

INSTRUCTIONS: STAR



Date: 05-07-2006 Check: 04

**DYNATECH
DYNAMICS AND TECHNOLOGY, S.L.**

**STAR
OVERSPEED GOVERNOR**

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1.- INTRODUCTION.

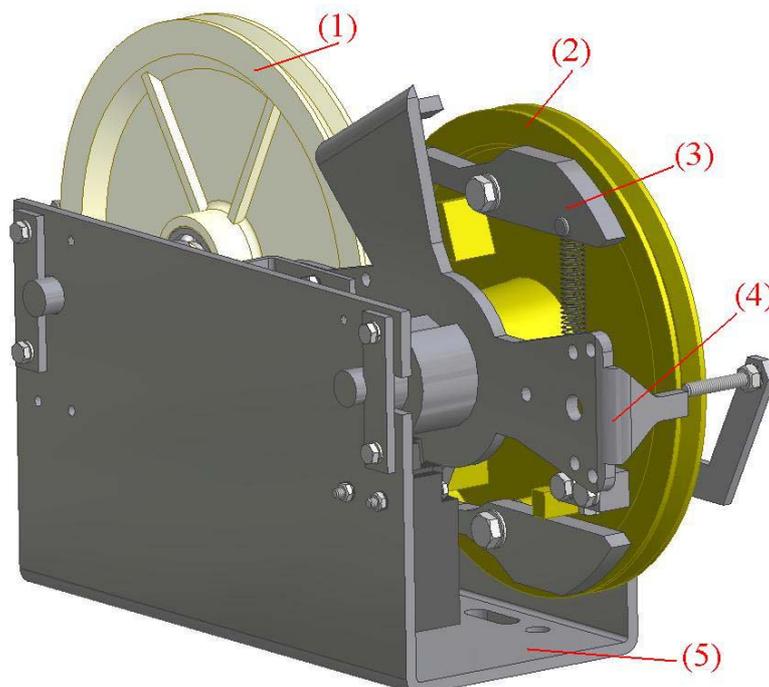
STAR overspeed governor by DYNATECH is specially designed to be fitted into the car or sling of the lift and to move together with them. Thanks to this, the engine room governor, the guide pulley and the mass at the bottom of the well can be removed.

By using this new concept, the governor moves, whereas the rope remains fixed, anchored to the well ceiling and to the pit by means of a small-sized tensing system. The information on the set of devices integrating the Governor will be broadened later on.

2.- MAIN COMPONENTS.

Each governor is composed of the following main elements: two pulleys, a centrifugal system, a locking device, a casing and an element linking the governor to the car or sling.

Below, a figure representing the governor set is shown:



Where:

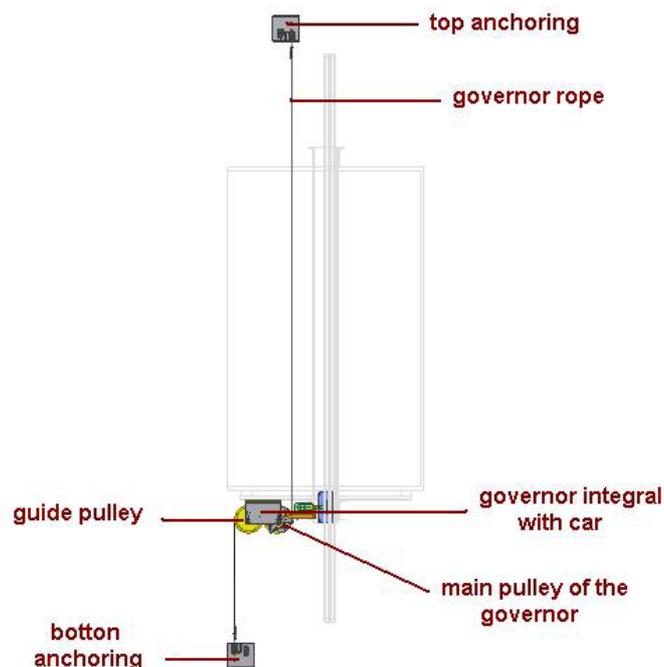
- (1) – Guide Pulley.
- (2) – Main Pulley.
- (3) – Centrifugal system.
- (4) – Locking system.
- (5) – Car or sling fixing plate.

3. WORKING PRINCIPLES.

The governor is of the centrifugal type, and is able to work either **upwards** or **downwards**.

As mentioned above, the designed object is fixed into the car or into the sling of the lift, and it can be placed either above or below both. The rope, anchored to the ceiling and to the pit floor, passes through the governor, along the pulley jaws. This way, when the car reaches its tripping speed, the rope-governor relative movement will lock it. This governor locking will drive the safety gear and will stop the car movement.

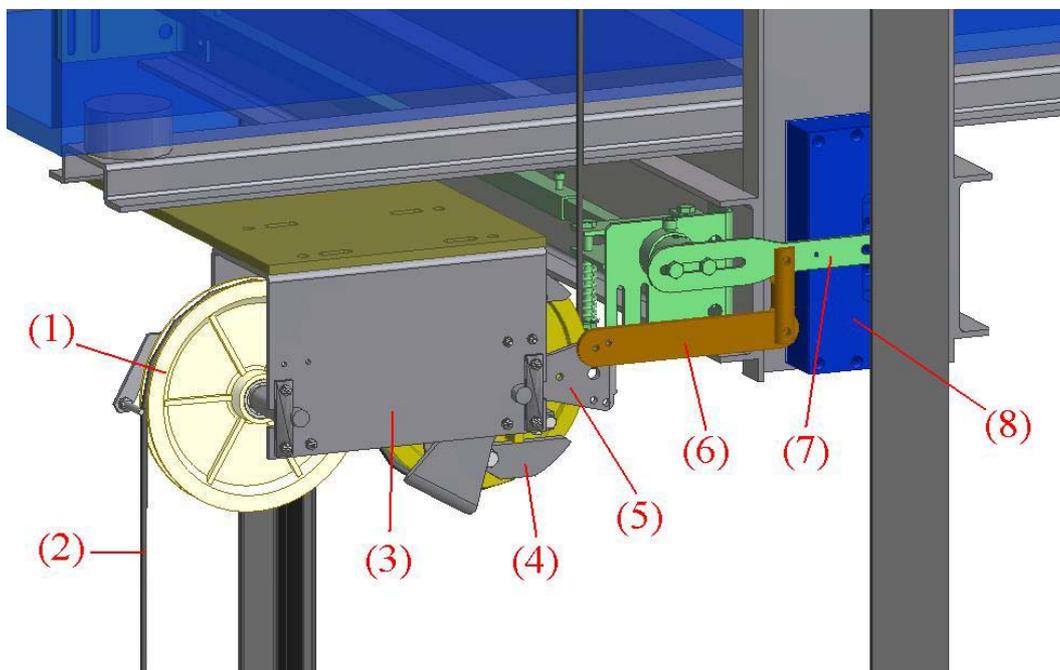
Working diagram is as follows:



