車輛安全檢測基準第 60 項機械式聯結裝置(草案)

97.3.18 版修

ECE	基準草案
ECE R55 MECHANICAL COUPLING **1. SCOPE** 1.1. This Regulation lays down the requirements which mechanical coupling devices and components shall meet in order to be regarded internationally as being mutually compatible. 1.2. This Regulation applies to devices and components intended for: 1.2.1. motor vehicles and trailers intended to form a combination of vehicles 1/; 1.2.2. motor vehicles and trailers intended to form articulated vehicles 1/, where the vertical load imposed on the motor vehicle by the trailer does not exceed 200 kN. 1.3. This Regulation applies to: 1.3.1. standard devices and components as defined in paragraph 2.3.; 1.3.2. non-standard devices and components as defined in paragraph 2.4.; 1.3.3. non-standard miscellaneous devices and components as defined in paragraph 2.5.	1. 實施時間及適用範圍： 1.1 中華民國九十九年一月一日起，除車輛安全檢測基準第17項所指小型汽車以外之使用於N及O類車輛之新型式機械式聯結裝置，以及中華民國一〇一年一月一日起，除車輛安全檢測基準第17項所指小型汽車以外之使用於N及O類車輛之各型式機械式聯結裝置，應符合本項規定。 1.2 申請少量車型安全審驗或逐車少量車型安全審驗者，得免符合本項「機械式聯結裝置」規定。 1.3 機動車輛及拖車所組成之鉸接式車輛，其拖車施加於機動車輛之垂直負載不超過200kN者，適用本項規定。
2. DEFINITIONS 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.	2. 名詞釋義： 2.1 機械式聯結裝置及其零組件：指在機動車輛及拖車之車身與底盤荷重部位上之部品，使形成聯結車輛或構成與車輛連接之方式。機械式聯結裝置及其零組件之安裝或操作方式皆包含固定或拆卸等方式。
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.	2.2 自動聯結裝置須為拖曳車輛往拖車方向倒車時足以充分嚙合，並自動鎖定，且在沒有任何外在干預下顯示出鎖定裝置已適當嚙合。而鉤狀式聯結器(Hook Type Couplings)自動聯結裝置於掛鉤孔插入掛鉤時，且在沒有任何外在干預下，聯結鎖定裝置應可開啟與閉合。

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.	2.3 標準式機械式聯結裝置及其零組件，係指符合本規定之標準式尺寸及特性值，且在不同製造廠情況下，相同類型內之聯結裝置是可互換的。
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.	2.4 非標準式機械式聯結裝置及其零組件，係指並未符合本規定之所有標準式尺寸及特性值，惟能與相關類型之標準式聯結裝置及零組件聯結。
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.	2.5 其他各式非標準式機械式聯結裝置及其零組件，係指並未符合本規定之標準式尺寸及特性值，且亦無法與標準式聯結裝置及零組件進行聯結。包含未符合名詞釋義2.6所述之類型C至L及T聯結裝置。
2.6. mechanical coupling devices and components are classified according to type as follows:	2.6 機械式聯結裝置及零組件之分類如下：
2.6.3. 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 - see annex 5, paragraph 3.:	2.6.1 類型 C 在拖曳車輛上之掛鉤聯結器(Drawbar Couplings)，具有直徑 50 公釐之銷(Pin)、鉗口(Jaw)及自動閉合與鎖定裝置，用以聯結拖車之掛鉤孔(Drawbar Eye)。
2.6.3.1. Class C50-1 to 50-7 Standard 50 mm pin diameter drawbar couplings.	2.6.1.1 類型 C50-1 至 50-7 標準式直徑 50 公釐之掛鉤聯結器。
2.6.3.2. Class C50-X Non-standard 50 mm pin diameter drawbar couplings.	2.6.1.2 類型 C50-X 非標準式直徑 50 公釐之掛鉤聯結器。
2.6.4. 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 - see annex 5, paragraph 4.:	2.6.2 類型 D 具有一平行孔供直徑 50 公釐聯結銷聯結，並裝設於拖車掛鉤上，用以聯結至自動式掛鉤聯結器之掛鉤孔。
2.6.4.1. Class D50-A Standard 50 mm pin diameter drawbar eyes for welded attachment.	2.6.2.1 類型 D50-A 以焊接方式固定安裝之標準式直徑 50 公釐掛鉤孔。

2.6.4.2. Class D50-B Standard 50 mm pin diameter drawbar eyes for threaded attachment.	2.6.2.2 類型 D50-B 以螺紋方式固定安裝之標準式直徑 50 公釐掛鉤孔。
2.6.4.3. Class D50-C and 50-D Standard 50 mm pin diameter drawbar eyes for bolted attachment.	2.6.2.3 類型 D50-C 及 D50-D 以螺栓方式固定安裝之標準式直徑 50 公釐掛鉤孔。
2.6.4.4. Class D50-X Non-standard 50 mm pin diameter drawbar eyes.	2.6.2.4 類型 D50-X 非標準式直徑 50 公釐聯結銷掛鉤孔。
2.6.5. 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 - see annex 5, paragraph 5. 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.	2.6.3 類型 E 非標準式曳引桿，包含超越裝置(Overrun)或類似之機械設備，安裝在被拖曳車輛前方或車輛底盤上，以提供掛鉤孔、聯結器或類似之聯結裝置適當聯結至拖曳車輛。曳引桿可為鉸鏈式而自由移動於垂直平面且未支撐任何垂直負荷，或為固定於垂直平面，支撐一垂直負荷(Rigid Drawbars；剛性曳引桿)。剛性曳引桿可為完全剛體或撓體裝設。曳引桿可包含一個以上之零組件且可為可調整或迴轉，本法適用於非為被拖曳車輛底盤一部份之曳引桿獨立元件。
2.6.6. 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 – see annex 5, paragraph 6.	2.6.4 類型 F 非標準式拖曳樑(Drawbeams)，包含聯結裝置間所有零組件及裝置，如聯結栓與聯結掛鉤，及拖曳車輛框架(例如：後方橫樑)、荷重部位之車體或底盤。
2.6.7. 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 - see annex 5, paragraph 7.	2.6.5 類型 G 安裝於拖曳車輛之第五輪聯結器(Fifth Wheel Couplings)，係具有自動聯結鎖定之盤式(Plate Type)聯結器，以提供與半拖車上直徑 50 公釐第五輪聯結銷(Fifth Wheel Coupling Pin)結合。
2.6.7.1. Class G50 Standard 50 mm pin diameter fifth wheel couplings.	2.6.5.1 類型 G50 標準式直徑 50 公釐聯結銷之第五輪聯結器。

2.6.7.2. Class G50-X Non-standard 50 mm pin diameter fifth wheel couplings.	2.6.5.2 類型 G50-X 非標準式直徑 50 公釐聯結銷之第五輪聯結器。
2.6.8. 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 - see annex 5, paragraph 8.:	2.6.6 類型 H 安裝於半拖車之直徑 50 公釐第五輪聯結銷，以供與拖曳車輛之第五輪聯結器聯結。
2.6.8.1. Class H50-X Non-standard 50 mm pin diameter fifth wheel coupling pins.	2.6.6.1 類型 H50-X 非標準式直徑 50 公釐第五輪聯結銷。
2.6.9. 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 - see annex 5, paragraph 9.	2.6.7 類型 J 非標準式第五輪座盤(mounting plate)，係指供第五輪聯結器固定至拖曳車輛底盤或車架等之所有零組件及裝置，且其可有水平移動，以構成滑動式(Sliding)之第五輪。
2.6.10. Class K Standard, hook type couplings intended for use with appropriate Class L type toroidal drawbar eyes - see annex 5, paragraph 10.	2.6.8 類型 K 標準式鉤狀聯結器(Hook Type Couplings)主要是與適切之類型 L 環狀掛鉤孔(Toroidal Drawbar Eyes)搭配使用。
2.6.11. Class L Standard toroidal drawbar eyes for use with appropriate Class K hook type couplings - see annex 5, paragraph 4.	2.6.9 類型 L 與適切之類型 K 鉤狀聯結器搭配使用之標準式環狀掛鉤孔。
2.6.12. 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.	2.6.10 類型 S 未符合上述類型 C 至 L 或 T 等之聯結裝置與零組件。
2.6.13. 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.	2.6.11 類型 T 非標準式且非自動式專用掛鉤型聯結器，只可利用工具進行分離之動作，且典型用於車輛運輸之拖車。
2.7. Steering wedges are devices or components mounted on semitrailers which control	2.7.轉向楔形物(Steering Wedges) ：安裝於半拖車上之裝置或零組件，控制

positive steering of the trailer in conjunction with the fifth wheel coupling.	與第五輪聯結器結合之拖車之實際轉向。
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.	2.8.遠端控制系統：使得由車輛側方或駕駛室內操作聯結裝置之裝置及零組件。
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.	2.9.遠端指示器(Remote Indicators)：駕駛室內指示信號，告知聯結已作動及鎖定裝置嚙合狀況之裝置及零組件。
2.11. The characteristic values D, Dc, S, V and U are defined or determined as:	2.10 D、Dc、S、V 及 U 等特性值定義如下：
2.11.1. 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: $D = g\frac{T \cdot R}{T + R} kN$ For mechanical coupling devices and components for centre axle trailers as defined in 2.13, the value is: $D_C = g\frac{T \cdot C}{T + C} kN$ For fifth wheel couplings of Class G, fifth wheel coupling pins of Class H and mounting plates of Class J, as defined in paragraph 2.6., the value is: $D = g\frac{0.6 \cdot T \cdot R}{T + R - U} kN$ 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. 2/ 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. 2/ C is the mass, in t, transmitted to the ground by the axle or axles of the centre axle trailer, as defined in paragraph 2.13., when coupled to the towing vehicle and loaded to	2.10.1 D 或 Dc 值指作用在拖曳車輛與拖車上之水平力量，且在動態測試期間作為水平負載基礎之理論參考值。對於未支撐垂直負載之機械聯結裝置或零組件，其值為： $D = g\frac{T \cdot R}{T + R} kN$ 對於名詞釋義 2.12 所描述之中心軸拖車，其值為： $D_C = g\frac{T \cdot C}{T + C} kN$ 對於名詞釋義 2.6 所描述類型 G 之第五輪聯結器、類型 H 之第五輪聯結銷及類型 J 之座盤等，其值為： $D = g\frac{0.6 \cdot T \cdot R}{T + R - U} kN$ 其中： T：指拖曳車輛之設計允許最大重量(單位：公噸)，且包括中心軸拖車所施加之垂直負載。 R：拖車(其曳引桿於垂直平面自由運動)或半拖車之設計允許最大重量(單位：公噸)。 C：指當聯結拖曳車輛及承載至設計允許最大重量，中心軸拖車(如名詞釋義 2.12 所述)車軸對地面所傳遞之重量(單位：公噸)。對於 O1 類及 O2 類之中心軸拖車，設計允許最大重量係為拖曳車輛製造廠所宣告之值。

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/s2) U is as defined in paragraph 2.11.2. S is as defined in paragraph 2.11.3.	g：重力加速度(以 9.81 m/s^2 引用)。 U：如名詞釋義 2.10.2 之描述。 S：如名詞釋義 2.10.3 之描述。
2.11.2. The U value is the vertical mass, in t, imposed on the fifth wheel coupling by the semitrailer of technically permissible maximum mass 2/.	2.10.2 U 值：垂直重量(單位：公噸)，半拖車施加在第五輪聯結器之設計允許最大重量。
2.11.3. 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 2.13., of technically permissible maximum mass 2/.	2.10.3 S 值：垂直重量(單位：公斤)，中心軸拖車(如名詞釋義 2.12 所述)在靜態下施加於聯結器之設計允許最大重量，。
2.11.4. 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. $V = \frac{a \cdot C \cdot X^2}{L^2}$ (See the Note below) where: 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/s2 For other types of suspension: a = 2.4 m/s2 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)	2.10.4 V 值：設計允許最大重量逾 3.5 公噸之中心軸拖車，施加於聯結器之垂直振幅力量理論參考值。V 值為使用於動態測試之垂直負載基礎。 $V = \frac{a \cdot C \cdot X^2}{L^2}$ 其中： a：為依據拖曳車輛後軸懸吊系統型式所對應於聯結器之垂直加速度。 對於空氣懸吊系統(或懸吊系統採用等同阻尼特性者)：a = 1.8 m/s^2 對於其他型式之懸吊系統者：a = 2.4 m/s^2 X 值：拖車承載區域之長度(單位：公尺)，如圖 1。 L 值：掛鉤孔之中心至軸組中心之距離(單位：公尺)，如圖 1。 注意：$\frac{X^2}{L^2} \geq 1.0$ (未滿 1.0 之場合，則以 1.0 計)

Note: $\frac{X^2}{L^2} \geq 1.0$

(If less than 1.0, the value of 1.0 shall be used)

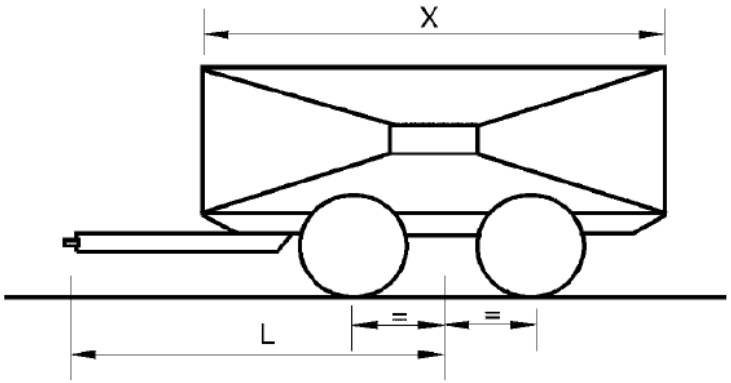


Figure 1
Dimensions of the centre axle trailer

2.12 Symbols and definitions used in annex 6 of this Regulation.

Av = maximum permitted axle mass of the steered axle in t.

C = mass of centre axle trailer in t - see paragraph 2.11.1. of this Regulation.

D = D value in kN - see paragraph 2.11.1. of this Regulation.

Dc = Dc value in kN for centre axle trailers - see paragraph 2.11.1. of this Regulation.

R = mass of towed vehicle in t - see paragraph 2.11.1. of this Regulation.

