

Type-approval of integral shield systems in UN Regulation 129

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GRSP-57 informed that integral shields “not authorised”



Shortcomings phase 1

- Flexibility for infant carrier systems
 - Temporary fix to allow for seatbelt routing
- Certain measures still have more potential for improvement
 - Frontal impact pulse revision (update 1970's car fleet)
- Consideration of Shields as ‘Integral ECRS’
 - Not authorised in phase 1

Integral and non-integral shield systems



Integral shield system



Non-integral shield system



Type-approval of integral shields in UN Regulation 129



- Does UN Regulation 129 allow the type-approval of integral shields?
- Are any provisions in UN Regulation 129 incompatible with integral shields?

The Scope defines what is covered by the regulation....



- 1 This Regulation applies (in its Phase 1) to Integral Universal ISOFIX Child Restraint Systems (i-Size) and Integral “Specific vehicle ISOFIX” Child Restraint Systems for child occupants of power driven vehicles.

A product that is “Integral”, “Universal ISOFIX” and a “Child Restraint System” must be within the scope of UN Regulation 129

Shield systems meet all elements of the definition of a CRS

2.1 “*Child Restraint System*” (CRS) means a device capable of accommodating a child occupant in a sitting or supine position. It is so designed to diminish the risk of injury to the wearer, in the event of a collision or of abrupt deceleration of the vehicle, by limiting the mobility of the child’s body.

A shield system can be a “Child Restraint System” in UN Regulation 129

Shields are explicitly included in the definition of integral CRS



2.4 "*Integral*" is a class of Child Restraint System, meaning that the child is restrained only by components which comprise the Child Restraint System (e.g. strap harness, **shield**, etc.), and not by means connected directly to the vehicle (e.g.; seat belt).

Shields are therefore explicitly included in all subsequent references to integral CRS in R129

Shield systems meet all elements of the definition of ISOFIX Universal



2.6 “*ISOFIX Universal*” is an ISOFIX comprising either a top-tether or a support-leg, to limit the pitch rotation of the Child Restraint System, attached to, or supported by, the corresponding vehicle.

**A shield system can be a “ISOFIX Universal” in
UN Regulation 129**

Coming back to the Scope...



- 1 This Regulation applies (in its Phase 1) to Integral Universal ISOFIX Child Restraint Systems (i-Size) and Integral “Specific vehicle ISOFIX” Child Restraint Systems for child occupants of power driven vehicles.

Integral ✓
Universal ISOFIX ✓
Child Restraint System ✓

Type-approval of integral shields is authorised

Provisions are made for shields within the requirements for integral CRS



6.6.2 Energy absorption

6.6.2.1 For all devices with backrests, the areas defined in Annex 14 to this Regulation, when tested according to Annex 13, shall give a peak acceleration of less than 60 g. This requirement applies also to areas of **impact shields** which are in the head strike area.

Type-approval must be authorised if specific provisions are made within a regulation

These provisions extend to individual components of the CRS – e.g. buckles



6.7.1.5 Opening of the buckle shall enable the child to be removed independently of the "chair", "chair support" or "**impact shield**", if fitted, and if the device includes a crotch strap the crotch strap shall be released by operation of the same buckle

All tests on individual components are applicable for shield systems too (buckles, adjusters, straps, etc.)

Component requirements must be met if the CRS has that component – except:



- 6.7.1.8.2 Depending of [*sic*] the mass limit declared by the manufacturer, a **harness** buckle shall withstand:
 - 6.7.1.8.2.1. 4 kN, if the mass limit is less or equal to 13 kg
 - 6.7.1.8.2.2. 10 kN, if the mass limit is greater than 13 kg

These requirements are appropriate for any buckle and we propose to delete “harness”

Type-approval of integral shields in UN Regulation 129



- Does UN Regulation 129 allow the type-approval of integral shields?

Yes!

- Are any provisions in UN Regulation 129 incompatible with integral shields?

Internal dimension requirements (Annex 18) are poorly specified for all CRS



When measured under a contact force of 50 N with the device described in Figure 2 of this annex the following tolerances will be applied to the dimensions:

Minimum sitting height:

- From 40 to 87 cm B – 5 per centile
- From 87 cm and up B – 10 per centile

Minimum shoulder breadth: C_{-0}^{+2} cm

Minimum hip breadth: D_{-0}^{+2} cm

Minimum shoulder height (5 per centile): $E1_{-2}^{+0}$ cm

Maximum shoulder height (95 per centile): $E2_{-0}^{+2}$ cm

Procedural amendments are underway within the Technical Services Group – specific procedural steps are needed for shields

Lap strap assemblies cannot subject “weak parts” to “excessive stresses”



6.2.1.5. All restraint devices utilizing a "lap strap" must positively guide the "lap strap" to ensure that the loads transmitted by the "lap strap" are transmitted through the pelvis. The assembly shall not subject weak parts of the child's body (abdomen, crotch, etc.) to excessive stresses.

This requirement is subjective and cannot be meaningfully assessed – we propose it is removed in favour of performance requirements

Adjuster conditioning applies to harnesses only



- 7.2.6. An adjuster mounted directly on the Child Restraint System shall be capable of withstanding repeated operation and shall, before the dynamic test prescribed in paragraph 7.1.3. undergo a test comprising $5,000 \pm 5$ cycles as specified in paragraph 7.2.3.

- 2.39. “*Adjuster mounted directly on a Child Restraint System*” means an adjuster for the **harness belt** which is directly mounted on the Child Restraint System, as opposed to being directly supported by the strap that it is designed to adjust

Conditioning may be relevant for adjusters connected to a strap (and not directly mounted to the CRS)

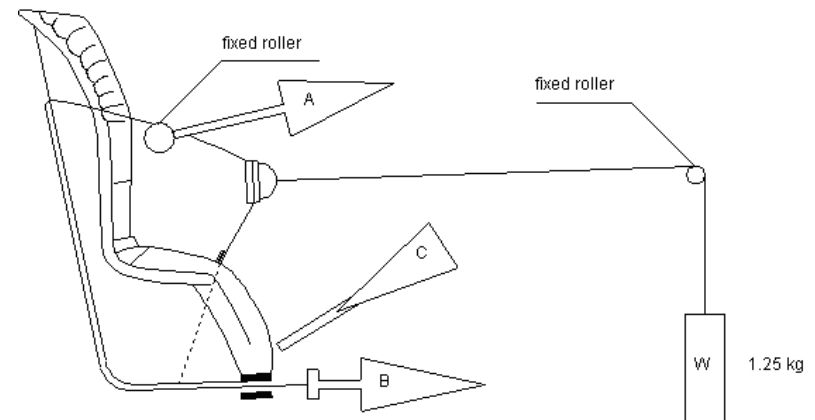
The current test for adjusters is incompatible with shields



7.2.6. Conditioning test for adjusters mounted directly on a child restraint

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Remove the dummy and place the restraint in the conditioning rig shown in Figure 1, Annex 16 [sic].



TRL (at CYBEX's request) has prepared a new procedure for cycling adjusters connected to a strap (and not directly mounted on the CRS)

Type-approval of integral shields in UN Regulation 129



- Does UN Regulation 129 allow the type-approval of integral shields?

Yes!

- Are any provisions in UN Regulation 129 incompatible with integral shields?

Maybe – adjuster conditioning...

