62 Mechanical coupling device or component:

Refer to: R55 01-S3

62.1 Effective date and Scope:

62.1.1 Effective date from 2011/7/1, the mechanical coupling device or component installed on new vehicle variant of categories of N2, N3, O3 and O4, and from 2012/1/1, mechanical coupling device or component on all vehicle variant of categories of N2, N3, O3 and O4 shall comply with this regulation.

62.1.2 The applicants applying for low volume safety type approval or vehicle-by-vehicle low volume safety type approval could exempt from this Regulation.

62.1.3 For the articulated vehicle which comprise motor vehicle and trailer, if the vertical load imposed by a trailer on motor vehicle is not more than 200 N, shall comply with this regulation.

62.2 Definitions

62.2.1 mechanical coupling devices and components: means all those items on the frame, load-bearing parts of the bodywork and the chassis of the motor vehicle and trailer by means of which they are connected together to form the combination of vehicles or the articulated vehicles. Fixed or detachable parts for the attachment or operation of the mechanical coupling device or component are included.

62.2.2 automatic coupling requirement is achieved if reversing the towing vehicle against the trailer is sufficient to engage the coupling completely, to lock it automatically and to indicate proper engagement of the locking devices without any external intervention. In the case of hook type couplings automatic coupling requirement is achieved if opening and closing of the coupling locking device takes place without any external intervention when the drawbar eye is inserted into the hook.

62.2.3 standard mechanical coupling devices and components conform to standard dimensions and characteristic values as given in this Regulation. They are interchangeable within their class, independent of manufacturer.

62.2.4 non-standard mechanical coupling devices and components do not conform in all respects to the standard dimensions and characteristic values given in this Regulation but can be connected to standard coupling devices and components in the relevant class.

62.2.5 non-standard miscellaneous mechanical coupling devices and components do not conform to standard dimensions and characteristic values as given in this Regulation and cannot be connected to standard coupling devices and components. They include, for example, devices which do not correspond with any of the Classes A to L and T listed in paragraph 2.6. such as those intended for special, heavy transport use and miscellaneous devices conforming to existing national standards.

62.2.6 mechanical coupling devices and components are classified according to type as follows:

62.2.6.1 Class C

Drawbar couplings with a 50 mm diameter pin and with a jaw and an automatic closing and locking pin on the towing vehicle for

connecting to the trailer by means of a drawbar eye.

62.2.6.1.1 Class C50-1 to 50-7

Standard 50 mm pin diameter drawbar couplings.

62.2.6.1.2 Class C50-X

Non-standard 50 mm pin diameter drawbar couplings.

62.2.6.2 Class D

Drawbar eyes having a parallel hole suitable for a 50 mm diameter pin and fitted to the drawbar of trailers for connecting to automatic drawbar couplings.

62.2.6.2.1 Class D50-A

Standard 50 mm pin diameter drawbar eyes for welded attachment.

62.2.6.2.2 Class D50-B

Standard 50 mm pin diameter drawbar eyes for threaded attachment.

62.2.6.2.3 Class D50-C and 50-D

Standard 50 mm pin diameter drawbar eyes for bolted attachment.

62.2.6.2.4 Class D50-X

Non-standard 50 mm pin diameter drawbar eyes.

62.2.6.3 Class E

Non-standard drawbars comprising overrun devices and similar items of equipment mounted on the front of the towed vehicle, or to the vehicle chassis, which are suitable for coupling to the towing vehicle by means of drawbar eyes, coupling heads or similar coupling devices. Drawbars may be hinged to move freely in a vertical plane and not support any vertical load or be fixed in a vertical plane so as to support a vertical load (Rigid drawbars). Rigid drawbars can be entirely rigid or be flexibly mounted. Drawbars may comprise more than one component and may be adjustable or cranked. This Regulation applies to drawbars which are separate units, not an integral part of the chassis of the towed vehicle.

62.2.6.4 Class F

Non-standard drawbeams comprising all components and devices between the coupling devices, such as coupling balls and drawbar couplings, and the frame (for example the rear cross member), the load-bearing bodywork or the chassis of the towing vehicle.

62.2.6.5 Class G

Fifth wheel couplings are plate type couplings having an automatic coupling lock and are fitted to the towing vehicle for connecting with a 50 mm diameter fifth wheel coupling pin fitted to a semitrailer.

62.2.6.5.1 Class G50

Standard 50 mm pin diameter fifth wheel couplings.

62.2.6.5.2 Class G50-X

Non-standard 50 mm pin diameter fifth wheel couplings.

62.2.6.6 Class H

Fifth wheel coupling pins, 50 mm diameter, are devices fitted to a semitrailer to connect with the fifth wheel coupling of the towing vehicle.

62.2.6.6.1 Class H50-X

Non-standard 50 mm pin diameter fifth wheel coupling pins.

62.2.6.7 Class J

Non-standard mounting plates comprising all components and devices for attaching fifth wheel couplings to the frame or chassis of the towing vehicle. The mounting plate may have provision for moving horizontally, that is to form a sliding fifth wheel.

62.2.6.8 Class K

Standard, hook type couplings intended for use with appropriate Class L type toroidal drawbar eyes.

62.2.6.9 Class L

Standard toroidal drawbar eyes for use with appropriate Class K hook type couplings.

62.2.6.10 Class S

Devices and components which do not conform to any of the Classes A to L or T above and which are used, for example, for special heavy transport or are devices unique to some countries and covered by existing national standards.

62.2.6.11 Class T

Non-standard, non-automatic dedicated drawbar type couplings which are able to be separated only by the use of tools and are typically used for trailers of car transporters. They shall be approved as a matched pair.

62.2.7 Steering wedges are devices or components mounted on semitrailers which control positive steering of the trailer in conjunction with the fifth wheel coupling.

62.2.8 Remote control systems are devices and components which enable the coupling device to be operated from the side of the vehicle or from the driving cab of the vehicle.

62.2.9 Remote indicators are devices and components which give an indication in the vehicle cab that coupling has been effected and that the locking devices have engaged.

62.2.10 The characteristic values D, Dc, S, V and U are defined or determined as:

62.2.10.1 The D or Dc value is the theoretical reference value for the horizontal forces in the towing vehicle and the trailer and is used as the basis for horizontal loads in the dynamic tests. For mechanical coupling devices and components not designed to support imposed vertical loads, the value is:

$$D = g\frac{T \cdot R}{T + R}\text{kN}$$

For mechanical coupling devices and components for centre axle trailers as defined in 62.2.12, the value is:

$$D_C = g\frac{T \cdot C}{T + C}\text{kN}$$

For fifth wheel couplings of Class G, fifth wheel coupling pins of Class H and mounting plates of Class J, as defined in paragraph 62.2.6, the value is:

$$D = g\frac{0.6 \cdot T \cdot R}{T + R - U}\text{kN}$$

where:
T is the technically permissible maximum mass of the towing vehicle, in t. Where relevant, this includes the vertical load imposed by a centre axle trailer.
R is the technically permissible maximum mass, in t, of a trailer with drawbar free to move in a vertical plane, or of a semitrailer.
C is the mass, in t, transmitted to the ground by the axle or axles of the centre axle trailer, as defined in paragraph 62.2.12, when coupled to the towing vehicle and loaded to the technically permissible maximum mass. For Category O1 and O2 centre axle trailers the technically permissible maximum mass will be that declared by the manufacturer of the towing vehicle.
g is the acceleration due to gravity (assumed to be 9.81 m/s^2)
U is as defined in paragraph 62.2.10.2.
S is as defined in paragraph 62.2.10.3

62.2.10.2 The U value is the vertical mass, in t, imposed on the fifth wheel coupling by the semitrailer of technically permissible maximum mass.

62.2.10.3 The S value is the vertical mass, in kg, imposed on the coupling, under static conditions, by the centre axle trailer, as defined in paragraph 62.2.12, of technically permissible maximum mass.

62.2.10.4 The V value is the theoretical reference value of the amplitude of the vertical force imposed on the coupling by the centre axle trailer of technically permissible maximum mass greater than 3.5 t. The V value is used as the basis for vertical forces in the dynamic tests.

where: $$V = \frac{a \cdot C \cdot X^2}{L^2}$$ (See the Note below)

a is an equivalent vertical acceleration at the coupling depending on the type of suspension system of the rear axle of the towing vehicle. For air suspension (or suspension systems with equivalent damping characteristics)
$a = 1.8\ m/s^2$
For other types of suspension:
$a = 2.4\ m/s^2$
X is the length of the loading area of the trailer, in m (see Figure 1)
L is the distance from the centre of the drawbar eye to the centre of the axle assembly, in m (see Figure 1)

Note: $\frac{X^2}{L^2} \geq 1.0$
(If less than 1.0, the value of 1.0 shall be used)

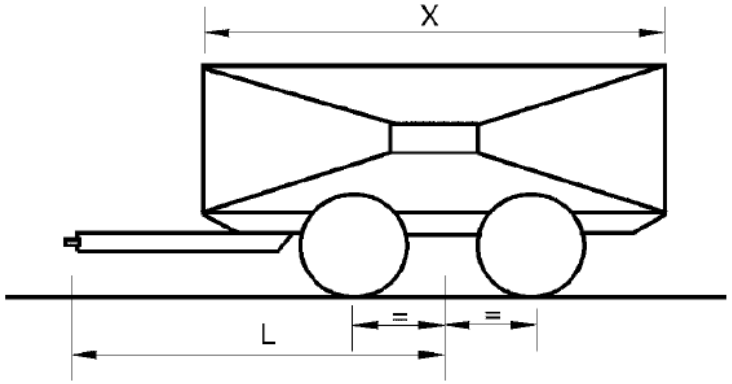


Figure 1
Dimensions of the centre axle trailer

62.2.11 Symbols and definitions used :

Av = maximum permitted axle mass of the steered axle in t.
C = mass of centre axle trailer in t - see paragraph 62.2.10.1. of this Regulation.
D = D value in kN - see paragraph 62.2.10.1 of this Regulation.
Dc = Dc value in kN for centre axle trailers - see paragraph 62.2.10.1. of this Regulation.
R = mass of towed vehicle in t - see paragraph 62.2.10.1 of this Regulation.