T = mass of towing vehicle in t - see paragraph 2.11.1. 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 2.11.4. of this Regulation.

a = equivalent vertical acceleration factor at the coupling point of centre axle trailers

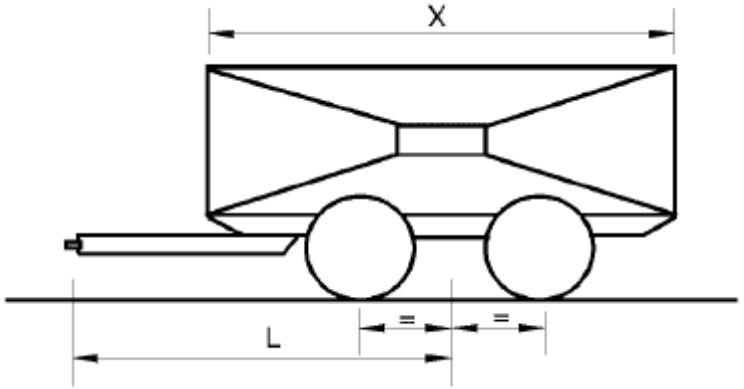


圖 1.中心軸拖車之尺寸

2.11.使用符號與定義：

Av=轉向軸之設計最大容許軸重(單位：公噸)。

C =中心軸拖車之重量(單位：公噸)，如名詞釋義 2.10.1 所述。

D =D 值(單位：kN)，如名詞釋義第 2.10.1 所述。

Dc=中心軸拖車之 Dc 值(單位：kN)，如名詞釋義第 2.10.1 所述。

R =拖車之重量(單位：公噸)，如名詞釋義 2.10.1 所述。

T =拖曳車輛之重量(單位：公噸)，如名詞釋義 2.10.1 所述。

Fa=靜態舉升力(Lifting Force) (單位：kN)。

Fh=車輛縱軸上測試力量之水平分力(Horizontal Component) (單位：kN)。

Fs=測試力量之垂直分力(Vertical Component) (單位：kN)。

S =靜態垂直重量(單位：公斤)。

U =施加在第五輪之垂直重量(單位：公噸)。

V = V 值(單位：kN)，如名詞釋義 2.10.4 所述。

a =依據拖曳車輛後軸懸吊系統型式所對應於聯結器之垂直加速度，如名詞釋義 2.10.4 所述。

e =在可拆離式聯結栓之聯結點與固定點之垂直平面間之縱向距離 (單位：公釐)。

f =在可拆離式聯結栓之聯結點與固定點垂直面間之縱向距離(單位：公釐)。

depending on the type of suspension of the rear axle(s) of the towing vehicle – see paragraph 2.11.4. 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/s2. 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	g =為重力加速度，假設為 9.81 m/s^2。 L =在掛鉤孔中心與軸組中心間之理論曳引桿長度(單位：公尺)。 X =中心軸拖車之承載區域長度(單位：公尺)。 下標符號說明： O =最大測試力量。 U =最小測試力量。 a =靜態力量。 h =水平。 p =振動(Pulsating)。 res =合力(Resultant)。 s =垂直。 w =交變力(Alternating Force)。
2.13. "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 4/.	2.12.中心軸拖車(Centre Axle Trailer)：當均勻承載時，其有無法獨立於拖車而在垂直平面移動之曳引桿，且配置有單軸或多軸於近拖車重心處。施加在拖曳車輛聯結器之垂直負荷應不逾拖車最大重量之 10%或 1,000 kg，以較低者為主。中心軸拖車之最大重量係指當聯結至拖曳車輛且承載設計允許最大重量時，其拖車單軸或多軸所傳遞至地面之總重量。

2.14. "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.	2.13.完全機械嚙合(Positive Mechanical Engagement)：指聯結裝置及其零組件之設計及幾何在正常使用或測試階段時，受任何力量或分力等作用下，不會開脫或分離。
2.10. "type of coupling device or component" means a device or component which does not differ in such essential respects as: 2.10.1. the manufacturer's or supplier's trade name or mark; 2.10.2. the class of coupling as defined in paragraph 2.6.; 2.10.3. the external shape, principal dimensions or fundamental difference in design including materials used; and 2.10.4. the characteristic values D, Dc, S, V and U as defined in paragraph 2.11.	3. 聯結裝置或零組件之適用型式及其範圍認定原則： 該裝置或零組件對於以下特點應無差異性產生。 3.1 製造廠廠牌相同。 3.2 聯結裝置類型相同。 3.3 外部形狀、主要尺寸或基本設計(包含使用材料)相同。 3.4 D、Dc、S、V 及 U 等特性值(characteristic values)相同。
Annex 6 **TESTING OF MECHANICAL COUPLING DEVICES OR COMPONENTS** **1. GENERAL TESTING REQUIREMENTS** 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 4.8 of this Regulation.	4. 機械式聯結裝置或零組件之測試規定 4.1 一般測試規定 4.1.1 聯結裝置之試件應進行強度及功能之測試，除規定中另有明述該零組件可進行理論查檢而得免進行實品強度測試外，其餘皆應執行實品測試。可利用理論查檢而決定各嚴苛受測件條件，且在所有情況下，理論查檢應確保與動態或靜態試驗結果相同之特性，請參閱 5.7 之規定。
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 3 of this annex).	4.1.2 聯結裝置之強度應由動態試驗(耐久試驗)驗證，並在某些情況下，增加靜態測試是必要的(參考 4.3 規定)。
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.	4.1.3 動態試驗應以近似正弦曲線負載(交變及/或振動負載)對其材料執行適當應力循環次數，測試件不得有破裂或斷裂。
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	4.1.4 在測試過程之變形量量測有安全性考量時，若其他試驗如動態試驗過程中，有查檢相同參數，則可省略靜態試驗中此部分作業。

% 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.	
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.	4.1.5 動態試驗之負載設定，係以車輛縱軸之水平分力與垂直分力為基礎，水平分力橫斷於車輛縱軸，而若力矩僅有些微影響，則不納入考量基礎。若聯結裝置、其與車輛聯結之部件或附屬系統之聯結部件(如：穩定裝置、封閉式聯結裝置(Close-Coupling Device)等)設計上會產生之附加力量或力矩，則由檢測機構決定其額外之測試。理論決定之參考力量(D 或 Dc 值)係代表車輛縱軸之水平分力，垂直分力係由靜態垂直負載 S 值表示(在聯結點)及假設之垂直負載 V 值表示，或為第五輪聯結器之靜態負載 U 值)。
1.6. The characteristic values D, Dc, S, V and U, on which the tests are based and which are defined in paragraph 2.11. of this Regulation, shall be taken from the manufacturer's information given in the application for type approval - see communication form shown in annexes 1 and 2.	4.1.6 D、Dc、S、V 及 U 特性值應由申請者提供。
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.	4.1.7 任何完全鎖定裝置(由彈簧力保持定位)，當施力於機械鎖定裝置最不利方向之本身重量 3 倍力量時，應保持於鎖定位置。
2. TEST PROCEDURES 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	4.2 測試程序 4.2.1 對於動態及靜態試驗，測試件應安裝在合適之設備上受力，避免測試力量規定以外之任何附加力量或力矩。在交變試驗時，施加力量之方向不得超過規定方向正負 1 度以上。在振動和靜態試驗時，應設定最大測試力量之角度。此通常需要一個在施力點(即聯結點)的接頭(Joint)和在與之適當

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.	距離處之第二個接頭。
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 10^6. 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.	4.2.2 測試頻率不應超過 35 Hz，選擇之頻率應與含試驗件之試驗設備共振頻率明確區隔。施加兩個分力之非同步測試時，其兩分力之頻率應間隔 1 % 至 3 %。對於鋼製材質所組成之聯結裝置，其應力循環次數為 2 x 10^6，惟鋼製以外材質所組成之聯結裝置，必要時應以更多之循環來進行，且應使用破壞測試之染料浸透法或等同方式來判定測試期間測試件破裂現象。
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.	4.2.3 振動試驗時，除已指定特殊測試程序者外，其試驗力之變化應介於最大及最小施力，且測試力量不大於最大施力之 5 %。
2.4. With static tests, other than the special tests required by paragraph 3.2.3 of this annex, the test force shall be applied smoothly and quickly and be maintained for at least 60 seconds.	4.2.4 除 4.3.2 規定特殊測試外，靜態試驗時，施力應平穩、迅速及至少維持 60 秒。
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.	4.2.5 聯結裝置或零組件在測試時應依車上實際位置正常固定於測試設備上，且固定裝置應由申請者宣告為聯結裝置裝設於車輛之配件所需，及/或應有一致之機械特性。
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.	4.2.6 聯結裝置或零組件，應依使用於道路上之型態進行測試。惟在製造廠考量與檢測機構同意之下，撓性零組件可視測試程序之需要調整，惟對測試結果應無任何不符實況之影響。撓性零組件在加速測試過程中會出現過熱者，可在測試中更換。測試負荷可藉由特殊緩衝和防止裝置施加。

3. SPECIFIC TESTING REQUIREMENTS

3.2.2. 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 23). 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.

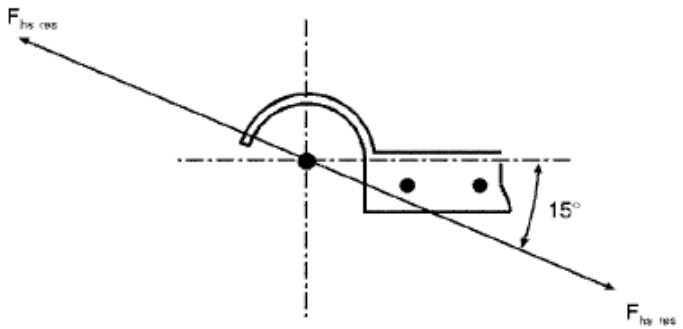


Figure 23
Dynamic test

3.2.3. A static separation test shall also be performed. The coupling ball used for the test shall have a diameter of 49.00 to 49.13 mm in order to represent a worn coupling ball. The separation force, Fa, shall be 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

4.3特定測試規定(Specific Testing Requirements)

4.3.1動態試驗：在測試設備上之試件應配置在製造廠宣告之正常使用狀況下相對位置上，且除了作用在試件上之測試力量外，應該無其他任何附加外力。試驗時之施力點，以通過試件中心點及往後方15度向下斜線方向施加(如圖2所示)。在試件上應以下述之力量為測試要求：

$F_{hs\ res\ w}$ ＝ ± 0.6D

最大之設計靜態垂直重量S超過120 D時，允許其試驗之角度增為20度。

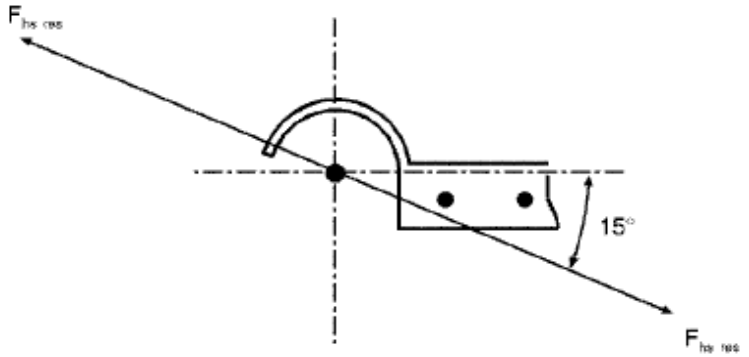


圖 2. 動態試驗之施力角度示意圖

4.3.2靜態分離試驗：分離力F_a 應垂直於試件橫斷面及縱軸線，且應迅速及平穩增加施力，並至少維持10秒以上。

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

聯結裝置之間不應有分離現象，且不能有對其功能產生任何影響之永久變形。

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.	
3.3. Drawbar couplings and drawbeams 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. 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. 3.3.3. Drawbar couplings for use with centre-axle trailers (S>0). 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 3.1 of this annex. 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	4.3.3 掛鉤聯結器及拖曳樑(Drawbar Couplings And Drawbeams) 4.3.3.1耐久性試驗應以測試件執行，且聯結裝置應利用所需固定配件裝設聯結至車輛上，並應就掛鉤聯結器和車輛間裝設之任一中介裝置以相同於聯結裝置之力量進行測試。當測試標準式掛鉤聯結器之拖曳樑時，垂直負荷之施力點應為與固定點所在垂直平面相一段縱向距離處，且該固定點為所搭配之標準式聯結器位置。 4.3.3.2絞鏈式曳引桿之掛鉤聯結器(Drawbar Couplings For Hinged Drawbars) (S=0) 動態試驗應以$F_{hw}=\pm$ 0.6D之水平交變力作用在平行地面之水平線及通過聯結銷中心之拖曳車輛縱向軸中心面上進行測試。 4.3.3.3使用於中心軸拖車之掛鉤聯結器(Drawbar Couplings For Use With Centre-Axle Trailers) (S>0)。 4.3.3.3.1總重量3.5公噸(含)以下之中心軸拖車： 使用於總重量3.5公噸以下中心軸拖車之掛鉤聯結器應依4.3.1至4.3.2描述之方式進行測試。 4.3.3.3.2總重量逾3.5公噸之中心軸拖車： 在非同步耐久測試裡，對測試件施加水平及垂直方向測試力量。水平分力應近平行於地面及沿著拖曳車輛之縱向中心面通過聯結銷之中心，而垂直分力應垂直於水平分力，且應沿著聯結銷之縱向中心線施加。裝設在設備上之掛鉤聯結器與掛鉤孔，其固定點配置應依製造廠宣告之安裝說明聯結。其施加測試力量如表1所述。 表 1. 負載試驗對照表

instructions.

The following test forces shall be applied:

TABLE 14 - 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 +/-0.5D_c 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 %.

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.

測試力量	平均值(Mean Value)(kN)	振幅(kN)
水平分力	0	+/-0.6Dc(參備註)
垂直分力	Sxg/1000	+/-0.6V(參備註)

備註：類型T專用掛鉤聯結器之振幅值應降至+/-0.5Dc(水平分力)及+/-0.5V(垂直分力)。垂直及水平分力應為正弦曲線且非同步施加，兩者頻率差應為1%~3%。

4.3.3.4聯結銷鎖定裝置之靜態試驗(Static Test On Coupling Pin Locking Device)

掛鉤聯結器也應施以0.25D之靜態力量測試其閉合及任何鎖定裝置。測試結果不應使閉合變成開啟且不應有任何損壞產生。對於圓柱狀聯結銷之測試力量為0.1 D。

3.4. Drawbar eyes

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 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 3.2) for trailer masses C up to and including 3.5 t and in the same way as drawbar couplings (paragraph 3.3.3.2.) for centre axle trailers with a mass, C, exceeding 3.5 t.

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

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.

4.3.4 掛鉤孔(Drawbar Eyes)

4.3.4.1掛鉤孔應承受與掛鉤聯結器相同之動態試驗。在垂直方向自由運動者，僅供使用於具有允許垂直移動絞鏈式曳引桿之拖車掛鉤孔，其應承受4.3.3.2所述之交變力。適用在總重量C 3.5公噸以下中心軸拖車之掛鉤孔應以4.3.1及4.3.2節進行測試，適用在總重量C逾3.5公噸中心軸拖車之掛鉤孔應以4.3.3.3.2節進行測試。

4.3.4.2類型 L之環狀掛鉤孔應以標準式掛鉤孔測試方式進行相同測試。

4.3.4.3掛鉤孔之測試應以交變力方式執行，並作用在與曳引桿配接之掛鉤孔上，且所有中間之易彎曲部分應予以固定。

3.5. Hook type couplings

3.5.1. Class K hook type couplings shall satisfy the dynamic test given in paragraph 3.5.2 of this annex.

4.3.5 鉤狀式聯結器(Hook Type Couplings)

4.3.5.1類型 K之鉤狀式聯結器應符合4.3.5.2之動態試驗規定。

4.3.5.2動態試驗

3.5.2. Dynamic test:

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;

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;

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 21), 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:

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

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

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.