Such is the interlocking process that, when the car speed exceeds a pre-set level (governor tripping speed), the centrifugal system, together with the pulley, interlocks with the governor "locking system", which, in turn, is coupled to the driving bar by means of an auxiliary component. At this moment, the main pulley locks and the friction between the rope and the pulley is transferred to the safety gear through the auxiliary component and the driving bar. The safety gear, on wedging, will cause the car to stop.

It is important to remark that the connection between governor and safety gear is not carried out through the governor rope, but through an auxiliary mechanical system.

Below, a more detailed view of one of the possible governor positions in the lift, as well as of the above-mentioned parts, is given. In the first view, the governor placed below the car is shown.

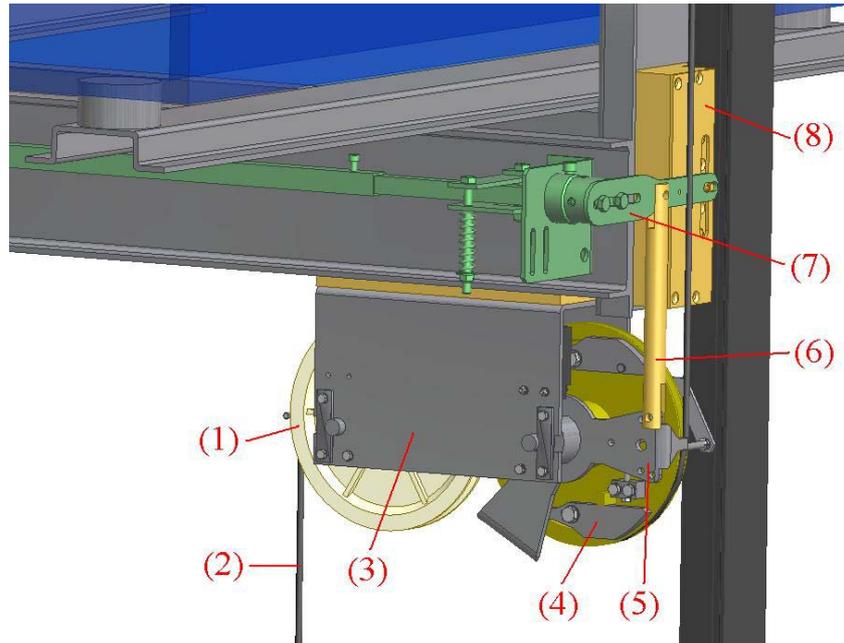


Where:

- (1) – Guide pulley.
- (2) – Rope.
- (3) – Governor.

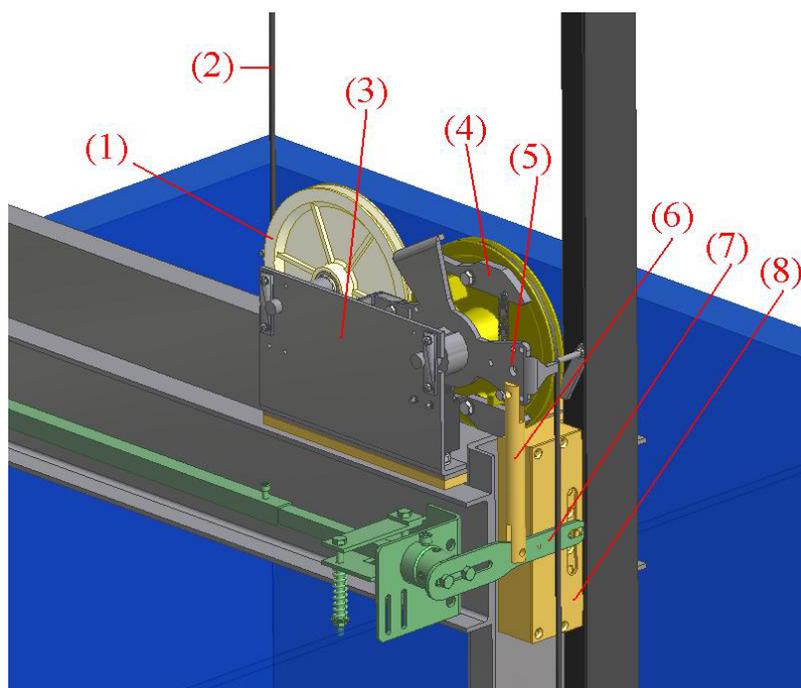
- (4) – Centrifugal system.
- (5) – Locking device.
- (6) – Auxiliary system.
- (7) – Driving bar.
- (8) – Safety gear.

The governor placed in a lower position would be as follows:



Where the numbers match those of the previous view.