T = mass of towing vehicle in t - see paragraph 62.2.10.1 of this Regulation.
Fa = static lifting force in kN.
Fh = horizontal component of test force in longitudinal axis of vehicle in kN.
Fs = vertical component of test force in kN.
S = static vertical mass in kg.
U = fifth wheel imposed vertical mass in t.
V = V-value in kN - see paragraph 62.2.10.4 of this Regulation.
a = equivalent vertical acceleration factor at the coupling point of centre axle trailers depending on the type of suspension of the rear axle(s) of the towing vehicle – see paragraph 62.2.10.4 of this Regulation.
e = longitudinal distance between the coupling point of coupling balls which can be dismantled and the vertical plane of the fixing points (see Figures 20c to 20f) in mm.
f = vertical distance between the coupling point of coupling balls which can be dismantled and the horizontal plane of the fixing points (see Figures 20c to 20f) in mm.
g = acceleration due to gravity, assumed as 9.81 m/s^2.
L = theoretical drawbar length between the centre of the drawbar eye and the centre of the axle assembly in m.
X = length of the loading area of a centre axle trailer in m.
Subscripts:
O = maximum test force
U = minimum test force
a = static force
h = horizontal
p = pulsating
res = resultant
s = vertical
w = alternating force

62.2.12 "Centre axle trailer" means a trailer having a drawbar which cannot move in a vertical plane independent of the trailer and having an axle or axles positioned close to the centre of gravity of the trailer, when uniformly loaded. The vertical load imposed on the coupling of the towing vehicle shall not exceed 10 % of the maximum mass of the trailer, or 1,000 kg, whichever is the lesser. The maximum mass of the centre axle trailer means the total mass transmitted to the ground by the axle or axles of the trailer when coupled to a towing vehicle and when loaded to the technically permissible maximum mass.

62.2.13 "Positive mechanical engagement" means that the design and geometry of a device and its component parts shall be such that it will not open or disengage under the action of any forces or components of forces to which it is subject during normal use or testing.

62.3 "type of coupling device or component" means a device or component which does not differ in such essential respects as:

62.3.1 the manufacturer's or supplier's trade name or mark;

62.3.2 the class of coupling;

62.3.3 the external shape, principal dimensions or fundamental difference in design including materials used; and

62.3.4 the characteristic values D, Dc, S, V and U.

62.4 Testing of mechanical coupling devices or components

62.4.1 General testing requirements

62.4.1.1 Samples of coupling devices shall be tested for both strength and function. Physical testing shall be carried out wherever possible but unless stated otherwise the type approval authority or technical service may waive a physical strength test if the simple design of a component makes a theoretical check possible. Theoretical checks may be carried out to determine worst case conditions. In all cases, theoretical checks shall ensure the same quality of results as with dynamic or static testing. In cases of doubt it is the results of physical testing that are overriding.See also paragraph 62.5.7 of this Regulation.

62.4.1.2 With coupling devices the strength shall be verified by a dynamic test (endurance test). In certain cases additional static tests may be necessary (see paragraph 62.4.3).

62.4.1.3 The dynamic test shall be performed with approximately sinusoidal load (alternating and/or pulsating) with a number of stress cycles appropriate to the material. No cracks or fractures shall occur.

62.4.1.4 Only slight permanent deformation is permitted with the static tests prescribed. Unless stated otherwise the permanent, plastic, deformation after releasing shall not be more than 10 % of the maximum deformation measured during the test. In the case where measurement of deformation during the test puts the tester at risk then, provided that the same parameter is checked during other tests, such as the dynamic test, then this part of the static test may be omitted.

62.4.1.5 The loading assumptions in the dynamic tests are based on the horizontal force component in the longitudinal axis of the vehicle and the vertical force component. Horizontal force components transverse to the longitudinal axis of the vehicle, and moments, are not taken into account provided they are of only minor significance. If the design of the coupling device or its attachment to the vehicle or the attachment of additional systems (such as stabilisers, close coupling devices, etc.) generate additional forces or moments, additional tests may be required by the type approval authority or technical service. The horizontal force component in the longitudinal axis of the vehicle is represented by a theoretically determined reference force, the D or Dc value. The vertical force component, where applicable, is represented by the static vertical bearing load, S, at the point of coupling and the assumed vertical load, V, or by the static vertical bearing load, U, in the case of fifth wheel couplings.

62.4.1.6 The characteristic values D, Dc, S, V and U, shall be taken from the manufacturer's information given in the application for type approval.

62.4.1.7 Any positive locking device, which is retained in position by spring force, shall remain in its secured position when subjected to a force applied in the least favourable direction and equivalent to three times the mass of the locking mechanism.

62.4.2 Test procedures

62.4.2.1 For the dynamic tests and static tests, the sample shall be placed in a suitable rig with a means of force application, such that it is not subjected to any additional forces or moments apart from the specified test force. In the case of alternating tests, the direction of force application shall not deviate by more than +/- 1 degree from the specified direction. In the case of pulsating and static tests, the angle shall be set for the maximum test force. This will normally require a joint at the point of force application (i.e. the point of coupling) and a second joint an adequate distance away.

62.4.2.2 The test frequency shall not exceed 35 Hz. The selected frequency shall be well separated from resonance frequencies of the test set up including the tested device. With asynchronous testing the frequencies of the two force components shall be between approximately 1 % and a maximum of 3 % apart. For coupling devices made from steel the number of stress cycles is 2 x 106. For devices made from materials other than steel a higher number of cycles may be necessary. The dye-penetration method of crack testing or an equivalent method shall be used to determine any cracking during test.

62.4.2.3 With pulsating tests, the test force varies between the maximum test force and a lower, minimum, test force, which may not be greater than 5 % of the maximum test force unless otherwise stated in the specific testing procedure.

62.4.2.4 With static tests, other than the special tests required by paragraph 62.4.3.2 , the test force shall be applied smoothly and quickly and be maintained for at least 60 seconds.

62.4.2.5 The coupling devices or component on test should normally be mounted as rigidly as possible on a test rig in the actual position in which they will be used on the vehicle. The fixing devices should be those specified by the manufacturer or applicant and should be those intended for the attachment of the coupling device or component to the vehicle and/or shall have identical mechanical characteristics.

62.4.2.6 Coupling devices or components shall be tested in the form used on the road. However, at the discretion of the manufacturer, and in agreement with the technical service, flexible components may be neutralised if this is necessary for the test procedure and if this will not have any unrealistic influence on the test result. Flexible components which are overheated during these accelerated test procedures may be replaced during the test. The test loads may be applied by means of special slack-free devices.

62.4.3 Specific testing requirements

62.4.3.1 The dynamic test shall be performed with a Class A coupling ball of appropriate strength. On the test rig the coupling ball and coupling head shall be arranged as instructed by the manufacturer and orientated in a way corresponding to the relative positions in normal use. There should be no possibility of extra forces in addition to the test force acting on the specimen. The test force shall be applied along a line passing through the centre of the ball and inclined downwards to the rear at 15 degrees (see Figure 2). An endurance test must be performed on a test specimen with the following test force:

Fhs res w = +/- 0.6 D

Where the maximum permissible static vertical mass, S, exceeds 120 D, then the angle of test shall be increased to 20 degrees.

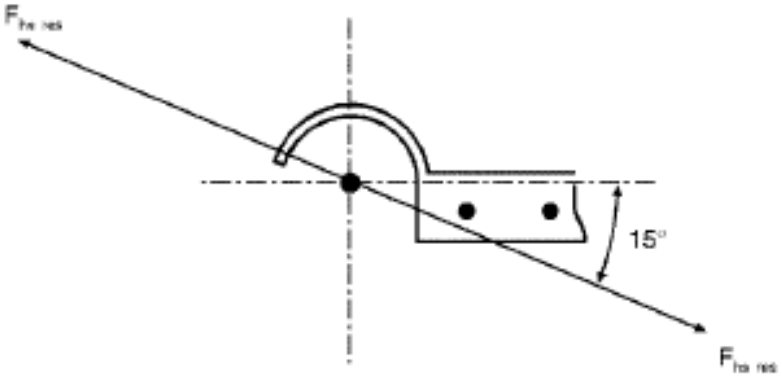


Figure 2: Dynamic testing

62.4.3.2 A static separatic test shall have a diameter of 49.00 to 49.13 mm in order to repre applied perpendicular to both the transverse and longitudinal centre line axes of the coupling head and shall be increased smoothly and quickly to a value of:

Fa = g(C+S/1,000) kN

and be held for 10 seconds.

The coupling head shall not separate from the ball nor shall any component of the coupling head exhibit any permanent distortion which could have an adverse effect on its functional capability.

62.4.3.3 Drawbar couplings and drawbeams

62.4.3.3.1 An endurance test shall be performed on a test sample. The coupling device shall be equipped with all the fixings needed to attach it to the vehicle. Any intermediate devices fitted between the drawbar couplings and the vehicle frame (i. e. drawbeams) shall be tested with the same forces as the coupling. When testing drawbeams intended for standard drawbar couplings, the vertical load shall be applied at a longitudinal distance from the vertical plane of the fixing points that is equal to the position of the corresponding standard coupling.

62.4.3.3.2 Drawbar couplings for hinged drawbars (S=0)

The dynamic test shall be performed with a horizontal alternating force of Fhw= +/-0.6 D acting in a line parallel to the ground and in the longitudinal median plane of the towing vehicle passing through the centre of the coupling pin.

62.4.3.3.3 Drawbar couplings for use with centre-axle trailers (S>0).

62.4.3.3.3.1 Centre axle trailer masses up to and including 3.5 t:

Drawbar couplings for use with centre axle trailers up to and including a mass of 3.5 t shall be tested in the same way as coupling balls and towing brackets described in 62.4.3.1 to 62.4.3.2.

62.4.3.3.3.2 Centre axle trailer masses exceeding 3.5 t:

The test forces are applied to the specimen in both horizontal and vertical directions in an asynchronous endurance test. The horizontal line of action shall be equivalent to being parallel to the ground and along the longitudinal median plane of the towing vehicle and pass through the centre of the coupling pin. The vertical line of action shall be perpendicular to the horizontal line of action and shall act along the longitudinal centre line of the coupling pin. The fixing arrangements for the drawbar coupling and the drawbar eye on the test rig shall be those intended for its attachment to the vehicle in accordance with the manufacturer's fitting instructions.
The following test forces shall be applied:

Table 1: Test forces

Test force	Mean Value (kN)	Amplitude (kN)
Horizontal force	0	+/- 0.6D_c (See Note)
Vertical force	S x g/1,000	+/- 0.6V (See Note)

Note: In the case of Class T dedicated drawbar couplings these values shall be reduced to +/-0.5Dc and +/-0.5V.
The vertical and the horizontal components shall be sinusoidal in shape and shall be applied asynchronously, where the difference of their frequencies shall be between 1 % and 3 %.

62.4.3.3.4 Static test on coupling pin locking device

With drawbar couplings it is also necessary to test the closure and any locking devices by means of a static force of 0.25 D acting in the direction of opening. The test shall not cause the closure to open and it shall not cause any damage. A test force of 0.1 D is sufficient in the case of cylindrical coupling pins.