4.3.5.2.1動態試驗應使用類型 L之環狀掛鉤孔及安裝於車輛上之聯結器與所有必要之車輛安裝零組件進行振動試驗，惟任何撓性元件可經由檢測機構同意後得以調整。

4.3.5.2.2搭配絞鏈式曳引桿拖車之鉤狀式聯結器，其施予聯結器之垂直負載S為零，測試力量應施加在聯結鉤上且以水平方向模擬張力，該力量介於0.05D及1.00D間。

4.3.5.2.3對於使用在中心軸拖車之鉤狀式聯結器，測試力量應為聯結器上水平及垂直分力之合力，且應沿著-α 角度(從前方上端至後方下端(如圖3)，其等同於聯結器上水平及垂直分力間計算合力之角度，$F_{hs\,res}$計算方式如下所示：

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

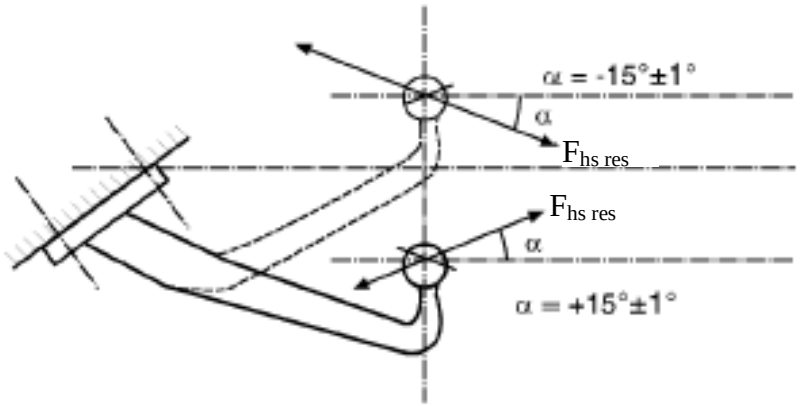


圖 3. 測試力量之應用角度示意圖

4.3.5.2.4所施加之力量應介於$0.05F_{hs\,res}$及$1.00F_{hs\,res}$間變化。

4.3.5.3聯結鎖定裝置之靜態試驗(Static Test On Coupling Locking Device)

對於鉤狀式聯結器，應藉由0.25D靜態力量作用在聯結器開啟方向，測試其閉合及任何鎖定裝置，該試驗結果不應使閉合變成開啟，且不應造成任何損壞。

3.6. Drawbars 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 2.11.4. 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. 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. 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)	4.3.6 曳引桿(Drawbars) 4.3.6.1曳引桿應以掛鉤孔相同方式進行測試(如4.3.4)。如果零組件之測試件設計強度可執行理論性查驗，則檢測機構可省略耐久試驗。總重量C 3.5公噸(含)以下中心軸拖車之曳引桿，其理論力量應取自ISO 7641/1:1983，而總重量C逾3.5公噸中心軸拖車之曳引桿，其理論力量應由下述方式計算： $F_{sp} = (g \times S/1000) + V$ V值係指名詞釋義2.11.4所述之振動力量。以設計重量為基礎之總量量逾3.5公噸之拖車允許應力，且應依據ISO 7641/1:1983第5.3節所述。對於鵝頸狀曳引桿及全拖車(full trailers)曳引桿，應考慮水平分力$F_{hp} = 1.0\ D$。 4.3.6.2對於全拖車上可自由移動於垂直平面之曳引桿，除耐久試驗或強度理論計算驗證，其撓曲(Buckling)阻抗也應以進行3.0D設計力量之理論計算或3.0D力量撓曲試驗等方式之一驗證，且計算方式之允許應力應依據ISO7641/1:1983第5.3節所規定。 4.3.6.3轉向軸之彎曲(Bneding)阻抗應由理論計算或彎曲試驗證明，且水平側向靜態力量應施加在聯結點之中心，力量強度應選擇以施加力矩0.6 Av g (kNm)於前軸中心，允許應力應依據ISO7641/1:1983第5.3節所規定，惟對於前雙軸車輛之力矩應增加至0.95 Av g (kNm)。
3.7. Fifth wheel couplings 3.7.1. The basic strength tests are a dynamic test and a static test (lifting test). Fifth wheel	4.3.7 第五輪聯結器 4.3.7.1基本強度試驗係指動態試驗及靜態試驗(舉昇試驗)。搭配半拖車

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.

3.7.2. Static tests

3.7.2.1. Standard fifth wheel couplings designed for a steering wedge or similar device for the positive steering of semitrailers (see paragraph 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.

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

(Semitrailers)完全轉向之第五輪聯結器應承受靜態試驗(彎曲試驗)，且為達測試之目的，第五輪聯結器應與所有需要之固定配件裝設至車輛上，安裝方法應與實際使用於車輛上相同，不允許以計算方法替代實品試驗。

4.3.7.2靜態試驗

4.3.7.2.1設計搭配轉向楔形物或類似半拖車完全轉向裝置(參閱名詞釋義2.7所述)之標準式第五輪聯結器，應在轉向裝置隨著第五輪負荷同步施加之工作範圍內，藉由靜態彎曲試驗之適當力量進行測試，且第五輪最大允許施加之垂直負載U應垂直施加在操作位置之聯結器 (利用足夠尺寸之硬板完全覆蓋聯結器)。其施加負載之合力應通過第五輪聯結器之水平接頭中心點，同時，水平側向力量代表半拖車完全轉向時，導引側緣側向之力量應施加在聯結銷，且該力量之大小及作用方向應為使0.75m D之力矩作用於聯結銷中心，且係藉由力量作用在0.5m ± 0.1m長之槓桿臂上。允許標稱尺寸0.5%以下之永久塑性變形量，且不得有任何斷裂之現象。

4.3.7.2.2靜態舉升試驗(Lifting test)應執行在所有第五輪聯結器，且在Fa = gU之向上舉升力施加之下不應造成接合板(Coupling plate)任何明顯永久彎曲量超過其寬度之0.2%。類型G50之標準式第五輪聯結器及相同聯結銷直徑之聯結器，其施以$F_a = g \times 2.5U$舉升力之下不應聯結銷自聯結器有任何分離。使用直徑逾50公釐之聯結銷之非標準式聯結器(例如：直徑90公釐聯結銷之聯結器)，其舉升力應為$F_a = g \times 1.6U$，至少為500 kN，應以一端固定在接合板之槓桿臂，在距離聯結銷中心1.0～1.5公尺舉升末端，如圖4所示。槓桿臂應與聯結銷進入聯結器之方向成90度，若已知嚴苛條件，則以該條件進行測試，惟若嚴苛條件不易決定時，則由檢測機構決定其一測試條件。

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 24. 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.

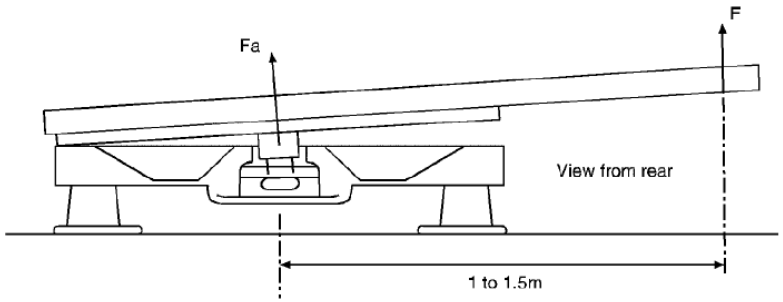


Figure 24
Lifting test on fifth wheel couplings

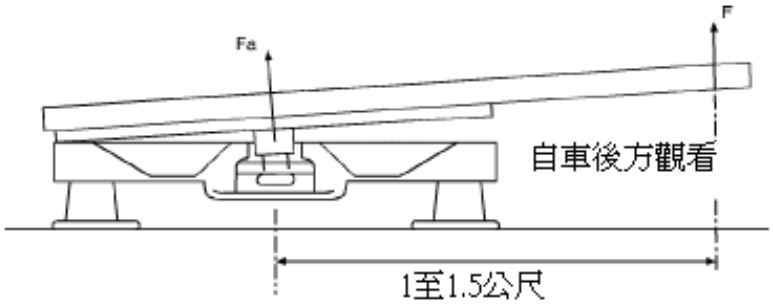


圖 4. 第五輪聯結裝置之舉升試驗示意圖

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.

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.

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

4.3.7.3動態試驗

第五輪聯結器應在測試設備上以水平交變力及垂直振動力同時作用之交變應力進行測試(非同步動態測試)。

4.3.7.3.1對於半拖車非搭配完全轉向之第五輪聯結器，應使用下述力量進行測試：

水平交變力：$F_{hw} = \pm 0.6 \times D$

垂直振動力：$F_{sO} = g \times 1.2\ U$

$F_{sU} = g \times 0.4\ U$

該二力量應施加在車輛縱軸中心面，使F_{sO} 及 F_{sU}兩力量作用線通過聯結器接頭之中心。其垂直力F_s為介於$+g \times 1.2\ U$及$+g \times 0.4\ U$之間交變，水平力為$\pm 0.6\ D$之間交變。

4.3.7.3.2對搭配完全轉向半拖車之第五輪聯結器，應使用下述力量進行測試：

水平交變力：$F_{hw} = \pm 0.675 \times D$

垂直振動力：F_{sO} 及 F_{sU}，如第4.3.7.3.1節所示

Vertical: FsO and FsU as in paragraph 3.7.3.1. The lines of action of the forces are as given in paragraph 3.7.3.1. 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.	施力之作用線同第4.3.7.3.1節所示。 4.3.7.3.3第五輪聯結器之動態試驗，適當潤滑材質應塗抹在聯結裝置接合板與拖車座板(Trailer plate)間，使最大摩擦係數為：mu< 0.15。
3.8. Mounting plates for fifth wheel couplings The dynamic test for fifth wheel couplings described in paragraph 3.7.3. and the static tests described in paragraph 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.	4.3.8 第五輪聯結器之座盤(Mounting Plates For Fifth Wheel Couplings) 有關前述 4.3.7.3 第五輪聯結器之動態試驗及前述 4.3.7.2 之靜態試驗亦應適用於座盤測試。僅執行一側之舉升測試即以足夠，且該項試驗應以聯結器最大設計安裝高度、座盤之最大設計寬度及最小設計長度為基準。若與已獲認證之座盤規格一致者，得免執行測試，惟較窄及/或較長、總高度較低者除外。不允許以理論計算方法取代實品測試。
3.9. Fifth wheel coupling pins of semitrailers 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. 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 (see annex 5, Figure 18).	4.3.9 半拖車之第五輪聯結銷(Fifth Wheel Coupling Pins Of Semitrailers) 4.3.9.1交變應力之動態試驗應在測試設備上之測試件執行，聯結銷之測試不應與第五輪測試結合執行，應使測試力施加在聯結銷配接至半拖車之固定處，且不允許以理論計算方法取代實品測試。 4.3.9.2以F_{hw}=± 0.6 D之水平交變力進行動態試驗，應作用於在使用位置之聯結銷，作用力應通過直徑50.8公釐之類型 H50聯結銷圓柱最小直徑之中心(如圖18)。
4.1. 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	5. 機械式聯結裝置之一般規定 5.1 每一測試件均應符合條文 4.及 5.之尺度及強度規定，且依 4.規定之測試後，不應有任何破裂、斷裂或有損於其正常操作之過度且永久扭曲。

satisfactory operation of the device or component.	
4.2. 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.	5.2 機械聯結裝置或零組件因失效會導致車輛與拖車分離等狀況產生者，應使用「鋼製」材料；若使用其他材料，申請者應向檢測機構提出防止失效而分離之佐證。
4.3. 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.	5.3 機械式聯結裝置或零組件應可由一個人在未使用工具下完成安全操作、聯結及脫開等動作，且除類型 T 聯結器外，自動聯結器僅允許用於設計最大重量逾 3.5 公噸拖車之聯結。
4.4. 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.	5.4 機械式聯結裝置或零組件應設計及製造使於正常使用、正確保養及磨耗零件更換下，功能持續正常且保持所規定之特性。
4.5. 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 annex 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 annex 6. Positive mechanical engagement shall be as defined in paragraph 2.14. 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.	5.5 所有機械式聯結裝置或零組件，應設計使能完全機械嚙合(positive mechanical engagement)，以及除非章節 5.有其他規定，閉合位置應至少一次由更進一步之完全機械嚙合而鎖定。可兩個或更多之個別配置，以確保裝置之完整性，惟每個配置應設計具有完全機械嚙合且應依 4.規定個別測試，完全機械囓合定義如名詞釋義 2.13。彈簧力量可僅被使用於閉合聯結裝置，及防止振動使聯結裝置之元件或零組件移動位置而產生開啟或鬆脫，且任何一個彈簧的失效或省略應不得產生聯結裝置之開啟或鬆脫。
4.6. Every device or component shall be accompanied by installation and operating	5.6 各聯結裝置或零組件應附有安裝及操作說明書，以提供充分資訊使任

instructions giving sufficient information for any competent person to install it correctly on the vehicle and operate it properly - see also annex 7. 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.	何一位技師正確安裝於車輛上及正常操作，如車輛安全檢測基準第 2 項車輛規格規定之 7.7 所述。操作說明書應至少具備中文，若聯結裝置和零組件是交由車輛製造廠或車體打造廠所配備安裝時，車輛製造廠或車體打造廠應確保提供車輛操作員關於聯結裝置或零組件正確操作之說明文件。
4.8. For heavy duty and other non-standard miscellaneous coupling devices or components, Class S and Class T, the relevant requirements in annexes 5, 6 and 7 for the closest standard or non-standard device or component shall be used.	5.7 重型及其他非標準式混雜聯結裝置或零組件之類型 S 及類型 T，應符合 4.、5 及車輛安全檢測基準第 2 項車輛規格規定之 7.7 等接近之標準式或非標準式之要求。
Annex 6 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.	5.8 靜態試驗後，僅允許輕微永久變形之產生。除非規定中另有明述，否則永久塑性變形不應逾測試期間最大變形量之 10 %。
Annex 5 **REQUIREMENTS FOR MECHANICAL COUPLING DEVICES OR COMPONENTS** 3. DRAWBAR COUPLINGS The requirements of paragraphs 3.1. to 3.6. 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 3.7.	5.9 掛鉤聯結器(Drawbar Couplings) 5.9.1 至 5.9.6 之規定係適用於所有類型 C50 之掛鉤聯結器，且標準式類型 C50-1 至 C50-6 之掛鉤聯結器必須滿足 5.9.7 之額外規定。
3.1. Performance requirements - All drawbar couplings shall be able to satisfy the tests stated in annex 6, paragraph 3.3.	5.9.1 性能要求： 所有掛鉤聯結器應能滿足 4.3.3 節之測試。
3.2. Suitable drawbar eyes - Class C50 drawbar couplings shall be compatible with all Class D50 drawbar eyes and couplings with the specified characteristics.	5.9.2 適當之掛鉤孔(Suitable Drawbar Eyes) 類型 C50 之掛鉤聯結器應與類型 D50 之掛鉤孔相容，且符合所規定之特性。
3.3. Jaw	5.9.3 鉗口(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 form shown in annex 1.	類型 C50 之掛鉤聯結器應設計有一適當之鉗口以引導掛鉤孔進入聯結器。如果鉗口或支撐鉗口之元件可旋轉於垂直軸，則應能自我自動定位在正常位置，及聯結銷開啟之下，在聯結過程中被有效地限制在此位置上，使掛鉤孔得以被正確導引進入。如果鉗口或支撐鉗口之元件可旋轉於水平橫軸，則旋轉接頭(Joint)應藉由鎖定扭矩限制在正常位置，該扭矩應足以防止 200 N 之力量向上垂直作用於鉗口上部而產生接頭之任何偏移。鎖定扭矩應大於 5.9.6 所述手桿之操作力，且應可使鉗口被手動回復至正常位置。旋轉於水平橫軸之鉗口，僅 S 荷重≦50 公斤及 V 值≦5 kN 得以申請認證。 若鉗口或支撐鉗口之元件是旋轉於縱軸，則該旋轉角度應受至少 100 Nm 之鎖定扭矩限制，鉗口最小尺寸係依聯結器下述 D 值規定： D 值< 18 kN – 寬度 150 mm,高度 100 mm D 值> 18 kN < 25 kN -寬度 280 mm,高度 170 mm D 值> 25 kN -寬度 360 mm,高度 200 mm 鉗口之外部邊角可為圓弧導角。 若為限制使用在設計最大總重量 3.5 公噸以下中心軸拖車之類型 C50-X 聯結器、或因技術性原因使鉗口無法符合上述列表，且有特殊使用環境如有確認安全執行自動聯結程序之視覺輔助工具及使用範圍是依聯結器製造廠文件資料而受限，則可允許使用較小之鉗口。
3.4. Minimum articulation of the coupled drawbar eye The drawbar eye, when coupled to a drawbar coupling but not fitted to a vehicle, shall have	5.9.4 聯結掛鉤孔之最小聯結角度範圍 聯結掛鉤孔當聯結至非安裝在車輛上之掛鉤聯結器時，應符合下列聯

