440 Almussafes, Valencia Spain Ford Werke Aktiengesellschaft 66740 Saarlouis Germany

EC TA-No. :e13*70/311*1999/7*0042*03
ECE TA-No. :E13*79R00*79R01*0042*03
Information Folder No. :70/311-DW-R79

1.	**GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE**		
1.1.	Photographs and/or drawings of a representative vehicle:	see attachment	@
1.3.	Number of axles and wheels:	Axles: 2 Wheels: 4	
1.3.1.	Number and position of axles with double wheels:	Number: Not applicable Position: Not applicable	
1.3.2.	Number and position of steered axles:	Number: 1 Position: Axle 1	
1.3.3.	Powered axles (number, position, interconnection):	Number: 1 Position: Axle 1 Interconnection: Not applicable	
1.8.	Hand of drive:	Left hand drive or right hand drive	

2. **MASSES AND DIMENSIONS (in kg and mm)**
(Refer to drawing where applicable)

2.1. Wheel base(s) (fully loaded):

2615 mm

2.3.1. Track of each steered axle:

1484 mm to 1502 mm

2.4. Range of vehicle dimensions (overall)

2.4.1. For chassis without bodywork

2.4.1.1. Length:

Not applicable

2.4.1.2. Width:

Not applicable

2.4.1.4. Front overhang:

Not applicable

2.4.1.5. Rear overhang:

Not applicable

2.4.2. For chassis with bodywork

2.4.2.1. Length:

@

Body	Body Variant	Without Towbar [mm]	Attached Towbar [mm]
Estate	5-door	4454	4554
Sedan	3-door	4174	4292
	4-door	4382	4478
	5-door	4174	4292

2.4.2.2. Width:

Estate 1702 mm
Sedan 1702 mm

2.4.2.4. Front overhang:

@

Body	Body Variant	Front overhang [mm]
Sedan	5-door	858
	3-door	858
	4-door	858
Estate	5-door	858

EC TA-No. :e13*78/311*1999/7*0042*03
ECE TA-No. :E13*79R00*79R01*0042*03
Information Folder No. :78/311-DW-R79

2.4.2.5. Rear overhang: @

Body	Body Variant	Rear overhang [mm]
Sedan	5-door	701 to 819
	3-door	701 to 819
	4-door	909 to 1005
Estate	5-door	981 to 1081

2.8. Technically permissible maximum laden mass stated by the manufacturer (maximum and minimum for each variant):

Body	Body Variant	Min. to Max. [kg]
Estate	5-door	1630 kg to 1810 kg
Sedan	3-door	1570 kg to 1695 kg
Sedan	4-door	1590 kg to 1725 kg
Sedan	5-door	1585 kg to 1720 kg

2.9. Technically permissible maximum load/mass on each axle:

Axle	Load / Mass [kg]
Axle 1	965
Axle 2	960

EC TA-No. :e13*70/311*1999/7*0042*03
ECE TA-No. :E13*79R00*79R01*0042*03
Information Folder No. :70/311-DW-R79

6. **SUSPENSION**

6.6. Tyres and wheels

6.6.1. Tyre/wheel combination(s) (For tyres indicate size designation, minimum load-capacity index, minimum speed category symbol; for wheels indicate rim size(s) and off-set(s))

6.6.1.1. Axles

6.6.1.1.1. Axle 1:

Tyre Size	Rim Size (inches)	Rim Offset (mm)
215/45 R17	7J x 17 H2	49.0
215/40 R17	7J x 17 H2	49.0
205/55 R16	6J x 16 H2	52.5
205/50 R16	6J x 16 H2	52.5
195/60 R15	6J x 15 H2	47.5
	6J x 15 H2	50.0
	6J x 15 H2	52.5
195/55 R15	6J x 15 H2	52.5
	6J x 15 H2	50.0
	6J x 15 H2	47.5
185/65 R14	5.5J x 14 H2	47.5
	5.5J x 14 H2	43.5

6.6.1.1.2. Axle 2: see item 6.6.1.1.1.

6.6.1.1.3. Axle 3: Not applicable

6.6.1.1.4. Axle 4: Not applicable

6.6.3. Tyre pressure(s) as recommended by the vehicle manufacturer: 200 kPa to 310 kPa

EC TA-No.	**:e13*70/311*1999/7*0042*03**
ECE TA-No.	**:E13*79R00*79R01*0042*03**
Information Folder No.	**:70/311-DW-R79**

7.	**STEERING**		
7.1.	**Schematic diagram of steered axle(s) showing steering geometry:**	see attachment	@
7.2.	**Transmission and control**		
7.2.1.	**Type of steering transmission (specify for front and rear, if applicable):**	Axle 1: Rack and pinion steering Axle 2: Not applicable	
7.2.2.	**Linkage to wheels (including other than mechanical means; specify for front and rear, if applicable):**	mechanical	
7.2.3.	**Method of assistance, if any:**	hydraulic	
7.2.3.1.	**Method and diagram of operation, make(s) and type(s):**	see attachment	@
7.2.4.	**Diagram of the steering equipment as a whole, showing the position on the vehicle of the various devices influencing its steering behaviour:**	see attachment	@
7.2.5.	**Schematic diagram(s) of the steering control(s):**	see attachment	@
7.3.	**Maximum steering angle of the wheels**		
7.3.1.	**To the right [degrees]; number of turns of the steering wheel (or equivalent data):**	See attachment to item 7.2.4.	
7.3.2.	**To the left [degrees]; number of turns of the steering wheel (or equivalent data):**	See attachment to item 7.2.4.	

