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Contents

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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other acts are printed in bold type and preceded by an asterisk.

II

(Non-legislative acts)

DECISIONS

COMMISSION DECISION (EU) 2021/826

of 17 May 2021

on relief from import duties and VAT exemption granted for goods imported by Belgium as response to the assistance requested by Greece in order to deal with the migration crisis

(notified under document C(2021) 3274)

(Only the Dutch, the French and the Greek texts are authentic)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 2009/132/EC of 19 October 2009 determining the scope of Article 143(b) and (c) of Directive 2006/112/EC as regards exemption from value added tax on the final importation of certain goods ([1]), and in particular Article 53, first paragraph thereof,

Having regard to Council Regulation (EC) No 1186/2009 of 16 November 2009 setting up a Community system of reliefs from customs duty ([2]), and in particular Article 76, first paragraph thereof,

Whereas:

(1) On 2 March 2020, Greece launched an assistance request within the meaning of Article 15 of Decision No 1313/2013/EU of the European Parliament and of the Council ([3]) after a period of migration crisis.

(2) On 6 March 2020, in response to Greece's request the Ministry of Defence of Belgium, as a State organisation within the meaning of Article 74 of Regulation (EC) No 1186/2009 and of Article 51 of Directive 2009/132/EC, imported and dispatched to Greece urgent aid equipment and other necessary supplies for the distribution or making available to the asylum seekers and migrants.

(3) Pending notification of the Commission's decision, Belgium authorised the suspension of import duties and value added tax ('VAT') applicable to goods within the meaning of Article 76, second paragraph, of Regulation (EC) No 1186/2009 and of Article 53, second paragraph of Directive 2009/132/EC.

(4) On 23 March 2020, Belgium submitted a request to grant relief from import duties and exemption of VAT of goods supplied to Greece. Belgium provided the Commission with a detailed list indicating the nature and quantities of the goods admitted free of import duties and exempted of VAT sent to Greece.

([1]) OJ L 292, 10.11.2009, p. 5.
([2]) OJ L 324, 10.12.2009, p. 23.
([3]) Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (OJ L 347, 20.12.2013, p. 924).

(5) The request of Belgium to grant relief from import duties and exemption of value added tax of goods supplied to Greece is seen as submitted by the Member State concerned within the meaning of Article 76, first paragraph, of Regulation (EC) No 1186/2009 and Article 53, first paragraph, of Directive 2009/132/EC, taking into consideration that request for assistance by Greece was launched and Belgium responded within the meaning of Article 15 of Decision No 1313/2013/EU.

(6) The humanitarian crisis requiring urgently the other Member States' assistance in order to protect an increased number of asylum seekers and migrants during winter time and the extreme challenges it is causing, constitutes a disaster within the meaning of Chapter XVII, Section C, of Regulation (EC) No 1186/2009 and of Title VIII, Chapter 4, of Directive 2009/132/EC.

(7) It is therefore appropriate to grant Belgium a relief from import duties chargeable on goods imported for the purposes described in Article 74 of Regulation (EC) No 1186/2009 and an exemption of VAT chargeable on goods imported for the purposes described in Article 51 of Directive 2009/132/EC.

(8) On 22 October 2020, Greece confirmed to the Commission the reception of the goods referred to in the detailed list, submitted by Belgium; informed that the General Secretariat for Civil Protection of the Ministry of Citizen Protection had been designated as the recipient of abovementioned goods for the distribution or making available of the latter free of charge to migrants and asylum seekers; and acknowledged that appropriate measures had been taken to ensure compliance with Articles 78, 79 and 80 of Regulation (EC) No 1186/2009 and with Articles 55, 56 and 57 of Directive 2009/132/EC with regard to aforementioned goods.

(9) The relief from import duties and exemption of VAT should therefore be granted in respect of importation made by Belgium on 6 March 2020 with a view to further transferring it to Greece.

(10) On 11 February 2021, the Member States were consulted in accordance with Article 76 of Regulation (EC) No 1186/2009 and Article 53 of Directive 2009/132/EC,

HAS ADOPTED THIS DECISION:

Article 1

Goods shall be admitted free of import duties within the meaning of Article 2(1)(a) of Regulation (EC) No 1186/2009 and exempted of VAT on the imports within the meaning of Article 2(1)(a) of Directive 2009/132/EC, where the following conditions were fulfilled:

(a) the goods were intended for distribution and making available free of charge by the General Secretariat for Civil Protection of the Ministry of Citizen Protection of Greece to the benefit of the asylum seekers and migrants;

(b) the goods satisfy the requirements laid down in Articles 75, 78, 79 and 80 of Regulation (EC) No 1186/2009 and Articles 52, 55, 56 and 57 of Directive 2009/132/EC;

(c) appropriate measures had been taken by the Greek authorities to ensure compliance with Articles 78, 79 and 80 of Regulation (EC) No 1186/2009 and with Articles 55, 56 and 57 of Directive 2009/132/EC with regard to the imported goods falling under the scope of this Decision.

Article 2

Article 1 shall apply to importation of goods by Belgium made on 6 March 2020 and subsequently supplied to Greece as a response to the assistance request made by Greece on 2 March 2020 in accordance with Article 15 of Decision No 1313/2013/EU.

Article 3

This Decision is addressed to the Kingdom of Belgium and the Hellenic Republic.

Done at Brussels, 17 May 2021.

For the Commission
Paolo GENTILONI
Member of the Commission

GUIDELINES

GUIDELINE (EU) 2021/827 OF THE EUROPEAN CENTRAL BANK

of 29 April 2021

amending Guideline ECB/2013/24 on the statistical reporting requirements of the European Central Bank in the field of quarterly financial accounts (ECB/2021/20)

THE GOVERNING COUNCIL OF THE EUROPEAN CENTRAL BANK,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to the Statute of the European System of Central Banks and of the European Central Bank, and in particular Article 5.1 and 5.2, and Articles 12.1 and 14.3 thereof,

Whereas:

(1) The economic and statistical developments in the last years have made a review and update of the reporting requirements for quarterly financial accounts necessary in order to ensure their continued relevance for economic analyses.

(2) A more detailed breakdown of the other financial institutions (OFIs) sector becomes increasingly important for the analysis of sectoral financing and connectedness. The requirements for quarterly financial accounts set out in Guideline ECB/2013/24 of the European Central Bank ([1]) need to be modified to require the reporting of OFI sector breakdowns.

(3) For a better understanding of globalisation and cross-border merger and acquisitions, the requirements for quarterly financial accounts set out in Guideline ECB/2013/24 need to be modified to allow for the foreign direct investment (FDI) split of selected financial instruments, based on the definitions provided for in Regulation (EU) No 549/2013 of the European Parliament and of the Council ([2]) (Chapter 7 provision 7.98 (recording categories for FDI) and Table 18.14 of Annex A (links between the functional categories of the BPM6 and the financial instrument categories of the ESA)).

(4) Reporting of the central bank subsector in the quarterly financial accounts was introduced in 2019 on a voluntary basis. This should now be required by Guideline ECB/2013/24 in order to capture the full set of the relevant national reporting requirements.

(5) In addition, the requirement to report national data for financial assets and liabilities set out in Guideline ECB/2013/24 need to be modified to allow for additional instrument breakdowns for life insurance and pension entitlements to support economic and financial stability analyses.

(6) The requirement set out in Guideline ECB/2013/24 concerning the provision of explanatory information on single major events and reasons for revisions to quarterly national financial accounts needs to be amended to provide for events or revisions that are smaller than 0.2% of the quarterly euro area gross domestic product but significant at a national level.

([1]) Guideline of the European Central Bank of 25 July 2013 on the statistical reporting requirements of the European Central Bank in the field of quarterly financial accounts (ECB/2013/24) (OJ L 2, 7.1.2014, p. 34).

([2]) Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union (OJ L 174, 26.6.2013, p. 1).

(7) According to Article 4 of Council Regulation (EC) No 2533/98 of 23 November 1998 concerning the collection of statistical information by the European Central Bank ([3]) Member States should organise themselves in the field of statistics and fully cooperate with the European System of Central Banks in order to ensure the fulfilment of the obligations arising out of Article 5 of the Statute of the European System of Central Banks and of the European Central Bank.

(8) Therefore, Guideline ECB/2013/24 should be amended accordingly,

HAS ADOPTED THIS GUIDELINE:

Article 1

Amendments

Guideline ECB/2013/24 is amended as follows:

(1) in Article 1, point 1 is replaced by the following:

'1. "euro area" means the economic territory of the euro area Member States, the European Central Bank (ECB), the European Stability Mechanism (ESM) and the European Financial Stability Facility (EFSF);';

(2) in Article 2, paragraph 2 is replaced by the following:

'2. The "supplementary data" requirements shall cover transactions and stocks for the period from the last quarter of 2012 up to the reference quarter. The supplementary data specified in column "H" of Tables 1, 2, 4 and 5 of Annex I (supplementary data referring to the government sector), and in column "B", rows 3 and 17, of Tables 4 and 5 of Annex I (supplementary data referring to loans between non-financial corporations) may be reported on a voluntary basis.';

(3) in Article 2, paragraph 3, points (a) and (b) are replaced by the following:

'(a) transactions, stocks and other changes in volume data (transactions and stocks only for line 46 of Table 2 "net financial transactions/net financial worth") for the period from the last quarter of 2012 up to the reference quarter; and

(b) transactions and stocks data for the period from the first quarter of 1999 up to the third quarter of 2012. For the period from the first quarter of 1999 up to the fourth quarter of 2002 such data shall be reported on a best estimate basis. The data specified in columns "J" and "K" of Tables 1 and 2 of Annex I (the breakdown of households and non-profit institutions serving households) may be reported on a voluntary basis.';

(4) in Article 2, paragraph 5 is replaced by the following:

'5. The counterpart sectors "euro area other than domestic" and "residents outside the euro area" specified in rows 16-29 of Tables 3-7 and in rows 15-27 of Tables 8-9 of Annex I shall be adjusted to reflect the euro area composition at the reporting date. This adjustment shall be done whenever a Member State adopts the euro. The data provided shall be revised in line with the different data requirements specified in paragraphs 2, 3 and 4, on a best estimate basis.';

(5) in Article 2, paragraph 6 is replaced by the following:

'6. By exemption from paragraphs 1 to 5, NCBs shall not be required to transmit any of the following:

(a) at any time, the data relating to quarters prior to the first quarter of the year in which the relevant Member State acceded to the Union;

([3]) OJ L 318, 27.11.1998, p. 8.

(b) before June 2022, the "national data" and "supplementary data" relating to the sectoral breakdown of other financial institutions (OFI) (columns "E.1", "E.2" and "E.3" of Tables 1-2 of Annex I)

(c) before March 2024, the "national data" and "supplementary data" relating to the sectoral breakdown of other financial institutions (columns "E.1", "E.2" and "E.3" of Tables 4-9, rows 8-10 and rows 22-24 of Tables 3-7 and rows 7-9 and rows 20-22 of Tables 8-9 of Annex I);

(d) before March 2023, the "national data" referred to in paragraph 3(a) relating to foreign direct investment (rows 2, 12, 16, 22, 24, 43 and 45 of Tables 1-2 of Annex I);

(e) before March 2023 the "national data" referred to in paragraph 3(a) relating to the additional instrument breakdowns for life insurance and pension entitlements (rows 33-34 and rows 37-38 of Tables 1-2 of Annex I);

(f) at any time, the data referred to in points (b), (c) and (d) for the period from the last quarter of 2012 to the third quarter of 2013;

(g) at any time, the data referred to in point (e) for the period from the last quarter of 2012 to the third quarter of 2016.';

(6) in Article 2, paragraph 7 is replaced by the following:

'7. Together with the data reported pursuant to paragraphs 2 to 5 the NCBs shall provide explanatory information on:

(a) single major events observed for the reference quarter if the magnitude of such single major events is at least 0,2 % of the quarterly euro area gross domestic product, or if its magnitude is significant at the national level, or if the ECB requests such information; and

(b) reasons for revisions compared with the latest "national data" reported to the ECB in accordance with this Guideline, if the magnitude of the changes to the data caused by such revisions is at least 0,2 % of the quarterly euro area gross domestic product, or if its magnitude is significant at the national level, or if the ECB requests such information.';

(7) in Article 3, paragraph 2 is replaced by the following:

'2. The ECB shall publish the euro area aggregates it compiles, as well as the "national data" collected under Article 2, as described in paragraphs 3 to 5 thereof, as deemed relevant by the STC, except for data relating to the cells in rows 16-29 of Tables 3-7 and in rows 15-27 of Tables 8-9 of Annex I (referring to the counterpart sectors "euro area other than domestic" and "residents outside the euro area").';

(8) in Article 4, paragraph 1 is replaced by the following:

'1. The NCBs shall report the "supplementary data" described in Article 2(2) to the ECB within 85 calendar days of the end of the reference quarter. The Executive Board may reduce this deadline to 82 calendar days, if appropriate, taking into account the views of the STC. The Executive Board shall inform the Governing Council of its decision without undue delay. The ECB shall notify the NCBs of any change in the reporting period at least one year ahead of the first reporting date to which it applies. The NCBs shall report the associated explanatory information to the ECB within 87 calendar days of the end of the reference quarter.';

(9) Annex I is replaced by the Annex to this Guideline.

Article 2

Taking effect and implementation

1. This Guideline shall take effect on the day of its notification to the national central banks of the Member States whose currency is the euro.

2. The Eurosystem central banks shall comply with this Guideline from 1 June 2021.

Article 3

Addressees

This Guideline is addressed to all Eurosystem central banks.

Done at Frankfurt am Main, 29 April 2021.

For the Governing Council of the ECB
The President of the ECB
Christine LAGARDE

ANNEX

Annex I to Guideline ECB/2013/24 is replaced by the following:

'ANNEX I

DATA REPORTING REQUIREMENTS

Summary of data requirements

Article	Content	Tables	Data type			Reference period	1st Reporting date	Timeliness	Observations
			Stocks	Transactions	Other changes in volume				
2(2) 4(1)	Supplementary data; black shaded cells only- other than OFI breakdown	T1 – financial assets T2 – liabilities T4 – short-term loans (w-t-w) T5 – long-term loans (w-t-w)	✓	✓		2012Q4 onwards	Sep2014	End of reference quarter date (t)+85 (explanatory information at t+87)	— Black shaded cells in column H on a voluntary basis — Black shaded cells in column B, rows 3 and 17, of T4 and T5 on a voluntary basis — Accompanied by explanatory information
2(2) 4(1)	Supplementary data; black shaded cells only–OFI breakdown	T1 – financial assets T2 – liabilities	✓	✓		2013Q4 onwards	Jun2022	t+85 (explanatory information at t+87)	— Black shaded cells in columns E.1-E.3 — Accompanied by explanatory information
2(2) 4(1)	Supplementary data; black shaded cells only–OFI breakdown	T4 – short-term loans (w-t-w) T5 – long-term loans (w-t-w)	✓	✓		2013Q4 onwards	Mar2024	t+85 (explanatory information at t+87)	— Black shaded cells in columns E.1-E.3, rows 8-10 and 22-24 — Accompanied by explanatory information
2(3) (a) 2(5) 3(2) 3(3) (a), (b) 4(2)	National data; all cells - other than FDI, Insurance and Pension, and OFI breakdown	T1 – financial assets T2 – liabilities T3 – deposits (w-t-w) T4 – short-term loans (w-t-w) T5 – long-term loans (w-t-w)	✓	✓	✓	2012Q4 onwards	Sep2014	t+97	— Accompanied by explanatory information — data in rows 16-29 of T3-T5 to be adjusted to reflect euro area composition — data in rows 16-29 of T3-T5 not to be published

2(3) (a) 3(3) (a) 4(2)	National data - FDI	T1 – financial assets T2 – liabilities	✓	✓	✓	2013Q4 onwards	Mar2023	t+97	— data in rows 2, 12, 16, 22, 24, 43 and 45 — Accompanied by explanatory information
2(3) (a) 3(3) (a) 4(2)	National data – Insurance and Pension	T1 – financial assets T2 – liabilities	✓	✓	✓	2016Q4 onwards	Mar2023	t+97	— data in rows 33-34 and 37-38 — Accompanied by explanatory information
2(3) (a) 3(3) (a), (b) 4(2)	National data – OFI breakdown	T1 – financial assets T2 – liabilities	✓	✓	✓	2013Q4 onwards	Jun2022	t+97	— data in columns E.1-E.3 — Accompanied by explanatory information
2(3) (a) 3(3) (a), b) 4(2)	National data – OFI breakdown	T3 – deposits (w-t-w) T4 – short-term loans (w-t-w) T5 – long-term loans (w-t-w) T6 – short-term debt securities (w-t-w) T7 – long-term debt securities (w-t-w) T8 – listed shares (w-t-w) T9 – investment fund shares or units (w-t-w)	✓	✓	✓	2013Q4 onwards	Mar2024	t+97	— data in columns E.1-E.3 of T4-T9 — data in rows 8-10 and rows 22-24 of T3-T7 and rows 7-9 and rows 20-22 of T8-T9 — Accompanied by explanatory information
2(3) (b) 2(5) 3(2) 3(3) (c) 4(2)	National data; all cells - backdata	T1 – financial assets T2 – liabilities T3 – deposits (w-t-w) T4 – short-term loans (w-t-w) T5 – long-term loans (w-t-w)	✓	✓		1999Q1–2012Q3	Sep2017	t+97	— Accompanied by explanatory information — columns J, K of T1 and T2 on a voluntary basis — data in rows 16-29 of T3-T5 to be adjusted to reflect euro area composition — data in rows 16-29 of T3-T5 not to be published

									— Best estimates for 1999Q1–2002Q4
2(4) 2(5) 3(2) 3(3) (a), (b) 4(2)	National data; all cells	T6 – short-term debt securities (w-t-w) T7 – long-term debt securities (w-t-w) T8 – listed shares (w-t-w) T9 – investment fund shares (w-t-w)	✓	✓	✓	2013Q4 onwards	Sep2015	t+97	— Accompanied by explanatory information — data in rows 16-29 of T6-T7 and in rows 15-27 of T8-T9 to be adjusted to reflect euro area composition — data in rows 16-29 of T6-T7 and in rows 15-27 of T8-T9 not to be published

ANNEX II

Table 1

Financial assets[1), 2)]

	Financial instrument / Creditor sector	A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I	J	K	L
			Residents														
				MFIs[3)]			Other financial institutions							Households and NPISHs[5)]			
		Total (S.1)	Non-financial corporations (S.11)	Total (S.121+...+S.123)	Central bank (S.121)	Non-MMF[4)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Total (S14+S15)	Households (S.14)	NPISHs[5)] (S.15)	Rest of the world (S.2)
1	Total assets (F)																
2	*of which FDI*																
3	Monetary gold and SDRs (F.1)																
4	Monetary gold (F.11)																
5	Special drawing rights (F.12)																
6	Currency and deposits (F.2)																
7	Currency (F.21)																
8	Deposits (F.22+F.29)																
9	Transferable deposits (F.22)																
10	Other deposits (F.29)																
11	Debt securities (F.3)																
12	*of which FDI*																
13	Short-term debt securities (F.31)																
14	Long-term debt securities (F.32)																
15	Loans (F.4)																
16	*of which FDI*																
17	Short-term loans (F.41)																
18	Long-term loans (F.42)																
19	Equity and investment fund shares (F.5)																
20	Equity (F.51)																
21	Listed shares (F.511)																
22	*of which FDI*																
23	Unlisted shares and other equity (F.512+F.519)																
24	*of which FDI*																
25	Unlisted shares (F.512)																
26	Other equity (F.519)																
27	Investment fund shares (F.52)																
28	MMF shares (F.521)																
29	Non-MMF investment fund shares (F.522)																
30	Insurance, pension and standardised guarantees (F.6)																
31	Non-life insurance technical reserves (F. 61) and Provision for calls under standardised guarantees (F.66)																
32	Life insurance and annuity entitlements (F.62)																
33	Life insurance and annuity entitlements, unit linked (F.62A)																
34	Life insurance and annuity entitlements, non-unit linked (F.62B)																
35	Pension entitlements (F.63), claims of pension funds on pension managers (F.64), entitlements to non-pension benefits (F.65)																
36	Pension entitlements (F.63)																
37	Pension entitlements, defined contribution (F.63A)																
38	Pension entitlements, defined benefit (F.63B)[6)]																
39	Claims of pension funds on pension managers (F.64), Entitlements to non-pension benefits (F.65)																
40	Financial derivatives and employee stock options (F.7)																
41	Other accounts receivable (F.8)																
42	Trade credits and advances (F.81)																
43	*of which FDI*																
44	Other accounts receivable excluding trade credits and advances (F.89)																
45	*of which FDI*																

1) The data requirements for stocks, transactions and other changes in volume are identical, except for monetary gold (F.11) as an asset item of the Rest of the world, which is only requested for transactions and other volume changes.
2) ESA 2010 codes are used to classify institutional sectors (Chapter 2 of the ESA 2010) and financial transactions, other changes in volume and balance sheets (Chapters 5, 6 and 7 of the ESA 2010).
3) Monetary financial institutions (MFIs; S.121+S.122+S.123).
4) Money market fund (MMF; S.123).
5) Non-profit institutions serving households (NPISHs; S.15).
6) Pension entitlements, of which defined benefit (F63B) also includes hybrid schemes.