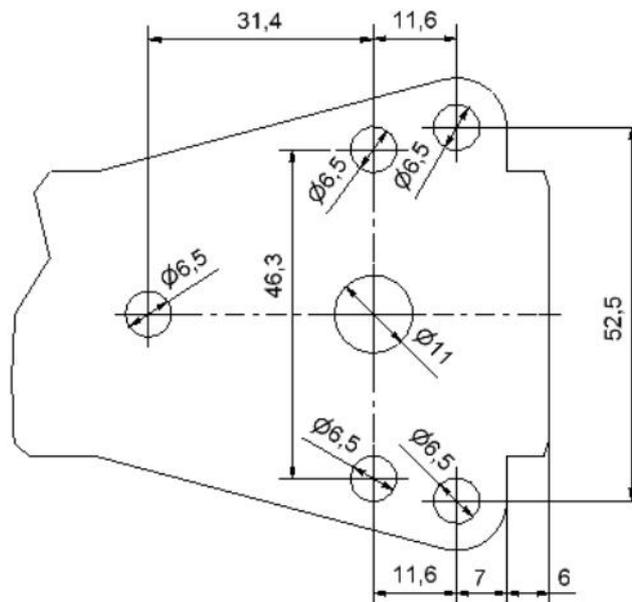
If the driving bar and the safety gear are placed above the car, this would be as follows:



In the last example, the picture doesn't display it but the speed governor has a protecting case.

Bearing in mind that the governor position in the car depends on the customer's design, the auxiliary system coupling the governor to the driving bar must be made by the lift manufacturer.

Below is attached, an enlarged drawing of the five anchoring drills of said auxiliary system to the locking device.



The guide pulley is used to re-divert the rope towards the tensor placed in the pit. This pulley rotates whenever there is movement of the car, even when the main pulley is locked. That is why we can assure that said pulley follows the car movement perfectly.

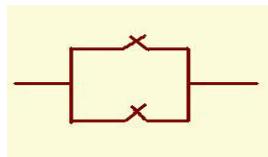
This is very important as it allows us to know the position of the lift at any time, by installing an Encoder on said pulley. (Dynatech offers its customers this possibility in the "Star Plus" governor).

Another important part of the Governor set is the rope tensing system. Below, the workings are briefly explained.

Rope tensing system.

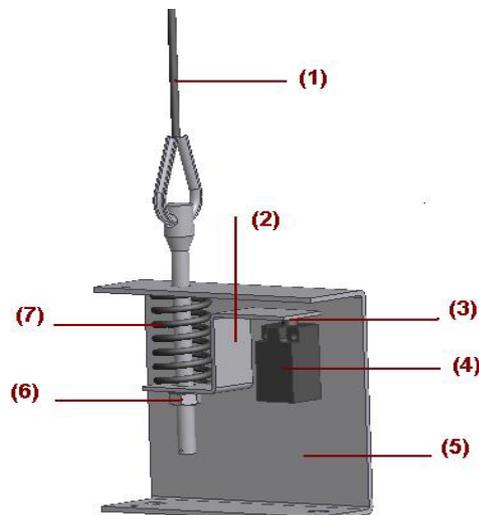
The rope is anchored to the pit and ceiling of the lift well, by means of a tensing spring system, in such a way that neither weight nor guide pulley are necessary in the pit.

The “detensing contacts” will be placed together with the anchorings. Said contacts must be connected parallel and, in turn, to the installation security series line.



The aim of the two contacts is to detect rope breakage or detensing, as, in such a case, both springs will drive the contacts. In the case of wedging, one of the springs will loosen and the other will tighten. As a result, therefore, only one of the two contacts will open without modifying the series line.

Below, a picture of the pit tensing device is shown:



Where:

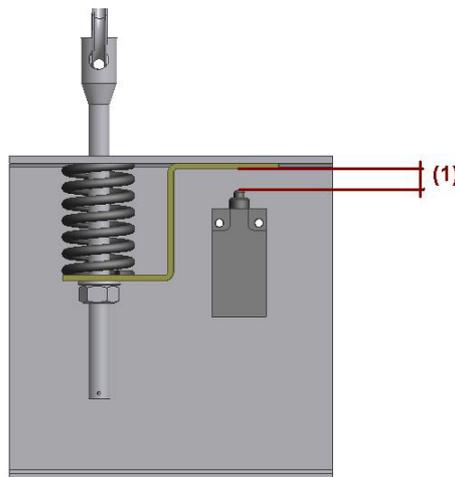
- (1) - Rope.
- (2) – Driving plate.
- (3) – Contact point
- (4) – Detensing contact.
- (5) – Bearing plate.
- (6) – Adjusting nut.
- (7) – Tensing spring.

Tensing is carried out by means of the “ adjusting nut”, as this will compress the spring to the maximum position allowed by the driving plate.

During the process of assembly, it is advisable to tense the rope manually as much as possible, before tensing the spring. In this way, it will be ensured that the length of the rope anchoring is enough for said tensing.

Tensing must be carried out on both tensors.

Below, the previously explained “maximum position”, may be observed in the picture:



Where (1) is the “detensing margin”

If the rope loosens or breaks, the springs, once their natural length is recovered, will allow the plates to drive the contacts, ensuring stopping of the machine.

The tensing device, which must be placed on the ceiling pit, has exactly the same shape and function as that previously explained.

The spring tensing system is sensitive to rope length, so, for very long ropes, retensing, once the rope has reached its final length, will be necessary.

Remote tripping system.

The governor has a built-in remote tripping system to check the correct interlocking of the governor and the subsequent safety gear wedging.

Basically, it consists of a remote interlocking electromagnetic system, which can be driven from the engine room. In order to help during the installation, three versions of the system are available.

- Solenoid fed by **24 V** DC (direct current). A current of **1,1 A** must be provided.
- Solenoid fed by **48 V** DC (direct current). A current of **0,75 A** must be provided.
- Solenoid fed by **190 V** DC (direct current). A current of **0,2 A** must be provided.

Remark: Anyway just a few seconds are necessary to engage the system. After the activation, the current that feeds the solenoid must be switched off to avoid its overheating. In that way, a button is recommended to activate the system.