DB1

15-Oct-2001

28-Oct-2001

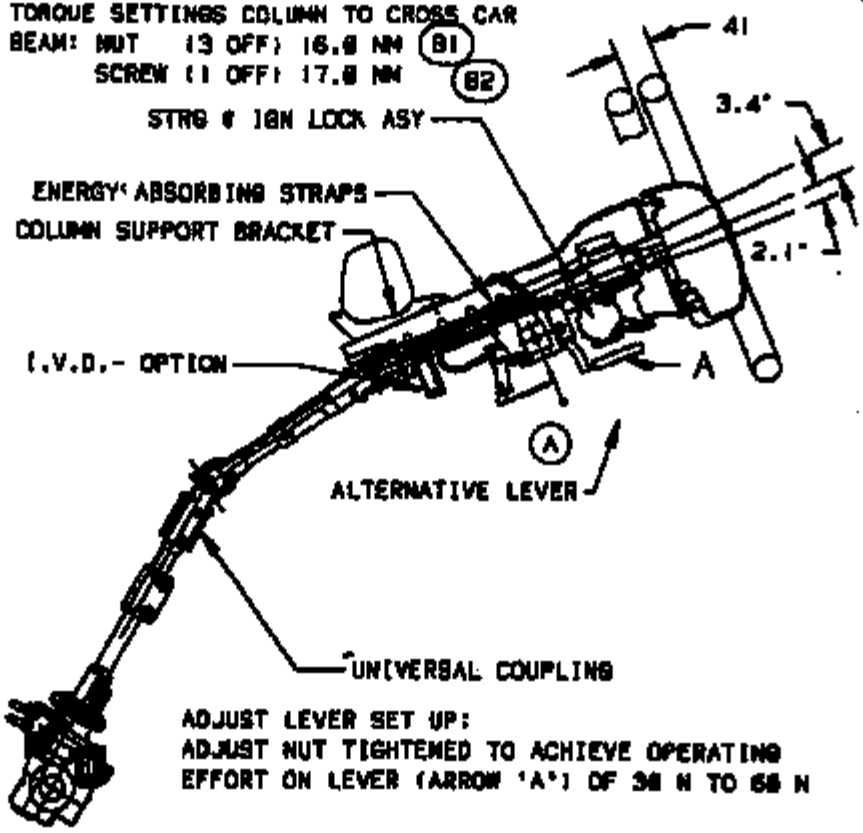
EN62-622 1429

DA1

15-Oct-2001 26-Oct-2001

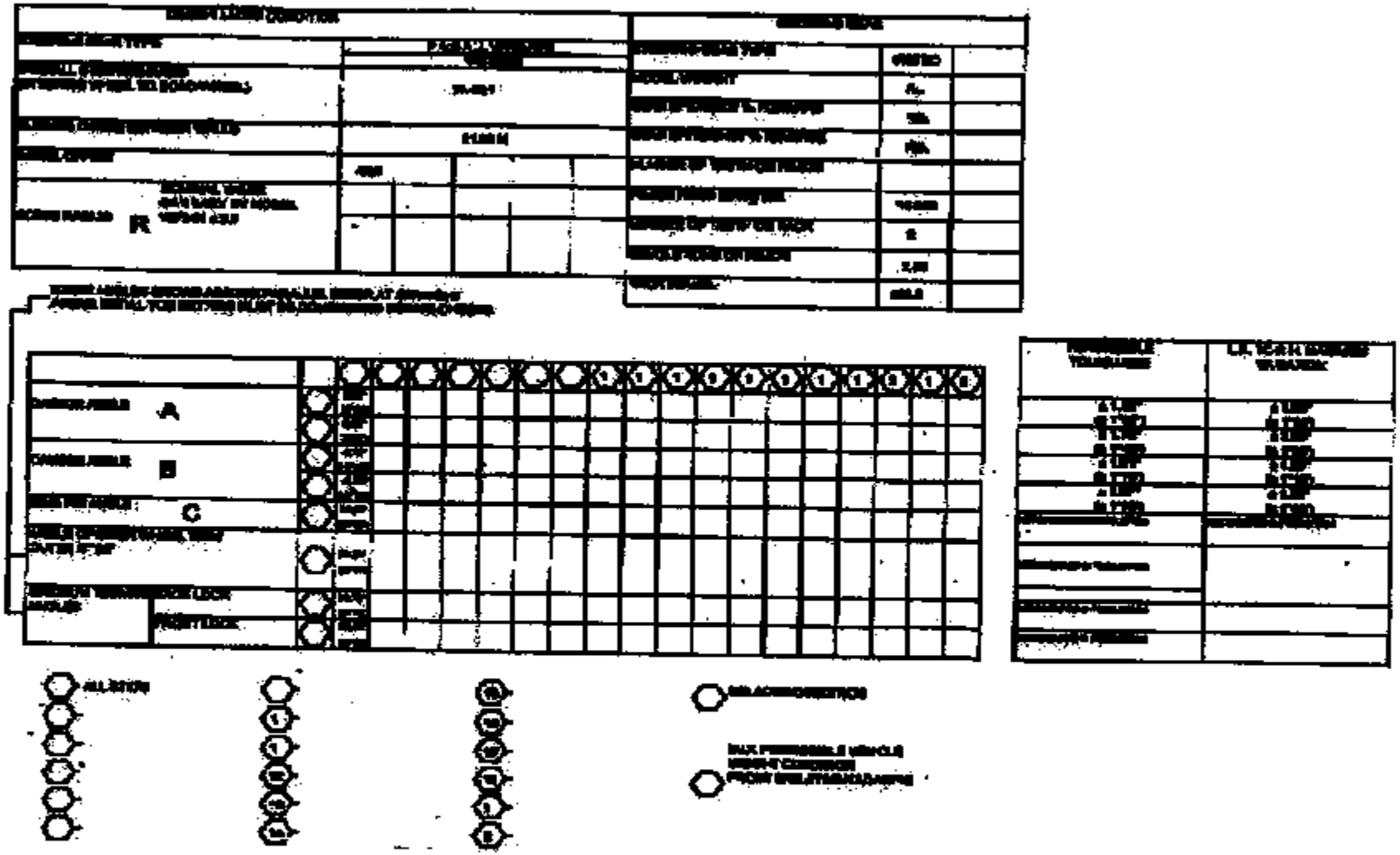
HOMOLOGATION ONLY						
CAB	BATZ	LET	REVISIONS	DR.	EN.	APP.
F	980115		ISSUED	HW	HS	HS
		B1	WAS 18 NM			
Y	980930	B2	WAS 22.7NM	JK	HS	HS

TORQUE SETTINGS COLUMN TO CROSS CAR BEAM: NUT (3 OFF) 16.8 NM (B1)
SCREW (1 OFF) 17.8 NM (B2)



ADJUST LEVER SET UP:
ADJUST NUT TIGHTENED TO ACHIEVE OPERATING EFFORT ON LEVER (ARROW 'A') OF 36 N TO 68 N

Reference	Issue Date	Title
D1W,D1X,DA1,DB1	29-Oct-1997	COL ASY-STNG ADJ
FORD	Revision Date 06-Nov-2001	Attachment Number HL-2M61-119400-BD4



Type		Issue Date	Revision Date	Title	Drawing Number
DB1, DA1	FORD	16-Aug-2001		Steering and front suspension arrangement	HL-2851-948106-004

J-2

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98B047/1
Request No.: ACA8171
Date: 24-Sep-98

SUBJECT:

Hydraulic brake test of 2000 MY C170, all sedans without ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I.	The test vehicle no. 8AS3321 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA8171 were satisfied. Signed B. Poets Test Engineer. Date: 25/9/98
II.	I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170, all sedans without ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135. Signed: P. Livingstone Requesting Manager. Date: 26 Oct 98

RESULTS: See attached sheets.

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III.	I, B. Poets, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure, dated 2 April 1997. Signed B. Poets Test Engineer. Date: 25/9/98

Comments:

Requesting area	T.R. No.	WTN	Model: 2000 MY C170, all sedans without ABS
GB-15/SA-M08	ACA8171	C1800	

Attachments:	Test request copy Draft test procedure		System No.: 08

Test Engineer	Test SIV.	Test Manager	Req. Manager	Distribution:
B. Poets	M.Claesen	R.Cale	P. Livingstone	G.Grimsey GB-15/SA-M08
		Mail Ref.	GB-15/SA-O08	Return original documents to Req. Man. on completion

ER02-022 1433

Vehicle Specifications

TESTED VEHICLE

Number : SAB3321
Model : C170

COVERED VEHICLE
Released brake system : B200 MY C170
Spec. : SPEC 1E NAAD
Comments for spec. : all sedans without ABS

Worst case data
Top speed (km/h) : 170
Weights :

	Total (kg)	Fr. Axle (%)
Unladen	1378	61.4
LADEN	1820	64.8

Front Brake Data
Caliper
Type: ITT AE FN54
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented
Outer diameter (mm): 288
Effective radius (mm): 109
Thickness (mm): 22
Shield: No

Friction material
Pads: FER4184F FF
Slots: No
Skins: Yes
Design friction: 0.4

Comments

REAR Brake Data Drum
System
Type: LCB6 HABF DRUM
Wheel cylinder (mm): 20.64

Drums
Diameter (mm): 200
Lin.width (mm): 35

Friction material
Shoes: D6288 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 254 6D
Diameter (mm): 254
Ratio: 5
Pedal ratio : 4
Reduction valve type : PCRV 0.3/65 bar

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : None

PARKING BRAKE Data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 6.6

Tyres
Type : Firestone Firehawk
Size : P195/60R15
Roll radius (ST/RTD) (mm) : 309
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax 170 km/h