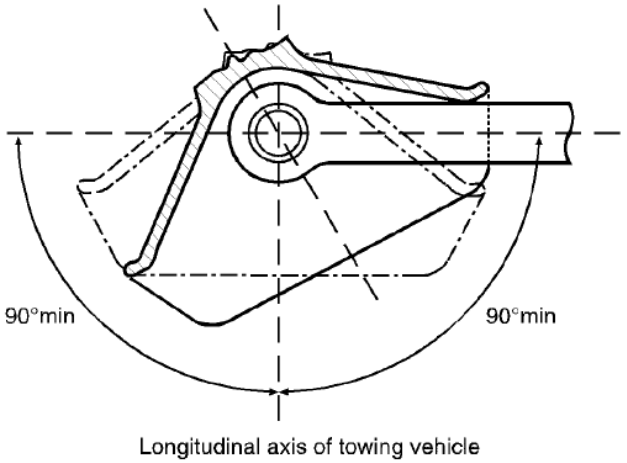
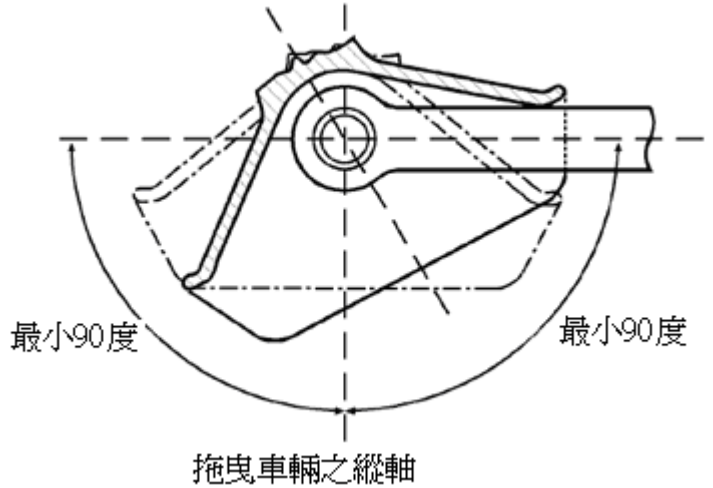
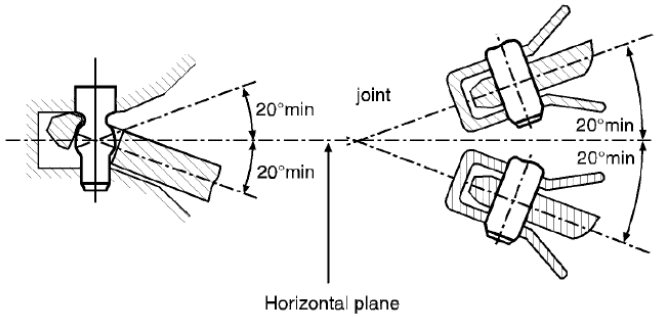
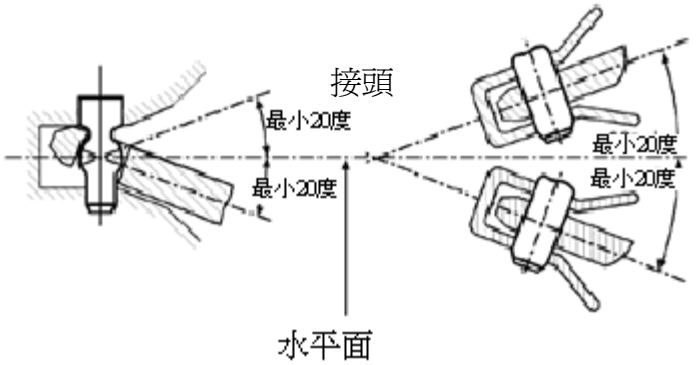
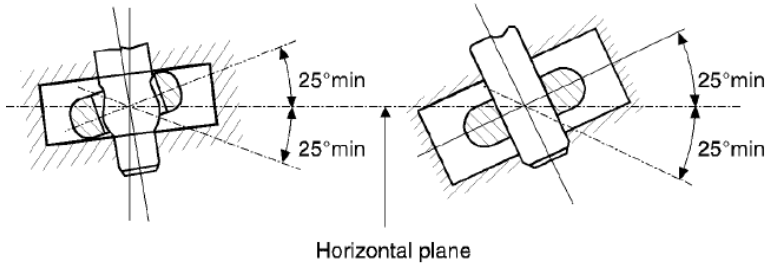
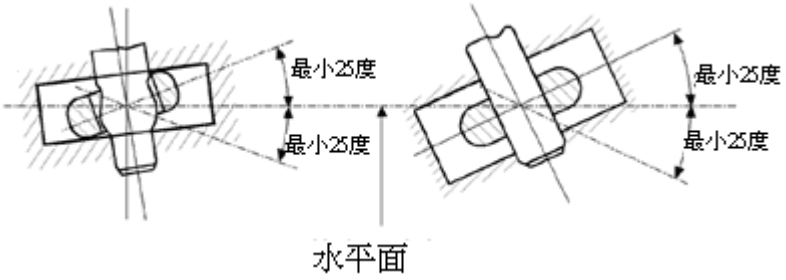
the degrees of articulation given below. If part of the articulation is provided by a special joint (Class C50-X drawbar couplings only), the field of application, given in the communication form shown in annex 1, shall be restricted to the cases stated in annex 7, paragraph 1.3.8.	結角度之規定。若聯結元件係為特殊接頭 (僅為類型 C50-X 掛鉤聯結器)，其適用範圍應受限於車輛安全檢測基準第 2 項車輛規格規定之 7.7.3.1.8 規定。
3.4.1. +/- 90 degrees horizontally about the vertical axis from the longitudinal axis of the vehicle - see Figure 5.  **Figure 5** **Horizontal rotation of the coupled drawbar eye**	5.9.4.1 自車輛縱軸，繞垂直軸水平左右移動為正負 90 度，如圖 5 所述。  圖 5. 聯結後掛鉤孔之水平旋轉示意圖
3.4.2. +/- 20 degrees vertically about the transverse axis from the horizontal plane of the vehicle - see Figure 6.  **Figure 6** **Vertical rotation of the coupled drawbar eye**	5.9.4.2 自車輛水平面，繞橫軸垂直上下移動為正負 20 度，如圖 6 所述。 

	圖 6. 聯結後掛鉤孔之垂直旋轉示意圖
3.4.3. +/- 25 degrees axial rotation about the longitudinal axis from the horizontal plane of the vehicle - see Figure 7.  **Figure 7** **Axial rotation of the coupled drawbar eye**	5.9.4.3 自車輛水平面，於縱軸軸向旋轉為正負 25 度，如圖 7 所述。  圖 7. 聯結後掛鉤孔之軸向旋轉示意圖
3.5. Locking to prevent inadvertent uncoupling: 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.	5.9.5 安全鎖 聯結銷在閉合位置應由兩個完全機械式嚙合鎖定裝置鎖定，且其中一個失效時，另一個應保持有效作動。聯結器之閉合及鎖定位置應清楚指示於外部機械裝置，並應可以由手觸摸確認指示器之位置(例如在黑暗中)。機械指示器裝置應同時指示兩個鎖定裝置之嚙合情況，若第二個鎖定裝置之作動是固定不變時，則指示第一個鎖定裝置之狀況即足夠。
3.6. 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.	5.9.6 手桿 手桿應適當設計易於使用，並不得有銳邊導角及可能導致操作中受傷之尖銳邊緣，且沿操作方向、垂直於手桿釋放聯結器之釋放力，在無掛鉤孔之下量測時，應不超過 250 N。
3.7. Special requirements for standard drawbar couplings of Class C50-1 to C50-6: 3.7.1. The swivel motion of the drawbar eye about the transverse axis must be achieved	5.9.7 類型 C50-1～C50-6 掛鉤聯結器之特殊規定 5.9.7.1 以橫軸為中心之掛鉤孔旋轉運動，必須透過聯結銷的球狀體

through the spherical shape of the coupling pin (and not by means of a joint);

3.7.2. 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).

3.7.3. The dimensions shall be as given in Figure 8 and Table 4.

3.7.4. The couplings shall be suitable and tested for the characteristic values given in Table 5.

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

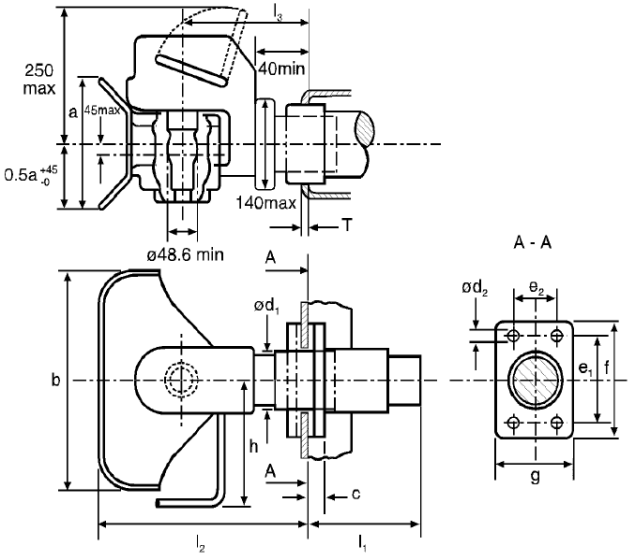


Figure 8
Dimensions of standard drawbar couplings (mm), see Table 4

來達成(非以接頭方式)。

5.9.7.2 因聯結銷與掛鉤孔間之間隙，而產生沿著縱軸之張力及壓縮力衝擊負載，應藉由彈簧及/或阻尼裝置減低(C50-1 除外)。

5.9.7.3 尺寸之規定如圖 8 及表 2 所述。

5.9.7.4 聯結器應適用且依表 3 所述之特性值進行測試。

5.9.7.5 以手桿方式進行聯結器之開啟動作(非遠端控制)。

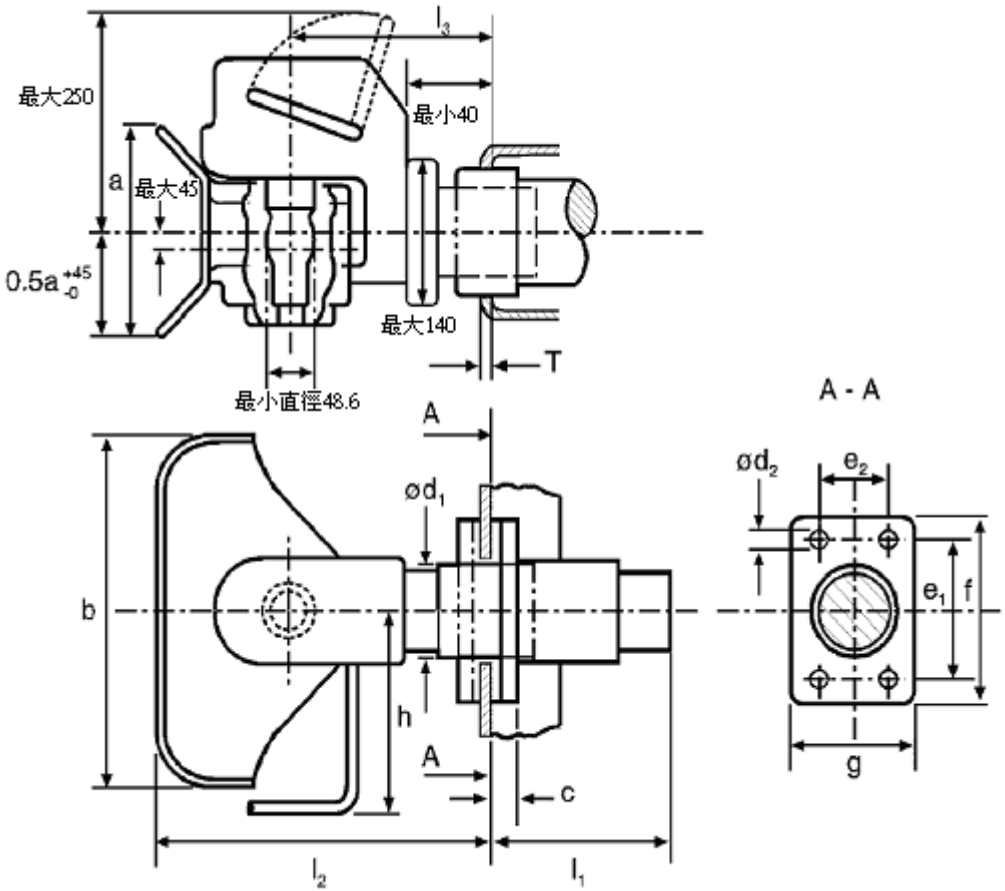


圖 8. 標準式掛鉤聯結器尺寸(單位：公釐)

表 2. 標準式掛鉤聯結器尺寸對照表

TABLE 4 - Dimensions of standard drawbar couplings (mm), see Figure 8

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

TABLE 5 - 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)

類型	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6 C50-7	備註
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	最大值
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	最大值
h	150	190	265	265	265	265	最大值
l_1	--	150	250	300	300	300	最大值
l_2	150	300	330	330	330	330	最大值
l_3	100	160	180	180	180	180	+/-20.0
T	--	15	20	35	35	35	最大值

表 3. 標準式掛鉤聯結器特性對照表

類型	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6	C50-7
D	18	25	70	100	130	190	190
Dc	18	25	50	70	90	120	130
S	200	250	650	900	1000	1000	1000
V	12	10	18	25	35	50	75

D：最大 D 值(kN)
Dc：搭配中心軸拖車之最大 D 值(kN)
S：在聯結器之最大靜態垂直負載(kN)
V：最大 V 值(kN)

4. DRAWBAR EYES

4.1. General requirements for drawbar eyes of Class D50:

All drawbar eyes of Class D50 shall be able to satisfy the test stated in annex 6, paragraph 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 4.2. 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 6.

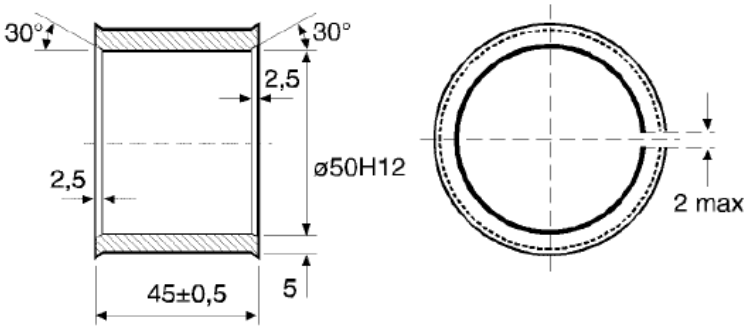


Figure 9
Slotted sleeve for Class D50 drawbar eyes

5.10 掛鉤孔(Drawbar Eyes)

5.10.1 類型 D50 掛鉤孔之一般規定

所有類型 D50 掛鉤孔應能符合 4.3.4 之測試。類型 D50 之掛鉤孔係搭配類型 C50 之掛鉤聯結器。掛鉤孔應不能軸向轉動(因各自聯結能夠轉動)。如果類型 D50 之掛鉤孔為銅套式(Sleeves)，則應符合圖 9(不允許用於類型 D50-C)或圖 10 之尺寸規格。銅套式不可焊接於掛鉤孔。類型 D50 之掛鉤孔尺寸應符合 5.10.2 之規定，類型 D50-X 掛鉤孔之掛鉤柄種類並未特別規定，但距掛鉤孔中心 210 公釐處之高度"h"及寬度"b"應如表 4 所規定之範圍。

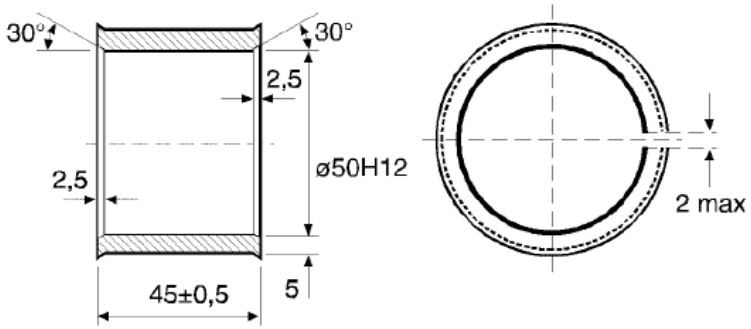


圖9. 類型D50掛鉤孔之溝槽式銅套示意圖(單位：公釐)