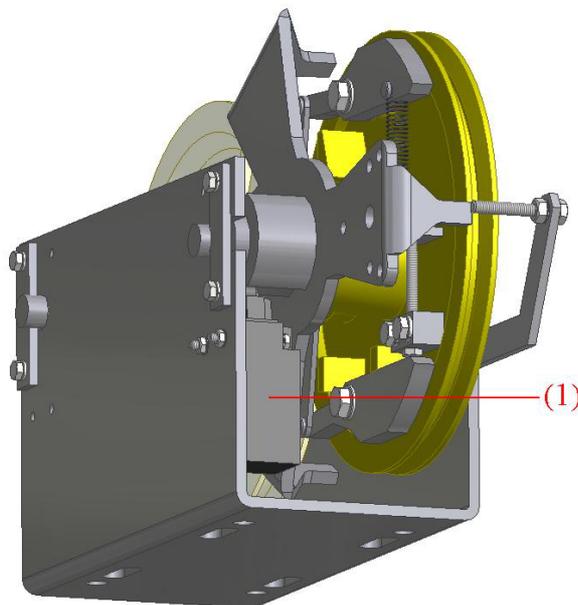
Some images of this, as well as of its position in the set are shown in the next pictures (1).



Overspeed contact.

The governor has a built-in overspeed contact. Bearing in mind that the governor will be placed in the car, said contact will have automatic rearming. In any case, the starting of the lift after interlocking must be carried out by a qualified person, but without the need for direct access to the governor.

Below, a picture of the overspeed contact position is shown, where (1) is the automatic rearming contact.



Minimum rated speed*: **0,4 m/s**

Minimum tripping speed: **0,6 m/s**

* The Notified Body allows the use of the overspeed governor with rated speeds below 0,4 m/s. The possible tripping values established by the Standard UNE-EN 81 must be guaranteed.

- **Rope:**

Diameter: 6 mm

Composition: 6 x 19 + 1

- **Rope pretensing:**

750 N

This tensing occurs by pretensing the springs placed at the rope ends up to the settled position.

- **Tension produced in the rope when interlocking:**

Greater than 300 N

- **Pulley diameter:** 200 mm

- **Overspeed contact.**

Explained in Section 3.

- **Serial remote interlocking:**

Explained in Section 3.

- **Other features:**

- Possibility of assembling an encoder to report the position of the car at all times. (**Star Plus** Model)

- The governor has 3 anchoring points, in this way the distance between two consecutive interlocking points is limited to a maximum of 200 mm.

- STAR overspeed governors will always be assembled with first quality **bearings**.

- **Safety gears with which it may be used:**

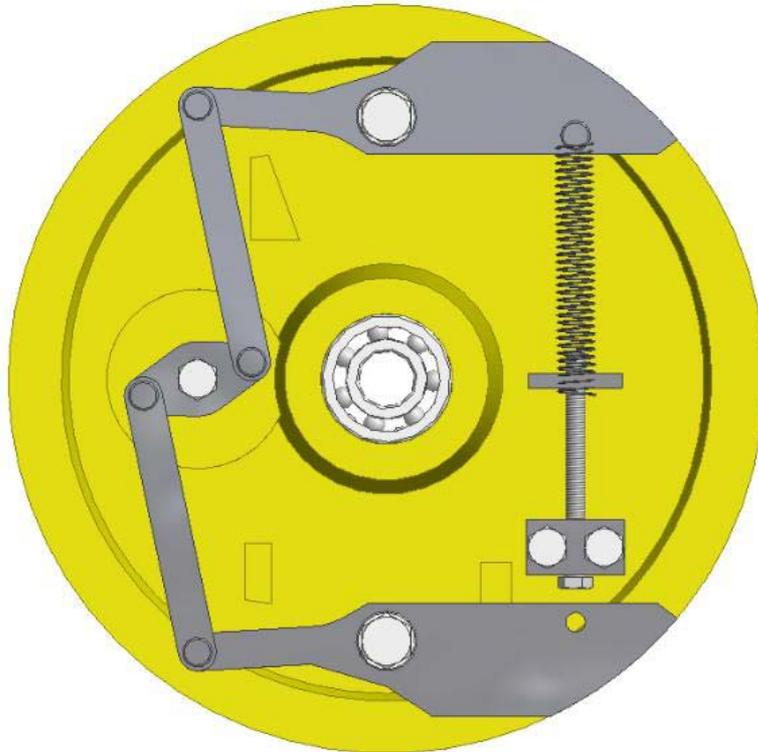
All safety gears whose tripping speed can be reached by the overspeed governor.

Remark: For tripping speeds below 1 m/s (generally instantaneous safety gears) a specifically designed version for low speeds will be supplied (**STAR BV**). This overspeed governor has the same dimensions and technical features than the standard one.

6.- TYPE OF ADJUSTMENT.

Tripping speed adjusting is carried out by means of a regulating screw which tenses or detenses the centrifugal system spring. When tensing the spring, the speed required to drive the centrifugal system will be higher. In this way, tripping speed can be adjusted within the speed range.

Said adjustment is carried out in the factory by means of a computerised gauging system according to customer's specifications. Once the adjustment is finished and checked, it is sealed so that it cannot be modified.



7.- INSTRUCTIONS FOR USE AND MAINTENANCE.

Positioning of the governor on the sling can be varied: at the top, at the bottom, in a cross-sectional or horizontal position... End location will depend on frame manufacturer's criteria. However, the marks and technical information supplied for that purpose must be taken into account, so that the governor functions accordingly.

The frame manufacturer must provide for the positioning of an articulated driving system between the governor and the driving bar. Depending on the distance between them, said system must bear the compression stress produced by wedging without causing bending. For this reason, it is recommended to place the governor as close as possible to the safety gear, so that the driving system is light, simple and does not send an inappropriate torque to the governor.

Checking of the tripping speed in the installation can be carried out acting on the engine frequency changer by progressively increasing the engine speed until interlocking is obtained.