FMVSS 135 Load cond.	FMVSS 135 Test Sect.	Test Description	FMVSS Requirements Speed (km/h)	Stopping distance (m) Min	Stopping distance (m) Max	Effort (N) Min.	Effort (N) Avg	Effort (N) Max.	Test results Speed (km/h)	Dist. (m)	Effort (N) Avg	Effort (N) Max.	Reqt. met? (Yes/No)
GVWR	S7.1	Burnish	80					500	80			100	
GVWR	S7.2	Wheel lock sequence low mu	65					1000	65				Yes
GVWR	S7.2	Wheel lock sequence high mu	100					1000	100				Yes
LLVW	S7.2	Wheel lock sequence low mu	65					1000	65				Yes
LLVW	S7.2	Wheel lock sequence high mu	100					1000	100				Yes
LLVW	S7.3	ABS Performance											
LLVW	S7.4	Torque wheel											
GVWR	S7.4	Torque wheel											
GVWR	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	58.7	350	385	Yes
GVWR	S7.6	High speed effectiveness	130		137.5	65		500	130	91.7		370	Yes
GVWR	S7.7	Stops with engine off	100		70.0	65		500	100	54.6		340	Yes
LLVW	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	55.2		280	Yes
LLVW	S7.6	High speed effectiveness	130		137.5	65		500	130	91.0		345	Yes
LLVW	S7.8	Failed antilock											
LLVW	S7.9	Failed proportioning valve											
LLVW	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	86.9		225	Yes
GVWR	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	114.8		270	Yes
GVWR	S7.8	Failed antilock											
GVWR	S7.9	Failed proportioning valve											
GVWR	S7.11	Power brake unit failure	100		168.0	65		500	100	125.6		405	Yes
GVWR	S7.12	Parking brake - static Hand						400				345	Yes
GVWR	S7.12	Parking brake - static Foot											
GVWR	S7.13	Heating snubs	120						120				
GVWR	S7.14	Hot performance : Stop 1	100		81.2		500		100	55.8	305	500	Yes
GVWR	S7.14	Hot performance : total	100		89.0			500	100	67.9		370	Yes
GVWR	S7.15	Brake cooling	50										
GVWR	S7.16	Recovery Performance	100	60.5	71.0		500		100	62.9	300	370	Yes
GVWR	S7.16	Recovery Performance : Total											Yes
GVWR	S7.17	Final inspection											Yes

All requirements of FMVSS 135 were met [X] not met [ ]

N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98B047/2
Request No.: ACA6171
Date: 25-Sep-98

SUBJECT:

Hydraulic brake test of 2000 MY C170, all sedans without ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. 8A53321 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6171 were satisfied.

Signed B. Poste Test Engineer. Date: 25/9/98

II. I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170, all sedans without ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed: P. Livingstone Requesting Manager. Date: 26 Oct 98.

RESULTS: See attached sheets.

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, B. Poste, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure, dated 2 April 1997.

Signed B. Poste Test Engineer. Date: 25/9/98

Comments:

Requesting area	T.R. No.	WTN	Model: 2000 MY C170, all sedans without ABS
GB-15/3A-M06	ACA6171	C1900	

Attachments:	Test request copy Draft test procedure		System No.: 06

Test Engineer	Test SSV.	Test Manager	Req. Manager	Distribution:
B. Poste	M.Claesen	R.Gast	P. Livingstone	G.Grimsey GB-15/3A-M06
		Mail Ref.	GB-15/3A-C02	Return original documents to Req. Man. on completion

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98S047/2
Request No.: ACA6171
Date : 25-Sep-98

Vehicle Specifications

TESTED VEHICLE

Number : 8AS3321
Model : C170

COVERED VEHICLE
Released brake system
: 2000 MY C170
Spec. : SPEC 12 NAAC
Comments for spec. : all sedans without ABS

Worst case data
Top speed (km/h) : 170
Weights :

	Total (kg)	Fr. Axle (%)
Unladen	1378	51.4
Laden	1880	54.8

Front Brake Data
Caliper
Type: ITT AE FN54
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc
Solid/Vented: Vented
Outer diameter (mm): 269
Effective radius (mm): 106
Thickness (mm): 22
Shield: NO

Friction material
Pads: FER4164F FF
Slots: No
Shims: Yes
Design friction: 0.4

Comments

REAR Brake Data Drum
System
Type: LC88 HASF DRUM
Wheel cyl.diam.(mm): 20.64

Drums
Diameter (mm): 203
Lin.width (mm): 38

Friction material
Shoes: DS258 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 254 SO
Diameter (mm): 254
Ratio: 6
Pedal ratio : 4
Reduction valve type : PCRV 0.5/25 bar

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : None

Parking Brake Data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 5.6

Tyres
Type : Firestone Firehawk
Size : P195/60R15
Roll radius (ETRTO) (mm) : 299
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax · 179 km/h

FMVSS 135		Test	FMVSS Requirements						Test results				Reqt.
Load	Test	Description	Speed	Stopping distance (m)		Effort (N)			Speed	Dist.	Effort (N)		met?
cond.	Sect.		(km/h)	Min	Max	Min.	Avg.	Max.	(km/h)	(m)	Avg.	Max.	(Yes/No)
GVWR	S7.1	Burnish	80	[illegible]	[illegible]	[illegible]	[illegible]	500	80	[illegible]	[illegible]	185	[illegible]
GVWR	S7.2	Wheel lock sequence low mu	65	[illegible]	[illegible]	[illegible]	[illegible]	1000	65	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.2	Wheel lock sequence high mu	100	[illegible]	[illegible]	[illegible]	[illegible]	1000	100	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.2	Wheel lock sequence low mu	65	[illegible]	[illegible]	[illegible]	[illegible]	1000	65	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.2	Wheel lock sequence high mu	100	[illegible]	[illegible]	[illegible]	[illegible]	1000	100	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.3	ABS Performance	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LLVW	S7.4	Torque wheel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.4	Torque wheel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.5	Cold Effectiveness constant distance	100	[illegible]	70.0	65	[illegible]	500	100	58.2	[illegible]	370	Yes
GVWR	S7.6	High speed effectiveness	[illegible]	[illegible]	127.4	65	[illegible]	500	[illegible]	83.1	[illegible]	310	Yes
GVWR	S7.7	Stops with engine off	100	[illegible]	70.0	65	[illegible]	500	100	62.4	[illegible]	330	Yes
LLVW	S7.5	Cold Effectiveness constant distance	100	[illegible]	70.0	65	[illegible]	500	100	61.5	[illegible]	235	Yes
LLVW	S7.6	High speed effectiveness	[illegible]	[illegible]	127.4	65	[illegible]	500	[illegible]	80.0	[illegible]	305	Yes
LLVW	S7.8	Failed antilock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LLVW	S7.9	Failed proportioning valve	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LLVW	S7.10	Hydraulic circuit failure	100	[illegible]	168.0	65	[illegible]	500	100	80.0	[illegible]	300	Yes
GVWR	S7.10	Hydraulic circuit failure	100	[illegible]	168.0	65	[illegible]	500	100	107.2	[illegible]	[illegible]	Yes
GVWR	S7.8	Failed antilock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.9	Failed proportioning valve	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.11	Power brake unit failure	100	[illegible]	168.0	65	[illegible]	500	100	133.0	[illegible]	495	Yes
GVWR	S7.12	Parking brake - static Hand	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	400	[illegible]	[illegible]	[illegible]	370	Yes
GVWR	S7.12	Parking brake - static Foot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.13	Heating snubs	120	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	120	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.14	Hot performance : Stop 1	100	[illegible]	87.2	[illegible]	225.0	[illegible]	100	74.7	335	280	Yes
GVWR	S7.14	Hot performance : total	100	[illegible]	89.0	[illegible]	[illegible]	500	100	77.8	[illegible]	300	Yes
GVWR	S7.15	Brake cooling	80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.16	Recovery Performance	100	40.5	75.1	[illegible]	255.0	N/A	100	67.4	325	510	Yes
GVWR	S7.16	Recovery Performance : Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
GVWR	S7.17	Final Inspection	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes

All requirements of FMVSS 135 were met [X] not met [ ]

N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98B085/1
Request No.: ACA6173
Date: 28-Sep-98

SUBJECT:

Hydraulic brake test of 2000MY C170, all wagons without ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. 9AV4253 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6173 were satisfied.