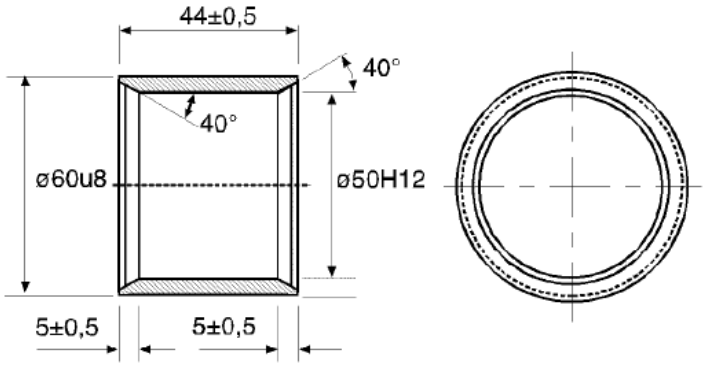


圖 10. 類型 D50-C 掛鉤孔之非溝槽式銅套示意圖(單位：公釐)

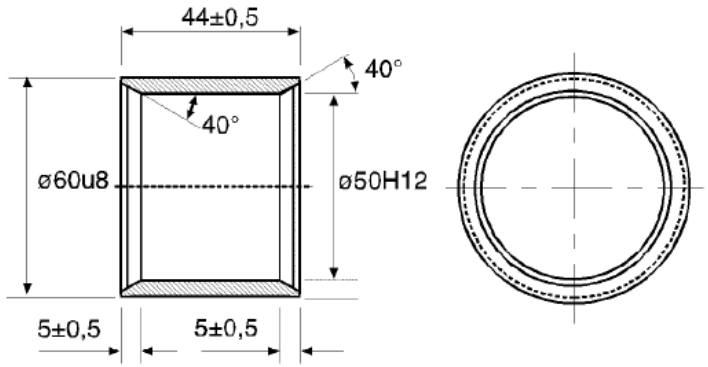


Figure 10
Non-slotted sleeve for Class D50-C drawbar eyes

TABLE 6 - Dimensions for drawbar eyes D50-A and D50-X, see Figure 11

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

表 4. 類型 D50-A 及 D50-X 之掛鉤孔尺寸表

類型	高度(公釐)	寬度(公釐)
D50-A	65 +2/-1	60 +2/-1
D50-X	最大為 80	最大為 62

4.2. Special requirements for Class D50 drawbar eyes:

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

5.10.2 類型 D50 之掛鉤孔特殊要求

5.10.2.1 類型 D50-A及D50-X之掛鉤孔尺寸如圖11所述。

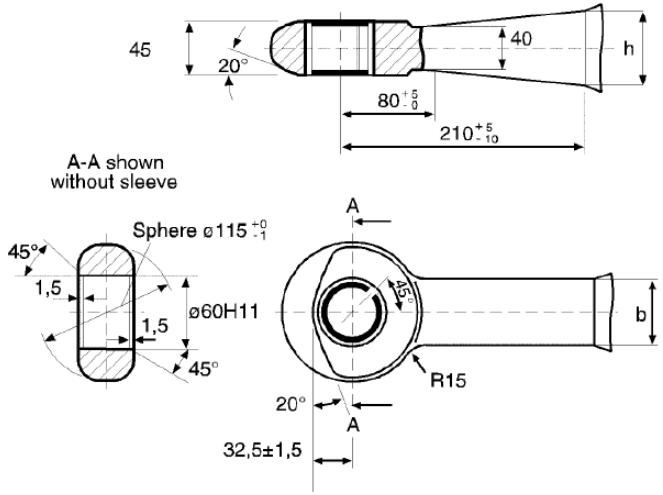


Figure 11
Dimensions of Classes D50-A and D50-X drawbar eyes, see Table 6

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

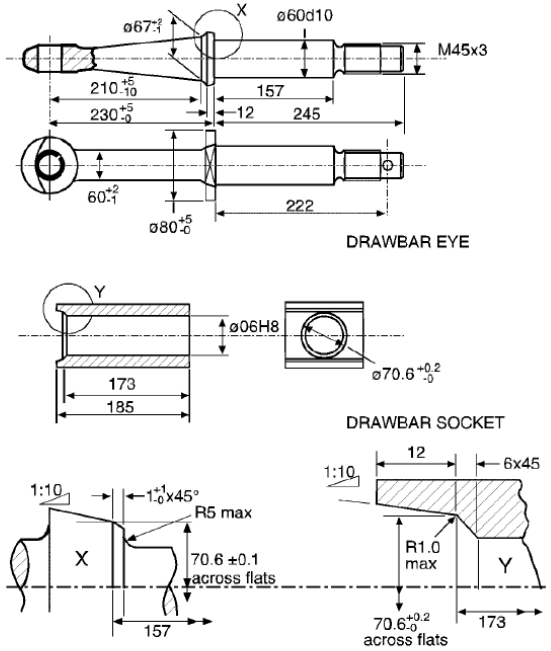


Figure 12
Dimensions of Class D50-B drawbar eyes, see other dimensions in Figure 11

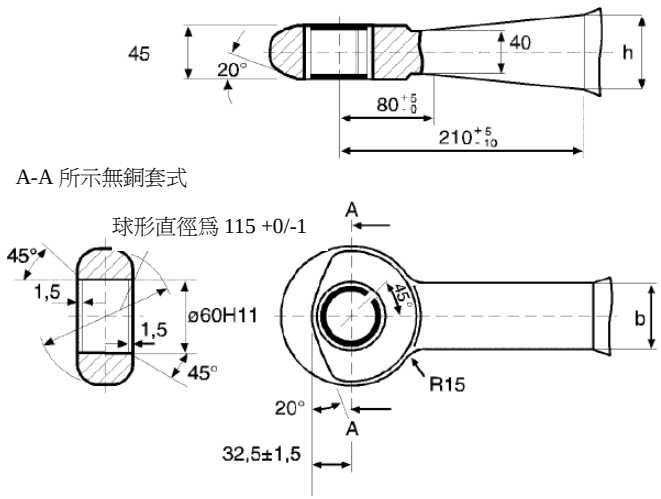
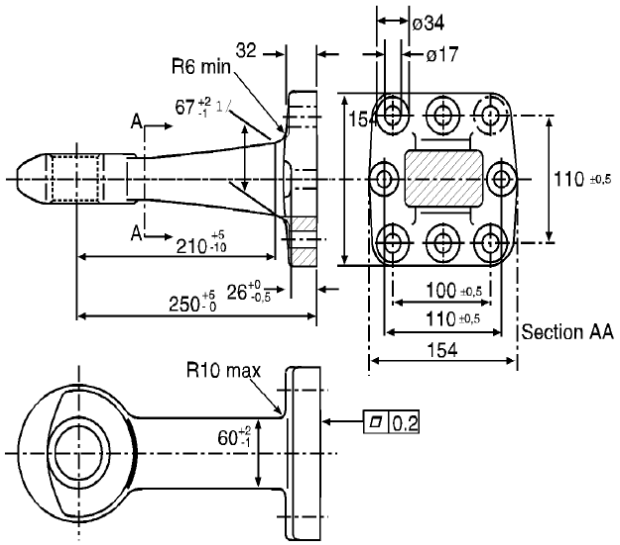


圖 11. 類型 D50-A 及 D50-X 掛鉤孔之尺寸(單位：公釐)

5.10.2.2 類型 D50-B之掛鉤孔尺寸如圖12所述。

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



1/ For Class D50-D drawbar eyes this dimension shall be "80 max."

Figure 13

Dimensions of Classes D50-C and D50-D drawbar eyes, see other dimensions in Figure 11

4.2.4. Classes D50-C and D50-D drawbar eyes shall be fitted with non slotted sleeves shown in Figure 10.

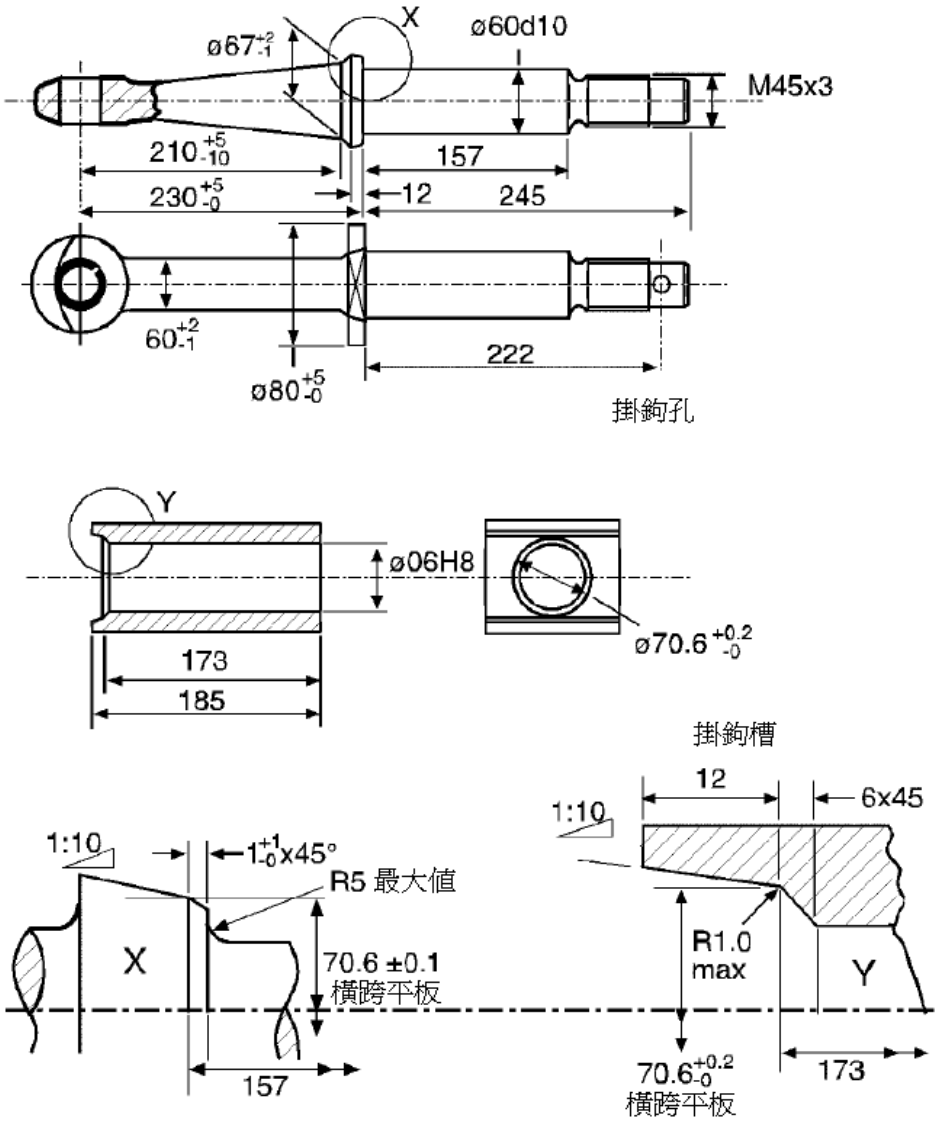


圖 12. 類型 D50-B 掛鉤孔之規格尺寸圖(單位：公釐)

5.10.2.3 類型 D50-C及D50-D之掛鉤孔尺寸如圖13所述。

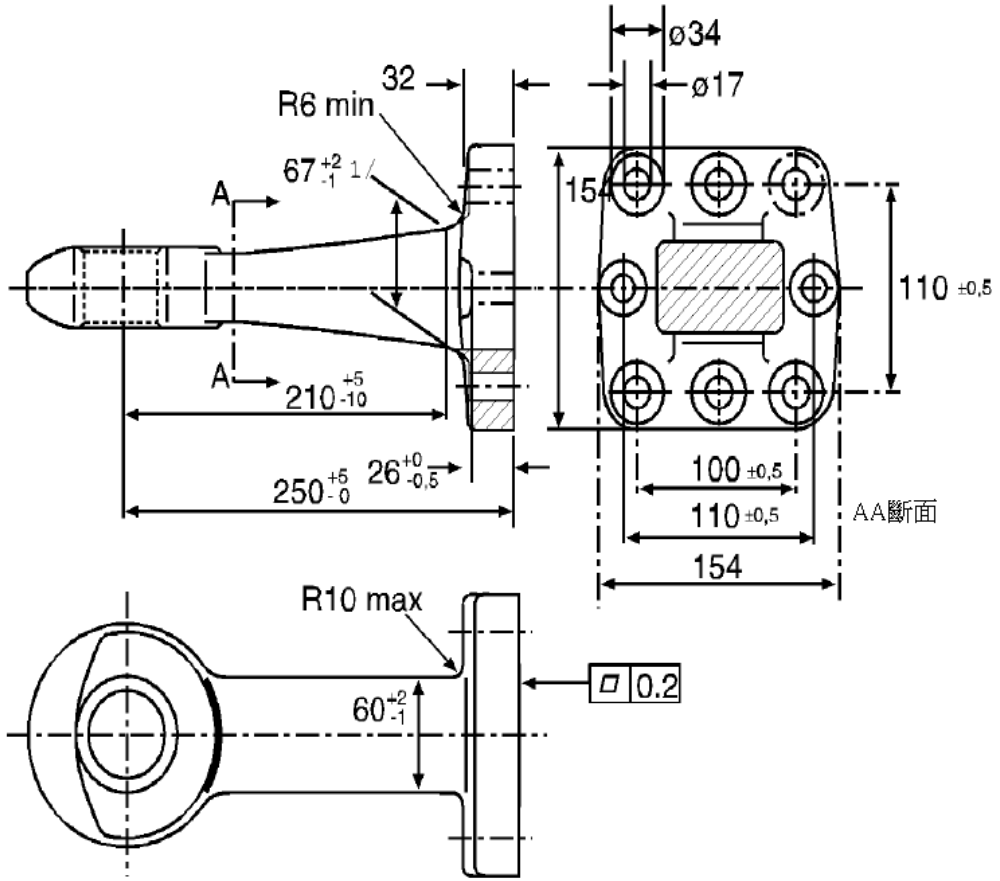
	 /1：類型 D50-D 掛鉤孔之距離最大應為 80 公釐 圖 13. 類型 D50-C 及 D50-D 掛鉤孔尺寸，其他尺寸如圖 11 (單位：公釐) 5.10.2.4 類型 D50-C及D50-D之掛鉤孔應裝設非溝槽式銅套，如圖10所述。
4.3. Load values for standard drawbar eyes Standard drawbar eyes and the means of attachment shall be suitable for, and tested for, the load values stated in Table 7.	5.10.3 標準式掛鉤孔之荷重值 標準式掛鉤孔及配接方式應適用表 5 所述之荷重值，且依此測試。 表 5. 類型 D50 之標準式掛鉤孔特性值對照表

TABLE 7 - 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

4.4. General requirements for Class L toroidal drawbar eyes:

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

4.4.2. When used with a Class K hook type coupling they shall meet the requirements for articulation given in paragraph 10.2 of this annex.