62.4.3.4 Drawbar eyes

62.4.3.4.1 Drawbar eyes shall be subjected to the same dynamic testing as drawbar couplings. Drawbar eyes used solely for trailers having hinged drawbars allowing free vertical movement shall be subjected to an alternating force as described in paragraph 62.4.3.3.2. Drawbar eyes also intended for use on centre axle trailers shall be tested in the same way as ball coupling heads (paragraph 62.4.3.1 to 62.4.3.2) for trailer masses C up to and including 3.5 t and in the same way as drawbar couplings (paragraph 62.4.3.3.3.2) for centre axle trailers with a mass, C, exceeding 3.5 t.

62.4.3.4.2 Toroidal eyes of Class L shall be tested in the same manner as standard drawbar eyes.

62.4.3.4.3 The testing of drawbar eyes shall be conducted in such a manner that the alternating force also acts on the parts used for attaching the drawbar eye to the drawbar. All flexible intermediate components shall be clamped.

62.4.3.5 Hook type couplings

62.4.3.5.1 Class K hook type couplings shall satisfy the dynamic test given in paragraph 62.4.3.5.2.

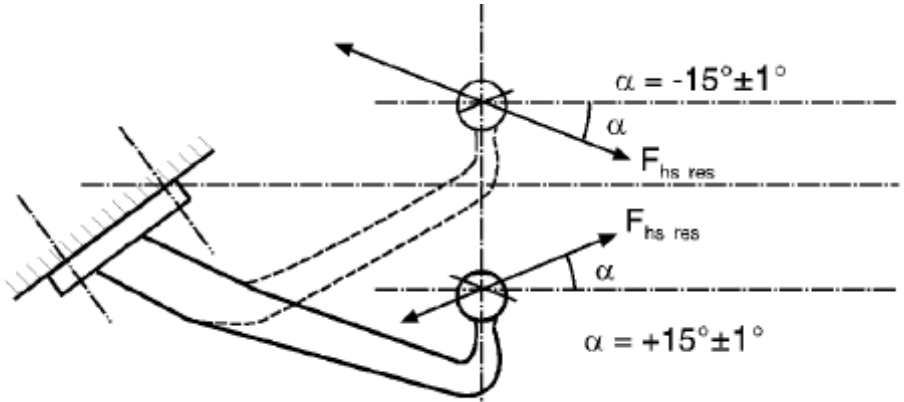
62.4.3.5.2 Dynamic test

62.4.3.5.2.1 The dynamic test shall be a pulsating test using a Class L toroidal eye and with the coupling mounted as it would be on a vehicle and with all of the necessary parts for vehicle installation. However, any flexible components may be neutralised with the agreement of the type approval authority or technical service;

62.4.3.5.2.2 For hook type couplings intended for use with hinged drawbar trailers, where the imposed vertical load on the coupling, S, is zero, the test force shall be applied in a horizontal direction simulating a tensile force on the hook and varying between 0.05 D and 1.00 D;

62.4.3.5.2.3 For hook type couplings intended for use with centre axle trailers the test force shall represent the resultant of the horizontal and vertical forces on the coupling and shall be applied along an angle, - alpha, that is, from top front to bottom rear (see Figure 3), and equivalent to the calculated angle of the resultant between the horizontal and vertical forces on the coupling. The force, Fhs res shall be calculated as:

$$F_{hs\,res} = \sqrt{F_h^2 + F_s^2}\ , \text{where } F_h = D_c \text{ and } F_s = \frac{9.81S}{1000} + 0.8V\ .$$



The official directions are written in Chine

62 Mechanical coupling device or component:

Figure 3: Angles of application of test force

62.4.3.5.2.4 The applied force shall vary between 0.05 Fhs res and 1.00 Fhs res.

62.4.3.5.3 Static test on coupling locking device

With hook type couplings it is also necessary to test the closure and any locking devices by means of a static force of 0.25 D acting in the direction of opening. The test shall not cause the closure to open and it shall not cause any damage.

62.4.3.6 Drawbars

62.4.3.6.1 Drawbars shall be tested in the same way as drawbar eyes (see paragraph 3.4.). The type approval authority or technical service may waive an endurance test if the simple design of a component makes a theoretical check of its strength possible. The design forces for the theoretical verification of the drawbar of centre axle trailers with a mass, C, of up to and including 3.5 t shall be taken from ISO 7641/1:1983. The design forces for the theoretical verification of drawbars for centre axle trailers having a mass, C, over 3.5 t shall be calculated as follows:

Fsp = (g x S/1000) + V

where the force amplitude V is that given in paragraph 62.2.10.4 of this Regulation.

The permissible stresses based on the design masses for trailers having a total mass, C, over 3.5 t shall be in accordance with paragraph 5.3. of ISO 7641/1:1983. For bent drawbars (e. g. swan neck) and for the drawbars of full trailers, the horizontal force component Fhp = 1.0 x D shall be taken into consideration.

62.4.3.6.2 For drawbars for full trailers with free movement in the vertical plane, in addition to the endurance test or theoretical verification of strength, the resistance to buckling shall be verified either by a theoretical calculation with a design force of 3.0 x D or by a buckling test with a force of 3.0 x D. The permissible stresses in the case of calculation shall be in accordance with paragraph 5.3. of ISO 7641/1:1983.

62.4.3.6.3 In the case of steered axles, the resistance to bending shall be verified by theoretical calculations or by a bending test. A horizontal, lateral static force shall be applied in the centre of the coupling point. The magnitude of this force shall be chosen so that a moment of 0.6 x Av x g (kNm) is exerted about the front axle centre. The permissible stresses shall be in accordance with paragraph 5.3. of ISO 7641/1:1983. However, in the case where the steered axles form a twin, tandem, axle front carriage (steered bogie) the moment shall be increased to 0.95 x Av x g (kNm).

62.4.3.7 Fifth wheel couplings

62.4.3.7.1 The basic strength tests are a dynamic test and a static test (lifting test). Fifth wheel couplings intended for the positive steering of semitrailers shall be subject to an additional static test (bending test). For the purpose of the tests the fifth wheel coupling shall be equipped with all the fixings needed to attach it to the vehicle. The method of mounting shall be identical to that employed on the vehicle itself. It is not permissible to use a calculation method as an alternative to physical testing.

62.4.3.7.2 Static tests

62.4.3.7.2.1 Standard fifth wheel couplings designed for a steering wedge or similar device for the positive steering of semitrailers (see paragraph 62.2.7 of this Regulation) shall be tested for adequate strength by means of a static bending test within the working range of the steering device with the simultaneous application of fifth wheel load. The maximum permitted imposed vertical load, U, for the fifth wheel shall be applied vertically to the coupling in its operating position by means of a rigid plate of sufficient size to cover the coupling completely.

The resultant of the applied load shall pass through the centre of the horizontal joint of the fifth wheel coupling. Simultaneously, a horizontal lateral force, representing the force needed for positive steering of the semitrailer, shall be applied to the flanks of the guide for the coupling pin. The magnitude of this force and the direction in which it acts shall be chosen so that a moment of 0.75m x D is exerted about the centre of the coupling pin by means of a force acting on a lever arm 0.5 m +/- 0.1 m long. Permanent, plastic deformation up to 0.5 % of all nominal dimensions is permitted. There shall not be any cracking.

62.4.3.7.2.2 A static lifting test shall be performed on all fifth wheel couplings. Up to a lifting force of Fa = g.U there shall not be any major permanent bending of the coupling plate over more than 0.2 % of its width. In the case of Class G50 standard fifth wheel couplings and comparable couplings for the same coupling pin diameter, there shall not be any separation of the coupling pin from the coupling with a lifting force of Fa = g x 2.5 U.

In the case of non-standard couplings using a pin diameter greater than 50 mm, for example 90 mm pin diameter couplings, the lifting force shall be: Fa = g x 1.6 U with a minimum value of 500 kN. The force shall be applied by means of a lever bearing on the coupling plate at one end and being raised at the other end at a distance of 1.0 to 1.5 m from the centre of the coupling pin - see Figure 4. The lever arm shall be at 90 degrees to the direction of entry of the coupling pin into the coupling. If the worst case is obvious, this worst case has to be tested. If the worst case is not easy to determine, the type approval authority or technical service shall decide which side to test. Only one test is necessary.

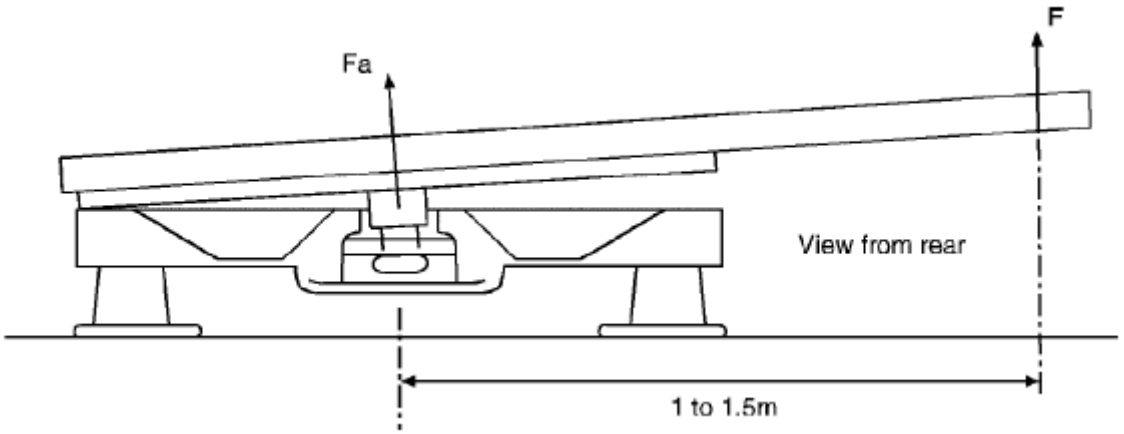


Figure 4: Lifting test on fifth wheel couplings

62.4.3.7.3 Dynamic test

The fifth wheel coupling shall be subjected to alternating stress on a test rig (asynchronous dynamic test) with horizontal alternating and vertical pulsating forces acting simultaneously.

62.4.3.7.3.1 In the case of fifth wheel couplings not intended for the positive steering of semitrailers, the following forces shall be used:

Horizontal: Fhw = +/- 0.6 x D
Vertical: FsO = g x 1.2 U
FsU = g x 0.4 U

These two forces shall be applied in the longitudinal median plane of the vehicle with the lines of action of both forces FsO and FsU passing through the centre of the joint of the coupling. The vertical force Fs alternates between the limits +g x 1.2 U and +g x 0.4 U and the horizontal force between +/- 0.6 D.