To avoid unnecessary risks that may cause incorrect governor functioning, two basic criteria must be taken into account: cleaning and monitoring for corrosion. There are moving elements in any governor that will carry out the action of interlocking. Dirt accumulation in these elements can cause malfunctioning. It is of vital importance that both the installer and the maintenance staff ensure that these elements are perfectly cleaned.

On the other hand, Dynatech governors have rustproof protection in all cases but it is important that the maintenance staff determine the possible existence of a corrosive process that may affect any mobile part of the element and stop its natural movement. This check will be carried out by visually inspecting the surface condition and by carrying out a wedging using the remote interlocking system. The frequency of these inspections is at the discretion of

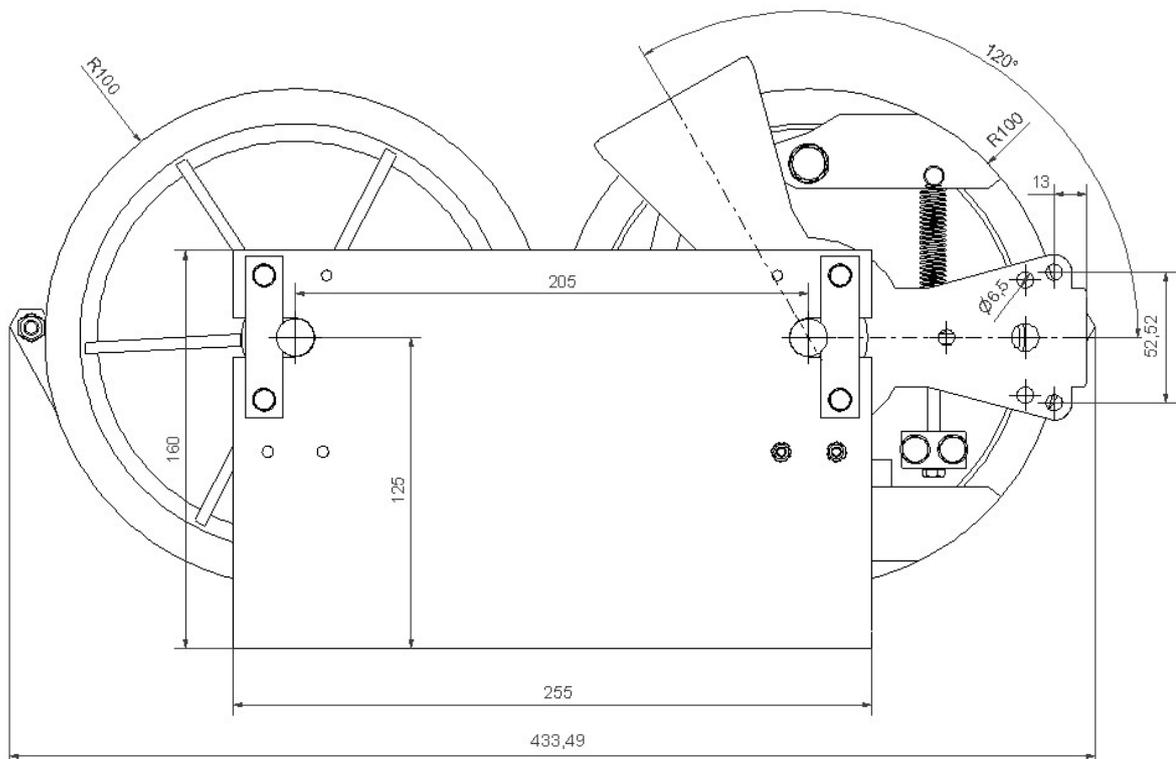
the maintenance staff, although they should be more frequent in the case of an especially corrosive environment.

Dynatech will not be responsible for any problem or accident caused by not observing the prescriptions and recommendations described, both in these instructions and in the EEC Type-examination certificate documents.

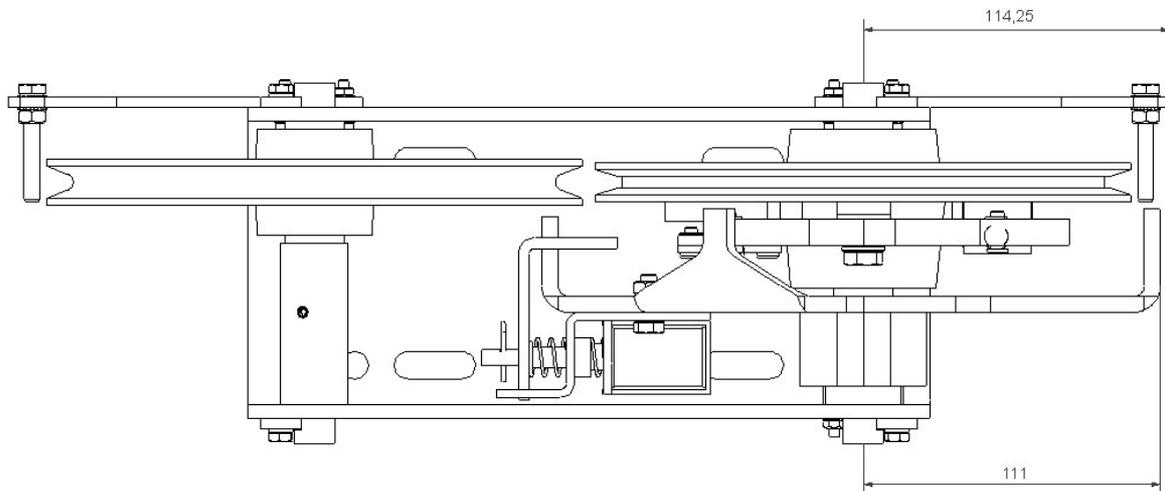
8.- INSTALLATION DRAWINGS.

The following drawings may be of help when adapting and installing the STAR overspeed governor to the sling.