Table 2

Liabilities[1), 2)]

	Financial instrument / Debtor sector	A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I	J	K	L
			Residents														
				MFIs[3)]			Other financial institutions							Households and NPISHs[5)]			
		Total (S.1)	Non-financial corporations (S.11)	Total (S.121+...+S.123)	Central bank (S.121)	Non-MMF[4)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Total (S14+S15)	Households (S.14)	NPISHs[5)] (S.15)	Rest of the world (S.2)
1	Total liabilities (F)																
2	*of which FDI*																
3	Monetary gold and SDRs (F.1)																
4	Monetary gold (F.11)																
5	Special drawing rights (F.12)																
6	Currency and deposits (F.2)																
7	Currency (F.21)																
8	Deposits (F.22+F.29)																
9	Transferable deposits (F.22)																
10	Other deposits (F.29)																
11	Debt securities (F.3)																
12	*of which FDI*																
13	Short-term debt securities (F.31)																
14	Long-term debt securities (F.32)																
15	Loans (F.4)																
16	*of which FDI*																
17	Short-term loans (F.41)																
18	Long-term loans (F.42)																
19	Equity and investment fund shares (F.5)																
20	Equity (F.51)																
21	Listed shares (F.511)																
22	*of which FDI*																
23	Unlisted shares and other equity (F.512+F.519)																
24	*of which FDI*																
25	Unlisted shares (F.512)																
26	Other equity (F.519)																
27	Investment fund shares (F.52)																
28	MMF shares (F.521)																
29	Non-MMF investment fund shares (F.522)																
30	Insurance, pension and standardised guarantees (F.6)																
31	Non-life insurance technical reserves (F. 61) and Provision for calls under standardised guarantees (F.66)																
32	Life insurance and annuity entitlements (F.62)																
33	Life insurance and annuity entitlements, unit linked (F.62A)																
34	Life insurance and annuity entitlements, non-unit linked (F.62B)																
35	Pension entitlements (F.63), claims of pension funds on pension managers (F.64), entitlements to non-pension benefits (F.65)																
36	Pension entitlements (F.63)																
37	Pension entitlements, defined contribution (F.63A)																
38	Pension entitlements, defined benefit (F.63B)[6)]																
39	Claims of pension funds on pension managers (F.64), Entitlements to non-pension benefits (F.65)																
40	Financial derivatives and employee stock options (F.7)																
41	Other accounts payable (F.8)																
42	Trade credits and advances (F.81)																
43	*of which FDI*																
44	Other accounts payable excluding trade credits and advances (F.89)																
45	*of which FDI*																
46	Net financial transactions/net financial worth																

1) The data requirements for stocks, transactions and other changes in volume are identical, except for monetary gold (F.11) as an asset item of the Rest of the world, which is only requested for transactions and other volume changes.
2) ESA 2010 codes are used to classify institutional sectors (Chapter 2 of the ESA 2010) and financial transactions, other changes in volume and balance sheets (Chapters 5, 6 and 7 of the ESA 2010).
3) Monetary financial institutions (MFIs; S.121+S.122+S.123).
4) Money market fund (MMF; S.123).
5) Non-profit institutions serving households (NPISHs; S.15).
6) Pension entitlements, of which defined benefit (F63B) also includes hybrid schemes.

Table 3

Deposits (F.22+F.29)[1), 2)]

	Creditor sector \ Debtor sector		A	B	B.1	C	D	E	F
			Residents				Non-residents		
				MFIs[3)]				Euro area other than domestic	Residents outside the euro area
			Total (S.1)[2)]	Total (S.121+...+S.123)	Central bank (S.121)	General government (S.13)	Total (S.2)	MFIs[3)] (S.121+...+S.123)	
1	Total (S.1)								
2	Residents	Total (S.1)							
3		S.11							
4		S.121+...+S.123							
5		S.121							
6		S.124							
7		S.125+...+S.127							
8		S.125							
9		S.126							
10		S.127							
11		S.128							
12		S.129							
13		S.13							
14		S.14+S.15							
15	Total (S.2)								
16	Non-residents	Total (S.1)							
17		S.11							
18		S.121+...+S.123							
19		S.121							
20		S.124							
21		S.125+...+S.127							
22		S.125							
23		S.126							
24		S.127							
25		S.128							
26		S.129							
27		S.13							
28		S.14+S.15							
29		Residents outside the euro area							

1) The data requirements for stocks, transactions and other changes in volume are identical.

2) According to the ESA 2010 (paragraph 5.79) deposits are contracts that are offered by deposit-taking corporations (i.e. S.121 and S.122) and, in some cases, by central government.
In addition, paragraph 5.86 specifies that repayable margin payments and short-term repurchase agreements which are liabilities of MFIs (i.e. S.121, S.122 and S.123) are included as deposits.

3) Monetary financial institutions (MFIs; S.121+S.122+S.123).

Table 4

Short-term loans (F.41)[1)]

	Debtor sector \ Creditor sector		A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I
				Residents											
					MFIs[2)]			Other financial institutions							
			Total	Non-financial corporations (S.11)	Total (S.121+...+S.123)	Central bank (S.121)	Non-MMF[3)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Households, including NPISHs[4)] (S.14+S.15)
1	Total (S.1)														
2	Residents	Total (S.1)													
3		S.11													
4		S.121+...+S.123													
5		S.121													
6		S.124													
7		S.125+...+S.127													
8		**S.125**													
9		**S.126**													
10		**S.127**													
11		S.128													
12		S.129													
13		S.13													
14		S.14+S.15													
15	Non-residents	Total (S.2)													
16		Euro area other than domestic	Total (S.1)												
17			S.11												
18			S.121+...+S.123												
19			S.121												
20			S.124												
21			S.125+...+S.127												
22			**S.125**												
23			**S.126**												
24			**S.127**												
25			S.128												
26			S.129												
27			S.13												
28			S.14+S.15												
29		Residents outside the euro area													

1) The data requirements for stocks, transactions and other changes in volume are identical.
2) Monetary financial institutions (MFIs; S.121+S.122+S.123). According to the ESA 2010 (paragraph 5.118) short-term loans granted to deposit-taking corporations (S.121+S.122) are to be classified as deposits (F.22 or F.29).
3) Money market funds (MMFs; S.123).
4) Non-profit institutions serving households (NPISHs; S.15).

Table 5

Long-term loans (F.42)[1)]

	Debtor sector \ Creditor sector		A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I
				Residents											
					MFIs[2)]			Other financial institutions							
			Total	Non-financial corporations (S.11)	Total (S.121+...+S.123)	Central bank (S.121)	Non-MMF [3)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Households, including NPISHs[4)] (S.14+S.15)
1	Total (S.1)														
2	Residents	Total (S.1)													
3		S.11													
4		S.121+...+S.123													
5		S.121													
6		S.124													
7		S.125+...+S.127													
8		**S.125**													
9		**S.126**													
10		**S.127**													
11		S.128													
12		S.129													
13		S.13													
14		S.14+S.15													
15	Non-residents	Total (S.2)													
16		Euro area other than domestic	Total (S.1)												
17			S.11												
18			S.121+...+S.123												
19			S.121												
20			S.124												
21			S.125+...+S.127												
22			**S.125**												
23			**S.126**												
24			**S.127**												
25			S.128												
26			S.129												
27			S.13												
28			S.14+S.15												
29		Residents outside the euro area													

1) The data requirements for stocks, transactions and other changes in volume are identical.

2) Monetary financial institutions (MFIs; S.121+S.122+S.123).

3) Money market fund (MMF; S.123).

4) Non-profit institutions serving households (NPISHs; S.15).

Table 6

Short-term debt securities (F.31)[1]

	Debtor sector / Creditor sector		A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I
				Residents											
					MFIs[2]				Other financial institutions						
	Debtor sector	Creditor sector	**Total**	**Non-financial corporations (S.11)**	Total (S.121+...+S.123)	Central bank (S.121)	**Non-MMF[3] investment funds (S.124)**	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	**Insurance corporations (S.128)**	**Pension funds (S.129)**	**General government (S.13)**	**Households, including NPISHs[4] (S.14+S.15)**
1	Total (S.1)														
2	Residents	Total (S.1)													
3		S.11													
4		S.121+...+S.123													
5		S.121													
6		S.124													
7		S.125+...+S.127													
8		S.125													
9		S.126													
10		S.127													
11		S.128													
12		S.129													
13		S.13													
14		S.14+S.15													
15	Non-residents	Total (S.2)													
16		Euro area other than domestic	Total (S.1)												
17			S.11												
18			S.121+...+S.123												
19			S.121												
20			S.124												
21			S.125+...+S.127												
22			S.125												
23			S.126												
24			S.127												
25			S.128												
26			S.129												
27			S.13												
28			S.14+S.15												
29		Residents outside the euro area													

1) The data requirements for stocks, transactions and other changes in volume are identical.
2) Monetary financial institutions (MFIs; S.121+S.122+S.123).
3) Money market fund (MMF; S.123).
4) Non-profit institutions serving households (NPISHs; S.15).

Table 7

Long-term debt securities (F.32)[1)]

	Debtor sector / Creditor sector		A	B	C	C.1	D	E	E.1	E.2	E.3	F	G	H	I
				Residents											
					MFIs[2)]				Other financial institutions						
	Debtor sector	Creditor sector	**Total**	**Non-financial corporations (S.11)**	Total (S.121+...+S.123)	Central bank (S.121)	**Non-MMF[3)] investment funds (S.124)**	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	**Insurance corporations (S.128)**	**Pension funds (S.129)**	**General government (S.13)**	**Households, including NPISHs[4)] (S.14+S.15)**
1	Total (S.1)														
2	Residents	Total (S.1)													
3		S.11													
4		S.121+...+S.123													
5		S.121													
6		S.124													
7		S.125+...+S.127													
8		S.125													
9		S.126													
10		S.127													
11		S.128													
12		S.129													
13		S.13													
14		S.14+S.15													
15	Non-residents	Total (S.2)													
16		Euro area other than domestic	Total (S.1)												
17			S.11												
18			S.121+...+S.123												
19			S.121												
20			S.124												
21			S.125+...+S.127												
22			S.125												
23			S.126												
24			S.127												
25			S.128												
26			S.129												
27			S.13												
28			S.14+S.15												
29		Residents outside the euro area													

1) The data requirements for stocks, transactions and other changes in volume are identical.
2) Monetary financial institutions (MFIs; S.121+S.122+S.123).
3) Money market fund (MMF; S.123).
4) Non-profit institutions serving households (NPISHs; S.15).

Table 8

Listed shares (F.511)[1)]

	Debtor sector \ Creditor sector		A	B	C	D	E	E.1	E.2	E.3	F	G	H	I
			Residents											
							Other financial institutions							
			Total	Non-financial corporations (S.11)	MFIs [2)] (S.121+...+S.123)	Non-MMF [3)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Households, including NPISHs[4)] (S.14+S.15)
1	Total (S.1)													
2	Residents	Total (S.1)												
3		S.11												
4		S.121+...+S.123												
5		S.124												
6		S.125+...+S.127												
7		S.125												
8		S.126												
9		S.127												
10		S.128												
11		S.129												
12		S.13												
13		S.14+S.15												
14	Non-residents	Total (S.2)												
15		Euro area other than domestic: Total (S.1)												
16		S.11												
17		S.121+...+S.123												
18		S.124												
19		S.125+...+S.127												
20		S.125												
21		S.126												
22		S.127												
23		S.128												
24		S.129												
25		S.13												
26		S.14+S.15												
27		Residents outside the euro area												

1) The data requirements for stocks, transactions and other changes in volume are identical.
2) Monetary financial institutions (MFIs; S.121+S.122+S.123).
3) Money market fund (MMF; S.123).
4) Non-profit institutions serving households (NPISHs; S.15).

Table 9

Investment fund shares or units (F.52)[1)]

	Debtor sector	Creditor sector	A	B	C	D	E	E.1	E.2	E.3	F	G	H	I
			Residents											
							Other financial institutions							
			Total	Non-financial corporations (S.11)	MFIs [2)] (S.121+...+S.123)	Non-MMF [3)] investment funds (S.124)	Total (S.125+...+S.127)	Other financial intermediaries, except insurance corporations and pension funds (S.125)	Financial auxiliaries (S.126)	Captive financial institutions and money lenders (S.127)	Insurance corporations (S.128)	Pension funds (S.129)	General government (S.13)	Households, including NPISHs [4)] (S.14+S.15)
1	Total (S.1)													
2	Residents	Total (S.1)												
3		S.11												
4		S.121+...+S.123												
5		S.124												
6		S.125+...+S.127												
7		S.125												
8		S.126												
9		S.127												
10		S.128												
11		S.129												
12		S.13												
13		S.14+S.15												
14	Total (S.2)													
15	Non-residents	Total (S.1)												
16		S.11												
17		S.121+...+S.123												
18		S.124												
19		S.125+...+S.127												
20		S.125												
21		S.126												
22		S.127												
23		S.128												
24		S.129												
25		S.13												
26		S.14+S.15												
27		Residents outside the euro area												

1) The data requirements for stocks, transactions and other changes in volume are identical.
2) Monetary financial institutions (MFIs; S.121+S.122+S.123).
3) Money market fund (MMF; S.123).
4) Non-profit institutions serving households (NPISHs; S.15).'.

ACTS ADOPTED BY BODIES CREATED BY INTERNATIONAL AGREEMENTS

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29fdocstts.html

UN Regulation No 158 – Uniform provisions concerning the approval of devices for reversing motion and motor vehicles with regard to the driver's awareness of vulnerable road users behind vehicles [2021/828]

Date of entry into force: 10 June 2021

This document is meant purely as documentation tool. The authentic and legally binding text is: ECE/TRANS/WP.292020/121.

CONTENTS

ANNEXES

INTRODUCTION (for information)

The purpose of this Regulation is to provide the provisions for reversing motion concerning on awareness of vulnerable road users proximity. UN Regulation No 46. provides the provisions for indirect vision of motor vehicles. This Regulation expands driver's vision or awareness for vehicle rear direction when in reversing motion. Therefore, some requirements of this Regulation may be satisfied by devices complying with UN Regulation No 46.

This Regulation cannot cover all the traffic conditions and infrastructure features in the type approval process; this Regulation recognises that the performances required in this Regulation cannot be achieved in all conditions (vehicle speed and condition, weather conditions, and traffic scenarios etc. may affect the system performances).

1. SCOPE

This Regulation applies to:

1.1. Approval of devices for reversing safety defined in Part I intended to be fitted to vehicles of category M and N.

1.2. Approval of vehicle installation of devices for reversing safety defined in Part II if fitted to vehicles of category M and N.

1.3. At the request of the manufacturer, Contracting Parties may grant approvals under Parts I and II to vehicles of other categories and devices for fitting to such vehicles.

1.4. The following vehicles of category M and N shall be exempted from this Regulation:

Vehicles where installation of any device for reversing safety is incompatible with their on-road use may be partly or fully exempted from this Regulation, subject to the decision of the Type Approval Authority.

1.5. If a vehicle has multiple device(s), the manufacturer shall designate the device that meets the provisions of the regulation.

Part I **Devices for Reversing Motion**

2. DEFINITIONS

For the purposes of this Regulation:

2.1. 'Devices for reversing motion' means devices intended to give a clear view of the rear of the vehicle within the fields of vision defined in paragraph 15.2. These can be conventional mirrors, Rear-View Camera System or other devices able to present information about the field of vision to the driver.

2.1.1. ‘Close-proximity rear-view device’ means a device that gives the field of vision defined in paragraph 15.2. of this Regulation.

2.1.2. ‘Devices for indirect vision’ means devices that present information of the fields of vision defined in paragraph 15.2.

2.1.2.1. ‘Rear-View Camera system (RVCS)’ means any system intended to render an image of the outside world and give a clear view to the rear of the vehicle within the fields of vision defined in paragraph 15.2. by means of camera.

2.1.2.1.1. ‘Luminance contrast’ means the brightness ratio between an object and its immediate background/ surrounding that allows the object to be distinguished from its background/surroundings. The definition is in accordance with the definition given in ISO 9241-302:2008.

2.1.2.1.2. ‘Resolution’ means the smallest detail that can be discerned with a perceptual system, i.e. perceived as separate from the larger whole. The resolution of the human eye is indicated as ‘visual acuity’.

2.1.2.1.3. ‘Visual spectrum’ means light with a wavelength within the range of the perceptual limits of the human eyes: 380-780 nm.

2.1.2.2. ‘Close-proximity rear-view mirror’ means any device, excluding devices such as periscopes, intended to give a clear view to the rear of the vehicle within the fields of vision defined in paragraph 15.2. by means of a reflective surface.

2.1.2.2.1. ‘r’ means the average of the radii of curvature measured over the reflecting surface, in accordance with the method described in Annex 7.

2.1.2.2.2. ‘The principal radii of curvature at one point on the reflecting surface (ri)’ means the values obtained with the apparatus defined in Annex 7, measured on the arc of the reflecting surface passing through the centre of this surface parallel to the segment b, as defined in paragraph 6.1.2.1.2. of this Regulation and on the arc perpendicular to this segment.

2.1.2.2.3. ‘The radius of curvature at one point on the reflecting surface (r_p)’ means the arithmetical average of the principal radii of curvature r_i and r_i', i.e.:

$$r_p = \frac{r_i + r_i'}{2}$$

2.1.2.2.4. ‘Spherical surface’ means a surface, which has a constant and equal radius in all directions.

2.1.2.2.5. ‘Aspherical surface’ means a surface, which has only in one plane a constant radius.

2.1.2.2.6. ‘Aspherical mirror’ means a mirror composed of a spherical and an aspherical part, in which the transition of the reflecting surface from the spherical to the aspherical part has to be marked. The curvature of the main axis of the mirror is defined in the x/y coordinate system defined by the radius of the spherical primary calotte with:

$$y = R - \sqrt{(R^2 - x^2)} + k(x - a)^3$$

Where:

R: nominal radius in the spherical part

k: constant for the change of curvature

a: constant for the spherical size of the spherical primary calotte

2.1.2.2.7. ‘Centre of the reflecting surface’ means the centre of the visible area of the reflecting surface.

2.1.2.2.8. ‘The radius of curvature of the constituent parts of the mirror’ means the radius ‘c’ of the arc of the circle which most closely approximates to the curved form of the part in question.

2.1.2.3. 'Other devices for indirect vision' means devices as defined in paragraph 2.1.2. above, where the field of vision is not obtained by means of a mirror or a Rear-View Camera System.

2.1.3. 'Test object' means a cylindrical object with a height of 0,8 m and a diameter of 0,30 m.

2.1.4. 'Field of vision' means the section of the tri-dimensional space above ground level which is monitored with the help of a device for indirect vision. Unless otherwise stated, this is based on the view offered by a device and/or devices other than mirrors. This may be limited by the relevant detection distance corresponding to the test object.

2.1.5. 'Detection System' means a system which uses signals to enable the driver to detect objects in the area adjacent to the vehicle.

2.1.5.1. 'Audible information' means information using auditory signals provided by a detection system as defined in paragraph 2.1.5. above to enable the driver to detect objects in the area adjacent to the vehicle.

2.1.5.2. 'Optical information' means information using optical signals provided by a detection system as defined in paragraph 2.1.5. above to enable the driver to detect objects in the area adjacent to the vehicle.

2.1.5.3. 'Haptic information' means information using haptic signals provided by a detection system as defined in paragraph 2.1.5. above to enable the driver to detect objects in the area adjacent to the vehicle.

2.1.6. 'Field of detection' means the section of the tri-dimensional space above ground level which is monitored with the help of a detection system.