62.4.3.7.3.2 In the case of fifth wheel couplings intended for the positive steering of semitrailers the following forces shall be used :

Horizontal: Fhw = +/- 0.675 D
Vertical: FsO and FsU as in paragraph 62.4.3.7.3.1.
The lines of action of the forces are as given in paragraph 62.4.3.7.3.1.

62.4.3.7.3.3 For the dynamic test of fifth wheel couplings, a suitable lubricating material shall be placed between the coupling plate and the trailer plate so that the maximum coefficient of friction, mu□ 0.15.

62.4.3.8 Mounting plates for fifth wheel couplings

The dynamic test for fifth wheel couplings described in paragraph 62.4.3.7.3. and the static tests described in paragraph 62.4.3.7.2. shall also be applied to mounting plates. With mounting plates, it is sufficient to perform the lifting test on one side only. The test shall be based on the maximum designated installation height for the coupling, the maximum designated width and the minimum designated length of the mounting plate design. It is not necessary to carry out this test if the mounting plate in question is identical to one which has already undergone this test except that it is narrower and/or longer and the total height is lower. It is not permissible to use a calculation method as an alternative to physical testing.

62.4.3.9 Fifth wheel coupling pins of semitrailers

62.4.3.9.1 A dynamic test with alternating stress shall be performed on a sample mounted on a test rig. The testing of the coupling pin shall not be combined with the testing of the fifth wheel coupling. The test shall be conducted so that the force is also applied to the fixings needed for attaching the coupling pin to the semitrailer. It is not permissible to use a calculation method as an alternative to physical testing.

62.4.3.9.2 A dynamic test with an alternating horizontal force of Fhw = +/- 0.6 D shall be applied to the coupling pin in the operating position. The line of action of the force shall pass through the centre of the smallest diameter of the cylindrical part of the coupling pin having a diameter of 50.8 mm for Class H50 (Figure 18).

62.5 General requirements for mechanical coupling device or component

62.5.1 Each sample shall conform to the dimensional and strength specifications set out in annexes 5 and 6. Following the tests specified in annex 6 there shall not be any cracks, fractures or any excessive permanent distortion which would be detrimental to the satisfactory operation of the device or component.

62.5.2 All parts of the mechanical coupling device or component whose failure could result in separation of the vehicle and trailer shall be made of steel. Other materials may be used provided that equivalence has been demonstrated by the manufacturer to the satisfaction of the type approval authority or technical service of the Contracting Party applying this Regulation.

62.5.3 The mechanical coupling devices or components shall be safe to operate and coupling and uncoupling shall be possible by one person without the use of tools. With the exception of Class T couplings only devices which allow automatic coupling shall be allowed for the coupling of trailers having a maximum technically permissible mass greater than 3.5 t.

62.5.4 The mechanical coupling devices or components shall be designed and manufactured such that in normal use and with correct maintenance and replacement of wearing parts they will continue to function satisfactorily and retain the characteristics prescribed by this Regulation.

62.5.5 All mechanical coupling devices or components shall be designed to have positive mechanical engagement and the closed position shall be locked at least once by further positive mechanical engagement unless further requirements are stated in paragraph

62.5. Alternatively there may be two or more separate arrangements to ensure the integrity of the device but each arrangement shall be designed to have positive mechanical engagement and shall be tested individually to any requirements given in paragraph 62.4. Positive mechanical engagement shall be as defined in paragraph 62.2.13. Spring forces may be used only to close the device and to prevent the effects of vibration from causing component parts of the device to move to positions where it may open or disengage. The failure or omission of any one single spring shall not allow the complete device to open or disengage.

62.5.6 Every device or component shall be accompanied by installation and operating instructions giving sufficient information for any competent person to install it correctly on the vehicle and operate it properly – see ". 610 The installation of the mechanical coupling device or component" of "Vehicle Safety Testing Directions". The instructions shall be in at least the language of the country in which it will be offered for sale. In the case of devices and components supplied for original equipment fitting by a vehicle manufacturer or bodybuilder, installation instructions may be dispensed with but the vehicle manufacturer or bodybuilder will be responsible for ensuring that the vehicle operator is supplied with the necessary instructions for correct operation of the coupling device or component.

62.5.7 For heavy duty and other non-standard miscellaneous coupling devices or components, Class S and Class T, the relevant requirements in paragraph 62.4, 62.5 and see ". 610 The installation of the mechanical coupling device or component" of "Vehicle Safety Testing Directions" for the closest standard or non-standard device or component shall be used.

62.5.8 Only slight permanent deformation is permitted with the static tests prescribed. Unless stated otherwise the permanent, plastic, deformation after releasing shall not be more than 10 % of the maximum deformation measured during the test.

62.5.9 Drawbar Couplings

The requirements of paragraphs 62.5.9.1 to 62.5.9.6. of this annex are applicable to all drawbar couplings of Class C50. Additional requirements which must be fulfilled by standard drawbar couplings of Classes C50-1 to C50-6 are given in paragraph 62.5.9.7.

62.5.9.1 Performance requirements

All drawbar couplings shall be able to satisfy the tests stated in paragraph 62.4.3.3.

62.5.9.2 Suitable drawbar eyes - Class C50 drawbar couplings shall be compatible with all Class D50 drawbar eyes and couplings with the specified characteristics.

62.5.9.3 Jaw

Class C50 drawbar couplings shall have a jaw which is designed such that the appropriate drawbar eye is guided into the coupling. If the jaw, or a part supporting the jaw, can pivot about the vertical axis, it shall establish itself automatically in the normal position and with the coupling pin open, be effectively restrained in this position to give satisfactory guidance for the drawbar eye during the coupling procedure. If the jaw, or a part supporting the jaw, can pivot about the horizontal transverse axis, the joint providing the rotation capability shall be restrained in its normal position by a locking torque. The torque shall be sufficient to prevent a force of 200 N acting vertically upwards on the top of the jaw producing any deflection of the joint from its normal position. The locking torque shall be greater than that created by operation of the hand lever described in paragraph 3.6 of this

annex. It shall be possible to bring the jaw to its normal position manually. A jaw that pivots about the horizontal transverse axis is only approved for bearing mass, S, of up to 50 kg and a V value of up to 5 kN.

If the jaw, or a part supporting the jaw, is pivoted about the longitudinal axis, the rotation shall be restrained by a locking torque of at least 100 Nm. The minimum required size of the jaw depends on the D value of the coupling:

D value < 18 kN - width 150 mm, height 100 mm

D value > 18 kN < 25 kN - width 280 mm, height 170 mm

D value > 25 kN - width 360 mm, height 200 mm

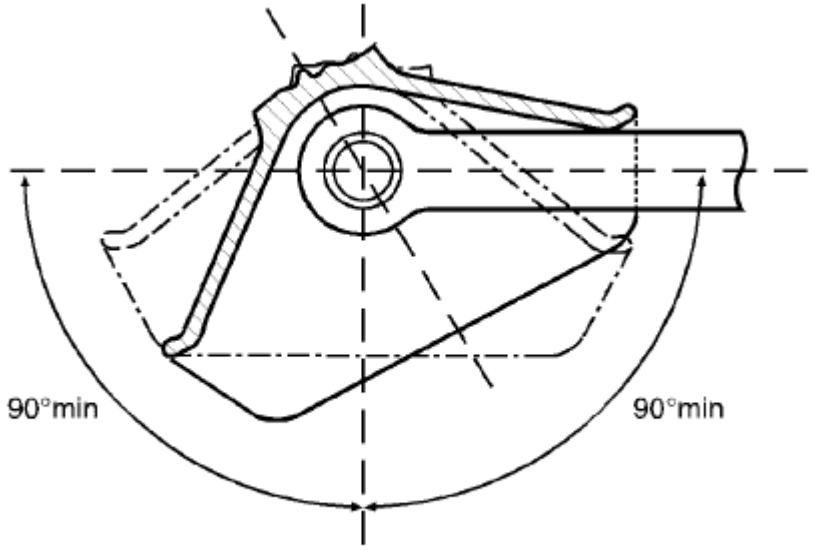
The external corners of the jaw may be radiused.

Smaller jaws are permitted for Class C50-X drawbar couplings if their use is restricted to centre axle trailers up to 3.5 t maximum permissible mass or if the use of a jaw from the above table is impossible due to technical reasons and if, furthermore, there are special circumstances such as visual aids for ensuring safe execution of the automatic coupling procedure and if the field of application is restricted in the approval according to information given by the coupling manufacturer in the communication.

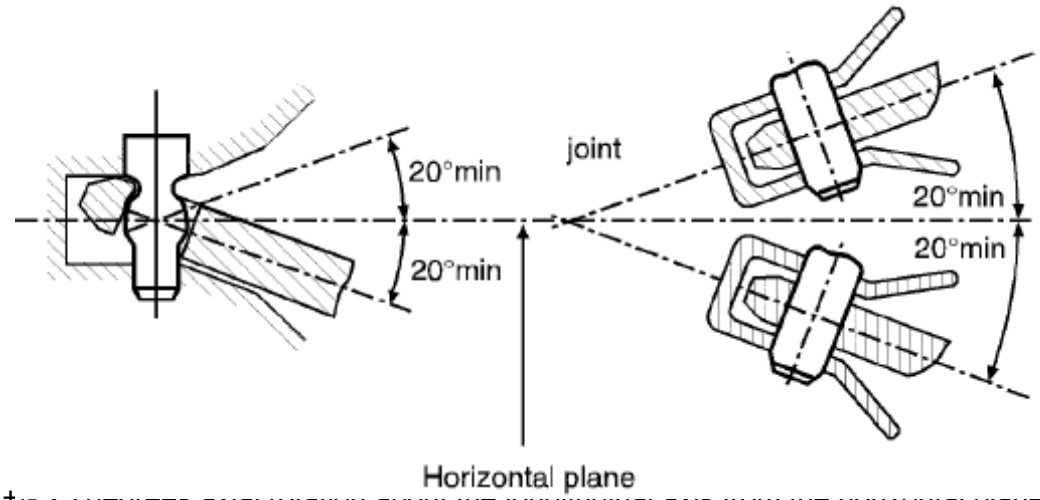
62.5.9.4 Minimum articulation of the coupled drawbar eye

The drawbar eye, when coupled to a drawbar coupling but not fitted to a vehicle, shall have the degrees of articulation given below. If part of the articulation is provided by a special joint (Class C50-X drawbar couplings only), the field of application, given in the communication, shall be restricted to the cases stated in paragraph 61.5.1.8 of ". 610 The installation of the mechanical coupling device or component".