4.4.3. Class L toroidal drawbar eyes shall have the dimensions given in Figure 14 and Table 8

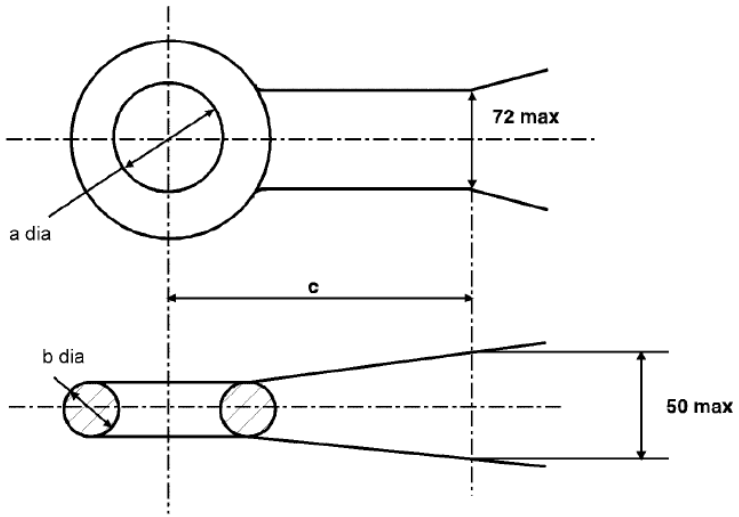


Figure 14
Dimensions of Class L toroidal drawbar eyes - see Table 8

類型	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

5.10.4 類型 L 之環狀掛鉤孔一般規定

5.10.4.1 類型 L之環狀掛鉤孔使用於類型 K之鉤狀式聯結器。

5.10.4.2 當使用類型 K之鉤狀式聯結器時，應符合5.16.2之要求。

5.10.4.3 類型 L環狀掛鉤孔應符合圖14及表6之尺寸要求。

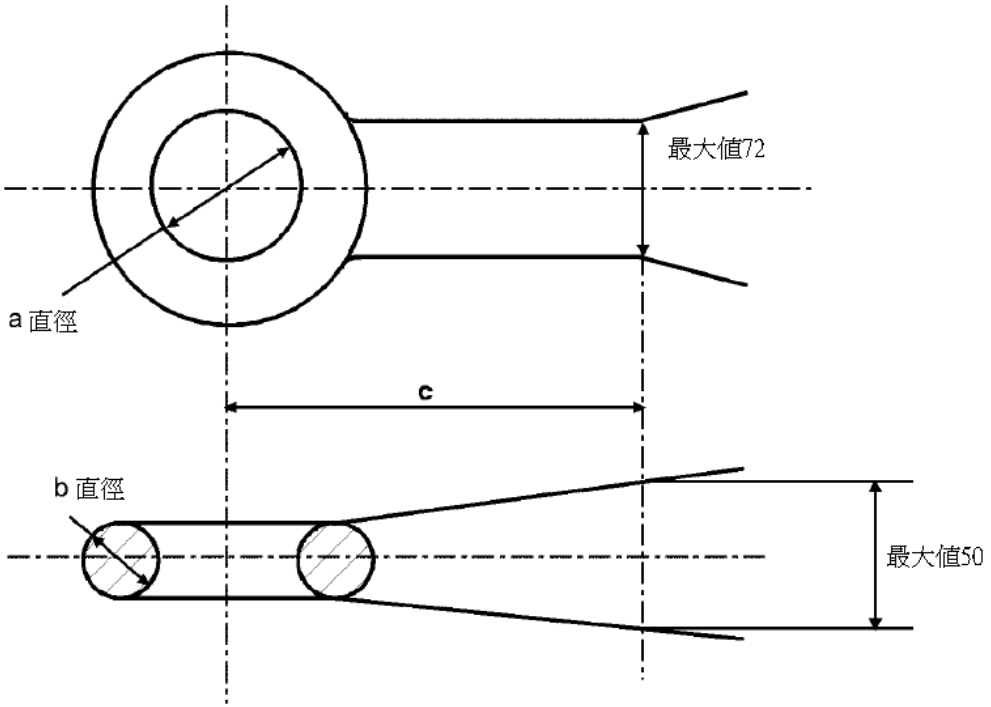


圖 14. 類型 L 環狀掛鉤孔之尺寸 (單位：公釐)

TABLE 8 - Dimensions of Class L toroidal drawbar eyes - see Figure 14 (Dimensions in mm)

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

4.4.4. Class L toroidal drawbar eyes shall satisfy the tests given in annex 6, paragraph 3.4 and shall be suitable for the characteristic values given in Table 9.

TABLE 9 - 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

表 6. 類型 L 之環狀掛鉤孔尺寸對照表(單位：公釐)

類型	L1	L2	L3	L4	L5	備註
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	最小值

5.10.4.4類型L環狀掛鉤孔應滿足4.3.4之測試規定及表7之特性值要求。

表 7. 類型 L 之環狀掛鉤孔特性值對照表

類型	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	1000	1000
V kN	12	18	25	35	50

5. DRAWBARS

5.1. Drawbars of class E shall satisfy the tests prescribed in annex 6, paragraph 3.3.

5.11 曳引桿(Drawbars)

5.11.1 類型 E 之曳引桿應滿足 4.3.3 之測試規定。

5.2. In order to provide a connection to the towing vehicle, the drawbars can be fitted either with coupling heads as in paragraph 2 or drawbar eyes as in paragraph 4 of this annex. The coupling heads and drawbar eyes can be attached by screwing, bolting or welding.

5.11.2 為提供聯結拖曳車輛，曳引桿應可裝設聯結頭(Coupling Heads)或掛鉤孔，且聯結頭和掛鉤孔皆可用螺絲、螺栓或焊接等方式連接。

5.3. Height adjusting devices for hinged drawbars

5.3.1. 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.

5.3.2. 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

5.11.3 絞鏈式曳引桿之高度調節裝置

5.11.3.1絞鏈式曳引桿應裝設對應裝設所搭配聯結裝置或鉗口高度之調整裝置，且該裝置應設計可由一人未使用工具或任何其他協助下進行調整。

5.11.3.2高度調整裝置應能調整使掛鉤孔或聯栓頭自距地高度至少300公釐處水平地上下調整，且在此範圍之曳引桿調整應為無段式

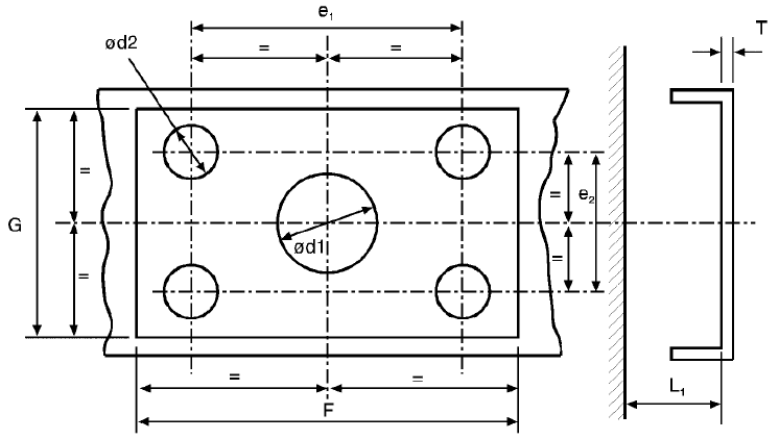
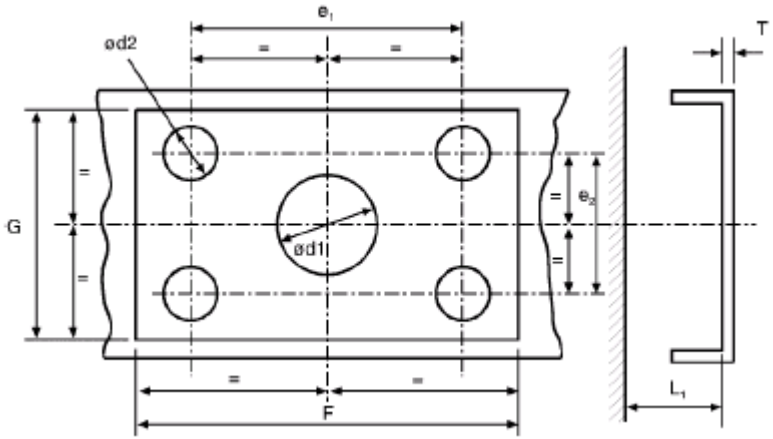
range the drawbar shall be adjustable steplessly, or in maximum steps of 50 mm measured at the drawbar eye or ball coupling. 5.3.3. Height adjusting devices shall not interfere with the easy movement of the drawbar after coupling. 5.3.4. The height adjusting devices shall not interfere with the action of any inertia, overrun type, brake.	或每次最大調整步進範圍為50公釐。 5.11.3.3高度調整裝置在聯結後不應妨礙曳引桿之輕易移動。 5.11.3.4高度調整裝置不應妨礙任何慣性、超越式(Overrun Type)及煞車之作動。
5.4. 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.	5.11.4 若曳引桿與慣性、超越裝置及煞車結合使用，在煞車作動時，其掛鉤孔中心與掛鉤孔軸柄間之距離不得少於 200 公釐，掛鉤孔軸柄完全插入時，該距離不得少於 150 公釐。
5.5. Drawbars for use on centre axle trailers shall possess at least half the moment of resistance against lateral forces as against vertical forces.	5.11.5 使用於中心軸拖車之曳引桿，其對側向力之阻抗力矩應至少為垂直阻抗力矩之一半。
6. DRAWBEAMS 6.1. Drawbeams of Class F shall satisfy the tests prescribed in annex 6, paragraph 3.3.	5.12 拖曳樑(Drawbeams) 5.12.1 類型 F 之拖曳樑應滿足 4.3.3 之規定。
6.2. The drilling pattern for mounting of Class C standard drawbar couplings shall be in accordance with Figure 15 and Table 10 below.  **Figure 15** **Mounting dimensions for standard drawbar couplings (see Table 10)**	5.12.2 類型 C 標準式掛鉤聯結器之鑽孔安裝示意圖，如圖 15 及表 8 之規定。  圖 15. 標準式掛鉤聯結器之安裝尺寸 表 8. 標準式掛鉤聯結器之尺寸對照表(單位：公釐)

TABLE 10 - Mounting dimensions for standard drawbar couplings (mm) - see Figure 15

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
T	-	15	20	35	35	35	maximum
F	120	120	165	190	210	210	minimum
G	95	95	100	130	150	150	minimum
L_1	-	200	300	400	400	400	minimum

類型	C50-1	C50-2	C50-3	C50-4	C50-5	C50-6 C50-7	備註
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
T	-	15	20	35	35	35	最大值
F	120	120	165	190	210	210	最小值
G	95	95	100	130	150	150	最小值
L_1	-	200	300	400	400	400	最小值

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

5.12.3 拖曳樑不應焊接於車輛底盤、車身或車輛其他部位。

7. FIFTH WHEEL COUPLINGS AND STEERING WEDGES

The requirements of paragraphs 7.1 to 7.7 are applicable to all fifth wheel couplings of Class G50. Additional requirements which shall be fulfilled by standard coupling devices are given in paragraph 7.9. Steering wedges shall satisfy the requirements listed in paragraph 7.8.

5.13 第五輪聯結器及轉向楔形物(Fifth Wheel Couplings And Steering Wedges)

所有類型 G50 第五輪聯結器適用於 5.13.1 至 5.13.7 之規定，且標準式聯結裝置應滿足 5.13.9 之附加規定。另轉向楔形物(Steering Wedges)應符合 5.13.8 之規定。

7.1. 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.

5.13.1 適當之第五輪聯結銷

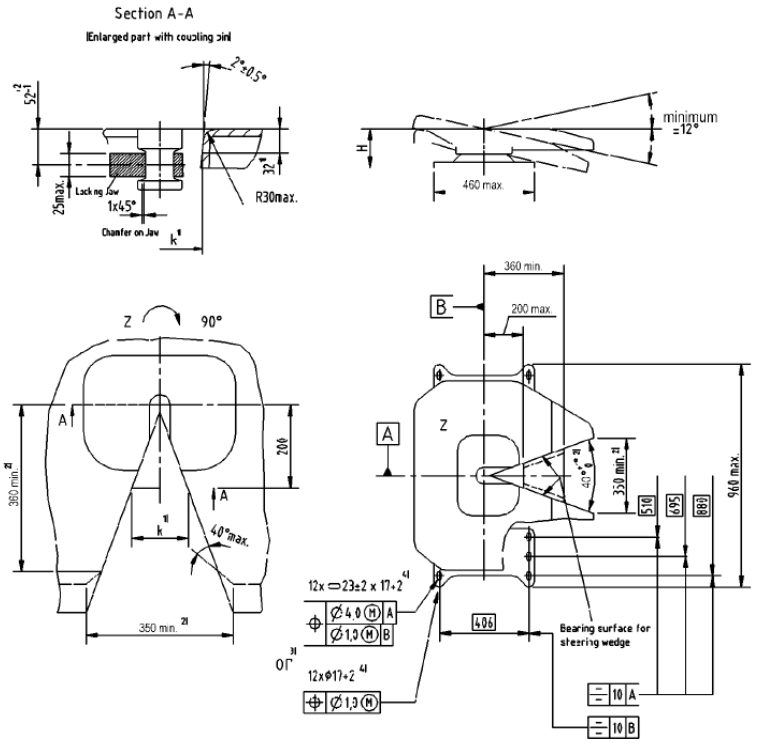
類型 G50 第五輪聯結器應設計與類型 H50 聯結銷相結合，且共同提供規定之特性。

7.2. 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.

5.13.2 導引

第五輪聯結器應配有確保聯結銷安全且正確嚙合之導引，標準式直徑 50 公釐第五輪聯結器之入口寬應至少為 350 公釐，如圖 16 所示。對於小型非標準式之類型 G50-X 第五輪聯結器及具有最大"D"值 25kN 者，其入口寬應至少為 250 公釐。



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.

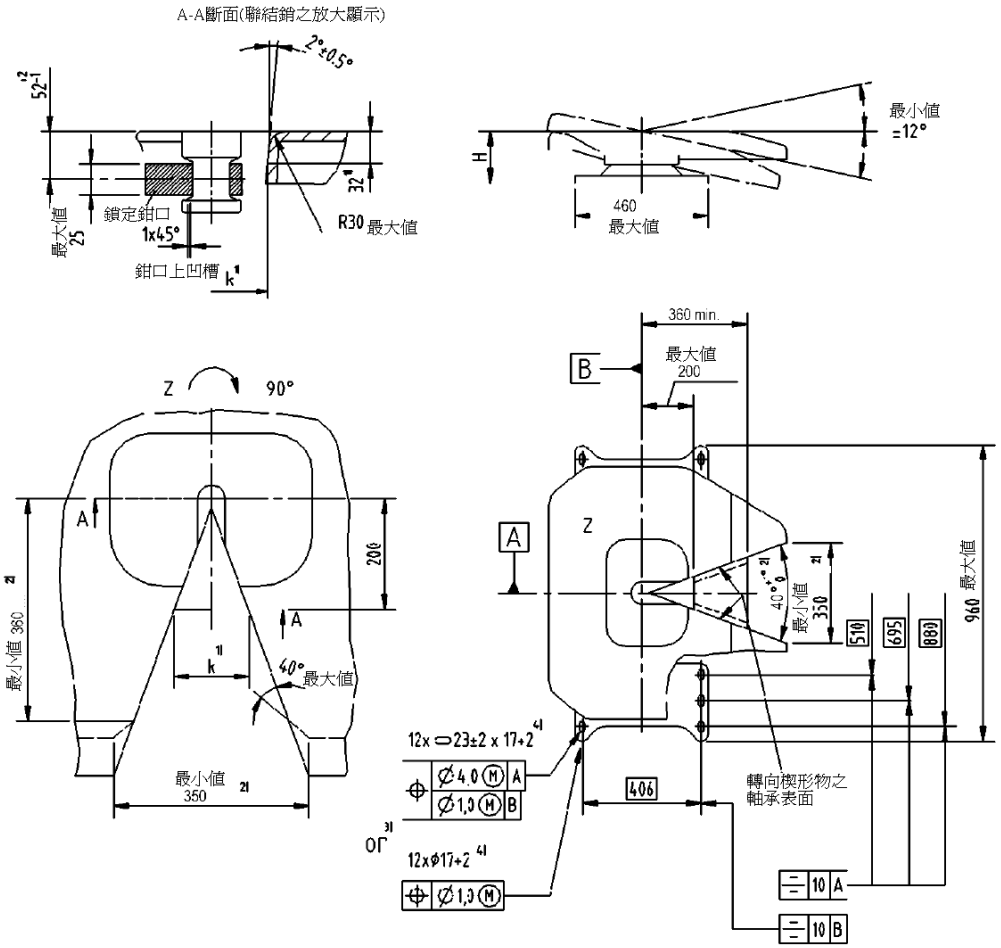


圖 16. 標準式第五輪聯結器之尺寸(單位：公釐)