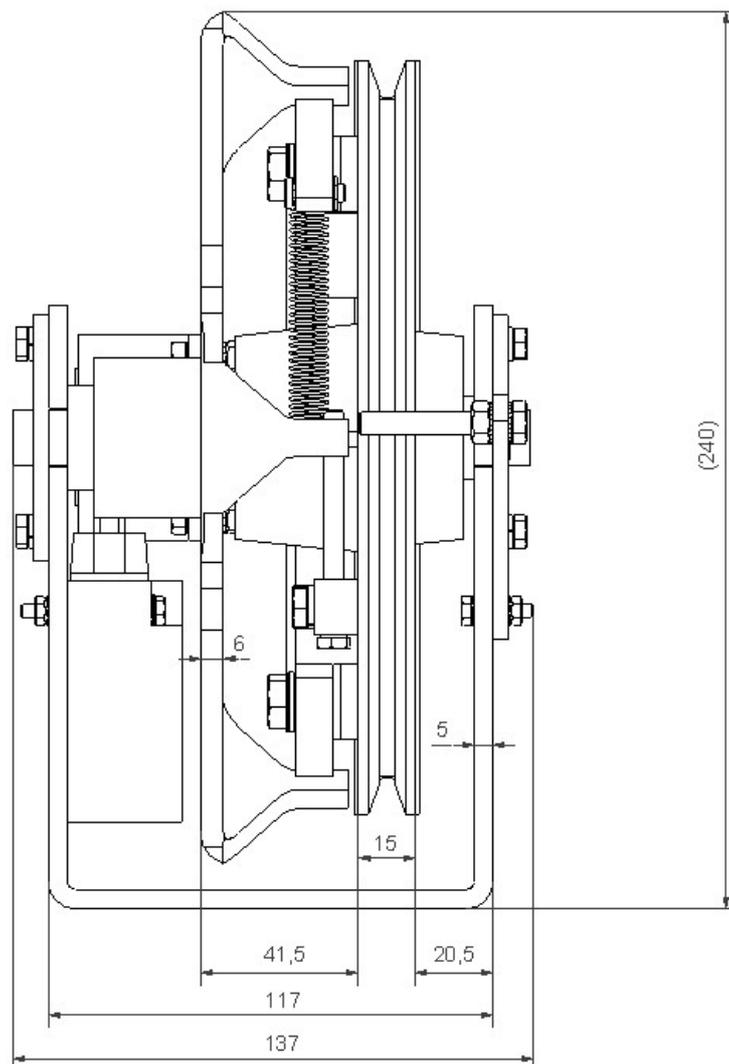
Front view:



Bottom view:



Side view:



9.- EC TYPE-EXAMINATION CERTIFICATE.

		
CERTIFICADO DE EXAMEN C.E. DE TIPO EC TYPE-EXAMINATION CERTIFICATE		
De un limitador de velocidad. Overspeed governor.		
Número de certificado. /Certificate number.	ATI / LD-VA / M109A-1 / 02	
Organismo Notificado. / Notified Body.	Asistencia Técnica Industrial S.A.E. (ATISAE) Avda. de la Industria, 51 bis E 28760 Tres Cantos MADRID (ESPAÑA) Nº de identificación 0053..	
Clase. Tipo. Product. Type.	Limitador de velocidad. STAR. Overspeed governor.	
Nombre y dirección del fabricante: Manufacturer's name and address.	DYNATECH DYNAMICS AND TECHNOLOGY S.L. C/ María de Luna, 11. Nave 7 50015 ZARAGOZA (ESPAÑA).	
Nombre y dirección del propietario del certificado: Name and address of Certificate holder.	DYNATECH DYNAMICS AND TECHNOLOGY S.L. C/ María de Luna, 11. Nave 7 50015 ZARAGOZA (ESPAÑA).	
Fecha de presentación: Date of submission.	NOVIEMBRE. 2000 ENERO. 2002 (AMPLIACION)	
Fecha del examen de tipo: Date of EC type examination.	DICIEMBRE. 2000 FEBRERO. 2002 (AMPLIACION)	
Laboratorio de ensayo: Test laboratory.	Lab. de ensayos de materiales de la E.T.S.I.I.M. C/ José Gutiérrez Abascal, 2. 28006 MADRID (ESPAÑA).	
Fecha y nº de protocolo de ensayo: Number and date of laboratory report.	2000014/1 DE OCTUBRE DE 2000 2001-013 DE OCTUBRE DE 2001	
Directiva CE aplicada EC- Directive.	Directiva 95/16/CE de 29 de Junio de 1995 EC- Directive 95/16/EC of 29.06.1995	
Norma de referencia: Reference standard	EN 81-1 : Agosto / August 1998	
Declaración: Statement	El campo de aplicación de este componente de seguridad queda establecido en el anexo de este certificado. The scope of this safety component is stated in the annex to this certificate.	
		
Establecido en Madrid, a FEBRERO DE 2002		
Este certificado consta de esta portada, un anexo técnico de 4 hojas y un plano. Su reproducción carece de validez si no se realiza totalmente. This certificate consists of this main page, a technical annex with 4 pages and one drawing. Only complete and unabridged reproduction is valid.		
Asistencia Técnica Industrial S.A.E. (ATISAE) Organismo Notificado Nº 0053 para la aplicación de la Directiva 95/16/CE Avda. de la Industria, 51 bis. E28760 Tres Cantos MADRID Tel: 91 806 17 30		



ANEXO AL CERTIFICADO CE DE EXAMEN DE TIPO ATI/LD-VA/M109A-1/02
 ANNEX TO THE EC TYPE EXAMINATION CERTIFICATE (ABOVE)

1. Campo de aplicación:
 Scope.

El presente certificado es la primera ampliación del certificado:
 This certificate is the first extension of the previous:

ATI / LD - VA / M109 / 00

consistente en la ampliación del alcance de la velocidad nominal de los ascensores en los que se encuentre instalado hasta un valor mínimo de 0.4 m/s.

and consist of the scope enhancement regarding rated speed of the lifts where installed up to a minimum value of 0.4 m/s.