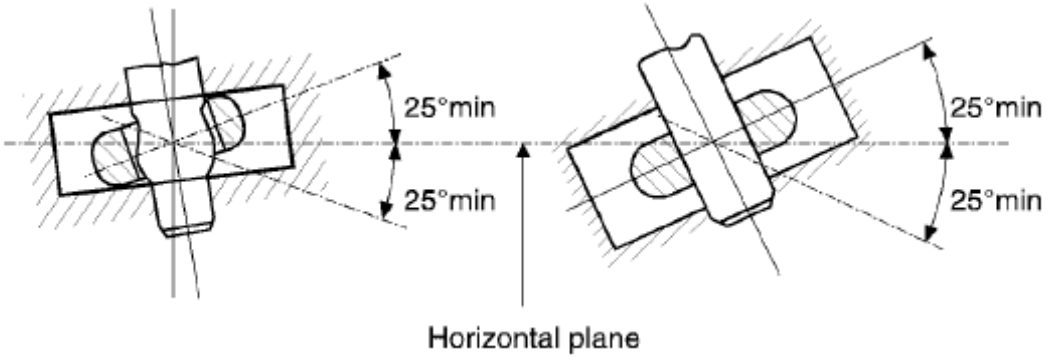
62.5.9.4.1 +/- 90 degrees horizontally about the vertical axis from the longitudinal axis of the vehicle - see Figure 5.



62.5.9.4.2 +/- 20 degrees vertically about the transverse axis from the horizontal plane of the vehicle - see Figure 6.



62.5.9.4.3 +/- 25 degrees axial rotation about the longitudinal axis from the horizontal plane of the vehicle - see Figure 7.



62.5.9.5 Locking to p

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62 Mechanical coupling device or component:

In the closed position the coupling pin shall be locked by two positive mechanical engagement locking devices each of which shall remain effective should the other fail. The closed and locked position of the coupling shall be clearly indicated externally by a mechanical device. It shall be possible to verify the position of the indicator by feel, for example, in the dark. The mechanical indication device shall indicate the engagement of both locking devices (an AND condition). However, it is sufficient for the engagement of only one locking device to be indicated if, in this situation, engagement of the second locking device is an inherent feature of the design.

62.5.9.6 Hand levers

Hand levers shall be of a design suitable for easy use with the end rounded off. The coupling shall not have any sharp edges or points of possible pinching near the hand lever which could result in injury during operation of the coupling. The force needed to release the coupling, measured without the drawbar eye, shall not exceed 250 N perpendicular to the hand lever along the line of operation.

62.5.9.7 Special requirements for standard drawbar couplings of Class C50-1 to C50-6:

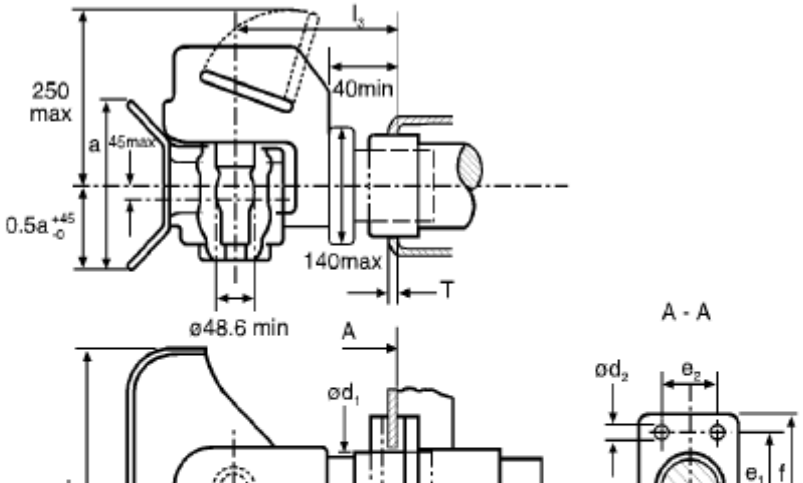
62.5.9.7.1 The swivel motion of the drawbar eye about the transverse axis must be achieved through the spherical shape of the coupling pin (and not by means of a joint);

62.5.9.7.2 Tensile and compressive shock loads along the longitudinal axis due to the clearance between the coupling pin and the drawbar eye shall be attenuated by spring and/or damping devices (except C50-1).

62.5.9.7.3 The dimensions shall be as given in Figure 8 and Table 2.

62.5.9.7.4 The couplings shall be suitable and tested for the characteristic values given in Table 3.

62.5.9.7.5 The coupling shall be opened by means of a hand lever at the coupling (no remote control).



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62 Mechanical coupling device or component:

Figure 8: Dimensions of standard drawbar couplings (mm)

Table 2: Dimensions of standard drawbar couplings (mm)

Class	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6 C50-7	Remarks
e_1	83	83	120	140	160	160	+/- 0.5
e_2	56	56	55	80	100	100	+/- 0.5
d_1	--	54	74	84	94	94	maximum
d_2	10.5	10.5	15	17	21	21	H13
f	110	110	155	180	200	200	+6.0 -0
g	85	85	90	120	140	140	+/- 3.0
a	100	170	200	200	200	200	+20.0 -0
b	150	280	360	360	360	360	+20.0 -0
c	20	20	24	30	30	30	maximum
h	150	190	265	265	265	265	maximum
l_1	--	150	250	300	300	300	maximum
l_2	150	300	330	330	330	330	maximum
l_3	100	160	180	180	180	180	+/- 20.0
T	--	15	20	35	35	35	maximum

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2 Mechanical coupling device or component:

Table 3: Characteristic values for standard drawbar couplings

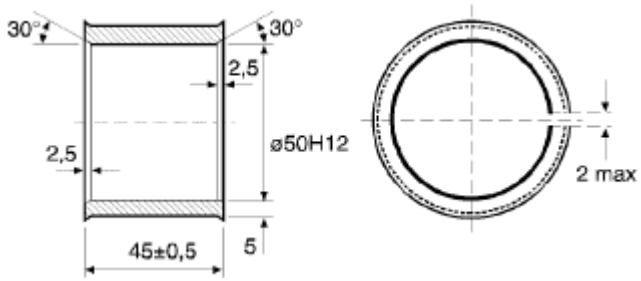
Class	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6	C50-7
D	18	25	70	100	130	190	190
D_c	18	25	50	70	90	120	130
S	200	250	650	900	1,000	1,000	1,000
V	12	10	18	25	35	50	75

D = maximum D value (kN)
D_c = maximum D value (kN) for centre axle trailer applications
S = maximum static vertical load on coupling (kg)
V = maximum V value (kN)

62.5.10 Drawbar Eyes

62.5.10.1 General requirements for drawbar eyes of Class D50:

All drawbar eyes of Class D50 shall be able to satisfy the test stated in paragraph 62.4.3.4. Class D50 drawbar eyes are intended for use with C50 drawbar couplings. Drawbar eyes shall not be able to rotate axially (because the respective couplings can rotate). If Class D50 drawbar eyes are fitted with sleeves, they shall comply with the dimensions shown in Figure 9 (not permitted for Class D50-C) or Figure 10. The sleeves must not be welded into the drawbar eyes. Class D50 drawbar eyes shall have the dimensions given in paragraph 62.5.10.2. The form of shank for drawbar eyes of Class D50-X is not specified. but for a distance of 210 mm from the centre of the eye the height "h" and the width "b" shall be within the limits given in Table 4.



eyes

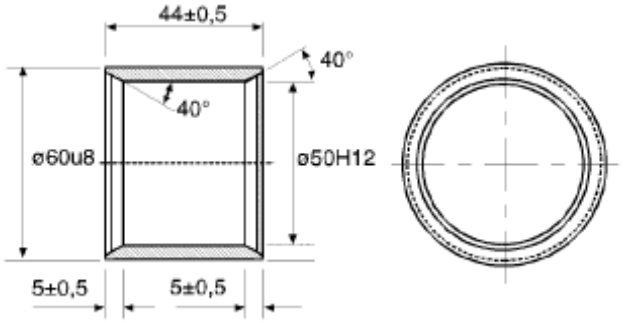


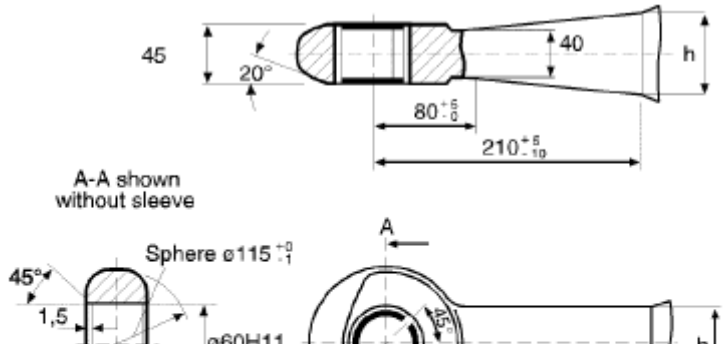
Fig ar eyes

Table 4:Dimensions for drawbar eyes D50-A and D50-X

Class	h (mm)	b (mm)
D50-A	65 +2/-1	60 +2/-1
D50-X	80 maximum	62 maximum

62.5.10.2 Special requirements fo

62.5.10.2.1 Class D50-A and D50-X drawbar eyes shall have the dimensions illustrated in Figure 11.



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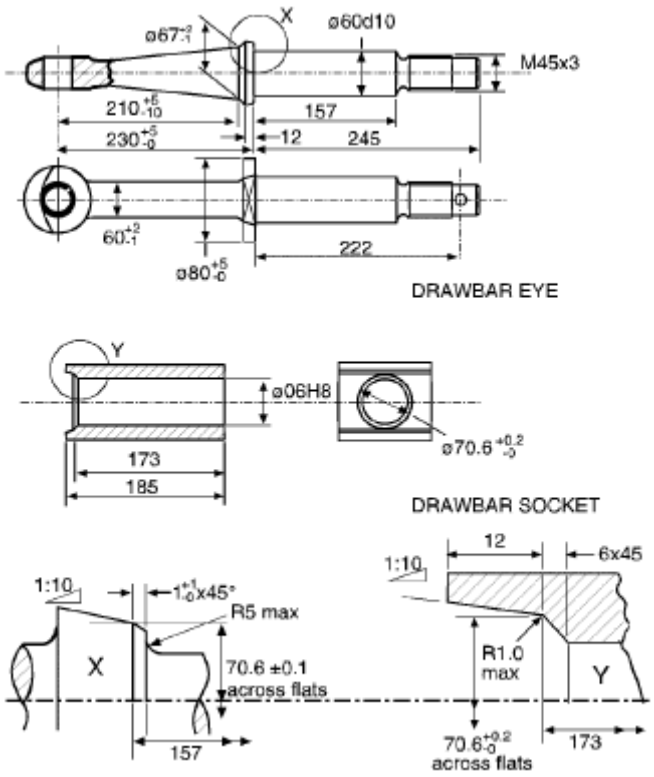
62 Mechanical coupling device or component:

Figure 11: Dimensions of Classes D50-A and D50-X drawbar eyes

62.5.10.2.2 Class D50-B drawbar eyes shall have the dimensions illustrated in Figure 12.



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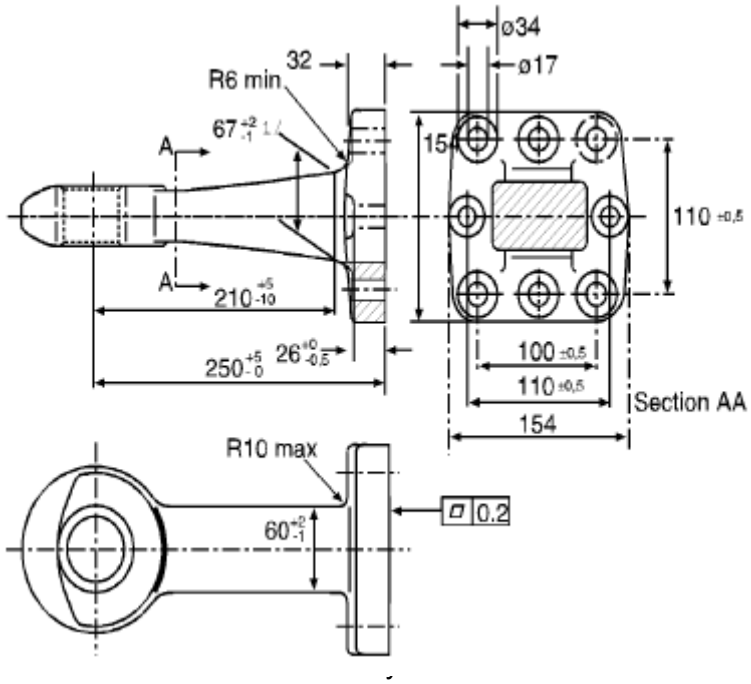
62 Mechanical coupling device or component:

Figure 12: Dimensions of Class D50-B drawbar eyes, see other dimensions

62.5.10.2.3 Classes D50-C and D50-D drawbar eyes shall have the dimensions illustrated in Figure 13.



max."

Figure 1: ee other dimensions

62.5.10.2.4 Classe otted sleeves shown in Figure 10.

62.5.10.3 Load values for standard drawbar eyes

Standard drawbar eyes and the means of attachment shall be suitable for, and tested for, the load values stated in Table 5.

Table 5: Characteristic values for standard drawbar eyes

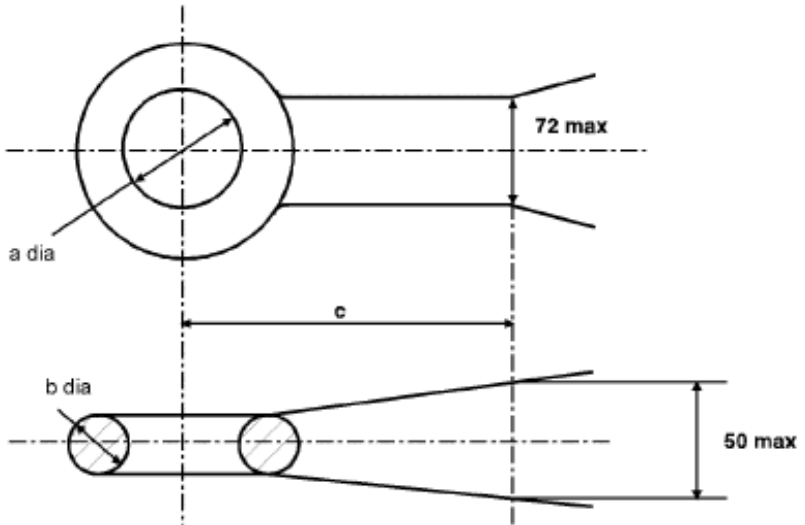
Class	D	D_c	S	V
D50-A	130	90	1,000	30
D50-B	130	90	1,000	25
D50-C	190	120	1,000	50
D50-D	190	130	1,000	75

62.5.10.4 General requirements for Class L toroidal drawbar eyes:

62.5.10.4.1 Class L toroidal drawbar eyes are intended for use with Class K hook type couplings

62.5.10.4.2 When used with a Class K hook type coupling they shall meet the requirements for articulation given in paragraph 62.5.16.2.

62.5.10.4.3 Class L toroidal drawbar eyes shall have the dimensions given in Figure 14 and Table 6.



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62 Mechanical coupling device or component:

Figure 14: Dimensions of Class L toroidal drawbar eyes

Table 6: Dimensions of Class L toroidal drawbar eyes

Class	L1	L2	L3	L4	L5	Remarks
a	68 +1.6/-0.0	76.2 +/- 0.8	76.2 +/- 0.8	76.2 +/- 0.8	68 +1.6/-0.0	
b	41.2 +/- 0.8	41.2 +/- 0.8	41.2 +/- 0.8	41.2 +/- 0.8	41.2 +/- 0.8	
c	70	65	65	65	70	Min

62.5.10.4.4 Class L toroidal drawbar eyes shall satisfy the tests given in paragraph 62.4.3.4 and shall be suitable for the characteristic values given in Table 7.

Table7: Characteristic values for Class L toroidal drawbar eyes

Class	L1	L2	L3	L4	L5
D kN	30	70	100	130	180
D_c kN	27	54	70	90	120
S kg	200	700	950	1,000	1,000
V kN	12	18	25	35	50

62.5.11 Drawbars

62.5.11.1 Drawbars of class E shall satisfy the tests prescribed in paragraph 62.4.3.3.

62.5.11.2 In order to provide a connection to the towing vehicle, the drawbars can be fitted either with coupling heads. The coupling heads and drawbar eyes can be attached by screwing, bolting or welding.

62.5.11.3 Height adjusting devices for hinged drawbars

62.5.11.3.1 Hinged drawbars shall be fitted with devices for adjusting the drawbar to the height of the coupling device or jaw. These devices shall be designed so that the drawbar can be adjusted by one person without tools or any other aids.

62.5.11.3.2 Height adjusting devices shall be able to adjust the drawbar eyes or ball couplings from the horizontal above the ground at least 300 mm upwards and downwards. Within this range the drawbar shall be adjustable steplessly, or in maximum steps of 50 mm measured at the drawbar eye or ball coupling.

62.5.11.3.3 Height adjusting devices shall not interfere with the easy movement of the drawbar after coupling.

62.5.11.3.4 The height adjusting devices shall not interfere with the action of any inertia, overrun type, brake.

62.5.11.4 In the case of drawbars combined with inertia, overrun, brakes, the distance between the centre of the drawbar eye and the end of the free shank of the drawbar eye shall not be less than 200 mm in the brake application position. With the shank of the drawbar eye fully inserted the distance shall not be less than 150 mm.

62.5.11.5 Drawbars for use on centre axle trailers shall possess at least half the moment of resistance against lateral forces as against vertical forces.

62.5.12 Drawbeams

62.5.12.1 Drawbeams of Class F shall satisfy the tests prescribed in paragraph 62.4.3.3.

62.5.12.2 The drilling pattern for mounting of Class C standard drawbar couplings shall be in accordance with Figure 15 and Table 8 below.

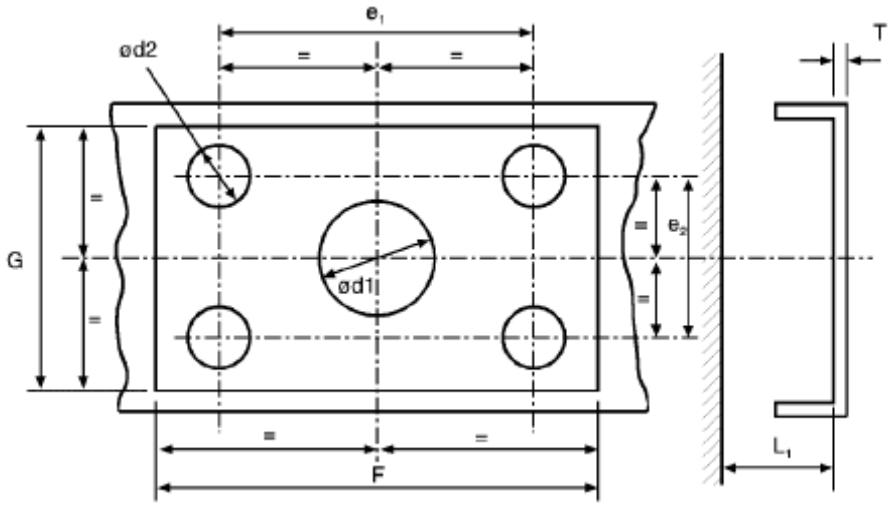

Table 8: Mounting dimensions for standard drawbar couplings (mm)

Class	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6 C50-7	Remarks
e_1	83	83	120	140	160	160	+/-0.5
e_2	56	56	55	80	100	100	+/-0.5
d_1	-	55	75	85	95	95	+1.0/-0.5
d_2	10.5	10.5	15	17	21	21	H13

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62.5.12.3 Drawbeams shall not be welded to the chassis, bodywork or other part of the vehicle.

62.5.13 Fifth Wheel Couplings And Steering Wedges

The requirements of paragraphs 62.5.13.1 to 62.5.13.7 are applicable to all fifth wheel couplings of Class G50. Additional requirements which shall be fulfilled by standard coupling devices are given in paragraph 62.5.13.9. Steering wedges shall satisfy the requirements listed in paragraph 62.5.13.8.

62.5.13.1 Suitable fifth wheel coupling pins

Class G50 fifth wheel couplings shall be designed so that they can be used with Class H50 coupling pins and, together, provide the specified characteristics.

62.5.13.2 Guides

Fifth wheel couplings shall be equipped with a guide which ensures safe and correct engagement of the coupling pin. The entry width of the guide for standard 50 mm diameter fifth wheel couplings shall be at least 350 mm (see Figure 16). For small, non-standard, fifth wheel couplings of Class G50-X and having a maximum "D" value of 25 kN, the entry width shall be at least 250 mm.