Signed B. Poels Test Engineer. Date: 15/9/98

II. I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000MY C170, all wagons without ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed: P. Livingstone Requesting Manager. Date: 26 Oct 98

RESULTS: See attached sheets.

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, B. Poels, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure, dated 2 April 1997.

Signed B. Poels Test Engineer. Date: 15/9/98

Comments:

Requesting area	T.R. No.	WTN	Model: 2000MY C170, all wagons without ABS
GB-15/3A-M06	ACA6173	C1800	

Attachments:	Test request copy Draft test procedure		System No.: 05

Test Engineer	Test Sup.	Test Manager	Req. Manager	Distribution:
B. Poels	N.Gibson	R.Lager	P. Livingstone	G.Grimsey GB-15/3A-M06
		Mail Ref.	GB-15/3A-C02	Return original documents to Req. Man. on completion

ER02-022 1439

Vehicle Specifications

TESTED VEHICLE

Number : 9AV4253
Model : C170

COVERED VEHICLE
Released brake system : 2000 MY C170
Spec. : SPEC 11 NAAO
Comments for spec. : all wagons without ABS

Worst case data
Top speed (km/h) : 170
Weights :

	TGW (kg)	Fr. Axle (%)
Unladen	1425	56.8
Laden	1890	52.1

Front Brake Data
Caliper
Type: ITT AE FN64
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented
Outer diameter (mm): 258
Effective radius (mm): 106
Thickness (mm): 22
Shield: No

Friction material
Pads: FER4164F FF
Slots: No
Shims: Yes
Design friction: 0.4

Comments

Rear Brake Data Drum
System
Type: LCBS HASF DRUM
Wheel cyl.diam.(mm): 20.64

Drums
Diameter (mm): 203
Lin.width (mm): 36

Friction material
Shoes: DB288 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 254 SD
Diameter (mm): 254
Ratio: 5
Pedal ratio : 4
Reduction valve type : PCRV 0.3/35 bar

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : None

Parking Brake Data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 5.6

Tyres
Type : Firestone Firehawk
Size : P195/60R15
Roll radius (SI/ISO) (mm) : 299
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax 170 km/h

FMVSS 135		Test	FMVSS Requirements						Test results				Requ.
Load	Test	Description	Speed	Stopping distance(s)		Effort (N)			Speed	Dist.	Effort (N)		met?
cond.	Sect.		(km/h)	Min	Max	Min.	Avg	Max.	(km/h)	(m)	Avg	Max.	(Yes/No)
GVWR	S7.1	Burnish	80					500	80			80	
GVWR	S7.2	Wheel lock sequence low mu	65					1000	65				Yes
GVWR	S7.2	Wheel lock sequence high mu	100					1000	100				Yes
LLVW	S7.2	Wheel lock sequence low mu	65					1000	65				Yes
LLVW	S7.2	Wheel lock sequence high mu	100					1000	100				Yes
LLVW	S7.3	ABS Performance											
LLVW	S7.4	Torque wheel											
GVWR	S7.4	Torque wheel											
GVWR	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	55.6	200	215	Yes
GVWR	S7.6	High speed effectiveness	130		127.4	65		500	130	87.2		280	Yes
GVWR	S7.7	Stops with engine off	100		70.0	65		500	100	54.5		225	Yes
LLVW	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	49.8		250	Yes
LLVW	S7.6	High speed effectiveness	130		127.4	65		500	130	80.6		225	Yes
LLVW	S7.8	Failed antilock	100		85.0	65		500	100	N/A		N/A	N/A
LLVW	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
LLVW	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	101.6		440	Yes
GVWR	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	116.1		400	Yes
GVWR	S7.8	Failed antilock	100		85.0	65		500	100	N/A		N/A	N/A
GVWR	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
GVWR	S7.11	Power brake unit failure	100		168.0	65		500	100	121.1		420	Yes
GVWR	S7.12	Parking brake - static Hand						400				350	Yes
GVWR	S7.12	Parking brake - static Foot						500				N/A	N/A
GVWR	S7.13	Heating snubs	120						120				
GVWR	S7.14	Hot performance : Step 1	100		89.3		200.0		100	75.3	160	190	Yes
GVWR	S7.14	Hot performance stop	100		89.0			500	100	65.0		415	Yes
GVWR	S7.15	Brake cooling	50										
GVWR	S7.16	Recovery Performance	100	49.5	70.4		300.0		100	65.0	172	185	Yes
GVWR	S7.16	Recovery Performance : Test											Yes
GVWR	S7.17	Final inspection											Yes

All requirements of FMVSS 135 were met [X] not met [ ]

N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 965068/2
Request No.: ACA6173.
Date: 29-Sep-98

SUBJECT:

Hydraulic brake test of 2000 MY C170, all wagons without ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1996 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. SAVC6S filled with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6173 were satisfied.

Signed B. Poels Test Engineer. Date: 29/9/98

II. I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170, all wagons without ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed: P. Livingstone Requesting Manager. Date: 26 oct 98.

RESULTS: See attached sheets.

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, B. Poels, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure, dated 2 April 1997.

Signed B. Poels Test Engineer. Date: 29/9/98

Comments :

Requesting area	T.R. No.	WIN	Model : 2000 MY C170, all wagons without ABS
GB-15/3A-M06	ACA6173	C1900	

Attachments :	Test request copy Draft test procedure		System No.: 06
Test Engineer	Test ASV.	Test Manager	Req. Manager
B. Poels	M.Clijsen	R.Cloet	P. Livingstone

Distribution : G.Grimsey GB-15/3A-M06

		Mail Ref.	GB-15/3A-G02	Return original documents to Req. Man. on completion

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 988055/2
Request No.: ACA6173
Date : 29-Sep-98

Vehicle Specifications

TESTED VEHICLE

Number : 9AV4253
Model : C170

COVERED VEHICLE
Released brake system : 2000 MY C170
Spec. : SPEC 11 NAAC
Comments for spec. : all wagons without ABS

Worst case data
Top speed (km/h) : 170
Weights :

	Total (kg)	Fr. Axle (%)
Unladen	1420	59.8
Laden	1990	62.1

Front Brake Data
Caliper
Type: ITT AE F9854
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented
Outer diameter (mm): 258
Effective radius (mm): 108
Thickness (mm): 22
Shield: No

Friction material
Pads: FER4184F FF
Slots: No
Shims: Yes
Design friction: 0.4

Comments

REAR BRAKE DATA DRUM
System
Type: LCB6 HASF Drum
Wheel cyl.diam.(mm): 20.64

Drums
Diameter (mm): 203
Lin.width (mm): 36

Friction material
Shoes: DB203 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 204 SD
Diameter (mm): 254
Ratio: 5
Pedal ratio : 4
Reduction valve type : PCRV 0.3/35 bar

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : None

Parking brake data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 5.8

Tyres
Type : Firestone Firehawk
Size : P195/60R15
Roll radius (BTRTO) (mm) : 299
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax 170 km/h