2.2. 'Type of device for Reversing Safety' means devices that do not differ on the following essential characteristics:

(a) Design of the device inclusive, if pertinent, the attachment to the bodywork;

(b) In the case of mirrors, the shape, the dimensions and radius of curvature of the mirror's reflecting surface;

(c) In the case of Rear-View Camera System, the field of view, the magnification.

(d) In the case of detection systems, the sensor type, the information signal type.

3. APPLICATION FOR APPROVAL

3.1. The application for approval of a type of device for indirect vision shall be submitted by the holder of the trade name or mark or by his duly accredited representative.

3.2. A model of information document is shown in Annex 1.

3.3. For each type of device for indirect vision the application shall be accompanied by three samples of the parts.

3.4. The RVCS shall be provided by the applicant with the following documents:

(a) Technical specification of the RVCS; and

(b) Operator's manual.

4. MARKINGS

4.1. The samples of devices for indirect vision submitted for approval shall bear the trade name or mark of the manufacturer; this marking shall be clearly legible and be indelible.

4.2. Every device for indirect vision shall possess, on at least one of the main components, a space large enough to accommodate the approval mark, which shall be legible; this space shall be shown on the drawings referred to in Annex 1. The approval mark shall also be legible when the device is mounted on the vehicle with the exception of Rear-View Camera System as defined in paragraph 2.1.2. or a detection system as defined in paragraph 2.1.5. Other components of the device shall bear a means of identification. In the case of limited space for the approval mark(s), other means of identification that link it to the approval mark shall be provided.

5. APPROVAL

5.1. If the samples submitted for approval meet the requirements of paragraph 6. of this Regulation, approval of the pertinent type of device for indirect vision shall be granted.

5.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of device for indirect vision.

5.3. Notice of approval or of refusal or of extension or withdrawal of approval or of production definitively discontinued of a type of device for indirect vision pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 3 to this Regulation.

5.4. There shall be affixed, on at least one of the main components, conspicuously and in the space referred to in paragraph 4.2. above, to every device for indirect vision, conforming to a type approved under this Regulation, in addition to the mark prescribed in paragraph 4.1. above, an international approval mark consisting of:

5.4.1. A circle surrounding the letter 'E' followed by:

(a) The distinguishing number of the country which has granted approval; ([1]) and

(b) The number of this Regulation, followed by the letter 'R', a dash and the approval number.

5.5. The approval mark and the additional symbol(s) shall be clearly legible and be indelible.

5.6. Annex 5 to this Regulation gives an example of the arrangement of the aforesaid approval mark and additional symbol.

6. REQUIREMENTS

6.1. Close-proximity rear-view mirrors

6.1.1. General specifications

6.1.1.1. All mirrors may be adjustable.

6.1.2. Special specifications

6.1.2.1. Dimensions

([1]) The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 – https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions

6.1.2.1.1. The contours of the reflecting surface shall be of simple geometric form and its dimensions such that the mirror provides the field of vision specified in paragraph 15.2. of this Regulation.

6.1.2.1.2. The dimensions of the reflecting surface shall be such that it is possible to inscribe therein:

(a) A rectangle 40 mm high the base length of which, measured in millimeters, has the value 'a';

(b) A segment which is parallel to the height of the rectangle and the length of which, expressed in millimeters, has the value 'b'.

6.1.2.2. Reflecting surface and coefficients of reflection

6.1.2.2.1. The reflecting surface of a mirror shall be either flat or spherically convex. Exterior mirrors may be equipped with an additional aspherical part provided that the main mirror fulfils the requirements of the indirect field of vision.

6.1.2.2.2. Differences between the radii of curvature of mirrors

6.1.2.2.2.1. The difference between r_i or r'_i, and r_p at each reference point shall not exceed 0,15 r.

6.1.2.2.2.2. The difference between any of the radii of curvature (r_p1, r_p2, and r_p3) and r shall not exceed 0,15 r.

6.1.2.2.2.3. When r is not less than 3 000 mm, the value of 0,15 r quoted in paragraphs 6.1.2.2.2.1. and 6.1.2.2.2.2. above is replaced by 0,25 r.

6.1.2.2.3. The value of the normal coefficient of reflection, as determined according to the method described in Annex 6, shall be not less than 40 per cent.

In the case of reflecting surfaces with a changeable degree of reflection, the 'day' position shall allow the colours of the signals used for road traffic to be recognized. The value of the normal coefficient of reflection in the 'night' position shall be not less than 4 per cent.

6.1.2.2.4. The reflecting surface shall retain the characteristics laid down in paragraph 6.1.2.2.3. above in spite of prolonged exposure to adverse weather conditions in normal use.

6.2. Close-proximity rear-view devices for indirect vision other than mirrors

6.2.1. General requirements

6.2.1.1. The effectiveness of the RVCS and other vision supporting devices of Close-proximity rear-view shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with the technical requirements and transitional provisions of UN Regulation No 10, 05 series of amendments or any later series of amendments.

7. MODIFICATION OF THE TYPE OF DEVICE FOR REVERSING MOTION AND EXTENSION OF TYPE APPROVAL

7.1. Every modification to an existing type of device for indirect vision including its connection to the bodywork shall be notified to the Type Approval Authority which approved the type of device for indirect vision. The Type Approval Authority shall then either:

(a) Decide, in consultation with the manufacturer, that a new type-approval is to be granted; or

(b) Apply the procedure contained in paragraph 7.1.1. (Revision) and, if applicable, the procedure contained in paragraph 7.1.2. (Extension).

7.1.1. Revision

When particulars recorded in the information folder have changed and the Type Approval Authority considers that the modifications made are unlikely to have an appreciable adverse effect and that in any case the device for indirect vision still complies with the requirements, the modification shall be designated a 'revision'.

In such a case, the Type Approval Authority shall issue the revised pages of the information folder as necessary, marking each revised page to show clearly the nature of the modification and the date of re-issue. A consolidated, updated version of the information folder, accompanied by a detailed description of the modification, shall be deemed to meet this requirement.

7.1.2. Extension

The modification shall be designated an 'extension' if, in addition to the change of the particulars recorded in the information folder;

(a) Further inspections or tests are required; or

(b) Any information on the communication document (with the exception of its attachments) has changed; or

(c) Approval to a later series of amendments is requested after its entry into force.

7.2. Confirmation or refusal of approval, specifying the alterations shall be communicated by the procedure specified in paragraph 5.3. above to the Parties to the Agreement which apply this Regulation. In addition, the index to the information package, attached to the communication document, shall be amended accordingly to show the date of the most recent revision or extension.

7.3. The Type Approval Authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension.

8. CONFORMITY OF PRODUCTION

8.1. The conformity of production procedure shall comply with those set out in the Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3).

8.2. Every device for indirect vision approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 6. above.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

9.1. The approval granted in respect of a type of device for indirect vision pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 8.1. above is not complied with or if the type of device for indirect vision did not satisfy the requirements prescribed in paragraph 8.2. above.

9.2. If a Contracting Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by means of a copy of the communication form bearing at the end, in large letters, the signed and dated annotation 'APPROVAL WITHDRAWN'.

10. PRODUCTION DEFINITIVELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of device for indirect vision approved in accordance with this Regulation, he shall so inform the Type Approval Authority which granted the approval. Upon receiving the relevant communication, the Authority shall inform thereof the other Parties to the Agreement applying this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation 'PRODUCTION DISCONTINUED'.

11. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF TYPE APPROVAL AUTHORITIES

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or refusal or extension or withdrawal of approval, issued in other countries, are to be sent.

Part II **Installation of devices for reversing motion**

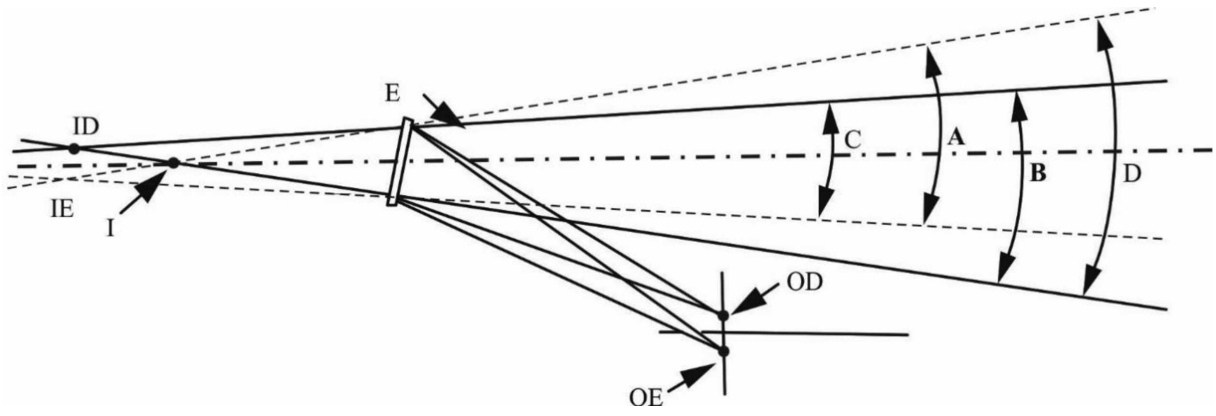
12. DEFINITIONS

For the purpose of this Regulation:

12.1. 'The driver's ocular points' means two points 65 mm apart and 635 mm vertically above point R of the driver's seat as defined in Annex 8. The straight line joining these points runs perpendicular to the vertical longitudinal median plane of the vehicle. The centre of the segment joining the two ocular points is in a vertical longitudinal plane which shall pass through the centre of the driver's designated seating position, as specified by the vehicle manufacturer.

12.2. 'Ambinocular vision' means the total field of vision obtained by the superimposition of the monocular fields of the right eye and the left eye (see Figure 2 below).

Figure 2



E = interior rear-view mirror

OD = driver's eyes

OE = driver's eyes

ID = virtual monocular images

IE = virtual monocular images

I = virtual ambinocular image

A = angle of vision of left eye

B = angle of vision of right eye

C = binocular angle of vision

D = ambinocular angle of vision

12.3. 'Type of vehicle as regards to the driver's awareness of vulnerable road users behind vehicles' means motor vehicles which are identical in respect of the following basic features:

12.3.1. Type of device for reversing motion;

12.3.2. The bodywork features which reduce the field of vision;

12.3.3. The coordinates of point R (where applicable);

12.3.4. The prescribed positions, and type-approval markings of compulsory and (if fitted) optional devices for indirect vision.

12.4. 'Vehicles of categories M_1, M_2, M_3, N_1, N_2 and N_3' means those defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), (document ECE/TRANS/WP.29/78/Rev.6).

12.5. 'Ocular reference point' means the middle point between the driver's ocular points.

12.6. 'Backing event' means an amount of time from start and ends of reversing motion as described in 15.1.1. in this Regulation.

12.7. 'The driver's looking-back ocular points' means two points located at 96 mm longitudinally rearward, 158 mm horizontally inside to vehicle centre direction and 6 mm vertically above from 'the driver's ocular points' described in paragraph 12.1.

12.8. 'Active vehicle mode' means the vehicle mode when:

The powertrain moves the vehicle, on release of the brake system and in some cases by application of pressure to the accelerator pedal (or activation of an equivalent control).

13. APPLICATION FOR APPROVAL

13.1. The application for approval of a vehicle type with regard to the installation of devices for indirect vision shall be submitted by the vehicle manufacturer or by his duly accredited representative.

13.2. A model of information document is shown in Annex 2.

13.3. A vehicle representative of the vehicle type to be approved shall be submitted to the Technical Service responsible for conducting the approval tests.

13.4. The Type Approval Authority shall verify the existence of satisfactory arrangements for ensuring effective checks on conformity of production before type-approval is granted.

13.5. The RVCS shall be provided by the applicant with the following documents:

(a) Technical specification of the RVCS;

(b) Operator's manual.

14. APPROVAL

14.1. If the vehicle type submitted for approval in accordance with paragraph 13. above meets the requirements of paragraph 15. of this Regulation, approval shall be granted.

14.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00) shall indicate the series of amendments incorporating the most recent or technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another vehicle type.

14.3. Notice of approval or of refusal or of extension or withdrawal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 4 to this Regulation.

15. REQUIREMENTS

15.1. General

For the purpose of this Regulation, the vehicle shall fulfil the following requirements:

During a backing event at least one means of vision or awareness shall be provided to the driver.

Means of vision provide a close-proximity rear-view field of vision as defined in paragraph 15.2 below. Possible means are:

(a) Direct vision,

(b) Devices approved to UN Regulation No 46,

(c) Close Proximity Rear-view Mirror complying with this Regulation,

(d) Rear-View Camera System complying with this Regulation.

Means of Awareness provide an information other than vision for field of detection as defined in paragraphs 15.3 below. Possible means are:

(a) Detection System complying with this Regulation.

15.1.1. Backing event starts when the vehicle is in Active vehicle mode and the vehicle's direction selector is placed from forward, park or neutral into reverse by the driver or a system, and ends when one of the following forward motion conditions, at the manufacturer's choosing, is met:

(a) A speed ≤ 16 km/h (including 0 km/h), or

(b) A distance travelled ≤ 10 meters (including 0 meters), or

(c) A continuous duration ≤ 10 seconds (including 0 seconds), or

(d) The vehicle's direction selector is not placed in reverse.

15.2. Close Proximity Rear-View Field of Vision

The field of vision shall be bounded by the following planes:

(a) A transverse vertical plane passing through a point 0.3 m from the outermost point of the rear of the vehicle;

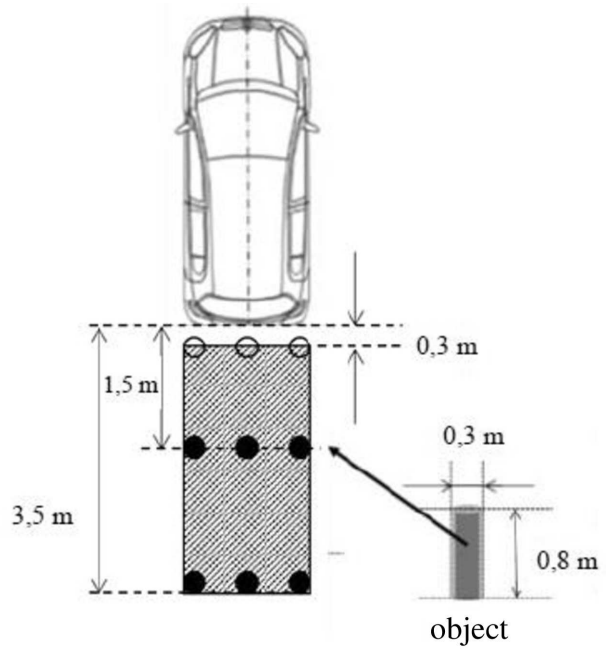
(b) A transverse vertical plane passing through a point 3.5 m behind the outermost point of the rear of the vehicle;

(c) Two longitudinal vertical planes parallel to the longitudinal vertical median plane passing through the outermost point of each side of the vehicle.

The height of the field of vision is defined at nine positions within the boundaries of the field of vision with test objects with a height of 0,8 m and a diameter of 0,3 m which are located on the ground plane as defined in Figure 3 below:

Figure 3

Close-proximity rear-view field of vision



15.2.1. Requirements

When tested under the conditions defined in Annex 9 the requirement for close-proximity rear-view field of vision shall be considered to be satisfied if the defined field of vision can be seen:

(a) For the test objects in the first row (Test objects A, B, and C):

A 0,15 m × 0,15 m area or the top of the test object shall be visible at least one position on each test object.

(b) For the test objects in the second row (Test objects D, E, and F) and the third row (Test objects G, H, and I);

The whole test object shall be seen.

15.2.1.1. Via the direct view from the driver's looking back ocular points; or

15.2.1.2. Via the direct view from the driver's looking back ocular points combined with a close-proximity rear-view mirror installed at the rear end of the vehicle supporting this direct view; or

15.2.1.3. Via a device of indirect vision (mirror or CMS or other) approved to UN Regulation No 46; or

15.2.1.4. Via a device of indirect vision (mirror or RVCS or other) complying with this Regulation; or

15.2.1.5. Via a device of detection system that complies with this Regulation except for the field of detection (e.g. very short range); or

15.2.1.6. Via a combination of devices of paragraphs 15.2.1.3, 15.2.1.4. and 15.2.1.5. except a combination of RVCS and mirror(s) or close-proximity rear-view mirror.

15.2.1.7. The options 15.2.1.1 and 15.2.1.2 only apply to the vehicle categories M_1 and N_1, when the distance between looking back ocular point to vehicle rear-end does not exceed 2 000 mm and when the vehicle has one seating row.

15.2.2. The close-proximity rear-view field of vision shall be established using ambinocular vision, the eyes being at the 'driver's ocular points' as defined in paragraph 12.1. above. The fields of vision shall be determined when the vehicle is in running order as defined in the consolidated Resolution on the Construction of vehicles (R. E.3) (ECE/TRANS/WP.29/78/Rev.6, para. 2.2.5.4.), plus for M1 and N1 vehicles one front seat passenger (75 kg). When established through windows, the glazing shall have a total light transmission factor in accordance with UN Regulation No 43, Annex 24.

In case of direct view from the driver's looking back ocular points the vertical position of rear seat headrests shall be set at the designed position of assumed to use or the highest position if the headrest has multiple position settings or at the position agreed with the Technical Service.

15.2.3. In case of combination of devices, each transverse row of test objects shall be seen by one device. The close-proximity rear-view field of vision shall be obtained from the minimum number of mirrors and monitors.

15.2.4. In the case of mirrors consisting of several reflecting surfaces which are either of different curvature or make an angle with each other, at least one of the reflecting surfaces shall provide the field of vision and have the dimensions specified for the class to which they belong.

15.3. Field of detection

The field of detection shall be bounded by the following planes (see figure 4):

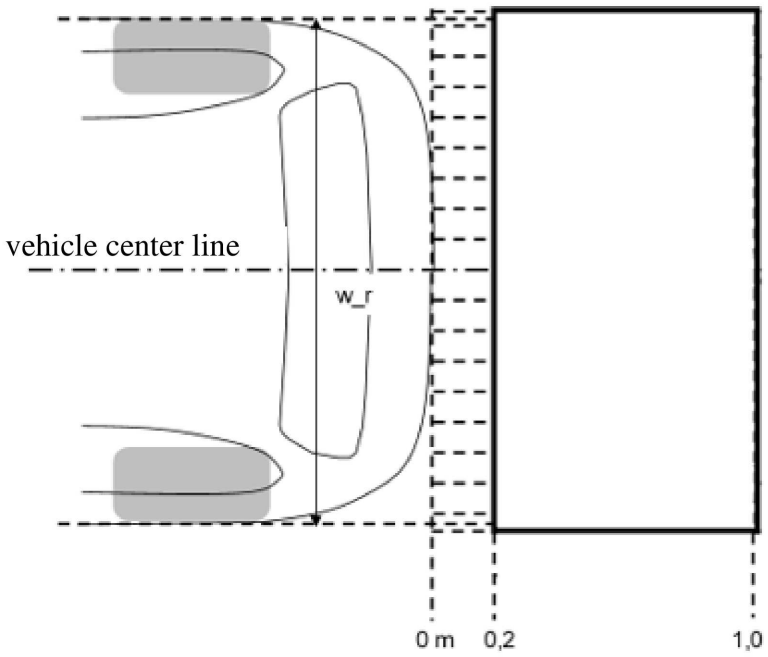
(a) A transverse vertical plane passing through a point 200 mm from the outermost point of the rear of the vehicle;

(b) A transverse vertical plane passing through a point 1 000 mm behind the outermost point of the rear of the vehicle;

(c) Two longitudinal vertical planes parallel to the longitudinal vertical median plane passing through the outermost point of each side of the vehicle.

Figure 4

Field of detection



15.3.1. When tested under the conditions defined in Annex 10 the requirement for field of detection shall be considered to be satisfied if the information as defined in paragraph 17.2 is provided to the driver.

15.4. Devices for reversing motion

15.4.1. Position

15.4.1.1. Devices for indirect vision shall be so placed that the driver, when sitting on the driving seat in a normal driving position, has a clear view of the road to the rear, side(s) or front of the vehicle.

15.4.1.2. In the case of any vehicle, which is in chassis/cab form when the field of vision is measured, the minimum and maximum body widths shall be stated by the manufacturer and, if necessary, simulated by dummy headboards. All vehicles and devices for indirect vision configurations taken into consideration during the tests shall be shown on the type-approval certificate for a vehicle with regard to the installation of devices for indirect vision (see Annex 4).