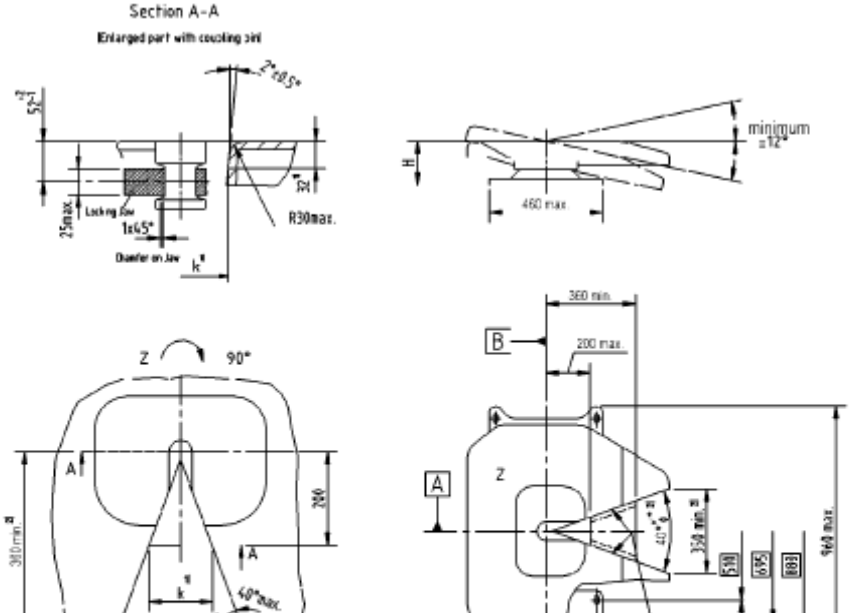

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Figure 16: Dimensions of standard fifth wheel couplings

Notes

1/ To provide for the use of steering wedges, measure the reference dimension k = 137 +/-3 mm at 32 mm below the top surface and at a distance of 200 mm from the transverse centre line of the coupling.

2/ The 40 degrees +1 degree/-0 degrees throat angle must be maintained over a distance of 360 mm minimum from the transverse centre line of the coupling. The entry width of 350 mm minimum may be obtained outside this distance by increasing the entry angle up to an included angle of 120 degrees maximum as shown in dotted line.

3/ Elongated mounting holes 23 +/- 2 mm x 17 +2/-0 mm or round mounting holes Dia. 17 +2/-0 mm could be used.

4/ When using elongated holes or holes > 18 mm diameter, washers 40 mm diameter, 6 mm thick, or means of equal strength, e.g. flat steel plate, are to be used.

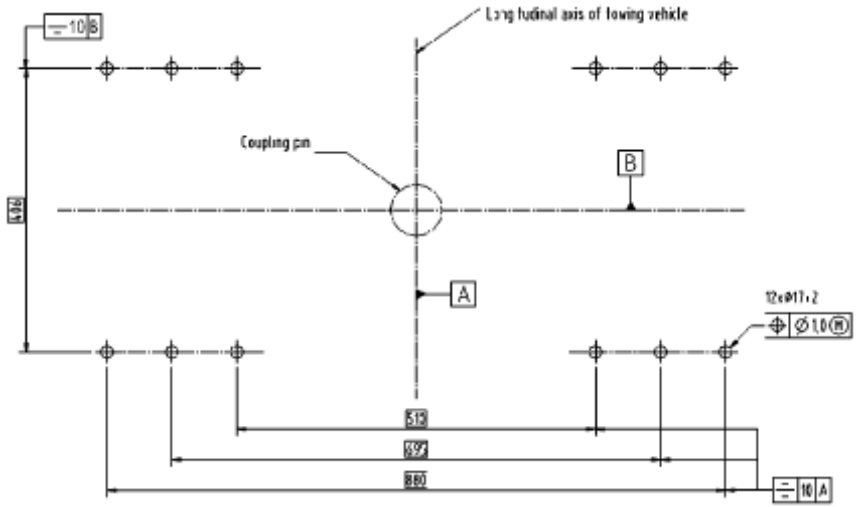


Figure 16a: Mounting hole ee paragraph 62.5.15.1)

Table 9: Dimensions of standard fifth wheel couplings (mm)

Class	G50-1	G50-2	G50-3	G50-4	G50-5	G50-6
H	140-159	160-179	180-199	200-219	220-239	240-260

62.5.13.3 Minimum articulation of the fifth wheel coupling

With the coupling pin engaged, without the fifth wheel coupling being attached to a vehicle or mounting plate, but taking into account the effect of the mounting bolts, the coupling shall permit, simultaneously, the following minimum values of articulation of the coupling pin:

62.5.13.3.1 +/- 90 degrees about the vertical axis (not applicable to fifth wheel couplings with positive steering);

62.5.13.3.2 +/- 12 degrees about the horizontal axis transverse to the direction of travel. This angle does not necessarily cover off-road use.

62.5.13.3.3 Axial rotation about the longitudinal axis of up to +/- 3 degrees is permitted. However, on a fully oscillating fifth wheel coupling, this angle may be exceeded, providing that the locking mechanism enables the restriction of the rotation to +/- 3 degrees maximum.

62.5.13.4 Locking devices to prevent uncoupling of fifth wheel couplings

The fifth wheel coupling shall be locked in the coupled position by two positive mechanical locking devices each of which shall remain effective should the other fail. The primary locking device shall operate automatically but the secondary locking device may either be automatic or be engaged manually. The secondary locking device may be designed to work in conjunction with the primary device and provide an additional positive mechanical lock for the primary device. It shall only be possible to engage the secondary locking device if the primary device is properly engaged. It shall not be possible for the locking devices to be released inadvertently. Release shall require intentional action by the driver or operator of the vehicle. The closed and locked position of the coupling shall be indicated visually by a mechanical device and it shall be possible to verify the position of the indicator by feel, for example, to allow the position to be checked during darkness. The indication device shall indicate the engagement of both primary and secondary locking devices, however, it is sufficient for the engagement of only one device to be indicated if, in this case, the engagement of the other device is a simultaneous and inherent feature of the design.

62.5.13.5 Operating devices or release mechanisms

In the closed position the operating devices or release mechanisms shall be prevented from being operated inadvertently or accidentally. The locking system shall be such as to require positive, conscious action to release the locking device in order to operate coupling release mechanism.

62.5.13.6 Surface finish

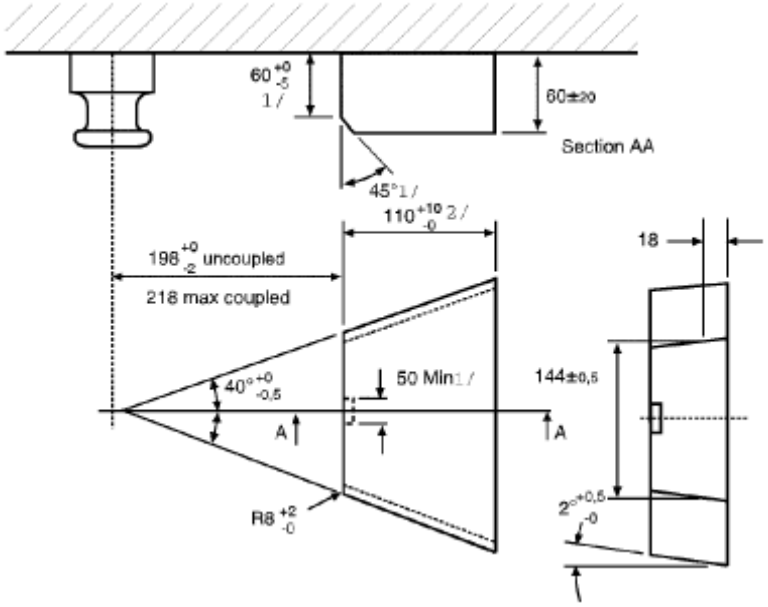
The surfaces of the coupling plate and coupling lock shall be functionally satisfactory and be carefully machined, forged, cast or pressed.

62.5.13.7 Load requirements

All fifth wheel couplings shall be able to satisfy the tests described in paragraph 62.4.3.7.

62.5.13.8 Steering wedges

62.5.13.8.1 The dimensions of steering wedges for the positive steering of semitrailers shall be as in Figure 17.



Notes: 1/ On ...les

2/ This d... edge itself can be longer.

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62.5.13.8.2 The steering wedge shall allow safe and correct coupling and shall be spring-mounted. The strength of the spring shall be selected so that it is possible to couple an unloaded semitrailer and so that, with the semitrailer fully loaded the steering wedge is firmly in contact with the flanks of the coupling during use. Uncoupling of the fifth wheel shall be possible with the semitrailer both loaded and unloaded.

62.5.13.9 Special requirements for standard fifth wheel couplings:

62.5.13.9.1 the dimensions shall be as shown in Figure 16 and Table 9.

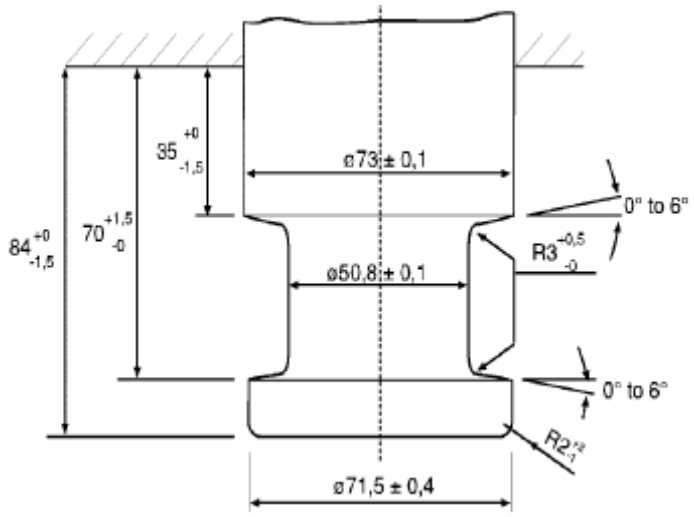
62.5.13.9.2 they shall be suitable for, and tested for, a D value of 150 kN and a U value of 20 t.

62.5.13.9.3 release shall be possible by a hand lever mounted directly on the coupling.

62.5.13.9.4 they shall be suitable for the positive steering of semitrailers by means of steering wedges - see paragraph 62.5.13.8.

62.5.14 Fifth Wheel Coupling Pins

62.5.14.1 Fifth wheel coupling pins of Class H50 (ISO 337) shall have the dimensions shown in Figure 18.



Figu ıs

62.5.14.2 The coupling pins shall be able to satisfy the tests described in paragraph 62.5.13.9.

62.5.15 Mounting Plates

62.5.15.1 Class J mounting plates for fifth wheel couplings shall have circular mounting holes positioned as shown in Figure 16a if they are intended for standard fifth wheel couplings. However, the mounting holes shall be 17 mm +2.0 mm/ -0.0 mm diameter. The holes shall be circular, NOT slotted (see Figure 16a).