1/供轉向楔形物之使用者，在低於上表面 32 公釐處及自聯結器之橫軸中心線 200 公釐距離處，量測參考尺度 K=137+/-3 公釐。

2/40 +1/-0 度之喉角在自聯結器橫軸中心線至少 360 公釐距離內必須維持。藉由增加入口角度至最大 120 度(含)，可於此距離外部獲得最小 350 公釐之入口寬度，如虛線所示。

Figure 16

Dimensions of standard fifth wheel couplings (see Table 11)

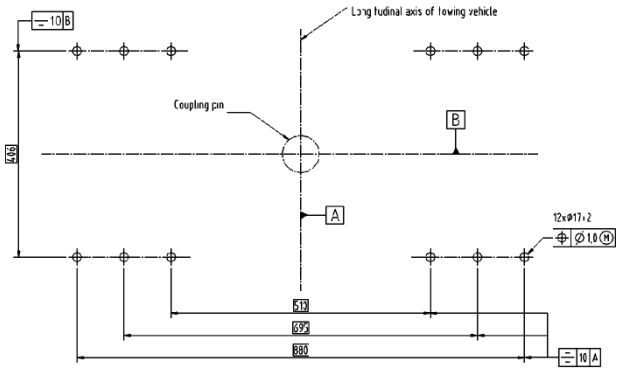


Figure 16a
Mounting holes tolerances for class J mounting plates for fifth wheel couplings (see para. 9.1. of this annex)

TABLE 11 - Dimensions of standard fifth wheel couplings (mm), see Figure 16

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

3/得以使用加長型安裝孔為 23 +/-2 公釐x17 +2/-0 公釐或環型安裝孔直徑為 17 +2/-0 公釐。

4/當使用加長型安裝孔或大於直徑 18 公釐之安裝孔，要使用直徑 40 公釐、厚度 6 公釐或相同強度(例如平面鋼板)墊圈。

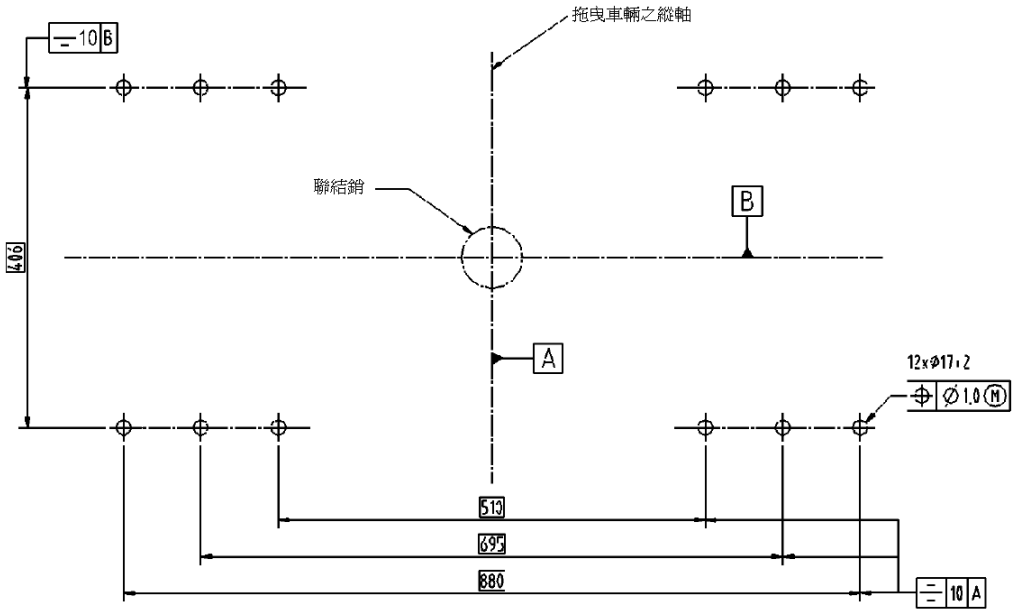


圖 16a. 類型 J 之第五輪座盤之安裝孔位尺寸(參閱表 9)

表 9. 標準式第五輪聯結器之尺寸對照表(單位：公釐)

類型	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

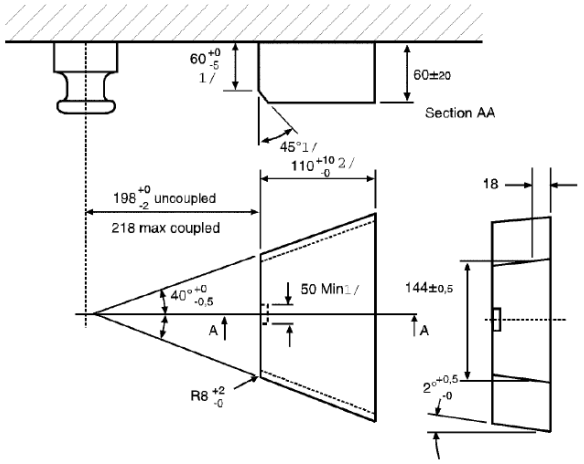
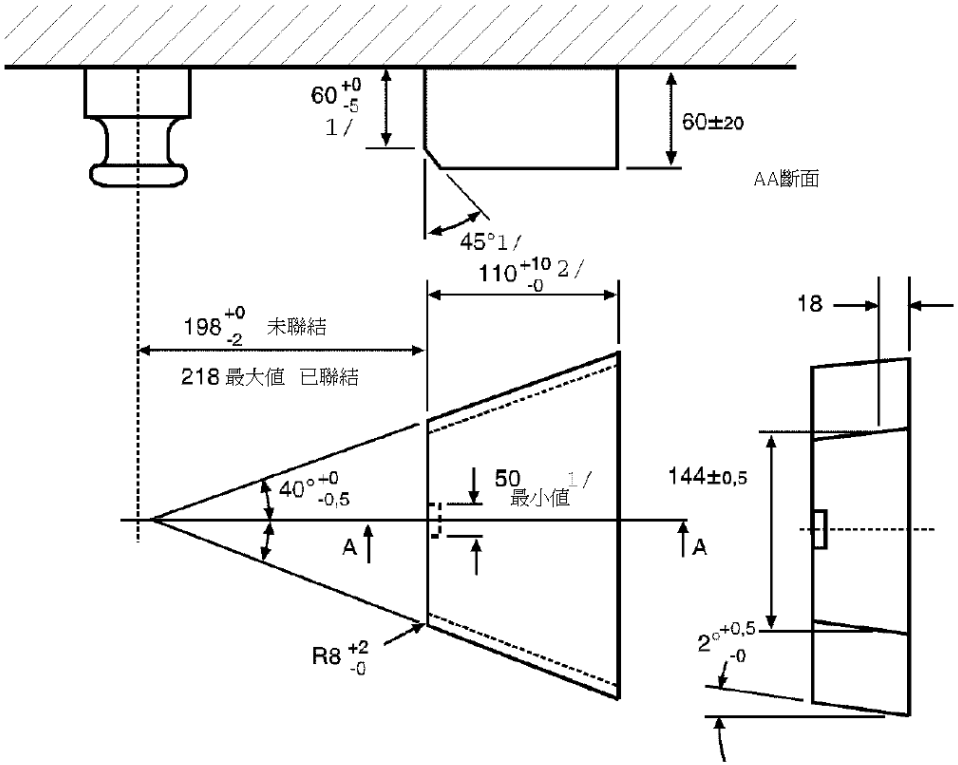
7.3. Minimum articulation of the fifth wheel coupling

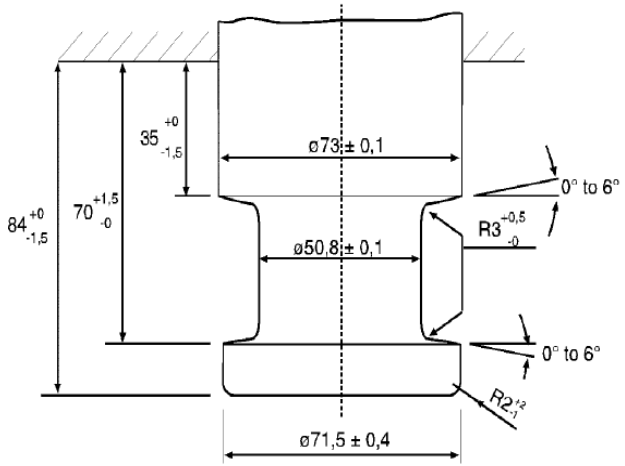
With the coupling pin engaged, without the fifth wheel coupling being attached to a

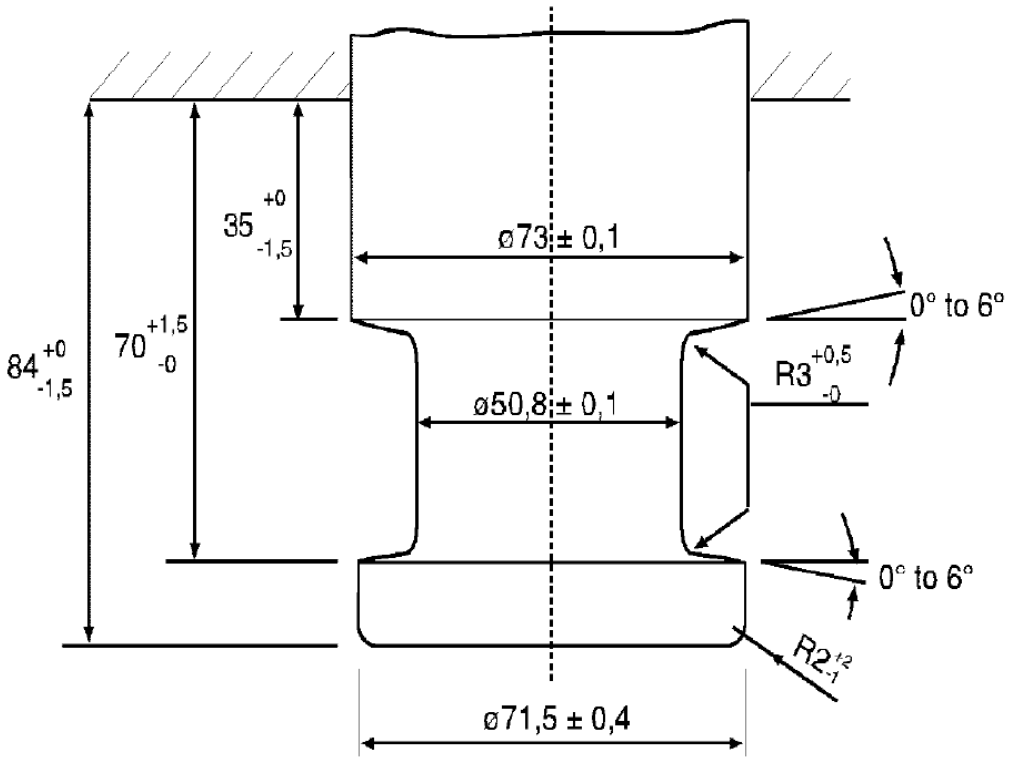
5.13.3 第五輪聯結器之最小聯結角度範圍

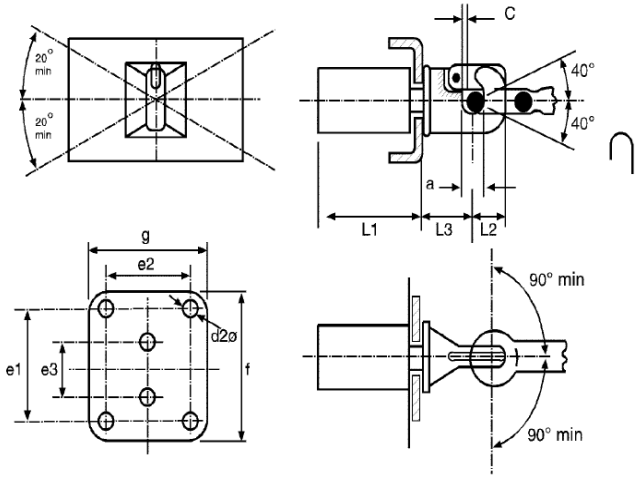
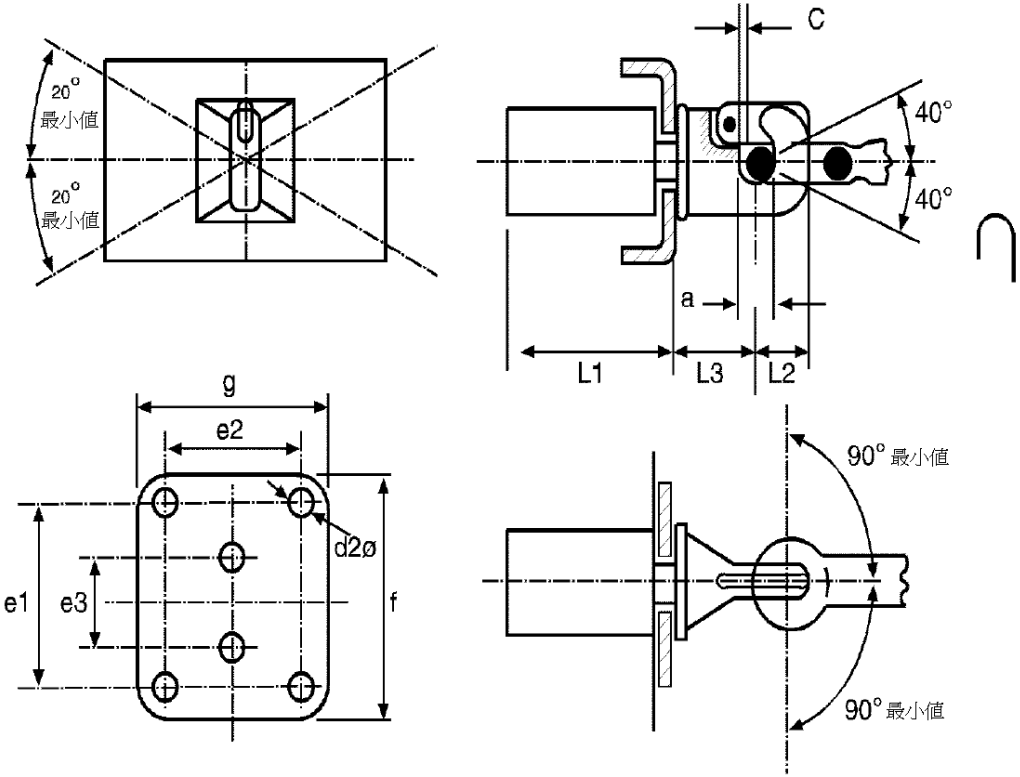
與聯結銷嚙合且第五輪聯結器不裝設於車輛或座盤，但考慮安裝螺栓