15.4.1.3. Devices for indirect vision shall not project beyond the external bodywork of the vehicle substantially more than is necessary to comply with the requirements concerning fields of vision.

15.4.1.4. Devices for indirect vision shall be fitted in such a way that the devices do not move so as significantly to change the field of vision as measured or vibrate to an extent which would cause the driver to misinterpret the nature of the image perceived.

16. REQUIREMENTS FOR REAR-VIEW CAMERA SYSTEM

16.1. Default view

In default view the RVCS shall show the field of view at least as defined in paragraph 15.2.

The RVCS must default to the rear-view image at the beginning of each backing event regardless of any modifications to the field of view that the driver has previously selected.

16.1.1. Object size

When the Rear-view image is measured in accordance with the paragraphs 3. of Annex 9, the calculated visual angle subtended by the horizontal width of:

(a) All three test objects at the last row specified in 15.2 shall average not less than 5 minutes of arc; and

(b) Each individual test object shall not be less than 3 minutes of arc.

16.1.1.1. Luminance and contrast adjustment

If manual adjustment is provided, the operator's manual shall provide information on how to change the luminance/contrast.

16.1.1.2. Overlay requirements within the required field of vision

Overlays shall display only rearward driving-related visual information or safety-related information. Overlays for other purposes of information in the required field of vision are not allowed.

Manually activated overlays are allowed, only when the driver needs to activate a rearward driving-related function or safety-related function (e.g. cleaning of the lens or activation of trailer hitch view) or requires specific information in such an environment. The driver may have an option to close the overlay.

16.1.1.3. Deactivation

The rear-view image shall remain visible during the backing event until either, the driver modifies the view, or the vehicle direction selector is no longer in the reverse position.

Modifying the view means to switch to any other camera views.

The view can be manually switched off when the vehicle is not moving rearward.

The system may be switched off when the vehicle detects a coupling by means of a coupling device.

16.1.1.4. Automatic change of view

When there is a risk of collision, the field of view may change and focus on the collision area. It shall be demonstrated to the Technical Service that this change of view increases the safety.

When the vehicle is not driving straight, the field of view may change following the vehicle trajectory.

16.1.2. Operating readiness (System availability)

Non-operation of the system shall be recognizable to the driver (e.g. RVCS failure by, i.e. warning indication, display information, black screen, absence of status indicator). The information for the driver shall be explained in the operator's manual.

16.1.2.1. Response time

The rear-view image meeting the requirements described in 15.2. shall be provided after a maximum of 2,0 seconds after start of the backing event, when tested according to paragraphs 2. of Annex 9.

16.1.3. Monitor inside the vehicle

16.1.3.1. The monitor defined size shall be visible without any obstruction from the ocular reference point. A virtual testing is acceptable.

16.1.4. Obstruction of the driver's direct view caused by the installation of a device for indirect vision shall be restricted to a minimum.

16.2. Vehicles may be equipped with additional devices for indirect vision.

16.3. Notwithstanding the provisions above, any other design concept shall be demonstrated to the satisfaction of the Technical Service within the safety concept that is provided in the provisions above.

17. REQUIREMENTS FOR DETECTION SYSTEMS

17.1. System activation

The system shall be activated when the backing event starts. If proper functioning cannot be effected, either the system shall automatically shut off or the driver shall be able to deactivate the system manually.

The detection system shall remain active as long as the vehicle direction selector is in the reverse position.

In case the vehicle can detect coupling with a coupling device, the system may be switched off.

17.2. Driver interface and information presentation strategy

17.2.1. The system shall have at least two kinds of information signal selected from audible, optical, and haptics.

17.2.1.1. As long as one information signal remains active, the driver may de-activate the other information signals.

17.2.2. Audible information

When an object is detected in the rear horizontal area as described in paragraph 1.3. of Annex 10. while the reverse gear is selected/engaged, audible information in accordance with ISO 15006:2011 shall be given.

In presenting audible information, the distance may be identified at two or more levels. These zones differentiated by levels (distance) and detection width may be indicated by changing the frequency of intermittent sound, and a faster intermittent sound or continuous sound shall be used as the distance becomes closer.

17.2.3. Duration of signalling

Signalling for an object shall last as long as the object is detected and shall end when the object is no longer detected or when the system is deactivated.

To reduce the driver's discomfort, the audible signal can be automatically suspended temporarily after a certain time set by the manufacturer has elapsed, provided that the system remains activated. If, while the audible signal is automatically suspended temporarily, the distance to the object becomes short, the audible signal shall be automatically resumed. If the distance to the object becomes long, the audible signal may remain suspended.

17.2.4. Optical information

In the case optical information is placed on a monitor used for other information such as meter cluster display or other displays, overlay is allowed and shall comply with the overlay requirements of the RVCS in 16.1.1.2. of this Regulation.

17.2.5. Operating readiness (System availability)

Non-operation of the system shall be recognizable to the driver (e.g. Detection system failure by, i.e. warning indication, display information, black screen, absence of status indicator). The information for the driver shall be explained in the operator's manual.

17.3. Performance of object detection

17.3.1. Response time

At least one of the audible or haptic information signals that meets the requirements as described in 17.2., shall be given to the driver within a maximum of 0,6 seconds after the start of the backing event, when tested according to paragraph 2. of Annex 10.

18. MODIFICATIONS OF THE VEHICLE TYPE AND EXTENSION OF APPROVAL

18.1. Every modification of the vehicle type shall be notified to the Type Approval Authority which approved the vehicle type. Type Approval Authority shall then either:

(a) Decide, in consultation with the manufacturer, that a new type approval is to be granted; or

(b) Apply the procedure contained in paragraph 18.1.1. (Revision) and, if applicable, the procedure contained in paragraph 18.1.2. (Extension).

18.1.1. Revision

When particulars recorded in the information folder have changed and the Type Approval Authority considers that the modifications made are unlikely to have an appreciable adverse effect, and that in any case the vehicle still complies with the requirements, the modification shall be designated a 'revision'.

In such a case, the Type Approval Authority shall issue the revised pages of the information folder as necessary, marking each revised page to show clearly the nature of the modification and the date of re-issue. A consolidated updated version of the information folder, accompanied by a detailed description of the modification, shall be deemed to meet this requirement.

18.1.2. Extension

The modification shall be designated an 'extension' if, in addition to the change of the particulars recorded in the information folder,

(a) Further inspections or tests are required; or

(b) Any information on the communication document (with the exception of its attachments) has changed; or

(c) Approval to a later series of amendments is requested after its entry into force.

18.2. Confirmation or refusal of approval, specifying the alterations, shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 4 to this Regulation. In addition, the index to the information package, attached to the communication document, shall be amended accordingly to show the date of the most recent revision or extension.

18.3. The Type Approval Authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension.

19. CONFORMITY OF PRODUCTION

19.1. The conformity of production procedure shall comply with those set out in the Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3).

19.2. Every vehicle approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 15., where applicable paragraph 16. and paragraph 17. above.

20. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

20.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 19.1. above is not complied with or if the vehicle fails to pass the checks prescribed in paragraph 19.2. above.

20.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation 'APPROVAL WITHDRAWN'.

21. PRODUCTION DEFINITIVELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of vehicle approved in accordance with this Regulation, he shall so inform the Type Approval Authority which granted the approval. Upon receiving the relevant communication, the Authority shall inform thereof the other Parties to the Agreement applying this Regulation by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation 'PRODUCTION DISCONTINUED'.

22. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF TYPE APPROVAL AUTHORITIES

The Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or refusal or extension or withdrawal of approval, issued in other countries, are to be sent.

ANNEX 1

Information document for type approval of a device for reversing motion

The following information, if applicable, shall be supplied in triplicate and shall include a list of contents.

Any drawings shall be supplied in appropriate scale and in sufficient detail on size A4 paper or on a folder of A4 format.

Photographs, if any, shall show sufficient details.

1. Make (trade name of manufacturer): .....

2. Type and general commercial description(s): .....

3. Means of identification of the type, if indicated on the device: .....

4. Category of vehicle for which the device is intended: .....

5. Name and address of manufacturer: .....

6. Location and method of affixing of the approval mark: .....

6.1. Other mean of identification link to the approval mark: .....

7. Address(es) of assembly plant(s): .....

8. Mirrors (state for each mirror): .....

8.1. Variant .....

8.2. Drawing(s) for the identification of the mirror: .....

8.3. Details of the method of attachment: .....

9. Devices for indirect vision other than mirrors: .....

9.1. Type and characteristics (such as a complete description of the device): .....

9.2. Sufficiently detailed drawings to identify the complete device including installation instructions; the position for the type-approval mark has to be indicated on the drawings: .....

ANNEX 2

Information document for type approval of a vehicle with respect to the installation of devices for reversing motion

The following information, if applicable, shall be supplied in triplicate and include a list of contents.

Any drawings shall be supplied in appropriate scale and in sufficient detail on size A4 paper or on a folder of A4 format.

Photographs, if any, shall show sufficient details.

General

1. Make (trade name of manufacturer):.....

2. Type and general commercial description(s): .....

3. Means of identification of type, if marked on the vehicle: .....

4. Location of that marking:.....

5. Category of vehicle:.....

6. Name and address of manufacturer: .....

7. Address(es) of assembly plant(s):.....

General construction characteristics of the vehicle

8. Photograph(s) and/or drawing(s) of a representative vehicle: .....

9. Driving position: left/right ([1]).....

9.1. The vehicle is equipped to be driven in right-hand/left hand traffic ([1]) .....

10. Range of vehicle dimensions (overall):.....

10.1. For chassis without bodywork.....

10.1.1. Width: ([2]) .....

10.1.1.1. Maximum permissible width:.....

([1]) Strike out what does not apply.

([2]) "Overall width" of a vehicle means a dimension which is measured according to ISO standard 612-1978, term No 6.2. In the case of vehicles of category other than M, in addition to the provisions of that standard, when measuring the vehicle width the following devices shall not be taken into account:

(a) Customs sealing devices and their protection;
(b) Devices for securing the tarpaulin and their protection;
(c) Tyre failure tell-tale devices;
(d) Protruding flexible parts of a spray-suppression system;
(e) Lighting equipment;
(f) For buses, access ramps in running order, lifting platforms and similar equipment in running order provided that they do not exceed 10 mm from the side of the vehicle and the corners of the ramps facing forwards or rearwards are rounded to a radius of not less than 5 mm; the edges shall be rounded to a radius of not less than 2.5 mm;
(g) Devices for indirect vision;
(h) Tyre-pressure indicators;
(i) Retractable steps;
(j) The deflected part of the tyre walls immediately above the point of contact with the ground.

10.1.1.2. Minimum permissible width: .....

10.2. For chassis with bodywork: .....

10.2.1. Width[2] .....

11. Bodywork .....

11.1. Devices for indirect vision .....

11.1.1. Mirrors .....

11.1.1.1. Drawing(s) showing the position of the mirror relative to the vehicle structure: .....

11.1.1.2. Details of the method of attachment including that part of the vehicle structure to which it is attached: .....

11.1.1.3. Optional equipment which may affect the rearward field of vision: .....

11.1.1.4. A brief description of the electronic components (if any) of the adjustment device: .....

11.1.2. Devices for indirect vision other than mirrors: .....

11.1.2.1. Sufficiently detailed drawings with the installation instructions: .....

11.1.2.2. In the case of Rear-View Camera System: .....

11.1.2.2.1. Drawing(s)/photograph(s) showing the position of the camera(s) relative to the vehicle structure: .....

11.1.2.2.2. Drawing(s)/photograph(s) showing the arrangement of the monitor(s) including surrounding interior parts: .....

11.1.2.2.3. Drawing(s)/photograph(s) showing the drivers view onto the monitor(s): .....

11.1.2.2.4. Drawing(s)/photograph(s) showing the setup and monitor image of the required field of view: .....

11.1.2.2.5. Details of the method of attachment of the Rear-View Camera System including that part of the vehicle structure to which it is attached: .....

11.1.2.2.6. Optional equipment which may affect the rearward field of vision: .....

11.1.2.2.7. A brief description of the electronic components (if any) of the adjustment device: .....

11.1.2.2.8. A technical specification and operator's manual of the Rear-View Camera System: .....

ANNEX 3

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration: .....

Concerning:[2] ([2]) Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of device for reversing motion pursuant to UN Regulation No 158

Approval No..... Extension No .....

1. Trade name or mark of device: .....

2. Manufacturer's name for the type of device:.....

3. Manufacturer's name and address:.....

4. If applicable, name and address of manufacturer's representative:.....

5. Submitted for approval on:.....

6. Technical Service responsible for conducting approval tests:.....

7. Date of report issued by that Service .....

8. Number of report issued by that Service.....

9. Brief description .....

   Identification of the device: mirror, Rear-View Camera System, other device[2].....

   Device for close-proximity rear-view[2] .....

10. Position of the approval mark:.....

11. Reason(s) for extension (if applicable):.....

12. Approval granted/refused/extended/withdrawn:[2]

([1]) Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulations).

([2]) Strike out what does not apply.

13. Place: .....

14. Date: .....

15. Signature: .....

16. The list of documents deposited with the Type Approval Authority which has granted approval is annexed to this communication and may be obtained on request.

ANNEX 4

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:.....

Concerning: (2) Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of vehicle with regard to the mounting of devices for reversing motion pursuant to UN Regulation No 158

Approval number:..... Extension No:.....

1. Make (trade name of manufacturer): .....

2. Type and general commercial description(s) .....

3. Means of identification of type, if marked on the vehicle:.....

3.1. Location of that marking:.....

4. Category of vehicle: (M_1, M_2, M_3, N_1, N_2, N_3)[2]

5. Name and address of manufacturer:.....

6. Address(es) of the production plant(s) .....

7. Additional information: (where applicable). See appendix

8. Technical Service responsible for carrying out the tests: .....

9. Date of test report:.....

10. Number of test report: .....

11. Remarks: (if any). See appendix

12. Place:.....

13. Date: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulations).

(2) Strike out what does not apply.

14. Signature: .....

15. The index to the information package lodged with the Type Approval Authority, which may be obtained on request is attached.

Annex 4 – Appendix

Appendix to type approval communication form No ..... concerning the type approval of a vehicle with regard to the mounting of devices for reversing motion under UN Regulation No 158.

1. Trade name or mark of mirrors and supplementary devices for indirect vision and component type-approval number: .....

2. Close-proximity rear-view mirrors and devices for reversing motion[1]

3. Extension of type approval of the vehicle to cover the following device for indirect vision .....

4. Data for identification of the R point of the driver's seating position: .....

5. Maximum and minimum bodywork width in respect of which the mirror and the devices for indirect vision has been granted type-approval.....

6. The following documents, bearing the type approval number shown above, are annexed to this certificate: .....

(a) Drawings showing the mounting of the devices for indirect vision .....

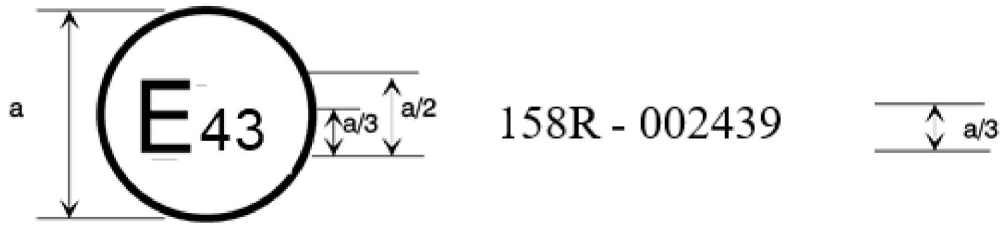
(b) Drawings and plans showing the mounting position and characteristics of the part of the structure where the devices for indirect vision are mounted.....

7. Remarks: (e.g. valid for right hand/left hand traffic[1]) .....

ANNEX 5

Arrangement of approval mark of a device for indirect vision

(See paragraph 5.4. of the Regulation)



a = 5 millimetre min.

The above approval mark affixed to a device for indirect vision indicates that the device is a main Close-proximity rear-view device, which has been approved in Japan (E 43) pursuant to UN Regulation No 158 and under approval number 002439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No 158 in its original form.

Note: The approval number and the additional symbol shall be placed close to the circle and either above or below the 'E' or to the left or right of that letter. The digits of the approval number shall be on the same side of the 'E' and point in the same direction. The additional symbol shall be directly opposite the approval number. The use of Roman numerals as approval numbers shall be avoided so as to prevent any confusion with other symbols.

ANNEX 6

Test method for determining reflectivity

1. Definitions

1.1. CIE standard illuminate A:[1] ([1]) Colorimetric illuminate, respecting the full radiator at T_{68} = 2 855,6 K.

1.1.2. CIE standard source A[1]: Gas-filled tungsten filament lamp operating at a correlated colour temperature of T_{68} = 2 855,6 K.

1.1.3. CIE 1931 standard colorimetric observer[1]: Receptor of radiation whose colorimetric characteristics correspond to the spectral tristimulus values $\bar{x}(\lambda)$, $\bar{y}(\lambda)$, $\bar{z}(\lambda)$ (see table).

1.1.4. CIE spectral tristimulus values[1]: Tristimulus values of the spectral components of an equi energy spectrum in the CIE (XYZ) system.

1.1.5. Photopic vision:[1] Vision by the normal eye when it is adapted to levels of luminance of at least several cd/m^2.

2. Apparatus

2.1. General

The apparatus shall consist of a light source, a holder for the test sample, a receiver unit with a photodetector and an indicating meter (see Figure 1), and means of eliminating the effects of extraneous light.

The receiver may incorporate a light-integrating sphere to facilitate measuring the reflectance of non-flat (convex) mirrors (see Figure 2).

2.2. Spectral characteristics of light source and receiver

The light source shall consist of a CIE standard source A and associated optics to provide a near-collimated light beam. A voltage stabiliser is recommended in order to maintain a fixed lamp voltage during instrument operation.

The receiver shall have a photodetector with a spectral response proportional to the photopic luminosity function of the CIE (1931) standard colorimetric observer (see table). Any other combination of illuminate-filter-receptor giving the overall equivalent of CIE standard illuminate A and photopic vision may be used. When an integrating sphere is used in the receiver, the interior surface of the sphere shall be coated with a matt (diffusive) spectrally non-selective white coating.

2.3. Geometrical conditions

The angle of the incident beam (ϑ) should preferably be 0,44 ± 0,09 rad (25 ± 5°) from the perpendicular to the test surface and shall not exceed the upper limit of the tolerance (i.e. 0,53 rad or 30°). The axis of the receptor shall make an angle (ϑ) with this perpendicular equal to that of the incident beam (see Figure 1). The incident beam upon arrival at the test surface shall have a diameter of not less than 13 mm (0,5 inch). The reflected beam shall not be wider than the sensitive area of the photodetector, shall not cover less than 50 per cent of such area, and as nearly as possible shall cover the same area segment as used during instrument calibration.

([1]) Definitions taken from CIE publication 50 (45), International Electronical Vocabulary, Group 45, Lighting

When an integrating sphere is used in the receiver section, the sphere shall have a minimum diameter of 127 mm (5 inch). The sample and incident beam apertures in the sphere wall shall be of such a size as to admit the entire incident and reflected light beams. The photodetector shall be so located as not to receive direct light from either the incident or the reflected beam.

2.4. Electrical characteristics of the photodetector-indicator unit

The photodetector output as read on the indicating meter shall be a linear function of the light intensity of the photosensitive area. Means (electrical and/or optical) shall be provided to facilitate zeroing and calibration adjustments. Such means shall not affect the linearity or the spectral characteristics of the instrument. The accuracy of the receptor indicator unit shall be within ± 2 per cent of full scale, or ± 10 per cent of the magnitude of the reading, whichever is the smaller.

2.5. Sample holder

The mechanism shall be capable of locating the test sample so that the axes of the source arm and receptor intersect at the reflecting surface. The reflecting surface may lie within or at either face of the mirror sample, depending on whether it is a first surface, second surface or prismatic 'flip' type mirror.

3. Procedure

3.1. Direct calibration method

In the direct calibration method, air is used as the reference standard. This method is applicable for those instruments, which are so constructed as to permit calibration at the 100 per cent point by swinging the receiver to a position directly on the axis of the light source (see Figure 1).

It may be desired in some cases (such as when measuring low-reflectivity surfaces) to use an intermediate calibration point (between 0 and 100 per cent on the scale) with this method. In these cases, a neutral density filter of known transmittance shall be inserted in the optical path, and the calibration control shall then be adjusted until the meter reads the percentage transmission of the neutral density filter. This filter shall be removed before reflectivity measurements are performed.