FMVSS 135		Test Description	FMVSS Requirements						Test results				Req. met?
Load cond.	Test Sect.		Speed	Stopping distance(m)		Effort (N)			Speed	Dist.	Effort (N)		
			(km/h)	Min	Max	Min.	Avg	Max.	(km/h)	(m)	Avg	Max.	(Yes/No)
GVWR	S7.1	[illegible]	80	[illegible]		[illegible]		500	80	[illegible]	[illegible]	90	[illegible]
GVWR	S7.2	Wheel lock sequence low stv	65	[illegible]		[illegible]		1000	65	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.2	Wheel lock sequence high stv	100	[illegible]		[illegible]		1000	100	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.2	Wheel lock sequence low stv	65	[illegible]		[illegible]		1000	65	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.2	Wheel lock sequence high stv	100	[illegible]		[illegible]		1000	100	[illegible]	[illegible]	[illegible]	Yes
LLVW	S7.3	ABS Performance	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LLVW	S7.4	Torque wheel	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.4	Torque wheel	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.5	Cold effectiveness stopping distance	100	[illegible]	70.0	60	[illegible]	500	100	54.0	315	335	Yes
GVWR	S7.6	High speed effectiveness	130	[illegible]	197.5	65	[illegible]	500	130	91.5	[illegible]	510	Yes
GVWR	S7.7	Stops with engine off	100	[illegible]	70.0	65	[illegible]	500	100	51.7	[illegible]	695	Yes
LLVW	S7.5	Cold effectiveness stopping distance	100	[illegible]	70.0	65	[illegible]	500	100	50.0	[illegible]	540	Yes
LLVW	S7.6	High speed effectiveness	130	[illegible]	197.5	65	[illegible]	500	130	89.5	[illegible]	525	Yes
LLVW	S7.8	Pedal setback	100	[illegible]	85.0	45	[illegible]	500	100	N/A	[illegible]	N/A	N/A
LLVW	S7.9	Pedal proportioning valve	100	[illegible]	110.0	65	[illegible]	500	100	N/A	[illegible]	N/A	N/A
LLVW	S7.10	Hydraulic circuit failure	100	[illegible]	165.0	65	[illegible]	500	100	95.8	[illegible]	295	Yes
GVWR	S7.10	Hydraulic circuit failure	100	[illegible]	165.0	65	[illegible]	500	100	115.4	[illegible]	355	Yes
GVWR	S7.8	Pedal setback	100	[illegible]	85.0	65	[illegible]	500	100	N/A	[illegible]	N/A	N/A
GVWR	S7.9	Pedal proportioning valve	100	[illegible]	110.0	65	[illegible]	500	100	N/A	[illegible]	N/A	N/A
GVWR	S7.11	Power brake unit failure	100	[illegible]	165.0	65	[illegible]	500	100	135.0	[illegible]	475	Yes
GVWR	S7.12	Parking brake - static Hand	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	450	[illegible]	[illegible]	[illegible]	345	Yes
GVWR	S7.12	Parking brake - static Foot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	500	[illegible]	[illegible]	[illegible]	N/A	N/A
GVWR	S7.13	Heating model	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	130	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.14	Hot performance : Step 1	100	[illegible]	85.0	[illegible]	315.0	[illegible]	100	74.4	300	310	Yes
GVWR	S7.14	Hot performance total	100	[illegible]	85.0	[illegible]	[illegible]	500	100	74.7	[illegible]	495	Yes
GVWR	S7.15	Brake cooling	80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.16	Recovery Performance	100	56.3	72.9	[illegible]	315.0	[illegible]	100	48.5	165	200	Yes
GVWR	S7.16	Recovery Performance : Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.17	Final inspection	N/A	N/A	[illegible]	N/A	N/A	N/A	[illegible]	N/A	N/A	N/A	Yes

All requirements of FMVSS 135 were met [X] not met [ ]
N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 99B049a
Request No.: ACC 084
Date : 30.06.1999

SUBJECT:

Hydraulic brake test of 2000MY C170 all models with ABS according to appended Test Procedure ETP:ST-48

OBJECT:

To check the brake performance of the above mentioned vehicle , when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 29, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. WP59473 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACC 084 were satisfied.

Signed E Curry Test Engineer. MIRA C.E.Curry Date: 30/06/99

II. I , G Knuefermann, Manager C170-CDW Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170 with ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed : G.Knuefermann Requesting Manager . Date:

RESULTS : See attached sheets .

PROCEDURE: The test was carried out in accordance with appended Test Procedure ETP : ST-48.

III. I, E Curry (MIRA), Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Test Procedure ETP: ST-48.

Signed C E Curry Test Engineer. Date: 3.7.99
E Curry
(MIRA)

Comments :				
Requesting area GB-15/3A-M05	T.R. No. ACC084	WTN C1909	Model : 2000MY C170 all models with ABS	
Attachments :	Test request copy Test procedure		System No.: 08	
Test Engineer	Test SSV.	Test Manager	Req. Manager	Distribution :
[signature]	[signature]	[signature]	[signature]	G.Grimsey GB-15/3A-M09
E Curry (MIRA)	[illegible]	A Case	G.Knuefermann	
		Mail. Ref.	D-MC/PE-4	Return original documents to Req. Man. on completion

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Vehicle Specifications

TESTED VEHICLE

Number : WP58473
Model : C170

COVERED VEHICLE

Released brake system : 2000MY C170
Spec. : SPEC 13 NAAO
Comments for spec. : all models with ABS

Worst case data
Top speed (km/h) : 170 km/h
Weights :

	Total (kg)	Fr. Axle (%)
Unladen	1370	61.4
Laden	1880	52.1

Front Brake Data

Caliper
Type: ITT A8 N84
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented (Allegheny
Outer diameter (mm): 258 Dacromet Coat
Effective radius (mm): 108
Thickness (mm): 22
Slotst: No

Friction material
Pads: FB4464F FF
Slots: None
Skims: Yes
Design friction: 0.4

Comments

Rear Brake Data Drum

System
Type: LCB8 HA6F DRUM
Wheel Cyl.diam (mm): 20.64

Drums
Diameter (mm): 203
Lin.width(mm): 38

Friction material
Pads: FB6F FF
Design brake factor 1.1

Comments

BRAKE ACTUATION

Booster
Type: BOSCH 254 6D
Diameter (mm): 254
Ratio: 5.0
Pedal ratio : 4
Reduction valve type : EBD

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : 6D ITT MK20

PARKING BRAKE DATA

Operation : Hand Control
Type : Cable to rear brakes
Lever ratio : 5.8

TYRES

Type : Firestone Firehawk
Size : P195/60R15
Roll radius (ETRTO) (mm) : 289
Wheel covers : Poly blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of Results - FMVSS135 Requirements

Vmax 179 km/h

FMVSS 135		Test Description	FMVSS Requirements						Test results				Req. met?
Cond.	Test		Speed	Stopping distance(m)		Effort (N)			Speed	Dist.	Effort (N)		
	Sect.		(km/h)	Min	Max	Min.	Avg	Max.	(km/h)	(m)	Avg	Max.	(Yes/No)
C/WR	S7.1	Bench	80	N/A	N/A	N/A	N/A	600	N/A	N/A	N/A	N/A	N/A
C/WR	S7.2	Wheel lock sequence low mu	Not Applicable to this Brake Type										
C/WR	S7.2	Wheel lock sequence high mu	Not Applicable to this Brake Type										
C/W	S7.2	Wheel lock sequence low mu	Not Applicable to this Brake Type										
C/W	S7.2	Wheel lock sequence high mu	Not Applicable to this Brake Type										
C/W	S7.3	ABS Performance	Not Applicable to this Brake Type										
C/W	S7.4	Torque wheel	Not Applicable to this Brake Type										
C/WR	S7.4	Torque wheel	Not Applicable to this Brake Type										
C/WR	S7.5	Cold Effectiveness stop/fast distance	100	N/A	70.0	65	N/A	600	100.0	51.8	340	420	Yes
C/WR	S7.6	High speed effectiveness	130	N/A	137.5	65	N/A	600	130.0	95.5	N/A	730	Yes
C/WR	S7.7	Stops with engine off	100	N/A	70.0	65	N/A	600	100.0	48.8	N/A	420	Yes
C/W	S7.5	Cold Effectiveness stop/fast distance	100	N/A	70.0	65	N/A	600	100.0	60.0	N/A	380	Yes
C/W	S7.6	High speed effectiveness	130	N/A	137.5	65	N/A	600	130.0	95.4	N/A	310	Yes
C/W	S7.8	Failed systems	100	N/A	85.0	65	N/A	600	100.0	69.8	N/A	460	Yes
C/W	S7.9	Failed proportioning valve	Not Applicable to this Brake Type										
C/W	S7.10	Hydraulic circuit failure	100	N/A	149.0	65	N/A	600	100.0	69.8	N/A	180	Yes
C/WR	S7.10	Hydraulic circuit failure	100	N/A	149.0	65	N/A	600	100.0	101.9	N/A	720	Yes
C/WR	S7.8	Failed systems	100	N/A	85.0	65	N/A	600	100.0	51.9	N/A	300	Yes
C/WR	S7.9	Failed proportioning valve	Not Applicable to this Brake Type										
C/WR	S7.11	Power brake unit failure	100	N/A	149.0	65	N/A	600	100.0	116.8	400	480	Yes
C/WR	S7.12	Parking brake - static test	Hill Hold on 30% gradient					400	Held on 30% gradient			425	Yes
C/WR	S7.12	Parking brake - static test	Not Applicable to this Brake Type										
C/WR	S7.13	Fading brake	120 down to 60 km/h			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C/WR	S7.14	Hot performance Sto- 1	100	N/A	79.3	N/A	420	N/A	100.0	67.1	320	380	Yes
C/WR	S7.14	Hot performance Sto- 2	100	N/A	85.0	N/A	N/A	600	100.0	80.3	N/A	385	Yes
C/WR	S7.15	Brake cooling	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A
C/WR	S7.16	Recovery Performance Step 1	100	37.7	68.4	N/A	340	N/A	100.0	51.5	400	470	Yes
C/WR	S7.16	Recovery Performance Step 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
C/WR	S7.17	Final inspection	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes

All requirements of FMVSS 135 were met [√] not met [ ]

N/A = Not applicable

Detailed results can be found on page 4 to page 37.
The test procedure can be found in appendix A

SUBJECT:

Hydraulic brake test of 2000MY C170 all models with ABS according to appended Test Procedure ETP:ST-48.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. WP59473 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACC 084 were satisfied.

Signed E Curry Test Engineer. Date: 03/07/99
MIRA

II. I, G Kruefermann, Manager C170 -Cars Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170 with ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed : G Kruefermann Requesting Manager . Date:

RESULTS : See attached sheets .

PROCEDURE: The test was carried out in accordance with appended Test Procedure ETP : ST-48.

III. I, E Curry (MIRA) , Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Test Procedure ETP : ST-48.

Signed Test Engineer. Date: 6-7-99
E Curry
(MIRA)

Comments :

Requesting area	T.R. No.	WTN	Model : 2000MY C170 all models with ABS
GB-15/3A-M09	ACC084	C1500	

Attachments :	Test request copy Test procedure		System No.: 09
Test Engineer	**Test Sify.**	**Sect. Manager**	**Req. Manager**
E Curry (MIRA)	M.Clissen	R.Case	G Kruefermann 16.7.99
	Mail. Ref.	C-MC/PE-4	

Distribution : G.Grimsey GB-15/3A-M09

Return original documents to Req. Man. on completion.

Vehicle Specifications

TESTED VEHICLE

Number : WP89473
Model : C170

COVERED VEHICLE

Released brake system : 2000MY C170
Spec. : SPEC 13 NAAO
Comments for spec. : all models with ABS

Worst case data

Top speed (km/h) : 170 km/h
Weights :

	Total (kg)	Fr. Axle (%)
Unladen	1378	61.4
Laden	1660	52.1

Front Brake Data

Caliper
Type: ITT A2 PN54
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented (Newtec
Outer diameter (mm): 258 Dacromet Coat
Effective radius (mm): 108
Thickness (mm): 22
Shield: No

Friction material
Pads: FERODO FF
Slots: None
Shims: Yes
Design friction: 0.4

Comments

Rear Brake Data Drum

System
Type: LCB8 HARF DRUM
Wheel Cyl.diam (mm): 20.64

Drums
Diameter (mm): 203
Lin.width(mm): 36

Friction material
Pads: FERODO FF
Design brake factor 1.1

Comments

BRAKE ACTUATION

Booster
Type: BOSCH 254 SD
Diameter (mm): 254
Ratio: 5.0
Pedal ratio : 4
Reduction valve type : EBD

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : ESP ITT MK20

PARKING BRAKE DATA

Operation : Hand Control
Type : Cable to rear brakes
Lever ratio : 5.5

TYRES

Type : Firestone Firehawk
Size : P185/60R15
Roll radius (STATIC) (mm) : 298
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of Results - FMVSS135 Requirements

Vmax 179 km/h

FMVSS 135		Test	FMVSS Requirements						Test results				Req.
Load cond.	Test Sect.	Description	Speed	Stopping distance(m)		Effort (N)			Speed	Dist.	Effort (N)		met?
			(km/h)	Min	Max	Min.	Avg	Max.	(km/h)	(m)	Avg	Max.	(Yes/No)
GVWR	S7.1	[illegible]	60	[illegible]	[illegible]	[illegible]	[illegible]	500	[illegible]				[illegible]
GVWR	S7.2	[illegible]	[illegible]										
GVWR	S7.3	[illegible]	[illegible]										
LLVW	S7.2	[illegible]	[illegible]										
LLVW	S7.3	[illegible]	[illegible]										
LLVW	S7.3	[illegible]	[illegible]										
LLVW	S7.4	[illegible]	[illegible]										
GVWR	S7.4	[illegible]	[illegible]										
GVWR	S7.5	[illegible]	100	[illegible]	70.0	65	[illegible]	500	100.0	49.4	280	300	Yes
GVWR	S7.6	[illegible]	135	[illegible]	137.5	65	[illegible]	500	135.0	80.7	[illegible]	380	Yes
GVWR	S7.7	[illegible]	100	[illegible]	70.0	65	[illegible]	500	100.0	49.8	[illegible]	470	Yes
LLVW	S7.5	[illegible]	100	[illegible]	70.0	65	[illegible]	500	100.0	47.1	[illegible]	280	Yes
LLVW	S7.6	[illegible]	135	[illegible]	137.5	65	[illegible]	500	135.0	83.2	[illegible]	280	Yes
LLVW	S7.8	[illegible]	100	[illegible]	65.0	65	[illegible]	500	100.0	58.2	[illegible]	140	Yes
LLVW	S7.9	[illegible]	[illegible]										
LLVW	S7.10	[illegible]	100	[illegible]	100.0	65	[illegible]	500	100.0	58.1	[illegible]	280	Yes
GVWR	S7.10	[illegible]	100	[illegible]	100.0	65	[illegible]	500	100.0	100.6	[illegible]	270	Yes
GVWR	S7.8	[illegible]	100	[illegible]	65.0	65	[illegible]	500	100.0	47.9	[illegible]	270	Yes
GVWR	S7.9	[illegible]	[illegible]										
GVWR	S7.11	[illegible]	100	[illegible]	100.0	65	[illegible]	500	100.0	119.4	450	500	Yes
GVWR	S7.12	[illegible]	Hill Hold on 20% gradient					400	Hold on 20% gradient			300	Yes
GVWR	S7.13	[illegible]	[illegible]										
GVWR	S7.13	[illegible]	120 down to 60 km/h			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GVWR	S7.14	[illegible]	100	[illegible]	70.2	[illegible]	280	[illegible]	100.0	69.7	280	280	Yes
GVWR	S7.14	[illegible]	100	[illegible]	69.0	[illegible]	[illegible]	500	100.0	68.7	[illegible]	420	Yes
GVWR	S7.15	[illegible]	60	[illegible]	100	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	140	[illegible]
GVWR	S7.16	[illegible]	100	36.3	69.8	[illegible]	280	[illegible]	100.0	68.2	280	300	Yes
GVWR	S7.16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Yes

All requirements of FMVSS 135 were met [√] not met [ ]
N/A = Not applicable

Detailed results can be found on page 4 to page 37.
The test procedure can be found in appendix A.