El limitador de velocidad 'STAR' está certificado para actuar como:
 Overspeed governor 'STAR' is certified to operate as:

A. medio de protección en bajada (sensor de velocidad), al ser utilizado para accionamiento de paracaídas instantáneos de rodillos, instantáneos con efecto amortiguado, paracaídas progresivos.

Downward protection mean (speed probe), acting on instantaneous safety gears of the captive roller type, instantaneous safety gears with buffered effect, progressive safety gears.

B. medio de protección en subida (sensor de velocidad), al actuar sobre medios de frenado de protección contra embalamiento en subida del tipo paracaídas. Además puede ser utilizado como medio de protección en bajada con el campo de aplicación indicado en A.

Upward protection mean (speed probe), acting on braking means against upward over speed, safety gear type. Besides, this solution can be adopted to operate as Downward speed probe under the scope mentioned in A.



1.1. Descripción del limitador:

Brief description of the overspeed governor:

El limitador 'STAR' NO ES TOTALMENTE CONFORME con norma armonizada.

El limitador 'STAR' se concibe para ser incorporado en la propia cabina del ascensor, viajando con ella a lo largo de todo el recorrido. Para lograr su funcionamiento correcto, se emplea un cable tensado en las partes superior e inferior del hueco por medio de dispositivos tensores de muelles trabajando a compresión, incorporando un dispositivo eléctrico de seguridad contra el destensamiento, que abre la línea de seguridades en tal caso.

La adherencia del cable a la polea del limitador, que incorpora las masas centrífugas permite detectar la sobrevelocidad al imprimir un movimiento circular a la polea y generar la apertura de las masas por efecto de la fuerza centrífuga.

Al detectar la sobrevelocidad el sistema de masas centrífugo, enclava sobre una pieza en forma de estrella de 3 puntas, que mediante un pequeño giro acciona una barra (elemento mecánico inextensible) que unida al dispositivo de frenado (paracaídas), frena la cabina sobre las guías.

El sistema consta además de una polea de desvío sin restricciones mecánicas, como muestra la figura.

'Star' overspeed governor does not follow completely harmonised standard.

The overspeed governor 'STAR' is conceived in a new way assembled in the car itself and travelling with it along the hoistway. In order to achieve a suitable working of the system, a wire rope, stressed in its upper and lower end, is used, strained thanks to compressed springs with an electric safety device according 14.1.2. 2 (EN 81-1) that alerts in case of breakage or rope leakage, opening the safety line circuit.

The driving traction between rope and overspeed governor pulley, where a pair of centrifugal masses are implemented, allows to detect the overspeed by means of the circular movement, that makes the masses to move outside the limits of the pulley due to the centrifugal force.

When the over speed is detected by the centrifugal masses system, one of them is locked on a star shaped piece with 3 tips. Then this star performs a small spin and acts over a rigid rod (out of the scope of this certificate) attached to a braking device, such as a safety gear, stopping the car over the guide rails.

Besides, the assembly has a deviation pulley, without mechanical constraints, installed as shows the figure.

1.2. Velocidad nominal máxima y mínima de los ascensores:

Maximum and minimum Lift rated speed.

Velocidad Nominal Mínima: 0,40 m/s
Minimum rated speed

Velocidad Nominal Máxima: 2.30 m/s
Maximum rated speed

1.3. Diámetro de la polea de tracción:

Diameter of the traction pulley

Diámetro primitivo de la polea del limitador 200 mm
Pitch diameter of the pulley of the overspeed governor

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1.4. Cable:

Driving rope:

Diámetros: 6 mm
Diameter.

Composición: 6 x 19 + 1
Type.

1.5. Fuerza de pretensión en el cable:

Tensile force in normal use:

Esta tensión se debe obtener pretensando los muelles de los extremos del cable, para garantizar un adecuado funcionamiento.

This tensile force shall be obtained acting over the springs at the end tips of the rope, in order to assure the correct work of the whole system.

Fuerza de pretensión (750 – 1050) N
Tensile force.

1.6. Fuerza susceptible de ser transmitida al paracaídas:

Force able to be transmitted to the safety gear:

Para ambos sentidos, subida o bajada, se garantiza un valor máximo de: 300 N.

For both ways, downward and upward, the maximum value assured is:

2. Notas.

Remarks.

2.1. Sobre el dispositivo del limitador de velocidad debe colocarse una placa con los datos indicados a continuación:

It shall be placed an identifiable plate on the overspeed governor with the following items.

Nombre del fabricante

Manufacturer's name

Signo del examen de tipo y sus referencias

CE type-examination mark and its references

Velocidad de disparo mecánico para la cual ha sido ajustado

The actual tripping speed for which it has been adjusted

2.2. Otras características importantes a considerar en el diseño del limitador presentado son:

Other important features included in the overspeed governor are:

a) **El conjunto de limitador puede ser ubicado tanto en la parte inferior de cabina como en la parte superior. Cuando se sitúe en la zona superior, accesible a personal de mantenimiento, se proveerán las protecciones adecuadas.**

The overspeed governor assembly may be located in the upper or lower side of the car, When located in the upper side, and being accessible to maintenance personnel, adequate protections shall be provided.

b) **El limitador debe disponer de un dispositivo de disparo auxiliar con mando a distancia.**

The overspeed governor must have an auxiliary tripping device with cableless remote control.

c) **El contacto eléctrico de seguridad es de rearme automático.**

The safety electric contact returns automatically into the normal position after tripping when the overspeed governor is reset.



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- d) El método de accionamiento del dispositivo de frenado no es evaluado en este certificado. La resistencia adecuada de los elementos de interconexión limitador - paracaídas, deben ser asegurados por el instalador para los requerimientos del dispositivo de frenado utilizado conjuntamente con el limitador y los mencionados elementos de conexión entre ambos.