3.2. Indirect calibration method

The indirect calibration method is applicable in the case of instruments with fixed source and receiver geometry. A properly calibrated and maintained reflectance standard is required. This reference standard should preferably be a flat mirror with a reflectance value as near as possible to that of the test samples.

3.3. Flat mirror measurement

The reflectance of flat mirror samples can be measured on instruments employing either the direct or the indirect calibration method. The reflectance value is read directly from the indicating meter.

3.4. Non-flat (convex) mirror measurement

Measurement of the reflectance of non-flat (convex) mirrors requires the use of instruments which incorporate an integrating sphere in the receiver unit (see Figure 2). If the instrument-indicating meter indicates n_e divisions with a standard mirror of E per cent reflectance, then, with a mirror of unknown reflectance, n_x divisions will correspond to a reflectance of X per cent, in accordance with the formula:

$$X = E\frac{n_x}{n_e}$$

Figure 1

Generalised reflectometer showing experimental set-ups for the two calibration methods

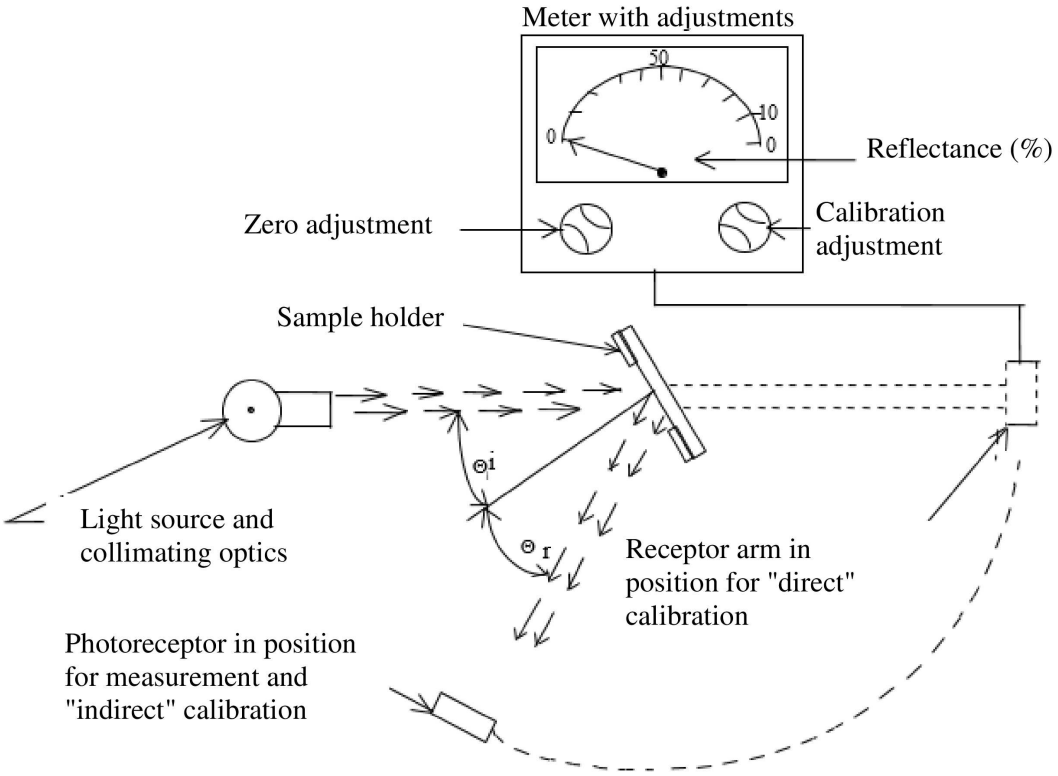
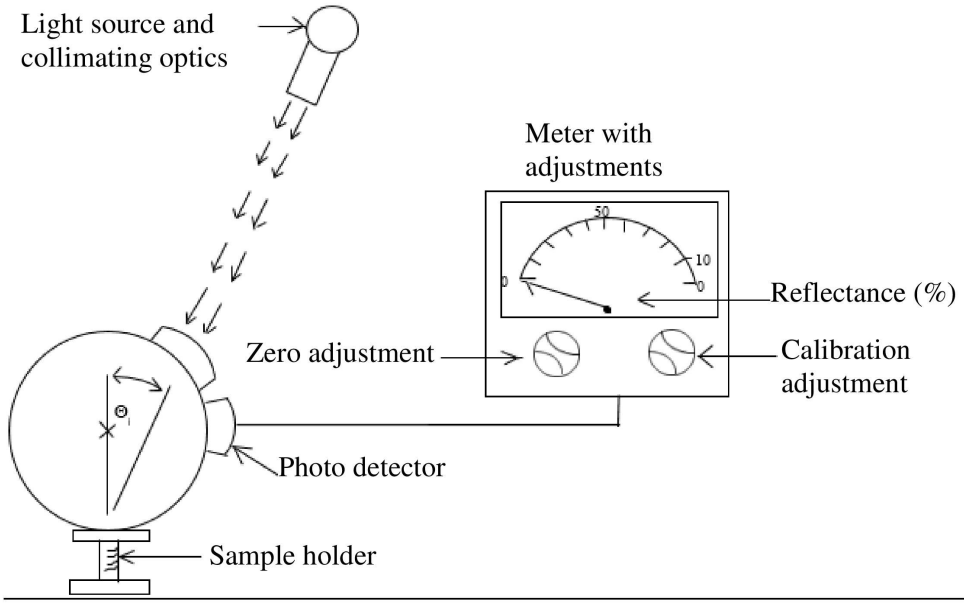


Figure 2

Generalised reflectometer, incorporating an integrating sphere in the receiver



4. Spectral tristimulus values for the CIE 1931 standard colormetric observer [2]

This table is taken from CIE publication 50 (45) (1970)

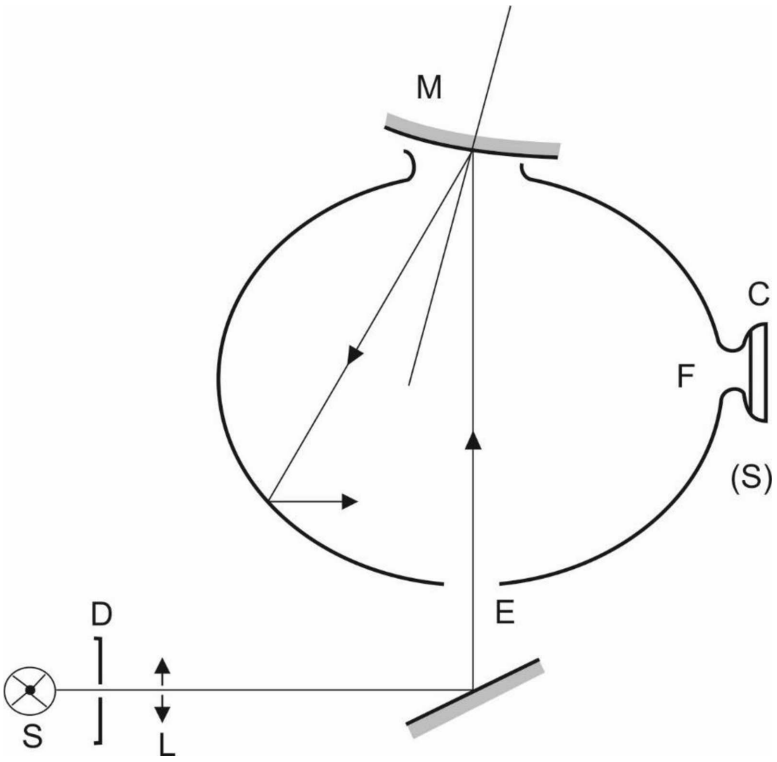
λ nm	$\bar{x}(\lambda)$	$\bar{y}(\lambda)$	$\bar{z}(\lambda)$
380	0,001 4	0,000 0	0,006 5
390	0,004 2	0,000 1	0,020 1
400	0,014 3	0,000 4	0,067 9
410	0,043 5	0,001 2	0,207 4
420	0,134 4	0,004 0	0,645 6
430	0,283 9	0,011 6	1,385 6
440	0,348 3	0,023 0	1,747 1
450	0,336 2	0,038 0	1,772 1
460	0,290 8	0,060 0	1,669 2
470	0,195 4	0,091 0	1,287 6
480	0,095 6	0,139 0	0,813 0
490	0,032 0	0,208 0	0,465 2
500	0,004 9	0,323 0	0,272 0
510	0,009 3	0,503 0	0,158 2
520	0,063 3	0,710 0	0,078 2
530	0,165 5	0,862 0	0,042 2
540	0,290 4	0,954 0	0,020 3
550	0,433 4	0,995 0	0,008 7
560	0,594 5	0,995 0	0,003 9
570	0,762 1	0,952 0	0,002 1
580	0,916 3	0,870 0	0,001 7
590	1,026 3	0,757 0	0,001 1
600	1,062 2	0,631 0	0,000 8
610	1,002 6	0,503 0	0,000 3
620	0,854,4	0,381 0	0,000 2
630	0,642 4	0,265 0	0,000 0
640	0,447 9	0,175 0	0,000 0
650	0,283 5	0,107 0	0,000 0
660	0,164 9	0,061 0	0,000 0
670	0,087 4	0,032 0	0,000 0
680	0,046 8	0,017 0	0,000 0
690	0,022 7	0,008 2	0,000 0
700	0,011 4	0,004 1	0,000 0
710	0,005 8	0,002 1	0,000 0
720	0,002 9	0,001 0	0,000 0
730	0,001 4	0,000 5	0,000 0
740	0,000 7	0,000 2 *	0,000 0
750	0,000 3	0,000 1	0,000 0
760	0,000 2	0,000 1	0,000 0
770	0,000 1	0,000 0	0,000 0
780	0,000 0	0,000 0	0,000 0

* Changed in 1966 (from 3 to 2)

[2] Abridged table. The values of $\bar{y}(\lambda) = V(\lambda)$ are rounded off to four decimal places

Explanatory figure

Example of device for measuring the reflection factor of spherical mirrors



C = Receiver

D = Diaphragm

E = Window of entry

F = Window of measurement

L = Lens

M = Object window

S = Light source

(S) = Integrating sphere

ANNEX 7

Procedure for determining the radius of curvature 'r' of the reflecting surface of a mirror

1. Measurement

1.1. Equipment

A 'spherometer' similar to the one described in Figure 1 of this annex having the indicated distances between the tracing pin of the dial gauge and the fixed legs of the bar is used.

1.2. Measuring points

1.2.1. The principal radii of curvature shall be measured at three points situated as close as possible to positions at one-third, one-half and two-thirds of the distance along the arc of the reflecting surface passing through the centre of this surface and parallel to segment b, or of the arc passing through the centre of the reflecting surface which is perpendicular to it if this arc is the longer.

1.2.2. Where, owing to the size of the reflecting surface, it is impossible to obtain measurements in the directions defined in paragraph 2.1.2.2.2. of this Regulation, the Technical Services responsible for the tests may take measurements at the said point in two perpendicular directions as close as possible to those prescribed above.

2. Calculation of the radius of curvature 'r'

'r' expressed in mm is calculated from the formula:

$$r = \frac{r_p1 + r_p2 + r_p3}{3}$$

Where:

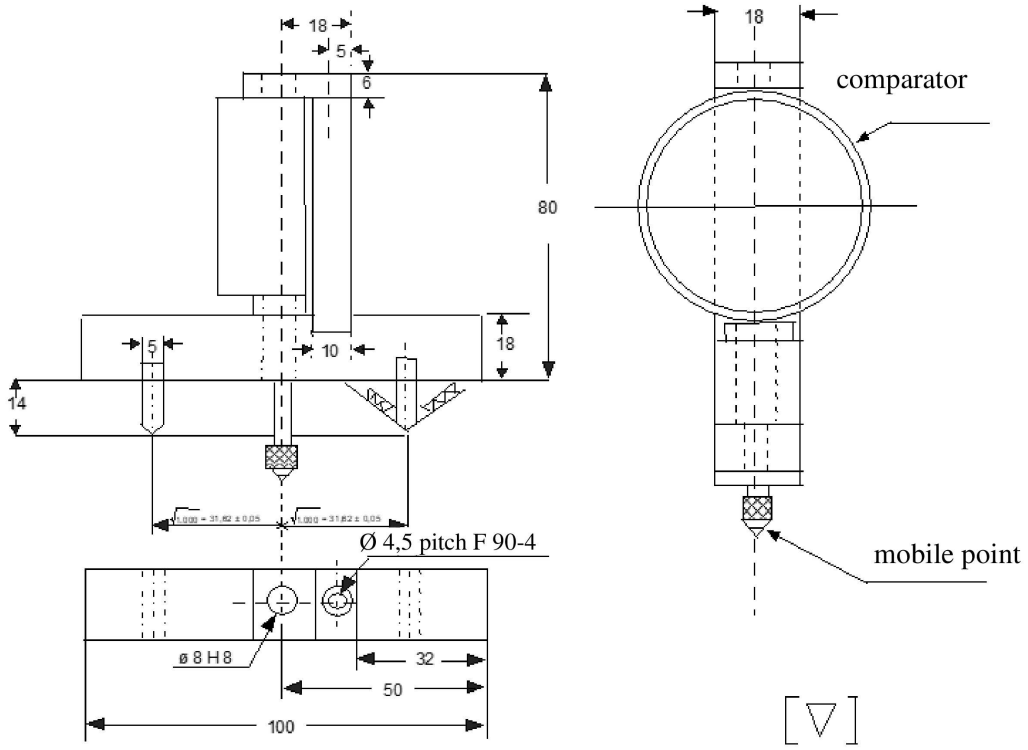
r_p1 = the radius of curvature at the first measuring point,

r_p2 = the radius of curvature at the second measuring point,

r_p3 = the radius of curvature at the third measuring point.

Figure 1

Spherometer



(all dimensions in millimetres)

ANNEX 8

Procedure for determining the 'H' point and the actual torso angle for seating positions in motor vehicles ([1])

Appendix 1 – Description of the three dimensional 'H' point machine (3-D H machine)[1]

Appendix 2 – Three-dimensional reference system[1]

Appendix 3 – Reference data concerning seating positions[1]

([1]) The procedure is described in Annex 1 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (document ECE/TRANS/WP.29/78/Rev.6). https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions

ANNEX 9

Test methods for close-proximity rear-view field of vision

1. Field of vision

The requirements of field of vision defined in paragraphs 15.2. of this Regulation can be tested under the conditions described in this Annex.

1.1. Test objects

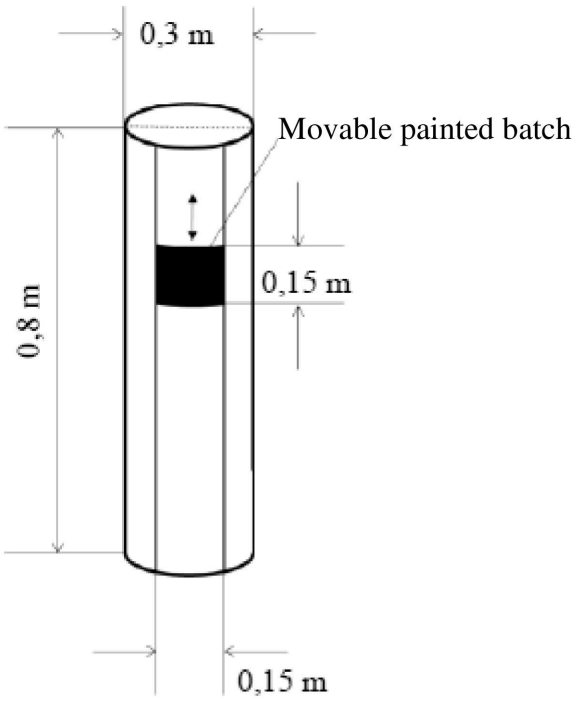
Each test object shall be a straight circular cylinder that is 0,8 m high and 0,3 m in external diameter. Each test object shall be marked as follows.

(a) The test object shall have a painted patch measuring 0,15 m × 0,15 m that can be moved from the bottom to the top of the side of the cylinder.

(b) The painted patch shall be of a colour that contrasts with both the rest of the cylinder and the test surface.

Figure A

Test object



1.2. Test object locations and orientations

Place the test objects at the locations specified in (a) to (h) and illustrated in Figure B. Measure the distances shown in Figure B from a test object to another test object or other object from the cylindrical centre (axis) of the test object as viewed from above. Each test object shall be oriented so that its axis is vertical.

(a) Place test objects A, B, and C so that their centres are in a transverse vertical plane that is 0,3 m to the rear of a transverse vertical plane tangential to the rearmost surface of the vehicle.

(b) Place test object B so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

(c) Place test objects D, E, and F so that their centres are in a transverse vertical plane that is 1,5 m to the rear of a transverse vertical plane tangential to the rearmost surface of the vehicle.

(d) Place test object E so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

(e) Place test objects G, H, and I so that their centres are in a transverse vertical plane that is 3,35 m to the rear of a transverse vertical plane tangential to the rearmost surface of the vehicle.

(f) Place test object H so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

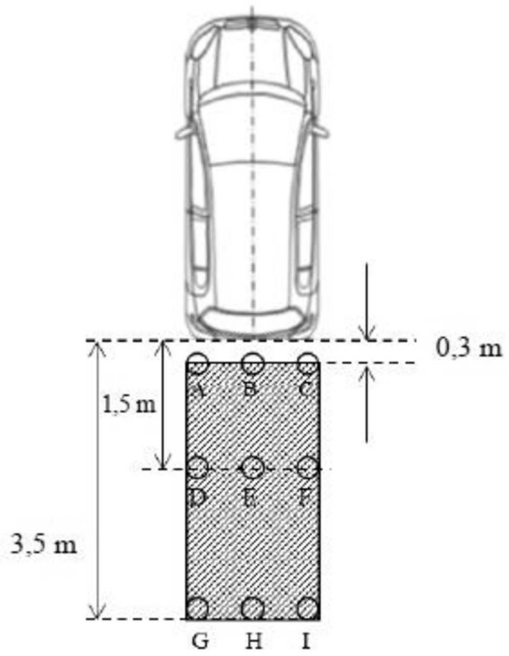
(g) Place test objects A, D, and G so that their outermosts are in a longitudinal vertical plane tangential to the left-side outermost surface of the vehicle.

(h) Place test objects C, F, and I so that their outermosts are in a longitudinal vertical plane tangential to the right-side outermost surface of the vehicle.

Mechanical coupling devices and luggage racks located on the rear of the vehicle shall be disregarded.

Figure B

Test object locations



1.3. Test conditions

1.3.1. Lighting.

The ambient illumination conditions in which testing is conducted consists of light that is evenly distributed from above and is at an intensity of between 7 000 lux and 10 000 lux, as measured at the centre of the exterior surface of the vehicle's roof.

1.3.2. Temperature.

The temperature inside the vehicle during test is any temperature between 15 °C and 25 °C,

1.3.3. Vehicle conditions.

1.3.3.1. Tires.

The vehicle's tires are set to the vehicle manufacturer's recommended cold inflation pressure.

1.3.3.2. Vehicle load.

The vehicle is in running order as defined in the consolidated Resolution on the Construction of vehicles (R.E.3) (ECE/TRANS/WP.29/78/Rev.6, paragraph 2.2.5.4.)

1.3.3.3. Adjustable suspension

If the vehicle is equipped with adjustable suspension system, it shall be set at worst condition.

1.3.3.4. Rear hatch and trunk lids.

If the vehicle is equipped with rear hatches or trunk lids, they are closed and latched in their normal vehicle operating condition.

1.4. Test procedure

The visibility of each pole shall be tested one by one.

Optionally, one row can be tested at the same time. After successful pole identification, the pole can be removed.

The poles of the first row (A, B, C) may rotate direction in order to be visible the painted patch as much as possible.

2. System readiness

2.1. Test conditions

(a) The vehicle shall be left in a parked parking status until it is ensured that all electronic systems are de-activated; or for a minimum of 30 minutes.

(b) It is permissible for the test person or equipment to be already situated within the vehicle.

(c) Ensure the vehicle gear selector is in neutral or forward gear.

(d) The test may start with opening the driver door. Once the door is opened, it shall be closed again.

2.2. Test procedure

(a) Put the vehicle into the active vehicle mode. This action shall initiate/start the first timer.

(b) Wait for a minimum of 6 sec

(c) Start the backing event by selecting the reverse mode. If it is not possible to put the vehicle into reversing mode 6 sec after being put into active vehicle mode, the backing event shall be started as soon as technically possible.