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: 7.3.1. +/- 90 degrees about the vertical axis (not applicable to fifth wheel couplings with positive steering); 7.3.2. +/- 12 degrees about the horizontal axis transverse to the direction of travel. This angle does not necessarily cover off-road use. 7.3.3. 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.	作用之下，其聯結器應同時允許聯結銷下列聯結最小值： 5.15.3.1繞垂直軸之左右正負90度(不適用於完全轉向之第五輪) 。 5.15.3.2繞橫斷行車方向之水平軸之垂直上下角度正負12度。 5.15.3.3繞縱軸之軸向旋轉角度允許有正負3度以內。在完全擺動之第五輪聯結器上，可超過此角度，惟仍受限於鎖定裝置機構最大角度限制值在正負3度內。
7.4. 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.	5.13.4 第五輪聯結器之鎖定安全裝置 第五輪聯結器應由兩個完全機械鎖定機構裝置鎖定在聯結位置上，其一個裝置失效時，則應保持另一個裝置之有效性。主要鎖定裝置應自動作動，惟次要鎖定裝置可為自動或手動嚙合。次要鎖定裝置可設計與主要聯結裝置聯結，及提供主要裝置之附加完全機械鎖定。當主要裝置正確嚙合，則次要鎖定裝置應嚙合，且鎖定裝置不應自主鬆脫。鬆脫應由該車輛駕駛者或操作者作動，且聯結器之閉合及鎖定位置應由機械裝置指示出供目視，且應可摸觸確認指示器之位置，例如允許在暗處確認該位置。指示裝置應指示主要及次要鎖定裝置之嚙合狀況，但若僅有一個裝置充分指示嚙合，另一裝置之嚙合則應為同步且為固有不變之設計特性。
7.5. Operating devices or release mechanisms In the closed position the operating devices or release mechanisms shall be prevented from	5.13.5 操作裝置或釋放機構 位於閉合位置時，應防止操作裝置或釋放機構操作不慎或意外情形發生。

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.	鎖定系統應在主動且刻意之釋放鎖定裝置行為下，才能操作聯結器釋放機構。
7.6. Surface finish The surfaces of the coupling plate and coupling lock shall be functionally satisfactory and be carefully machined, forged, cast or pressed.	5.13.6 表面加工(Surface Finish) 接合板及聯結鎖定裝置之表面應作用正常且由機械加工、鍛造、鑄造壓製而成。
7.7. Load requirements All fifth wheel couplings shall be able to satisfy the tests described in annex 6, paragraph 4.7.	5.13.7 荷重要求 所有第五輪聯結器均應滿足 4.3.7 之規定。
7.8. Steering wedges 7.8.1. The dimensions of steering wedges for the positive steering of semitrailers shall be as in Figure 17.  Notes: 1/ Only applicable to steering wedges over 60 mm thick. 2/ This dimension only refers to the functional surface: the steering wedge itself can be longer. **Figure 17** **Dimensions of spring-mounted steering wedges** 7.8.2. 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	5.13.8 轉向楔形物(Steering Wedges) 5.13.8.1搭配半拖車完全轉向之轉向楔形物尺寸如圖17所示。 

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.	圖 17. 彈簧式轉向楔形物之尺寸 (單位：公釐) 5.13.8.2轉向楔形物應促成安全及正確聯結，且為彈簧式，彈簧式強度應選用能聯結無負載半拖車，且當半拖車完全負載於轉向楔形物是牢靠地與聯結器之側面，且第五輪聯結器應能在半拖車有負載及無負載狀態開脫。
7.9. Special requirements for standard fifth wheel couplings: 7.9.1. the dimensions shall be as shown in Figure 16 and Table 11. 7.9.2. they shall be suitable for, and tested for, a D value of 150 kN and a U value of 20 t. 7.9.3. release shall be possible by a hand lever mounted directly on the coupling. 7.9.4. they shall be suitable for the positive steering of semitrailers by means of steering wedges - see paragraph 7.8.	5.13.9 標準式第五輪聯結器之特殊規定 5.13.9.1尺寸如圖16及表9。 5.13.9.2在規定之試驗中，D值與U值應分別具有150 kN及20公噸。 5.13.9.3應可直接由聯結器上之手桿來釋放。 5.13.9.4半拖車之完全轉向應可藉由轉向楔形物搭配，如5.13.8之規定。
8. FIFTH WHEEL COUPLING PINS 8.1. Fifth wheel coupling pins of Class H50 (ISO 337) shall have the dimensions shown in Figure 18  **Figure 18** **Dimensions of Class H50 fifth wheel coupling pins**	5.14 第五輪聯結銷(Fifth Wheel Coupling Pins) 5.14.1 類型 H50 (ISO 337)第五輪聯結銷之尺寸，如圖 18。

	 圖 18. 類型 H50 第五輪聯結銷之尺寸 (單位：公釐)
8.2. The coupling pins shall be able to satisfy the tests described in annex 6, paragraph 3.9.	5.14.2 聯結銷之測試應滿足 4.3.9 之規定。
9. MOUNTING PLATES 9.1. 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).	5.15 座盤(Mounting Plates) 5.15.1 類型 J 第五輪聯結器之座盤應有環形安裝孔供標準式第五輪聯結器用，如圖 16a 所示。惟安裝孔之孔徑應為 17(+2.0/-0.0)公釐，且安裝孔應為環狀，而非溝槽狀(如圖 16a)。
9.2. 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.	5.15.2 標準式第五輪聯結器之座盤應可與半拖車(具有轉向楔形物者)之完全轉向適切搭配，非標準式第五輪聯結器之座盤無法與完全轉向適切搭配者，應適切標註。

9.3. Mounting plates for fifth wheel couplings shall be able to satisfy the tests described in annex 6, paragraph 3.8.	5.15.3 第五輪聯結器之座盤應滿足 4.3.8 之測試規定。
10. HOOK TYPE COUPLINGS 10.1. General requirements for Class K hook type couplings: 10.1.1. All Class K hook type couplings shall satisfy the tests given in annex 6, paragraph 3.5 and shall be suitable for the characteristic values given in Table 13 10.1.2. Class K hook type couplings shall have the dimensions given in Figure 19 and Table 12. 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.  **Figure 19** **Dimensions and articulation of Class K hook type couplings** 10.1.3. 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 10.2 of this annex. 10.1.4. 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 form shown in annex 1.	5.16 鉤狀式聯結器(Hook Type Couplings) 5.16.1 類型 K 之鉤狀式聯結器之一般規定： 5.16.1.1所有類型 K鉤狀式聯結器應符合4.3.5之測試規定及表11之特性值要求。 5.16.1.2類型 K之鉤狀式聯結器之尺寸應符合圖19及表10之規定。類型 K1～類型 K4為非自動聯結器，僅適用於設計最大重量小於3.5公噸拖車，類型 KA1～類型 KA3係為自動聯結器。  圖 19. 類型 K 鉤狀式聯結器之尺寸圖

	5.16.1.3鉤狀式聯結器僅能用於環狀掛鉤孔，且當使用於類型L環狀掛鉤孔時，此類型K之鉤狀式聯結器應具有5.16.2所述之聯結角度。 5.16.1.4環狀掛鉤孔與類型K鉤狀聯結器搭配之下，其間應具有最小間隙或自由移動介於為3～5公釐，製造商應宣告適用之掛鉤孔。
10.2. 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: 10.2.1. +/- 90 degrees horizontally about the vertical axis of the coupling; 10.2.2. +/- 40 degrees vertically about the horizontal transverse axis of the coupling; 10.2.3. +/- 20 degrees axial rotation about the horizontal longitudinal centre line of the coupling.	5.16.2 類型 K 鉤狀式聯結器與類型 L 環狀掛鉤孔搭配之下，未與車輛聯結時，應符合下列(圖 19)非同時聯結角度範圍： 5.16.2.1繞聯結器垂直軸之水平左右角度為正負90度。 5.16.2.2繞聯結器水平橫軸之垂直上下角度為正負40度。 5.16.2.3軸向旋轉於聯結器水平縱軸中心線之角度為正負20度。
10.3. Automatic Class K hook type couplings shall have a jaw designed such that the drawbar eye is guided into the coupling.	5.16.3 類型 K 自動鉤狀式聯結器應設計有鉗口以導引掛鉤孔進入聯結器。
10.4. 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.	5.16.4 防止脫離之鎖定裝置 在聯結器閉合位置上應由兩個完全機械嚙合之鎖定裝置鎖定，其一個裝置失效時，則應保持另一個裝置之有效性。聯結器之閉合及鎖定位置應由機械裝置清楚指示於外部，應可觸摸確認指示器之位置，例如允許在暗處確認該位置。機械指示裝置應指示該二鎖定裝置之嚙合狀況，但若僅有一個裝置機械指示嚙合，另一裝置之嚙合則應為固有不變之設計特性。
10.5. 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.	5.16.5 手桿 手桿應適當設計易於使用，並不得有銳邊導角及可能在操作中導致受傷之尖銳邊緣，且沿操作方向、垂直於手桿釋放聯結器之釋放力，在無掛鉤孔之下量測時，應不超過 250 N。 表 12. 類型 K 鉤狀聯結器之尺寸對照表(單位：公釐)

類型	K1	K2	K3	K4	KA1	KA2	KA3	備註

TABLE 12 - Dimensions for Class K hook type couplings - see Figure 19

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

TABLE 13 - Characteristic values for Class K hook type couplings

Class	K1	K2	K3	K4	KA1	KA2	KA3
D kN	17	20	20	25	70	100	130
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

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	最小值
f	130	175	175	180	180	200	200	最大值
g	100	100	100	120	120	140	200	最大值
a	45	45	45	45	45	45	45	+1.6/-0.0
L_1	120	120	120	120	250	300	300	最大值
L_2	74	74	63	74	90	90	90	最大值
L_3	110	130	130	150	150	200	200	最大值

表 13. 類型 K 鉤狀聯結器之特性值對照表(單位：公釐)

類型	K1	K2	K3	K4	KA1	KA2	KA3
D kN	17	20	20	25	70	100	130
Dc kN	--	--	17	20	54	70	90
S kN	120	120	200	250	700	900	1000
V kN	--	--	10	10	18	25	35

11. DEDICATED DRAWBAR TYPE COUPLINGS - CLASS T

11.1. 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.

5.17 類型 T 專用掛鉤聯結器(Dedicated Drawbar Type Couplings-類型 T)

5.17.1 類型 T 專用掛鉤聯結器係使用於特殊車輛組合，例如：車輛運輸車。這些車具有特殊結構且可能需要特定或非常用之聯結位置。

11.2. Class T couplings shall be restricted to use with centre axle trailers and this restriction shall be notified on the Communication form shown in annex 1.

5.17.2 類型 T 專用掛鉤聯結器應限制使用於中心軸拖車，且應將限制條件記錄在檢測報告內。

11.3. 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.

5.17.3 類型 T 專用掛鉤聯結器應以配對申請並不應分離，除非在工廠使用非正常在車輛上之工具。

11.4. Class T couplings shall not be automatic in operation.	5.17.4 類型 T 專用掛鉤聯結器不應自動式作動裝置。
11.5. Class T couplings shall satisfy the relevant test requirements given in annex 6, paragraph 3.3., except paragraph 3.3.4.	5.17.5 類型 T 專用掛鉤聯結器應滿足 4.3.3 之測試規定，第 4.3.3.4 節除外。
11.6. 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; 11.6.1. +/- 90 degrees horizontally about the vertical axis; 11.6.2. +/- 8 degrees vertically about the horizontal transverse axis; 11.6.3. +/- 3 degrees axial rotation about the horizontal longitudinal axis.	5.17.6 聯結器未裝設至車上但處於車上安裝時之同樣正常位置下，聯結器之最小且同時聯結角度應滿足下列規定： 5.17.6.1繞垂直軸之水平左右角度為正負90度。 5.17.6.2繞水平橫軸之垂直上下角度為正負8度。 5.17.6.3軸向旋轉於水平縱向中心線角度為正負3度。
12. DEVICES FOR REMOTE INDICATION AND REMOTE CONTROL 12.1. 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.	5.18 遠端指示及控制裝置 5.18.1 一般規定 遠端指示及控制裝置僅允許使用於類型 C50-X 及 G50-X 之自動聯結裝置，且不應妨礙聯結有掛鉤孔或半拖車時之最小自由移動範圍。此裝置應永久裝設於車輛上。所有遠端指示及控制裝置皆應與聯結裝置和所有操作裝置與傳輸裝置之零組件一同接受測試。
12.2. Remote indication 12.2.1. 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 12.2.2. Additionally the open position may be indicated as in paragraph 12.2.3. The remote indication device shall be automatically activated and reset during every opening and closing of the coupling. 12.2.2. The change from the open to the closed and doubly locked position shall be indicated by a green optical signal. 12.2.3. If the open and/or unlocked position is indicated, a red optical signal shall be used.	5.18.2 遠端指示(Remote Indication) 5.18.2.1對於自動聯結程序，遠端指示裝置應依5.18.2.2所述之光學方式指示聯結器之閉合及雙重鎖定位置。可附加指示5.18.2.3所述之開啟位置。在聯結器之每一個開啟及閉合時應自動作動及重置遠端指示裝置。 5.18.2.2從開啟至閉合及雙重鎖定位置之變換應由綠色光學訊號指示。 5.18.2.3若指示開啟且/或未鎖定位置時應使用紅色光學訊號。 5.18.2.4自動聯結程序完成聯結時之指示，遠端指示器應確保聯結銷已達到雙重鎖定終端位置。

12.2.4. 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. 12.2.5. 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. 12.2.6. 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. 12.2.7. The mechanical indicators fitted directly to the coupling device shall be retained. 12.2.8. 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 12.2.1. 12.2.9. 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.	5.18.2.5在聯結進行期間未達鎖定終端位置時，遠端指示系統之任何故障，不應使指示裝置指示其處於閉合及鎖定位置。 5.18.2.6兩個鎖定裝置之一脫離時，應使綠色光學訊號熄滅，且亮起紅色光學訊號(若有安裝時)。 5.18.2.7直接裝設於聯結裝置之機械式指示器，應固定良好。 5.18.2.8為避免駕駛者在正常駕駛時產生分心，應備有關掉遠端指示裝置之方式，惟當聯結裝置再次開啟及閉合時應自動重新作動，如5.18.2.1所述。 5.18.2.9遠端指示裝置之操作控制器及指示器，應安裝在駕駛視野範圍內且可持續地清晰識別。
12.3. Remote control 12.3.1. If a remote control device, as defined in paragraph 2.8 of this Regulation, is employed, there shall also be a remote indication device as described in paragraph 12.2 which shall at least indicate the open condition of the coupling. 12.3.2. 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. 12.3.3. 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	5.18.3 遠端控制(Remote Control) 5.18.3.1若使用遠端控制裝置(如名詞釋義2.8之規定)，則應有5.18.2所述遠端指示裝置，其應至少指示聯結器之開啟狀態。 5.18.3.2應有一個專屬開關(即主開關、控制桿或閥)，以藉由遠端控制裝置之方式使聯結器開啟或閉合。若此主開關不位於駕駛室，則其不應位於非經許可人士自由碰觸之位置或應設計可上鎖之方式。聯結器可從駕駛室實際操作，但應杜絕不經意之操作，例如：需要使用兩手操作。完成應能狀態在遠端控制下確認聯結器之開啟完成狀態。 5.18.3.3若遠端控制裝置包含聯結器被外部力量開啟，則聯結器受外部力量作用之狀態應適當指示予駕駛者，惟若該外部力量僅出現在遠端控制之操作狀態時則不需要指示。 5.18.3.4若遠端控制之下，用以開啟聯結器之作動裝置係裝設於車輛外部，應能監看車輛聯結區域，惟應不需進入此區域進行操作。

driver. This is not necessary if the external force is only operative while the remote control is operating. 12.3.4. 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. 12.3.5. 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. 12.3.6. 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 3.6 of this annex are not applicable to hand levers used exclusively for opening the coupling in an emergency. 12.3.7. The operating controls and indicators for the remote control devices shall be permanently and clearly identified.	5.18.3.5系統在操作過程中出現任何錯誤或發生任何故障時，應不使在正常道路使用期間造成聯結意外開啟，且系統任何失誤應被直接指示出或在下一個操作時立即顯現，例如：發生故障。 5.18.3.6在遠端控制發生失效時，應可在緊急情況用至少一種其他方式開啟聯結器，若此需要使用工具，則應包含在車上工具組；其5.9.6不適用於緊急情況開啟聯結器之專用手桿。 5.18.3.7遠端控制裝置之控制器及指示器應有永久且清晰明確之識別。