[redacted]

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.:	98B043/3
Request No.:	ACA6172
Date :	28-Sep-98

SUBJECT:

Hydraulic brake test of 2000MY C170, all models with ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle (fitted with Dacromet coated front brake discs), when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1996.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. 9AS3337 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6172 were satisfied.

Signed S. Poste Test Engineer. Date: 19/9/98

II. I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000MY C170, all models with ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed : P. Livingstone Requesting Manager . Date:
P.D. Livingstone 26 Oct 98

RESULTS : See attached sheets .

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, S. Poste, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure , dated 2 April 1997.

Signed S. Poste Test Engineer. Date: 26/9/97

Comments :

Requesting area	T.R. No.	WTN	Model : 2000MY C170, all models with ABS
GB-15/3A-M05	ACA6172	C1800	

Attachments :	Test request copy Draft test procedure		System No.: 05
Test Engineer	Test SUV.	Chassis Manager	Req. Manager
S. Poste	[illegible]	[illegible]	P. Livingstone
		Mail. Ref.	GB-15/3A-C02

Distribution : G.Grimsey GB-15/3A-M05

Return original documents to Req. Man. on completion

B882-622 1451

Vehicle Specifications

TESTED VEHICLE

Number : 8AS3337
Model : C170

COVERED VEHICLE
Released brake system : 2000MY C170
Spec. : SPEC 13 NAAO
Comments for spec. : all models with ABS

Worst case data
Top speed (km/h) : 170
Weights

	Total (kg)	Fr. Axle (%)
Unladen	1378	61.4
Laden	1680	52.1

Front Brake Data
Caliper
Type: ITT AE FN64
Piston diameter (mm): 54
Equivalent dia. (mm): 54

Disc:
Solid/Vented: Vented (Decreased cost)
Outer diameter (mm): 256
Effective radius (mm): 106
Thickness (mm): 22
Shield: No

Friction material
Pads: FER4184F FF
Slots: No
Shims: Yes
Design friction: 0.4

Comments

Rear Brake Data Drum
System
Type: LCSS HASF DRUM
Wheel cyl.diam.(mm): 20.64

Drums
Diameter (mm): 203
Lin.width (mm): 35

Friction material
Shoes: DS295 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 254 SD
Diameter (mm): 254
Ratio: 5
Pedal ratio : 4
Reduction valve type : ESD

Master cylinder
Type: CV
Diameter (mm): 23.8
Stroke (mm): 34
Brake split : Diagonal
ABS : ESD ITT MK20

Parking Brake Data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 5.6

Tyres
Type : Firestone Firehawk
Size : P195/60R15
Roll radius (ET/ITO) (mm) : 299
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax : 170 km/h

FMVSS 135 Load cond.	FMVSS 135 Test Sect.	Test Description	FMVSS Requirements Speed (km/h)	Stopping distance(m) Min	Stopping distance(m) Max	Effort (N) Min	Effort (N) Avg	Effort (N) Max	Test results Speed (km/h)	Dist. (m)	Effort (N) Avg	Effort (N) Max	Reqt. met? (Yes/No)
GVWR	S7.1	Burnish	80					500	80				
GVWR	S7.2	Wheel lock sequence low mu	65					1000	65				N/A
GVWR	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.2	Wheel lock sequence low mu	65					1000	65				N/A
LLVW	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.3	ABS Performance											
LLVW	S7.4	Torque wheel											
GVWR	S7.4	Torque wheel											
GVWR	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	47.7	[illegible]	[illegible]	Yes
GVWR	S7.6	High speed effectiveness	136		167.5	65		500	136	84.0		[illegible]	Yes
GVWR	S7.7	Stops with engine off	100		70.0	65		500	100	47.1		[illegible]	Yes
LLVW	S7.5	Cold Effectiveness shortest distance	100		70.0	65		500	100	44.0		485	Yes
LLVW	S7.6	High speed effectiveness	136		167.6	65		500	136	71.1		375	Yes
LLVW	S7.8	Failed antilock	100		85.0	65		500	100	[illegible]		160	Yes
LLVW	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
LLVW	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	64.1		440	Yes
GVWR	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	91.7		415	Yes
GVWR	S7.8	Failed antilock	100		85.0	65		500	100	46.7		[illegible]	Yes
GVWR	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
GVWR	S7.11	Power brake unit failure	100		168.0	65		500	100	128.8		[illegible]	Yes
GVWR	S7.12	Parking brake - static Hand						400				[illegible]	Yes
GVWR	S7.12	Parking brake - static Foot						500				N/A	N/A
GVWR	S7.13	Heating snubs	120						120				
GVWR	S7.14	Hot performance : Stop 1	100		73.4		250.0		100	65.4	250	[illegible]	Yes
GVWR	S7.14	Hot performance detail	100		89.0			500	100	57.5		410	Yes
GVWR	S7.15	Brake cooling	50										
GVWR	S7.16	Recovery Performance	100	65.1	89.0		250.0		100	57.2	215	250	Yes
GVWR	S7.16	Recovery Performance ; Total											Yes
GVWR	S7.17	Final inspection											Yes

All requirements of FMVSS 135 were met [X] **not met** [ ]

N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

[redacted]

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98B043/1
Request No.: ACA6172
Date : 25-Sep-98

SUBJECT:

Hydraulic brake test of 2000 MY C170, all models with ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1998 and as amended on July 24, 1995 and on August 28, 1995.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. BA33557 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6172 were satisfied.

Signed B. Poels Test Engineer. Date: 25/9/98

II. I, P. Livingstone, Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000 MY C170, all models with ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed : P. Livingstone Requesting Manager. Date: 26 Oct 98

RESULTS : See attached sheets.

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, B. Poels, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure , dated 2 April 1997.

Signed B. Poels Test Engineer. Date: 25/9/98

Comments :

Requesting area	T.R. No.	WIN	Model : 2000 MY C170, all models with ABS
GB-15/SA-M06	ACA6172	C1600	

Attachments :	Test request copy Draft test procedure		System No.: 08
Test Engineer	Test Supv.	Test Manager	Req. Manager
B. Poels	[redacted]	R. Cant	P. Livingstone
		Mail Ref.	GB-15/SA-C02

Distribution :
G.Grimsey GB-15/SA-M06

Return original documents to Req. Man. on completion

Overview of results - FMVSS135 Requirements

Vmax : 170 km/h

FMVSS 135		Test	FMVSS Requirements						Test results				Reqt.
Load	Test	Description	Speed	Stopping distance(m)		Effort (N)			Speed	Dist.	Effort (N)		met?
cond.	Sect.		(km/h)	Min	Max	Min.	Avg	Max.	(km/h)	(m)	Avg	Max.	(Yes/No)
GVWR	S7.1	Burnish	80					500	80			80	
GVWR	S7.2	Wheel lock sequence low mu	65					1000	65				N/A
GVWR	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.2	Wheel lock sequence low mu	65					1000	65				N/A
LLVW	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.3	ABS Performance											
LLVW	S7.4	Torque wheel											
GVWR	S7.4	Torque wheel											
GVWR	S7.5	Cold effectiveness shortest distance	100		70.0	65		500	100	45.1	[illegible]	450	Yes
GVWR	S7.6	High speed effectiveness	136		167.8	65		500	136	[illegible]		380	Yes
GVWR	S7.7	Stops with engine off	100		70.0	65		500	100	44.4		400	Yes
LLVW	S7.5	Cold effectiveness shortest distance	100		70.0	65		500	100	42.7		475	Yes
LLVW	S7.6	High speed effectiveness	136		137.8	65		500	136	76.1		465	Yes
LLVW	S7.8	Failed antilock	100		85.0	65		500	100	61.8		175	Yes
LLVW	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
LLVW	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	62.7		380	Yes
GVWR	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	[illegible]		380	Yes
GVWR	S7.8	Failed antilock	100		85.0	65		500	100	48.5		380	Yes
GVWR	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
GVWR	S7.11	Power brake unit failure	100		168.0	65		500	100	[illegible]		495	Yes
GVWR	S7.12	Parking brake - static Hand						400				345	Yes
GVWR	S7.12	Parking brake - static Foot						500				N/A	N/A
GVWR	S7.13	Heating snubs	120						120				
GVWR	S7.14	Hot performance : Stop 1	100		89.5		575.0		100	61.4	270	380	Yes
GVWR	S7.14	Hot performance total	100		89.0			500	100	65.3		480	Yes
GVWR	S7.15	Brake cooling	50										
GVWR	S7.16	Recovery Performance	100	52.4	80.1		575.0		100	53.0	[illegible]	310	Yes
GVWR	S7.16	Recovery Performance : Total											Yes
GVWR	S7.17	Final inspection											Yes

All requirements of FMVSS 135 were met [X] not met [ ]

N/A = Not applicable.