62.5.15.2 Mounting plates for standard fifth wheel couplings shall be suitable for the positive steering of semitrailers (with steering

wedges). Mounting plates for non-standard fifth wheel couplings which are unsuitable for positive steering shall be marked appropriately.

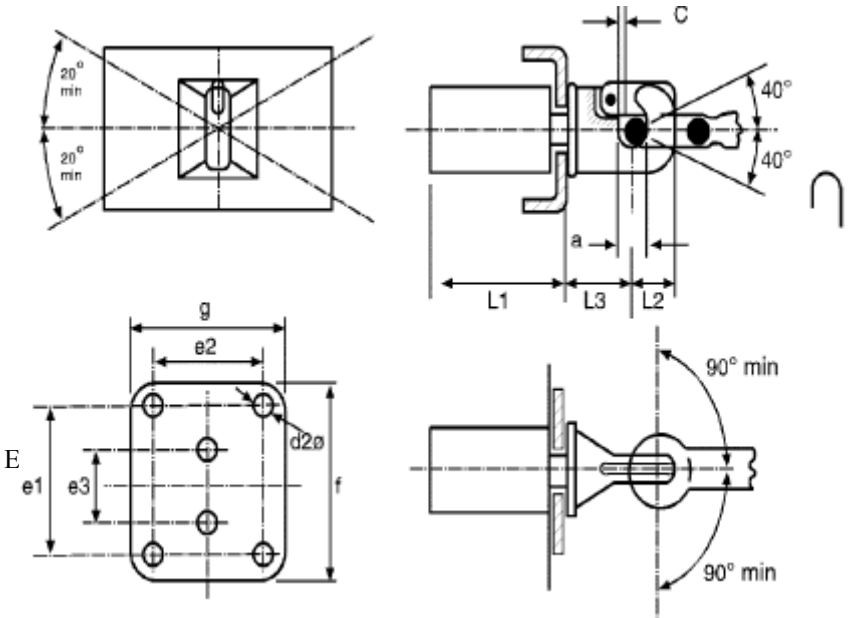
62.5.15.3 Mounting plates for fifth wheel couplings shall be able to satisfy the tests described in annex 62.4.3.8.

62.5.16 Hook Type Couplings

62.5.16.1 General requirements for Class K hook type couplings:

62.5.16.1.1 All Class K hook type couplings shall satisfy the tests given in paragraph 62.4.3.5 and shall be suitable for the characteristic values given in Table 11.

62.5.16.1.2 Class K hook type couplings shall have the dimensions given in Figure 19 and Table 10. Class K1 to K4 are non-automatic couplings for use only on trailers not exceeding 3.5 t maximum permissible mass and Class KA1 to KA3 are automatic couplings.



The official directions are written in Chinese, this E

62 Mechanical coupling device or component:

Figure 19: Dimensions and articulation of Class K hook type couplings

62.5.16.1.3 A hook type coupling shall only be used with a toroidal drawbar eye and when used with a Class L toroidal drawbar eye the Class K coupling shall have the degrees of articulation given in paragraph 62.5.16.2.

62.5.16.1.4 A Class K hook type coupling shall be used with a toroidal eye giving a minimum clearance, or free movement, of 3 mm and a maximum clearance of 5 mm when new. Suitable drawbar eyes shall be declared by the coupling manufacturer on the Communication.

62.5.16.2 A Class K coupling when used with a Class L toroidal eye, but not fitted to a vehicle, shall have the following non-simultaneous angles of articulation - see also Figure 19:

62.5.16.2.1 +/- 90 degrees horizontally about the vertical axis of the coupling;

62.5.16.2.2 +/- 40 degrees vertically about the horizontal transverse axis of the coupling;

62.5.16.2.3 +/- 20 degrees axial rotation about the horizontal longitudinal centre line of the coupling.

62.5.16.3 Automatic Class K hook type couplings shall have a jaw designed such that the drawbar eye is guided into the coupling.

62.5.16.4 Locking to prevent inadvertent uncoupling:

In the closed position the coupling shall be locked by two positive mechanical engagement locking devices each of which shall remain effective should the other fail. The closed and locked position of the coupling shall be clearly indicated externally by a mechanical device. It shall be possible to verify the position of the indicator by feel, for example, in the dark. The mechanical indication device shall indicate the engagement of both locking devices (an AND condition). However, it is sufficient for the engagement of only one locking device to be indicated if, in this situation, engagement of the second locking device is an inherent feature of the design.

62.5.16.5 Hand levers

Hand levers shall be of a design suitable for easy use with the end rounded off. The coupling shall not have any sharp edges or points of possible pinching near the hand lever which could result in injury during operation of the coupling. The force needed to release the coupling, measured without the drawbar eye, shall not exceed 250 N perpendicular to the hand lever along the line of operation.

Table12: Dimensions for Class K hook type couplings

Class	K1	K2	K3	K4	KA1	KA2	KA3	Remarks
e_1	-	83	83	120	120	140	160	+/-0.5
e_2	-	56	56	55	55	80	100	+/-0.5
e_3	90	-	-	-	-	-	-	+/-0.5
d_2	17	10.5	10.5	15	15	17	21	H13
c	3	3	3	3	3	3	3	Min
f	130	175	175	180	180	200	200	Max
g	100	100	100	120	120	140	200	Max
a	45	45	45	45	45	45	45	+1.6/-0.0
L_1	120	120	120	120	250	300	300	Max
L_2	74	74	63	74	90	90	90	Max
L_3	110	130	130	150	150	200	200	Max
D_c kN	-	-	17	20	54	70	90	
S kg	120	120	200	250	700	900	1,000	
V kN	-	-	10	10	18	25	35	

62.5.17 Dedicated drawbar type couplings-class T

62.5.17.1 Class T dedicated drawbar type couplings are intended for use on specific vehicle combinations, for example, car transporters. These vehicles have special structures and may need particular and unusual location of the coupling.

62.5.17.2 Class T couplings shall be restricted to use with centre axle trailers and this restriction shall be notified on the Communication.

62.5.17.3 Class T couplings shall be approved as a matched pair and it shall not be possible to separate the coupling other than in a workshop using tools which are not normally carried on the vehicle.

62.5.17.4 Class T couplings shall not be automatic in operation.

62.5.17.5 Class T couplings shall satisfy the relevant test requirements given in paragraph 62.4.3.3., except paragraph 62.4.3.3.4.

62.5.17.6 The following minimum and simultaneous angles of articulation shall be possible with the coupling not fitted to a vehicle but assembled, and in the same normal position as when fitted to a vehicle;

62.5.17.6.1 +/- 90 degrees horizontally about the vertical axis;

62.5.17.6.2 +/- 8 degrees vertically about the horizontal transverse axis;

62.5.17.6.3 +/- 3 degrees axial rotation about the horizontal longitudinal axis.

62.5.18 Devices for remote indication and remote control

62.5.18.1 General requirements

Devices for remote indication and remote control are permitted only on automatic coupling devices of Classes C50-X and G50-X. Devices for remote indication and remote control shall not interfere with the minimum free movement of the coupled drawbar eye or coupled semitrailer. They shall be permanently fitted to the vehicle. All the devices for remote indication or remote control fall within the scope of testing and approval of the coupling device together with all parts of the operating devices and transmission devices.

62.5.18.2 Remote indication

62.5.18.2.1 For an automatic coupling procedure, remote indication devices shall indicate the closed and doubly locked position of the coupling in an optical manner according to paragraph 62.5.18.2.2. Additionally the open position may be indicated as in paragraph 62.5.18.2.3. The remote indication device shall be automatically activated and reset during every opening and closing of the coupling.

62.5.18.2.2 The change from the open to the closed and doubly locked position shall be indicated by a green optical signal.

62.5.18.2.3 If the open and/or unlocked position is indicated, a red optical signal shall be used.

62.5.18.2.4 In the case of indicating the completion of the automatic coupling procedure, the remote indicator shall ensure that the coupling pin has reached the doubly locked end position.

62.5.18.2.5 The appearance of any fault in the remote indication system shall not indicate a closed and locked position during the coupling procedure if the end position has not been reached.

62.5.18.2.6 The disengagement of one of the two locking devices shall cause the green optical signal to extinguish and the red optical signal (if fitted) to show.

62.5.18.2.7 The mechanical indicators fitted directly to the coupling device shall be retained.

62.5.18.2.8 In order to avoid distracting the driver during normal driving, there shall be a provision for switching off the remote indication device but this shall be automatically reactivated when the coupling is next opened and closed - see paragraph 62.5.18.2.1.

62.5.18.2.9 The operating controls and indicators of the remote indication devices shall be mounted within the driver's field of vision and be permanently and clearly identified.

62.5.18.3 Remote control

62.5.18.3.1 If a remote control device, as defined in paragraph 62.2.8, is employed, there shall also be a remote indication device as described in paragraph 62.5.18.2 which shall at least indicate the open condition of the coupling.

62.5.18.3.2 There shall be a dedicated switch (i. e. master switch, lever or valve) to enable the coupling to be opened or closed by means of the remote control device. If this master switch is not located in the driving cab it shall not be in a position where it is freely accessible to unauthorised persons or it shall be lockable. The actual operation of the coupling from the driving cab may only be possible when inadvertent operation has been precluded, for example by an operation requiring the use of two hands. It shall be possible to ascertain whether opening of the coupling under remote control has been completed or not.

62.5.18.3.3 If remote control involves the coupling being opened by external force, the condition under which the external force acts on the coupling shall be indicated appropriately to the driver. This is not necessary if the external force is only operative while the remote control is operating.

62.5.18.3.4 If the actuating device for opening the coupling under remote control is mounted externally on the vehicle it shall be possible to oversee the area between the coupled vehicles, but it shall not be necessary, however, to enter this area in order to operate it.

62.5.18.3.5 Any single error in operation or the occurrence of any single fault in the system shall not result in accidental opening of the coupling during normal road use. Any faults in the system shall be indicated directly or be immediately obvious at the next operation e.g. by a malfunction.

62.5.18.3.6 In the event of a failure of the remote control it shall be possible, in an emergency, to open the coupling in at least one other way. If this requires the use of a tool then this shall be included in vehicle's tool kit. The requirements of paragraph 62.5.9.6 are not applicable to hand levers used exclusively for opening the coupling in an emergency.

62.5.18.3.7 The operating controls and indicators for the remote control devices shall be permanently and clearly identified.