(d) Initiate/start the second timer, in accordance with the manufacturer's specification and no later than when the reverse mode or gear is engaged.

(e) Record the response time on second timer until the rear-view is completely visible on the display.

3. Object size

3.1. Test reference point.

Obtain the test reference point using the following procedure.

(a) Locate the centre of the forward-looking eye midpoint (Mf) illustrated in Figure C so that it is 635 mm vertically above the H point (H) and 96 mm aft of the H point.

(b) Locate the head/neck joint centre (J) illustrated in Figure C so that it is 100 mm rearward of Mf and 588 mm vertically above the H point. In the case of the head/neck joint centre (J) is not compatible for the vehicle seat configuration, adjust the driver's seat to the midpoint of the longitudinal adjustment range. If the seat cannot be adjusted to the midpoint of the longitudinal adjustment range, the closest adjustment position to the rear of the midpoint shall be used.

(c) Draw an imaginary horizontal line between Mf and a point vertically above J, defined as J2.

(d) Rotate the imaginary line about J2 in the direction of the rear-view image until the straight-line distance between Mf and the centre of the display used to present the rear-view image required in this standard reaches the shortest possible value.

(e) Define this new, rotated location of Mf to be Mr (eye midpoint rotated).

3.1. Measurement procedure.

(a) Locate a 35 mm or larger format still camera, video camera, or digital equivalent such that the centre of the camera's image plane is located at Mr and the camera lens is directed at the centre of the display's rear-view image.

(b) Affix a ruler at the base of the rear-view image in an orientation perpendicular with a test object cylinder centreline. If the vehicle head restraints obstruct the camera's view of the display, they may be adjusted or removed.

(c) Photograph the image of the visual display with the ruler included in the frame and the rear-view image displayed.

3.2. Extract photographic data.

(a) Using the photograph, measure the apparent length, of a 50 mm delineated section of the in-photo ruler, along the ruler's edge, closest to the rear-view image and at a point near the horizontal centre of the rear-view image.

(b) Using the photograph, measure the horizontal width of the coloured band at the upper portion of each of the three test objects located at positions G, H, and I in Figure B.

(c) Define the measured horizontal widths of the coloured bands of the three test objects as d_G, d_H, and d_I.

3.3. Obtain scaling factor.

Using the apparent length of the 50 mm portion of the ruler as it appears in the photograph, divide this apparent length by 50 mm to obtain a scaling factor. Define this scaling factor as scale.

3.4. Determine viewing distance.

Determine the actual distance from the rotated eye midpoint location (Mr) to the centre of the rear-view image. Define this viewing distance as a_{eye}.

3.5. Calculate visual angle subtended by test objects.

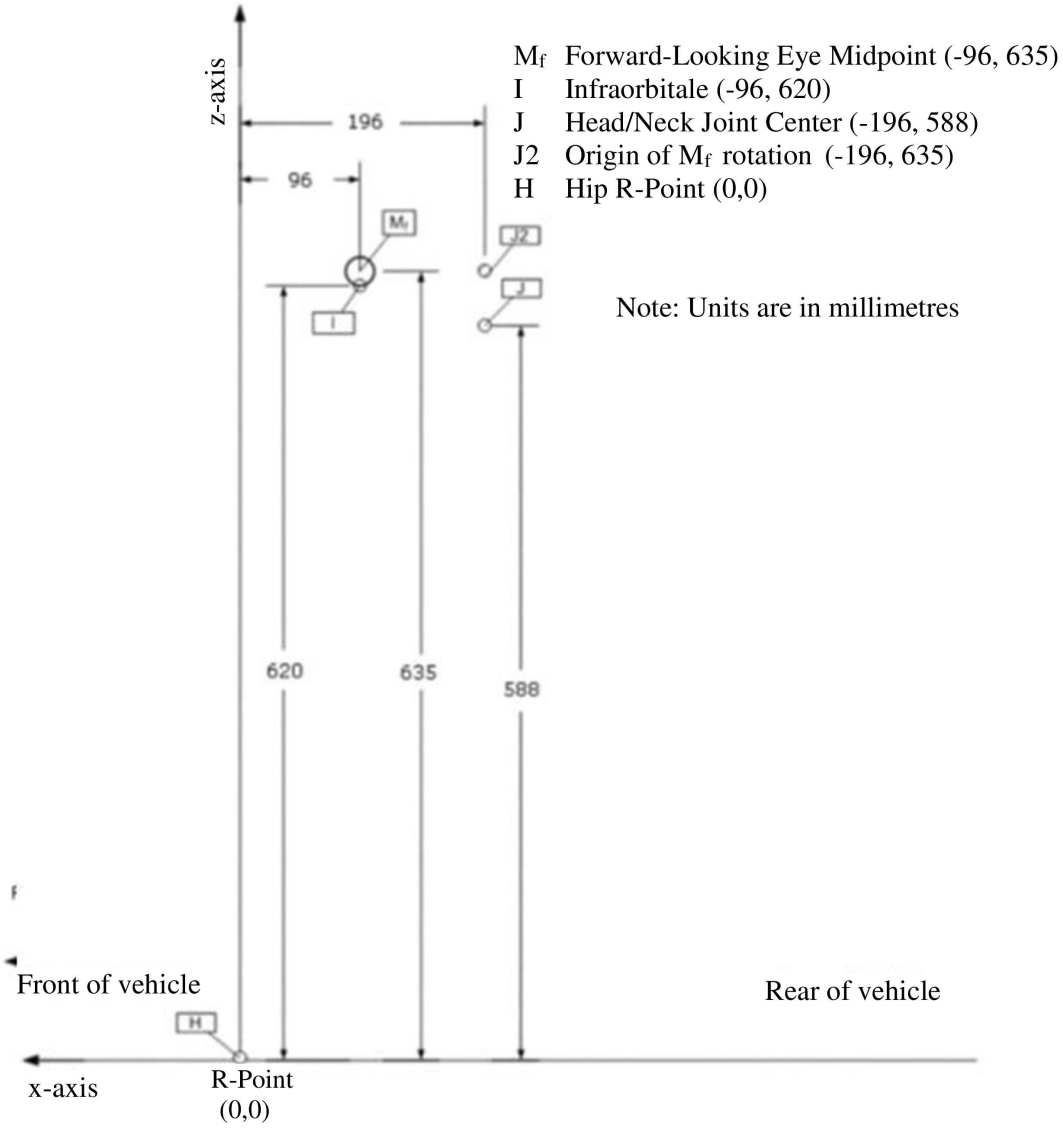
Use the following equation to calculate the subtended visual angles:

$$\theta_i = 60\ sin^{-1}\left(\frac{d_i}{a_{eye}S_{scale}}\right)$$

where i can take on the value of either test object G, H, or I, and arcsine is calculated in units of degrees.

Figure C

Eye Midpoint location (Mf) in the mid-sagittal plane with respect to R point for forward-looking 50th percentile male driver seated with 25 degree seat back angle



ANNEX 10

Test methods for detection systems

1. Rear horizontal area detection

Audible warning systems shall fulfil the test as specified in paragraph 1.3.1. in this Annex. However, if audible warning systems fulfil the test as specified in paragraph 1.4. in this Annex, the test as specified in paragraph 1.3.1. in this Annex shall be considered to be satisfied.

1.1. Test conditions

The test object shall be as per paragraph 7.1. of ISO 17386:2010. During testing, the wind speed shall not exceed 1 m/s. The temperature shall be 20 ± 5 °C and the humidity shall be 60 ± 25 percent. There shall be no rain or snow. The test shall be performed on a flat, dry asphalt or concrete surface. The test shall not be affected by the reflection of sound waves or electromagnetic waves from any walls, auxiliary testing equipment or any other objects in the environment.

1.2. Test preparation

One test object shall be used. The distance from the rear edge to the test object and the position of the test object are selected by the manufacturer to ensure the detection of the test object. The test object shall be located in the detectable grids within the rear horizontal area in 1.3.1. of this annex. The test vehicle in the initial state shall be with the detection system in the activated state, which is declared [by the manufacturer OR in the owner's manual] and shall be in the parking condition. Here, the parking condition means that the P (park) position is selected in the case of vehicles equipped with automatic transmissions, whereas it means the neutral gear being selected and the parking brake being engaged in the case of vehicles equipped with manual transmissions.

1.3. Test method

1.3.1. Field of detection

The maximum detection distance in paragraphs 5.4.2. and 5.4.3. of ISO 17386:2010 shall be 1,0 m (Class R2). The width of the rectangle, w_r, is equal to the vehicle width, measured along the rear axle. The dimensions shall be rounded up to the nearest 0,1 m. The figure below gives examples of different w_r. (Figure 1 and 2).

Figure 1

In the case of odd-numbered poles in the vehicle lateral direction (e.g. w_r = 1,67 m)

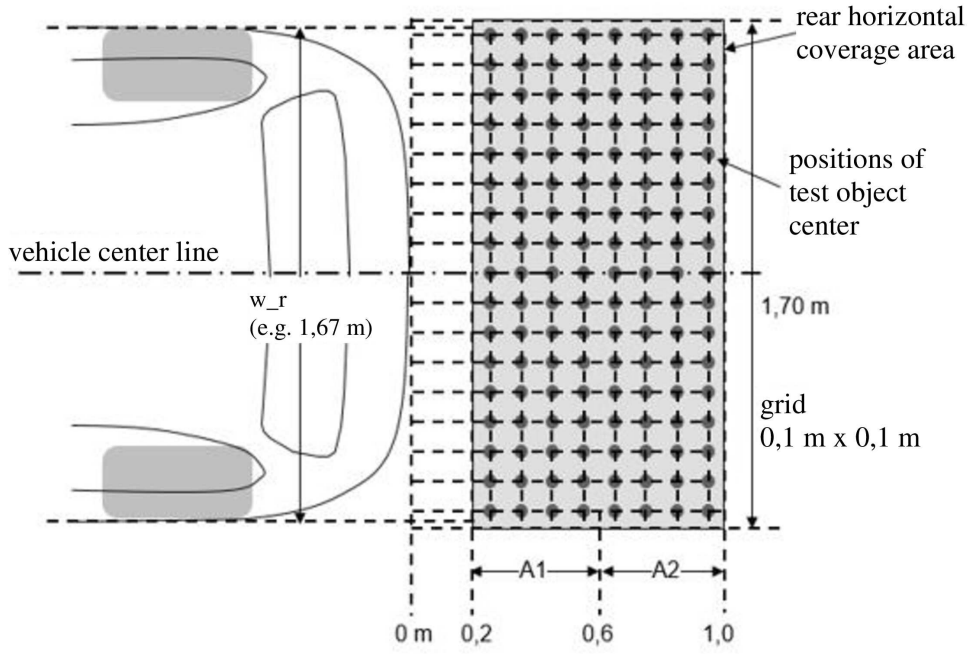
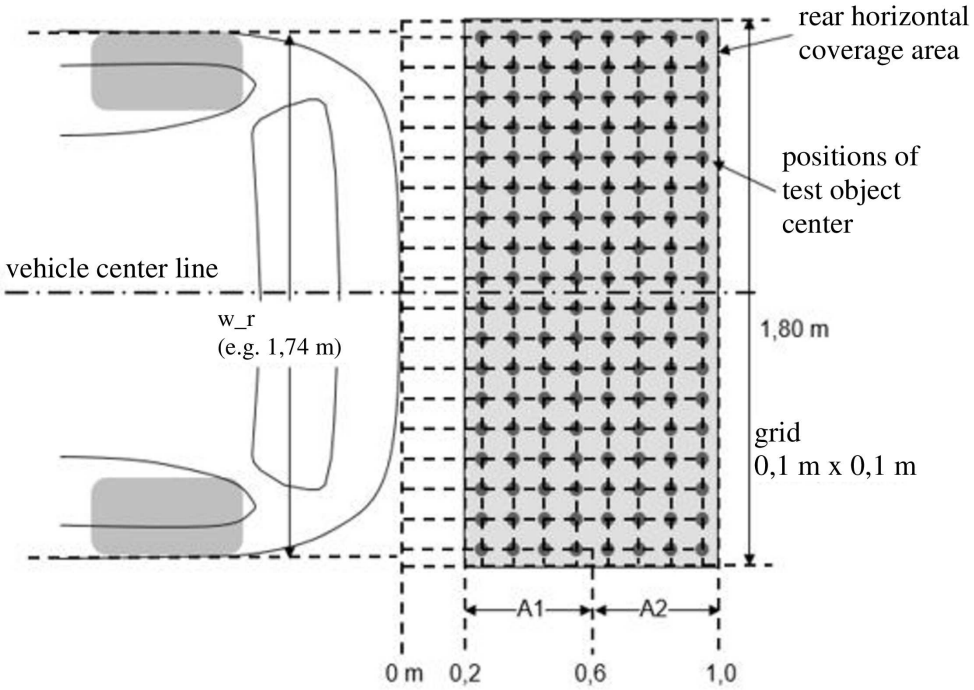


Figure 2

In the case of even-numbered poles in the vehicle lateral direction (e.g. w_r = 1,74 m)



1.3.2. Minimum detection rate

The minimum detection rate required for the rear horizontal area shall be as follows:

(a) 90 percent for A1 as defined in paragraph 5.4.3. of ISO 17386:2010;

(b) 87 percent for the rear-2 range in A2 as defined in paragraph 5.4.3. of ISO 17386:2010.

There shall be no undetected hole larger than a square consisting of two-by-two grids.

Here, the rear horizontal area test procedures shall be as per paragraph 7.3. of ISO 17386:2010.

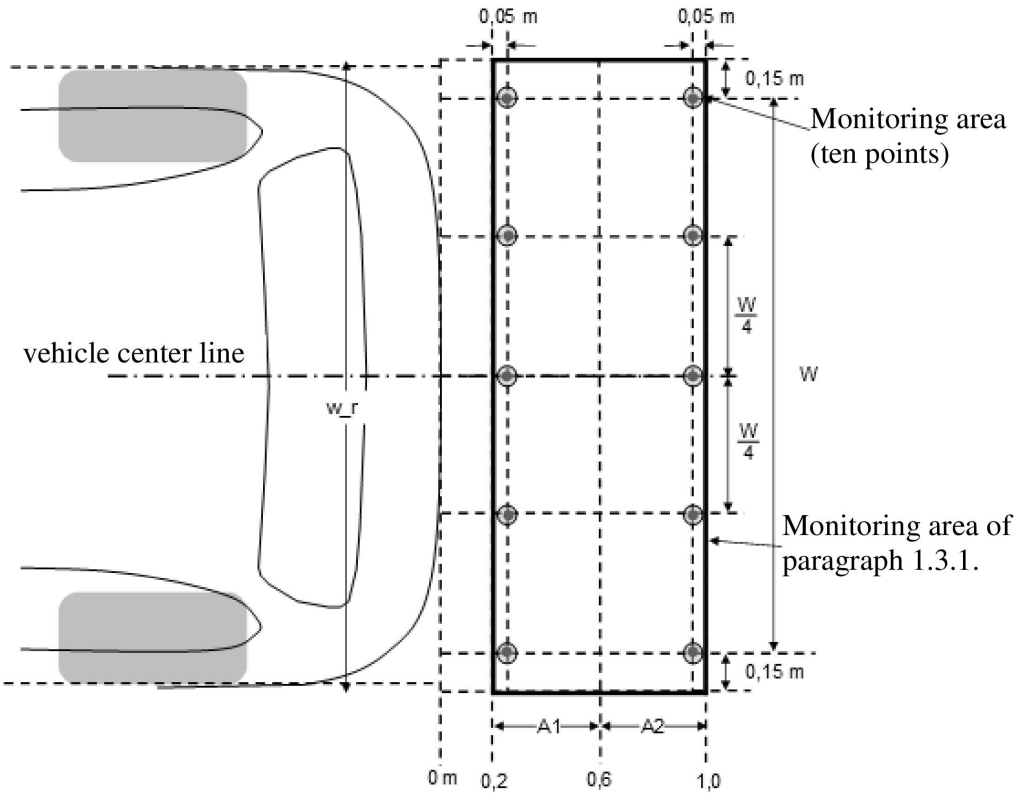
When the warning is provided for more than 5 seconds continuously, it is judged that the test object is detected. The detection test shall be performed 1 time for each test object. However, if necessary, according to the agreement of the Technical Service and manufacturer, it can be judged that the test object is detected in case warnings are provided in 4 out of 5 tests.

1.4. Alternative (simplified) test method

1.4.1. Field of detection

The monitoring areas are the ten points shown in Figure 3 below within the monitoring area of paragraph 1.3.1.

Figure 3



1.4.2. Minimum detection rate

The minimum detection rate required for the area of ten points shall be 100 %.

When the warning is provided for more than five seconds continuously, it is judged that the test object is detected. The detection test shall be performed one time for each test object. However, if necessary, according to the agreement of the Technical Service and manufacturer, it can be judged that the test object is detected in case warnings are provided in four out of five tests.

1.4.3. Self-test capabilities and failure indication

As per paragraph 5.5. of ISO 17386:2010, the system shall provide self-test functions. It shall provide system failure information which complies with paragraph 17.2.5. of this Regulation, whenever a fault condition is detected.

2. Response time

2.1. Test conditions

(a) The vehicle shall be left in a parked parking status until it is ensured that all electronic systems are de-activated; or for a minimum of 30 minutes.

(b) It is permissible for the test person or equipment to be already situated within the vehicle.

(c) Ensure the vehicle gear selector is in neutral or forward gear.

(d) The test may start with opening the driver door. Once the door is opened, it shall be closed again.

2.2. Test procedure

(a) Place a test object in the required field of detection

(b) Put the vehicle into the active vehicle mode. This action shall initiate/start the first timer.

(c) Wait for a minimum of 6 sec

(d) Start the backing event by selecting the reverse mode. If it is not possible to put the vehicle into reversing mode 6 sec after being put into active vehicle mode, the backing event shall be started as soon as technically possible. Initiate/start the second timer, in accordance with the manufacturer's specification and no later than when the reverse mode or gear is engaged.

(e) Record the response time on second timer until information signal is available.

UN Regulation No 159 – uniform provisions concerning the approval of motor vehicles with regard to the Moving Off Information System for the Detection of Pedestrians and Cyclists [2021/829]

Date of entry into force: 10 June 2021

This document is meant purely as documentation tool. The authentic and legally binding text is: ECE/TRANS/WP.29/2020/122.

CONTENTS

0. INTRODUCTION (for information)

0.1. Low-speed moving off from rest manoeuvres that involve collisions between M_2, M_3, N_2 and N_3 vehicle category vehicles (subject vehicles) and pedestrians and cyclists have serious consequences for these vulnerable road users (VRUs). In the past, VRU safety was raised by increasing the number of mirrors to provide better visibility of the area in front of the vehicle. Since collisions with these characteristics still occur and advanced driver assistance systems have been introduced in a lot of vehicle segments, it is obvious to use such assistance systems for avoiding accidents between subject vehicles and VRUs.

0.2. Theoretical considerations show that the criticality of traffic situations that involve subject vehicles and VRUs can be significant due to the misunderstandings of the situation by the vehicle operators. In some cases, the increase in situation criticality can occur so suddenly that high-urgency warnings, intended to generate a driver reaction to the situation, cannot be activated early enough for the driver to react in time. In general, driver reactions to any information (high/low urgency signals) can be expected only after a certain reaction time. This response time, particularly during close-proximity manoeuvres, is much longer than the time required to avoid the accident in many situations – the accident cannot be avoided despite the warning.

0.3. High-urgency warnings during a driving situation are only justified should the probability for an accident be high – otherwise vehicle drivers tend to ignore the system alerts. Should lower urgency information signals be activated sufficiently early, however, it may help the driver rather than annoy them. It is assumed to be possible to design a human-machine interface (HMI) for moving-off driver assistance systems in a way that it does not annoy drivers when the information is not needed, for instance by requiring the use of a less intrusive signal mode.

0.4. Therefore, this Regulation requires the activation of a proximity information signal in case pedestrians or cyclists enter the critical blind spot area in front of the vehicle, should the subject vehicle either be preparing to move off from rest in a straight line or be travelling straight ahead at low-speeds. This signal shall be deactivated automatically in case of system failure or contamination of the sensors, whilst manual deactivation may also be possible through a sequence of actions by the driver to avoid unintentional deactivation.