The tripping means and method of the braking devices, safety gear, are not assessed in this certificate. The installer of the lift shall assure the proper strength of the connection elements between overspeed governor and safety gear, according the mechanic requirements of the braking device used altogether with the governor, as well as the aforementioned connection elements.

- e) La fijación al suelo, del cable del limitador, estará protegida contra golpes involuntarios de personal de mantenimiento trabajando en foso. El instalador deberá asegurar en la fijación en el foso, la correcta protección contra la corrosión de las partes metálicas en previsión de un fallo de la impermeabilización del foso.

The attachments of the overspeed governor rope to the well floor, shall be protected against unintentional hit when maintenance personnel were working in the pit. The installer shall assure for he pit attachment a proper corrode protection of metallic elements in this attachment due to a foreseeable waterproof leak in the pit.

- f) El instalador se deberá cerciorar de que el valor de pretensión necesario indicado por el fabricante del limitador es alcanzado sin superar el valor límite.

The installer shall assure the adequate value of the tensile force in normal use between the margins settled by the governor's manufacturer.

2.5. Se adjunta a la presente certificación los siguientes documentos:

The following documents, are annexed to this certificate:

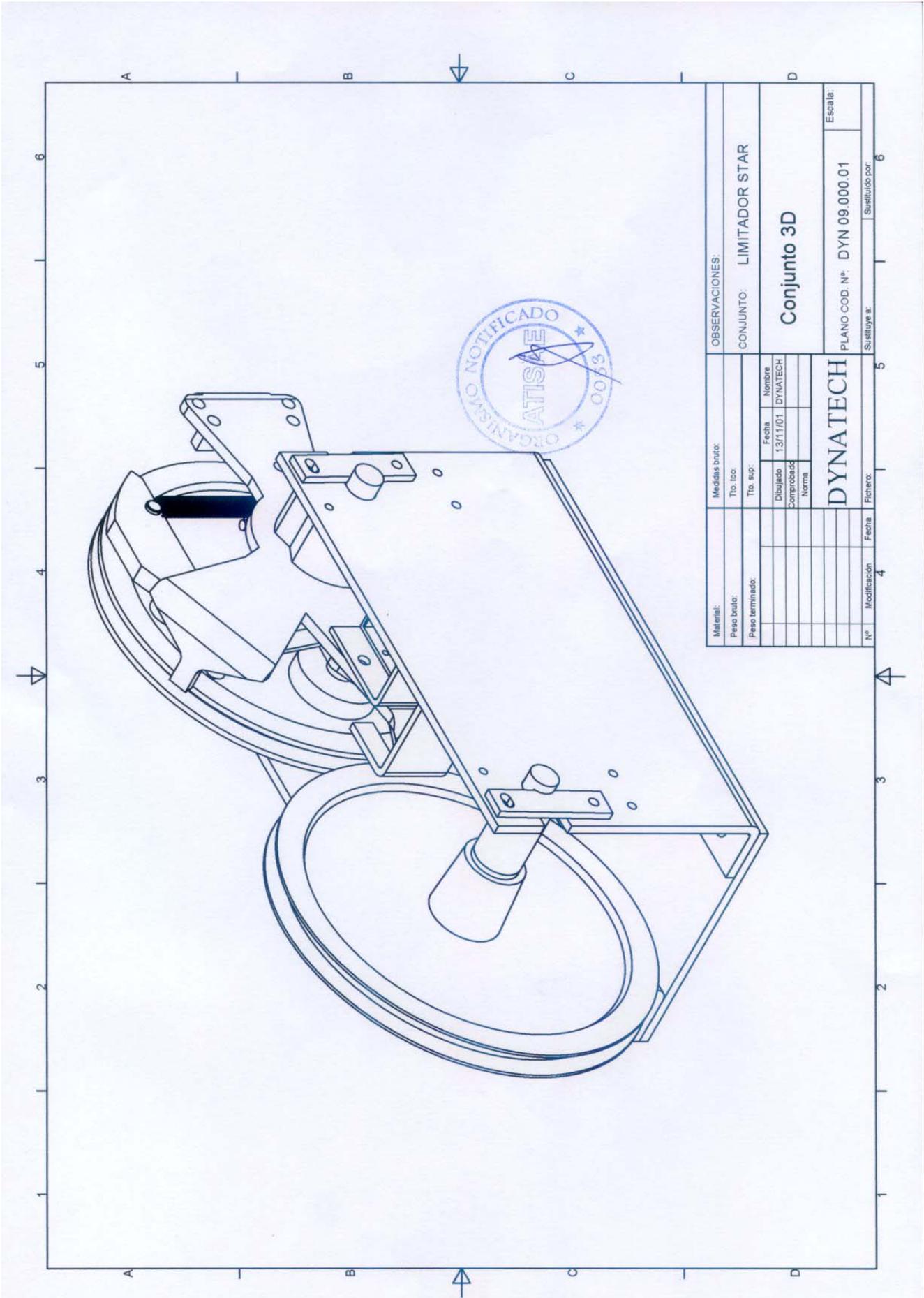
DESIGNACIÓN	FECHA	LEYENDA
DYN 09.000.01	13/11/01	LIMITADOR STAR CONJUNTO 3D

Estos planos se adjuntan con objeto de proporcionar identificación e información sobre el diseño básico del componente de seguridad.

These drawings are enclosed in order to provide identification and information about the basic design of the safety component.

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Materiales:		Medidas bruto:		OBSERVACIONES:	
Peso bruto:	Tto. lco:	Tto. lco:	Tto. sup:	CONJUNTO: LIMITADOR STAR	
Peso terminado:		Dibujado	Fecha	Conjunto 3D	
		Comprobado	13/11/01	PLANO COD. N°: DYN 09.000.01	
		Norma	DYNATECH	Escala:	
			DYNATECH	Sueltos por: 6	
N°	Modificación:	Fecha	Fichero:		