Detailed results can be found on page 4 to page 37.
The draft test procedure can be found in appendix A.

EUROPEAN PRODUCT GROUP
TESTING ACTIVITY
LOMMEL

Report No.: 98B043/2
Request No.: ACA6172
Date : 28-Sep-98

SUBJECT:

Hydraulic brake test of 2000MY C170, all models with ABS according to appended draft Test Procedure, dated 2 April 1997.

OBJECT:

To check the brake performance of the above mentioned vehicle, when subjected to the test requirements of FMVSS 135, dated February 2, 1995 and as amended on July 24, 1995 and on August 28, 1996.

SIGNIFICANT RESULTS AND CONCLUSION:

I. The test vehicle no. SA55537 fitted with the listed brake components was subjected to the test procedure noted above, with the deviations referenced below, and shows that the requirements as laid down in the test request ACA6172 were satisfied.

Signed S. Poste Test Engineer. Date: 28/9/98

II. I, P. Livingstone , Manager C170 Chassis Engineering, declare that I am familiar with the test procedure and am aware of the equipment used and in my judgement results above show that the 2000MY C170, all models with ABS brake system complies with the requirements of the Federal Motor Vehicle Safety Standard No. 135.

Signed : P. Livingstone Requesting Manager . Date: 26 Oct 98

RESULTS : See attached sheets .

PROCEDURE: The test was carried out in accordance with appended draft Test Procedure, dated 2 April 1997.

III. I, S. Poste, Test Engineer, declare, that the instrumentation used in these tests satisfies the instrumentation requirements referenced in the appended Draft Test Procedure , dated 2 April 1997.

Signed S. Poste Test Engineer. Date: 28/9/98

Comments :

Requesting area	T.R. No.	WTN	Model : 2000MY C170, all models with ABS
GB-15/3A-M06	ACA6172	C1809	

Attachments :	Test request copy Draft test procedure		System No.: 06

Test Engineer	Test Sup.	T&E Manager	Req. Manager	Distribution :
				G.Grimsey GB-15/3A-M06
S. Poste	[illegible]	[illegible]	P. Livingstone	
		Mail Ref.	GB-15/3A-C02	Return original documents to Req. Man. on completion

Vehicle Specifications

TESTED VEHICLE

Number : 6AB3337
Model : C170

COVERED VEHICLE
Released brake system : 2000MY C170
Spec. : SPEC 13 NAAO
Comments for spec. : all models with ABS

Worst case data
Top speed (km/h) : 170
Weights :

	TOM (kg)	Fr. Axle (%)
[illegible]	1378	61.4
[illegible]	1660	62.1

Front Brake Data
Caliper
Type: ITT AE FN84
Piston diameter (mm): 54
Equivalent dia. (mm): 54
Disc:
Solid/Vented: Vented
Outer diameter (mm): 256
Effective radius (mm): 108
Thickness (mm): 22
Shield: No

Friction material
Pads: FER4184F FF
Slots: No
Shims: Yes
Design friction: 0.4

Comments

REAR BRAKE DATA DRUM
System
Type: LCS9 HABF DRUM
Wheel cyl.diam.(mm): 20.64
Drums
Diameter (mm): 203
Lin.width (mm): 38

Friction material
Shoes: DS255 GG
Design brake factor: 1.1

Comments

BRAKE ACTUATION
Booster
Type: BOSCH 254 SD
Diameter (mm): 254
Ratio: 8
Pedal ratio : 4
Reduction valve type : ESO

Master cylinder
Type: CV
Diameter (mm): 20.6
Stroke (mm): 34
Brake split : Diagonal
ABS : ESC ITT MK20

Parking Brake Data
Operation : Hand
Type : Cable to rear brakes
Lever ratio : 5.6

TYRES
Type : Firestone Firehawk
Size : P185/60R15
Roll radius (ETRTO) (mm) : 299
Wheel covers : Fully blanked off

Pressure
Front (bar): 2.2
Rear (bar): 2.2

Overview of results - FMVSS135 Requirements

Vmax : 170 km/h

FMVSS 135 Load cond.	FMVSS 135 Test Sect.	Test Description	FMVSS Requirements Speed (km/h)	Stopping distance (m) Min.	Stopping distance (m) Max.	Effort (N) Min.	Effort (N) Avg.	Effort (N) Max.	Test results Speed (km/h)	Dist. (m)	Effort (N) Avg.	Effort (N) Max.	Req. met? (Yes/No)
GVWR	S7.1	Burnish	80					500	80				
GVWR	S7.2	Wheel lock sequence low mu	65					1000	65				
GVWR	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.2	Wheel lock sequence low mu	65					1000	65				N/A
LLVW	S7.2	Wheel lock sequence high mu	100					1000	100				N/A
LLVW	S7.3	ABS Performance											N/A
LLVW	S7.4	Torque wheel											
GVWR	S7.4	Torque wheel											
GVWR	S7.5	Cold effectiveness stopping distance	100		70.0	65		500	100	45.4	[illegible]	[illegible]	Yes
GVWR	S7.6	High speed effectiveness	[illegible]		127.5	65		500	[illegible]	89.4		[illegible]	Yes
GVWR	S7.7	Stops with engine off	100		70.0	65		500	100	47.4		[illegible]	Yes
LLVW	S7.5	Cold effectiveness stopping distance	100		70.0	65		500	100	49.7		340	Yes
LLVW	S7.6	High speed effectiveness	[illegible]		127.5	65		500	[illegible]	77.6		295	Yes
LLVW	S7.8	Failed antilock	100		85.0	65		500	100	54.7		170	Yes
LLVW	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
LLVW	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	60.8		[illegible]	Yes
GVWR	S7.10	Hydraulic circuit failure	100		168.0	65		500	100	68.5		[illegible]	Yes
GVWR	S7.8	Failed antilock	100		85.0	65		500	100	64.2		400	Yes
GVWR	S7.9	Failed proportioning valve	100		110.0	65		500	100	N/A		N/A	N/A
GVWR	S7.11	Power brake unit failure	100		168.0	65		500	100	[illegible]		400	Yes
GVWR	S7.12	Parking brake - slope Head						400				240	Yes
GVWR	S7.12	Parking brake - slope Rear						500				N/A	N/A
GVWR	S7.13	Heating snubs	120						120				
GVWR	S7.14	Hot performance : Stop 1	100		[illegible]		[illegible]		100	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.14	Hot performance 500N	100		[illegible]			500	100	[illegible]		[illegible]	Yes
GVWR	S7.15	Brake cooling	50										
GVWR	S7.16	Recovery Performance	100	[illegible]	[illegible]		[illegible]		100	[illegible]	[illegible]	[illegible]	Yes
GVWR	S7.16	Recovery Performance : Test											Yes
GVWR	S7.17	Final inspection											Yes

All requirements of FMVSS 135 were met [X] not met [ ]
N/A = Not applicable.

Detailed results can be found on page 4 to page 57.
The draft test procedure can be found in appendix A.