0.5. Furthermore, this Regulation asks for an additional signal, which shall be given when the collision becomes imminent, e.g. when the vehicle accelerates from rest and the pedestrian or cyclist is located directly in front of the vehicle. The activation and deactivation strategy for this collision warning signal may be determined by the manufacturer; however, in case of system failure or sensor contamination, the proximity information signal and collision warning signal shall be deactivated together.

0.6. This Regulation defines a test procedure based on subject vehicles that are stationary, moving-off from rest and moving ahead at low-speeds in a straight line for speeds of 10 km/h or less. Collision analysis data shows that the provision of information and warnings during these vehicle manoeuvres is appropriate since the information signal needs to be present sufficiently early to alert the driver of pedestrians and cyclists in close-proximity to the front end of the vehicle.

0.7. This Regulation cannot cover all the traffic conditions and infrastructure features in the type-approval process; this Regulation recognises that the performances required in this Regulation cannot be achieved in all conditions (vehicle condition, road environment, weather conditions and traffic scenarios etc. may affect the system performances). Actual conditions and features in the real world should not result in false warnings to the extent that they encourage the driver to switch the system off.

1. SCOPE

1.1. This Regulation applies to the approval of vehicles of categories M_2, M_3, N_2 and N_3 with regard to an onboard system to detect and inform the driver of the presence of pedestrians and cyclists in the close-proximity forward blind-spot of the vehicle and, if deemed necessary based on manufacturer strategy, warn the driver of a potential collision.

1.2. The requirements of this Regulation are so worded as to apply to vehicles which are developed for right-hand traffic. In vehicles that are developed for left-hand traffic, these requirements shall be applied by inverting the criteria, where appropriate.

1.3. The following vehicles of category M and N shall be exempted from this Regulation:

Vehicles where installation of any device for moving off information system is incompatible with their on-road use may be partly or fully exempted from this Regulation, subject to the decision of the Type Approval Authority.

2. DEFINITIONS

For the purposes of this Regulation:

2.1. 'Moving Off Information System (MOIS)' means a system to detect and inform the driver of the presence of pedestrians and cyclists in the close-proximity forward blind-spot of the vehicle and, if deemed necessary based on manufacturer strategy, warn the driver of a potential collision.

2.2. 'Approval of a vehicle type' means the full procedure whereby a Contracting Party to the Agreement certifies that a vehicle type meets the technical requirements of this Regulation.

2.3. 'Vehicle type with regard to its Moving Off Information System' means a category of vehicles which do not differ in such essential respects as:

(a) The manufacturer's trade name or mark;

(b) Vehicle features which significantly influence the performances of the MOIS;

(c) The type and design of the MOIS.

2.4. 'Subject vehicle' means the vehicle being tested.

2.5. 'Vulnerable Road User (VRU)' means an adult or child pedestrian or an adult or child cyclist.

2.6. 'Information signal' means a signal emitted by the MOIS with the purpose of informing the vehicle driver about a VRU in close-proximity to the front of the vehicle.

2.7. 'Collision warning signal' means a signal emitted by the MOIS with the purpose of warning the vehicle driver when the MOIS has detected a potential frontal collision with a VRU in close-proximity to the front of the vehicle.

2.8. 'Vehicle master control switch' means the device by which the vehicle's on-board electronics system is brought, from being switched off, as in the case where a vehicle is parked without the driver being present, to a normal operation mode.

2.9. 'Initialisation' means the process of setting-up the operation of the MOIS after the vehicle master control switch is activated until it is fully functional.

2.10. 'Common space' means an area on which two or more information functions (e.g. symbols) may be displayed, but not simultaneously.

2.11. 'Ocular reference point' means the middle point between two points 65 mm apart and 635 mm vertically above the reference point which is specified in Annex 1 of ECE/TRANS/WP.29/78/Rev.6 [1] on the driver's seat. The straight line joining the two points runs perpendicular to the vertical longitudinal median plane of the vehicle. The centre of the segment joining the two points is in a vertical longitudinal plane which shall pass through the centre of the driver's designated seating position, as specified by the vehicle manufacturer.

[1] See Annex 1 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 – www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

2.12. 'Vehicle front' means the plane perpendicular to the median longitudinal plane of the vehicle and touching its foremost point, disregarding the projection of devices for indirect vision and any part of the vehicle greater than 2,0 m above the ground.

2.13. 'Nearside' means the right side of the vehicle for right-hand traffic.

2.14. 'Nearside vehicle plane' means the plane parallel to the median longitudinal plane of the vehicle and touching its most outboard point in the nearside direction forward of the driver ocular reference point, disregarding the projection of devices for indirect vision and any part of the subject vehicle higher than 2,0 m above the ground.

2.15. 'Offside' means the left side of the vehicle for right-hand traffic

2.16. 'Offside vehicle plane' means the plane parallel to the median longitudinal plane of the vehicle and touching its most outboard point in the offside direction forward of the driver ocular reference point, disregarding the projection of devices for indirect vision and any part of the subject vehicle higher than 2,0 m above the ground.

2.17. 'Vehicle width' means the distance between the nearside and offside vehicle planes.

2.18. 'Vehicle trajectory' means the connection of all positions within the vehicle width where the vehicle front has been or will be during the test runs.

2.19. 'Soft target' means a target that will suffer minimum damage and cause minimum damage to the subject vehicle in the event of a collision.

2.20. 'Pedestrian test target' means an adult or child sized pedestrian simulated by a soft target device specified according to ISO 19206-2:2018.

2.21. 'Cyclist test target' means an adult sized cyclist and bicycle simulated by a soft target and bicycle device specified according to ISO (CD) 19206-4.

2.22. 'Blind spot boundary' means the line, described as defined in Annex 3, that joins all points located at the boundaries of the visible areas forward of the vehicle front and in close-proximity to the subject vehicle.

2.23. 'Collision point' means the position where the trajectory of any point of the vehicle front would intersect with any VRU soft target reference point should a moving off or low-speed manoeuvre be performed by the vehicle.

2.24. 'Forward separation distance' means the distance in the forward direction between the vehicle front and the nearest point of the soft target.

2.25. 'Maximum forward separation plane' means the plane perpendicular to the longitudinal plane of the vehicle representing the greatest forward separation distance that the MOIS is required to detect the presence of a VRU. The distance of this plane from the vehicle front shall be selected as either 3,7 m or the most forward point of the blind spot boundary at the manufacturer's choosing, and shall be no less than 1,0 m.

2.26. 'Minimum forward separation plane' means the plane perpendicular to the longitudinal plane of the vehicle representing the shortest forward separation distance that the MOIS is required to detect the presence of a VRU. The distance of this plane from the vehicle front shall be 0,8 m.

2.27. 'Nearside separation plane' means the plane parallel to the longitudinal plane of the vehicle and located 0,5 m outboard from the nearside vehicle plane.

2.28. 'Offside separation plane' means the plane parallel to the longitudinal plane of the vehicle and located 0,5 m outboard from the offside vehicle plane.

2.29. 'Forward vehicle mode' means the vehicle mode when the powertrain moves the vehicle forward, on release of the brake system or by the application of pressure to the accelerator pedal (or activation of an equivalent control).

2.30. 'Potential moving off manoeuvre' means the subject vehicle being stationary, the vehicle master control switch activated, the vehicle in a normal operation mode and with the forward vehicle mode or a forward gear engaged/selected.

2.31. 'Low-speed manoeuvre' means the subject vehicle being in a normal operation mode, moving forward in a straight line at speeds of below 10 km/h.

2.32. 'Last Point of Information (LPI)' means the point at which the information signal shall have been given.

3. APPLICATION FOR APPROVAL

3.1. The application for approval of a vehicle type with regard to the Moving Off Information Systems (MOIS) shall be submitted by the vehicle manufacturer or by their authorized representative.

3.2. It shall be accompanied by the documents mentioned below in triplicate and include the following particular:

3.2.1. A description of the vehicle type with regard to the items mentioned in paragraph 5., together with dimensional drawings and the documentation as referred to in paragraph 6.1. The numbers and/or symbols identifying the vehicle type shall be specified.

3.3. A vehicle representative of the vehicle type to be approved shall be submitted to the Technical Service conducting the approval tests.

4. APPROVAL

4.1. If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of paragraph 5. below, approval of that vehicle type shall be granted.

4.2. The conformity of the requirements in paragraph 5. shall be verified with the test procedure as defined in paragraph 6., however its operation shall not be limited to these specific test conditions.

4.3. An approval number shall be assigned to each vehicle type approved; its first two digits (00 for this Regulation in its initial form) shall indicate the series of amendments incorporating the most recent major technical amendments made to this Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to the same vehicle type equipped with another type of MOIS, or to another vehicle type.

4.4. Notice of approval or of refusal or withdrawal of approval pursuant to this Regulation shall be communicated to the Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 1 and photographs and/or plans supplied by the applicant being in a format not exceeding A4 (210 × 297 mm), or folded to that format, and on an appropriate scale.

4.5. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation, an international approval mark conforming to the model described in Annex 2, consisting of either:

4.5.1. A circle surrounding the letter 'E' followed by:

(a) the distinguishing number of the country which has granted approval ([2]); and

(b) the number of this Regulation, followed by the letter 'R', a dash and the approval number to the right of the circle prescribed in this paragraph;

or

4.5.2. An oval surrounding the letters 'UI' followed by the Unique Identifier.

4.6. If the vehicle conforms to a vehicle type approved under one or more other UN Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.5. above need not be repeated. In such a case, the UN Regulation and approval numbers and the additional symbols shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.5. above.

([2]) The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 – www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

4.7. The approval mark shall be clearly legible and be indelible.

4.8. The approval mark shall be placed close to or on the vehicle data plate.

5. SPECIFICATIONS

5.1. General requirements

5.1.1. Any vehicle fitted with a MOIS complying with the definition of paragraph 2.1. above shall meet the requirements contained in paragraphs 5.2. to 5.8. of this Regulation.

5.1.2. The effectiveness of the MOIS shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with the technical requirements and transitional provisions of UN Regulation No 10, 05 series of amendments or any later series of amendments.

5.2. Performance requirements

5.2.1. The MOIS shall at least operate during all potential moving off manoeuvres and low-speed manoeuvres, for ambient light conditions above 15 Lux with or without passing beam headlamps activated.

5.2.2. The MOIS shall inform the driver about VRUs in close-proximity to the vehicle front that might be endangered during a potential moving off manoeuvre or low-speed manoeuvre. This information shall be provided to the driver so that the vehicle may be prevented by the driver from interacting with the trajectory of the VRU.

5.2.2.1. The information signal shall be provided at least for as long as the conditions specified in paragraphs 5.2.2.2. and 5.2.2.3. are fulfilled.

5.2.2.2. Potential moving-off manoeuvre

5.2.2.2.1. When performing a potential moving-off manoeuvre, the MOIS shall provide an information signal for VRUs moving at speeds of between 3 km/h and 5 km/h, when travelling from the nearside and offside of the vehicle in a direction perpendicular to the vehicle median longitudinal plane and located within an area bounded by the maximum and minimum forward separation planes and the nearside and offside separation planes.

5.2.2.3. Low-speed manoeuvre

5.2.2.3.1. When performing a low-speed manoeuvre, the MOIS shall provide an information signal for adult and child cyclists that are stationary or moving forward in a direction parallel to the vehicle median longitudinal plane at speeds of between 0 km/h and 10 km/h and located within an area bounded by the nearside and offside vehicle planes and the maximum and minimum forward separation planes.

5.2.2.3.2. When a vehicle performing a low-speed manoeuvre has already detected an adult or child cyclist and provided an information signal in accordance with 5.2.2.3.1., the MOIS shall maintain the information signal even if the vehicle comes to a standstill. The information signal shall be maintained for as long as the cyclist remains within an area bounded by the nearside and offside vehicle planes and the maximum and minimum forward separation planes.

5.2.2.3.3. When performing a turning manoeuvre, the MOIS detection strategy may be adjusted. It is not required to adjust the sensors to the steering angle. The detection adjustment strategy shall be explained in the information referred to in paragraph 6.1. The Technical Service shall verify the operation of the system according to the strategy.

5.2.2.4. The information signal shall meet the requirements of paragraph 5.6.

5.2.3. The manufacturer shall demonstrate, to the satisfaction of the Technical Service and Type Approval Authority, through documentation, simulation or other means, that the MOIS is performing as specified for smaller cyclists and bicycles, similar in size to a child cyclist.

5.2.4. The manufacturer shall demonstrate, to the satisfaction of the Technical Service and Type Approval Authority, through documentation, simulation or other means, that the number of false reactions due to the detection of VRUs and static objects (such as cones, traffic signs, hedges and parked cars) located outside of the boundaries defined in 5.2.2.2 and 5.2.2.3 for the relevant vehicle manoeuvres are minimised.

5.3. Automatic Deactivation

5.3.1. The MOIS shall automatically deactivate if it malfunctions or cannot operate properly due to its sensor devices becoming contaminated by ice, snow, mud, dirt or similar material. The MOIS may also automatically deactivate due to ambient light conditions below that specified in paragraph 5.2.1.

5.3.2. Automatic deactivation shall be indicated by the failure warning signal specified in paragraph 5.8.

5.3.3. The MOIS shall automatically reactivate when the normal function of the sensors is verified. This shall be tested in accordance with the provisions of paragraphs 6.8 (failure detection test) and 6.9. (automatic deactivation test).

5.4. Manual deactivation

5.4.1. It may be possible to manually deactivate the MOIS.

5.4.2. Manual deactivation shall be through a sequence of intentional actions to be carried out by the driver, for example by requiring a single input exceeding a certain threshold of time or a double press, or two separate but simultaneous inputs.

5.4.3. It shall not be possible to manually deactivate any other system at the same time as the MOIS or through the same sequence of actions.

5.4.4. When manually deactivated, it shall be possible for the driver to easily manually reactivate the MOIS.

5.4.5. When manually deactivated, the MOIS shall automatically reactivate when the vehicle master control switch is activated.

5.5. System initialisation

5.5.1. If the MOIS has not been calibrated after a cumulative driving time of 15 seconds above a speed of 0 km/h (including stationary phases), information of this status shall be indicated to the driver. This information shall exist until the system has been successfully calibrated.

5.6. Information signal

5.6.1. The MOIS information signal referred to in paragraph 5.2.2. above shall be an optical information signal that is noticeable and easily verifiable by the driver from the driver's seat.

5.6.2. This information signal shall be visible by daylight and at night.

5.7. Collision warning signal

5.7.1. The MOIS shall warn the driver when the risk of a collision is imminent by providing the collision warning signal.

5.7.2. The collision warning signal shall be provided by the means of a combination of at least two modes selected from an optical signal, acoustic signal or haptic signal.

Where the collision warning signal is provided by using an optical mode, this shall be a signal differing in activation strategy from the information signal specified in paragraphs 5.2.2. and 5.6.

5.7.3. The collision warning signal shall be easily understandable for the driver to relate the warning signal to the potential collision. In case the warning signal is an optical signal this signal shall also be visible by daylight and at night.

5.7.4. The collision warning signal shall be activated according to the manufacturer strategy. The warning strategy shall be explained in the information referred to in paragraph 6.1.

The Technical Service shall verify the operation of the system according to the strategy.

5.7.5. The collision warning signal may be deactivated manually. In the case of a manual deactivation, it shall be reactivated on each activation of the vehicle master control switch.

5.8. Failure warning signals

5.8.1. The failure warning signal referred to in paragraph 5.3.2. above shall be a optical signal and shall be other than or clearly distinguishable from the information signal. The failure warning signal shall be visible by daylight and night and shall be easily verifiable by the driver from the driver's seat.

5.8.2. The failure warning signal shall remain active as long as the MOIS is unavailable.

5.8.3. The MOIS failure warning signal shall be activated with the activation of the vehicle master control switch. This requirement does not apply to collision warning signals shown in a common space to the failure warning signal.

5.9. Provisions for Periodic Technical Inspection

5.9.1. At a Periodic Technical Inspection, it shall be possible to confirm the correct operational status of the MOIS by a visible observation of the failure warning signal status.

In case of the failure warning signal being in a common space, the common space must be observed to be functional prior to the failure warning signal status check.

6. TEST PROCEDURE

6.1. The manufacturer shall provide a documentation package which gives access to the basic design of the system and, if applicable, the means by which it is linked to other vehicle systems. The function of the system including its sensing and warning strategy shall be explained and the documentation shall describe how the operational status of the system is checked, whether there is an influence on other vehicle systems, and the method(s) used in establishing the situations which will result in a failure warning signal being displayed. The documentation package shall give sufficient information for the Type Approval Authority to identify the vehicle type and to aid decision-making on the selection of worst-case conditions.

6.2. Test conditions

6.2.1. The test shall be performed on a flat, dry asphalt or a concrete surface.

6.2.2. The ambient temperature shall be between 0 °C and 45 °C.

6.2.3. The test shall be performed under visibility conditions that allow the target to be observed throughout the test and that allows safe driving at the required test speeds.

6.2.4. Natural ambient illumination shall be homogeneous in the test area and in excess of 1 000 lux. It should be ensured that testing is not performed whilst driving towards, or away from, the sun at a low angle.

6.3. Vehicle conditions

6.3.1. Test weight

The vehicle shall be tested in a condition of load to be agreed between the manufacturer and the Technical Service, with the distribution of mass among the axles stated by the manufacturer. No alteration shall be made once the test procedure has begun. The manufacturer shall demonstrate through the use of documentation that the system works at all conditions of load.

6.3.2. In the case where the MOIS is equipped with a user-adjustable information timing, the tests as specified in paragraphs 6.5., 6.6. and 6.7. below shall be performed for each test case with the information threshold set at the settings that generate the information signal closest to the collision point, i.e. worst-case setting. No alteration shall be made once the test procedure has begun.

6.3.3. Pre-Test Conditioning

6.3.3.1. If requested by the vehicle manufacturer, the subject vehicle may be driven a maximum of 100 km on a mixture of urban and rural roads with other traffic and roadside furniture to initialise the sensor system.

6.4. Verification of signals test

6.4.1. With the vehicle stationary check that the optical failure warning signals comply with the requirements of paragraph 5.6. above.

6.5. Static Crossing Tests

6.5.1. The subject vehicle shall remain in a potential moving off manoeuvre with the MOIS active and the test area marked out as shown in Figure 1 of Appendix 1. The relevant test target (*T*) shall be manoeuvred such that it moves on a trajectory perpendicular to the longitudinal median plane of the subject vehicle at the test case distance (d_{TC}) away from the vehicle front and from the relevant crossing direction (*c*) (Table 1 of Appendix 1). The pedestrian test target reference point shall be the H-point (as defined by ISO 19206-2:2018) nearest the subject vehicle. The cyclist test target reference point shall be at the intersection of a plane perpendicular to the test target centreline located at the most forward point of the bicycle and a plane parallel to the test target centreline located at the test target H-point nearest the subject vehicle (as defined by ISO (CD) 19206-4).

6.5.2. The test target shall be accelerated such that it reaches the test target speed (*v*) at a distance of no closer than 15 m from the plane relating to the subject vehicle side nearest the crossing direction. The test case speed shall be maintained until the plane relating to the opposite vehicle side is cleared by a distance of no less than 5 m.

6.5.3. In accordance with paragraph 5.2.2.2., the Technical Service shall verify the activation of the MOIS information signal before the test target (*T*) reaches a distance corresponding to the last point of information (d_{LPI}) in Table 1 of Appendix 1, and that the MOIS information signal remains on until the test target has at least crossed the separation plane relating to the vehicle side opposite to the crossing direction. The collision warning signal shall not be activated.

6.5.4. The Technical Service shall repeat paragraphs 6.5.1. to 6.5.3. for two test cases from Table 1 of Appendix 1 to this Regulation and for one additional test case selected from the combination of a soft target and the range of VRU speeds, VRU travel directions and detection boundaries defined in paragraph 5.2.2.2.

Where deemed justified, the Technical Service may also select additional test cases within the range of the soft targets, VRU speeds, travel directions and detection boundaries defined in paragraph 5.2.2.2.

6.6. Longitudinal Stopping for Moving Off Cyclist Tests

6.6.1. The cyclist test target (*T*) shall be located within the test area marked out as shown in Figure 2 in Appendix 1. The cyclist test target shall be positioned at the relevant test target starting point (p_{cyc}) in Table 2 of Appendix 1 and face in the direction of travel and parallel to the longitudinal median plane of the subject vehicle. The cyclist test target reference point shall be at the centre of the bottom bracket of the bicycle and on the centreline of the bicycle. Should there be less than 100 mm clearance between the vehicle front and the rear most point of the cyclist test target, then p_{cyc} may be moved an additional clearance distance (d_{clear}) away from the vehicle front, in a direction parallel to the longitudinal plane, such that there is 100 + 10/-0 mm clearance between the vehicle front and the rear most point of the cyclist test target.

6.6.2. The subject vehicle shall be accelerated in a straight line to a constant speed of 10 + 0/-0,5 km/h, before entering the stopping corridor. The subject vehicle shall maintain this constant speed until the vehicle front passes the braking plane (p_{brake}) shown in Figure 2 of Appendix 1, before braking to a stop such that the vehicle front is positioned at the stopping plane (p_{stop}). The subject vehicle shall be considered to have stopped when it has come to a rest and the vehicle is either no longer in a forward vehicle mode or forward gear.

6.6.3. After a delay of no less than 10 seconds from the point at which the subject vehicle is considered to have stopped, the test target shall then be accelerated in a straight line on a trajectory parallel to the longitudinal median plane of the vehicle to a speed of 10 + 0/-0,5 km/h within a distance of 5 m, before being brought to a stop. While accelerating, the lateral tolerance of the test target motion shall not exceed ± 0,05 m.

6.6.4. In accordance with paragraph 5.2.2.3., the Technical Service shall verify the activation of the MOIS information signal before the subject vehicle reaches a distance from the stopping plane (p_{stop}) corresponding to the last point of information (d_{LPI}) in Table 2 of Appendix 1, and the MOIS information signal remains on until the test target at least crosses a distance from the vehicle front relating to the maximum forward separation distance (d_{FSP}) in Figure 2 of Appendix 1. The collision warning signal may be activated, as appropriate.

6.6.5. The Technical Service shall repeat paragraphs 6.6.1. to 6.6.4. for two test cases shown in Table 2 of Appendix 1 to this Regulation and for one additional test case by selecting a cyclist test target and cyclist starting point from within the detection boundaries defined in paragraph 5.2.2.3.

Where deemed justified, the Technical Service may also select additional test cases within the range of the cyclist test targets and the detection boundaries defined in paragraph 5.2.2.3.

6.7. Longitudinal Moving Off with Cyclist Tests

6.7.1. The cyclist test target (*T*) shall be located within the test area marked out as shown in Figure 2 of Appendix 1. The cyclist test target shall be positioned at the relevant test target starting point (p_{cyc}) in Table 2 of Appendix 1 and face in the direction of travel and parallel to the longitudinal median plane of the subject vehicle. The cyclist test target reference point shall be at the centre of the bottom bracket of the bicycle and on the centreline of the bicycle. Should there be less than 100 mm clearance between the vehicle front and the rear most point of the cyclist test target, then p_{cyc} may be moved an additional clearance distance (d_{clear}) away from the vehicle front, in a direction parallel to the longitudinal plane, such that there is 100 + 10/-0 mm clearance between the vehicle front and the rear most point of the cyclist test target.

6.7.2. The subject vehicle shall be accelerated in a straight line to a constant speed of 10 + 0/-0,5 km/h, before entering the stopping corridor. The subject vehicle shall maintain a constant speed until the vehicle front passes the braking plane (p_{brake}) shown in Figure 2 of Appendix 1, before braking to a stop such that the vehicle front is positioned at the stopping plane (p_{stop}). The subject vehicle shall be considered to have stopped when it has come to a rest and the vehicle is either no longer in a forward vehicle mode or forward gear.

6.7.3. After a delay of no less than 10 seconds from the point at which the subject vehicle is considered to have stopped, the test target and subject vehicle shall be accelerated at the same time and in a straight line, on a trajectory parallel to the longitudinal median plane of the subject vehicle, to a constant speed of 10 + 0/-0,5 km/h in a distance of no greater than 5 m. The subject vehicle and test target shall maintain this constant speed until a total travel distance of no less than 15 m from the stopping point is traversed by the subject vehicle. The lateral tolerance of the subject vehicle shall not exceed ± 0,05 m, whilst the lateral tolerance of the test target motion shall not exceed ± 0,05 m. The forward separation distance between the vehicle front and test target while moving shall be maintained to be within the boundaries of the maximum and minimum forward separation planes.

6.7.4. In accordance with paragraph 5.2.2.3., the Technical Service shall verify the activation of the MOIS information signal before the subject vehicle reaches a distance from the stopping plane (p_{stop}) corresponding to the last point of information (d_{LPI}) in Table 2 of Appendix 1, and that the MOIS information signal remains on until the subject vehicle passes a distance of 15 m from the stopping point. The collision warning signal may be activated, as appropriate.

6.7.5. The Technical Service shall repeat paragraphs 6.7.1. to 6.7.4. for two test cases shown in Table 2 of Appendix 1 to this Regulation and for one additional test case by selecting a cyclist test target and cyclist starting point from within the detection boundaries defined in paragraph 5.2.2.3.

Where deemed justified, the Technical Service may also select additional test cases within the range of the cyclist test targets and the detection boundaries defined in paragraph 5.2.2.3.

6.8. Failure detection test

6.8.1. Simulate a MOIS failure, for example by disconnecting the power source to any MOIS component or disconnecting any electrical connection between the MOIS components. The electrical connections for the failure warning signal of paragraph 5.8. above shall not be disconnected when simulating a MOIS failure.

6.8.2. The failure warning signal specified in paragraph 5.8. shall be activated and remain activated while the vehicle is being driven and shall be reactivated upon each activation of the vehicle master control switch, as long as the simulated failure exists.

6.9. Automatic deactivation test

6.9.1. With the MOIS system active, contaminate any of the MOIS sensing devices completely with a substance comparable to snow, ice or mud (e.g. based on water). The MOIS shall automatically deactivate, indicating this condition as specified in paragraph 5.8.

6.9.2. Remove any contamination from the MOIS sensing devices completely and perform a reactivation of the vehicle master control switch. The MOIS shall automatically reactivate after a driving time not exceeding 60 seconds.

7. MODIFICATION OF VEHICLE TYPE AND EXTENSION OF TYPE APPROVAL

7.1. Every modification of the vehicle type as defined in paragraph 2.3. of this Regulation shall be notified to the Type Approval Authority which approved the vehicle type. The Type Approval Authority may then either:

7.1.1. Consider that the modifications made do not have an adverse effect on the conditions of the granting of the approval and grant an extension of approval;

7.1.2. Consider that the modifications made affect the conditions of the granting of the approval and require further tests or additional checks before granting an extension of approval.

7.2. Confirmation or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 4.4. above to the Contracting Parties to the Agreement applying this Regulation.

7.3. The Type Approval Authority shall inform the other Contracting Parties of the extension by means of the communication form which appears in Annex 1 to this Regulation. It shall assign a serial number to each extension, to be known as the extension number.

8. CONFORMITY OF PRODUCTION

8.1. Procedures for the conformity of production shall conform to the general provisions defined in Article 2 and Schedule 1 to the 1958 Agreement (E/ECE/TRANS/505/Rev.3) and meet the following requirements:

8.2. A vehicle approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of paragraph 5. above;

8.3. The Type Approval Authority which has granted the approval may at any time verify the conformity of control methods applicable to each production unit. The normal frequency of such inspections shall be once every two years.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

9.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8. above are not complied with.

9.2. If a Contracting Party withdraws an approval it had previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation by sending them a communication form conforming to the model in Annex 1 to this Regulation.

10. PRODUCTION DEFINITIVELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of vehicle approved in accordance with this Regulation, they shall so inform the Type Approval Authority which granted the approval, which in turn shall forthwith inform the other Contracting Parties to the Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

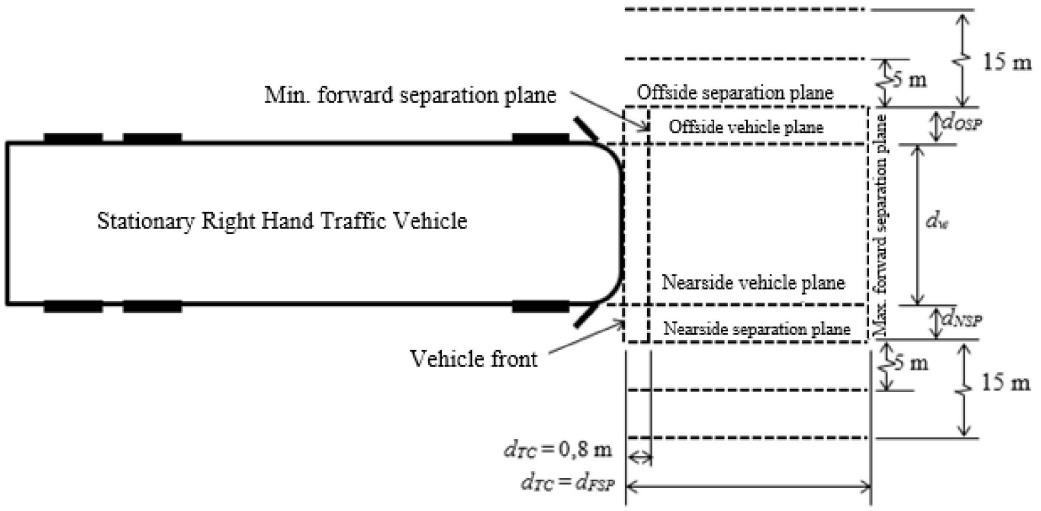
11. NAMES AND ADDRESSES OF THE TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF TYPE APPROVAL AUTHORITIES

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval are to be sent.

Appendix 1

Figure 1

Set Up for Static Crossing Tests



Where the following definitions apply:

d_w vehicle width

$d_{25\ \%}$ a distance relating to 25 % of the vehicle width

d_{NSP} the distance from the nearside vehicle plane to the nearside separation plane, defined as 0,5 m

d_{OSP} the distance from the offside vehicle plane to the offside separation plane, defined as 0,5 m

d_{TC} the forward separation distance for each test case

d_{FSP} the distance from the vehicle front to the maximum forward separation plane

d_{LPI} the distance relating to the last point of information (LPI)

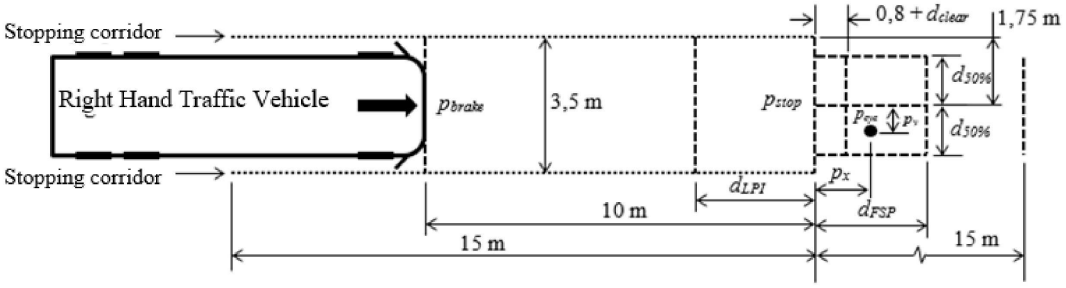
Table 1

Test Cases for Static Crossing Tests

Test Case	*Soft Target (T)*	*Test Case Distance (d_{TC})/m*	*Crossing Direction (c)*	*Soft Target Speed (v)/km/h*	*Distance to Last Point of Information (d_{LPI})/m*
1	Child Pedestrian	0,8	Nearside	3	d_{NSP}
2	Adult Pedestrian	d_{FSP}	Nearside	3	d_{NSP}
3	Adult Cyclist	0,8	Offside	3	d_{OSP}
4	Adult Cyclist	d_{FSP}	Nearside	5	d_{NSP}
5	Adult Pedestrian	0,8	Offside	5	d_{OSP}
6	Child Pedestrian	d_{FSP}	Offside	5	d_{OSP}

Figure 2

Set Up for Longitudinal Cyclist Tests



Where the following definitions apply:

$d_{50\ \%}$ the distance relating to 50 % of the vehicle width

p_{brake} the vehicle braking plane

p_{stop} the vehicle stopping plane

d_{FSP} the distance from the vehicle stopping plane to the maximum forward separation plane

d_{clear} the additional clearance distance that the cyclist test target is moved by to ensure at least 100 mm clearance between the vehicle front and the rear most point of the cyclist test target

p_{cyc} the cyclist test target starting point, taken from the cyclist test target reference point

p_x the distance between the stopping plane and cyclist test target starting point

p_y the distance between the vehicle longitudinal median plane and cyclist test target starting point, with the nearside of the vehicle being the positive direction

d_{LPI} the distance between the last point of information (LPI) line and the vehicle stopping plane

Table 2

Test Cases for Longitudinal Cyclist Tests

Test Case	*Test Target (T)*	*Distance to Forward Cyclist Start Point (p_x)/m*	*Distance to Lateral Cyclist Start Point (p_y)/m*	*Distance to Last Point of Information (d_{LPI})/m*
1	Adult Cyclist	$0,8 + d_{clear}$	$+d_{50\ \%}$	$d_{FSP} - 0,8 - d_{clear}$
2	Adult Cyclist	$0,8 + d_{clear}$	0,0	$d_{FSP} - 0,8 - d_{clear}$
3	Adult Cyclist	$0,8 + d_{clear}$	$-d_{50\ \%}$	$d_{FSP} - 0,8 - d_{clear}$
4	Adult Cyclist	$d_{FSP} - 0,1$	$+d_{50\ \%}$	0,1
5	Adult Cyclist	$d_{FSP} - 0,1$	0,0	0,1
6	Adult Cyclist	$d_{FSP} - 0,1$	$-d_{50\ \%}$	0,1

ANNEX 1

Communication

(Maximum format: A4 (210 × 297 mm)

issued by: Name of administration:
.....
.....
.....

Concerning (2): Approval granted
Approval extended
Approval withdrawn
Approval refused
Production definitively discontinued

of a type of vehicle with regard to the Moving Off Information System (MOIS) pursuant to UN Regulation No 159

Approval No: .....

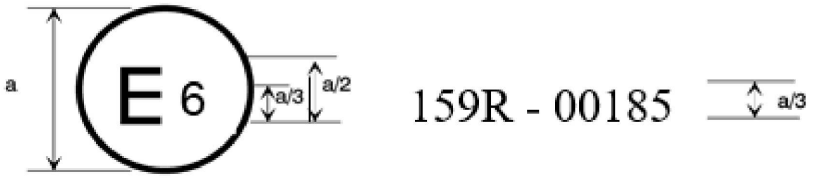
1. Trademark: .....
2. Type and trade name(s):.....
3. Name and address of manufacturer: .....
4. If applicable, name and address of manufacturer's representative:.....
5. Brief description of vehicle:.....
6. Date of submission of vehicle for approval: .....
7. Technical Service performing the approval tests: .....
8. Date of report issued by that Service:.....
9. Number of report issued by that Service:.....
10. Reason(s) for extension (if applicable):.....
11. Approval with regard to the MOIS is granted/refused[2]:.....
12. Place: .....
13. Date:.....
14. Signature:.....
15. Annexed to this communication are the following documents, bearing the approval number indicated above:.....
16. Any remarks: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in this Regulation).
(2) Strike out what does not apply.

ANNEX 2

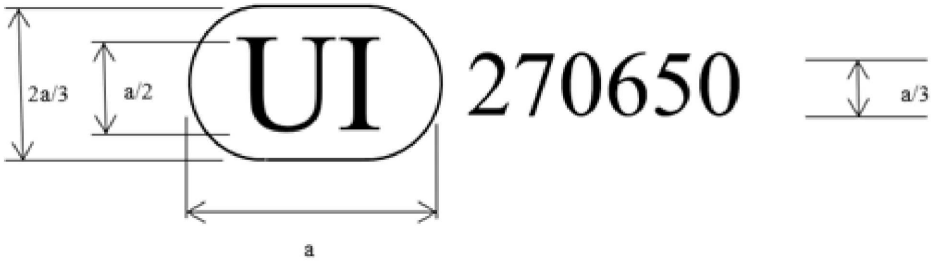
Arrangements of approval marks

(see paragraphs 4.5. to 4.5.2. of this Regulation)



a = 8 mm min

The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in Belgium (E 6) with regard to the Moving Off Information System (MOIS) pursuant to UN Regulation No 159. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No 159 in its original form.



a ≥ 8 mm

The above Unique Identifier shows that the type concerned has been approved and that the relevant information on that type-approval can be accessed on the UN secure internet database by using 270650 as Unique Identifier. Any leading zeroes in the Unique Identifier may be omitted in the approval marking.

ANNEX 3

Test method for determining blind spot boundary

1. BLIND SPOT BOUNDARY

The blind spot boundary defined in paragraph 2.22. of this Regulation can be determined through the approach described in this annex.

2. TEST METHODS

2.1. The test object shall be a circular cylinder that is 50 ± 2 mm in external diameter, with a 10 ± 2 mm high ring, contrasting in colour from the rest of the test object, located such that its lowest edge is 900 ± 2 mm from the base of the test object.

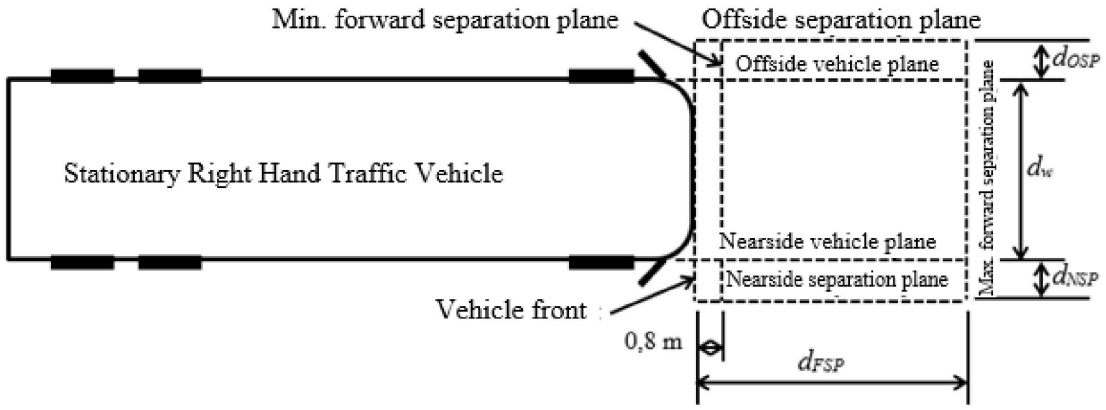
2.2. The test conditions shall be as defined in paragraphs 6.2. of this Regulation

2.3. The vehicle conditions shall be as defined in paragraphs 6.3. of this Regulation

2.4. The test area shall be marked out as shown in Figure 1 of this annex.

Figure 1

Blind spot boundary test area



Where the following definitions apply:

d_w vehicle width

d_{NSP} the distance from the nearside vehicle plane to the nearside separation plane, defined as 0,5 m

d_{OSP} the distance from the offside vehicle plane to the offside separation plane, defined as 0,5 m

d_{FSP} the distance from the vehicle front to the maximum forward separation plane

2.5. The ocular reference point shall be as defined in paragraph 2.11. of this Regulation.

2.6. Test procedure

2.6.1. Locate a 35 mm or larger format still camera, video camera, or digital equivalent such that the centre of the camera image plane is located at the ocular reference point.

The camera shall be capable of viewing the test object in all potential test positions. Should the camera require repositioning to view all potential test positions, it shall be verified that the centre of the camera image plane for all possible camera positions is located at the ocular reference point.

2.6.2. The visibility of the entire ring of the test object from the ocular reference point shall be recorded for test object positions located within the area bounded by the minimum and maximum forward separation planes and the nearside and offside separation planes.

2.6.3. Starting from the minimum forward separation plane, move the test object away from the vehicle front on an assessment plane parallel to the median longitudinal plane of the vehicle until the maximum forward separation plane is met.

2.6.4. The visibility of the test object ring shall be recorded at intervals of no greater than 150 mm in distance along the assessment plane.

2.6.5. This process shall be repeated for assessment planes between the nearside and offside separation planes, with distances of no greater than 150 mm between each assessment plane.

2.6.6. Approaches other than the above methods, such as CAD based or LASER based procedures, may be considered as equivalent by the Technical Service, should documentary evidence be provided to verify that the requirements of the test procedures described in this annex have been met.

3. BLIND SPOT BOUNDARY DEFINITION

3.1. The blind spot area shall be determined by all test object positions where the entire ring of the test object is not visible from the ocular reference point.

3.2. The blind spot boundary shall be determined at the first position outside of the blind spot area where the entire ring of the test object is visible from the ocular reference point.

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