

PUNTO eMANUAL

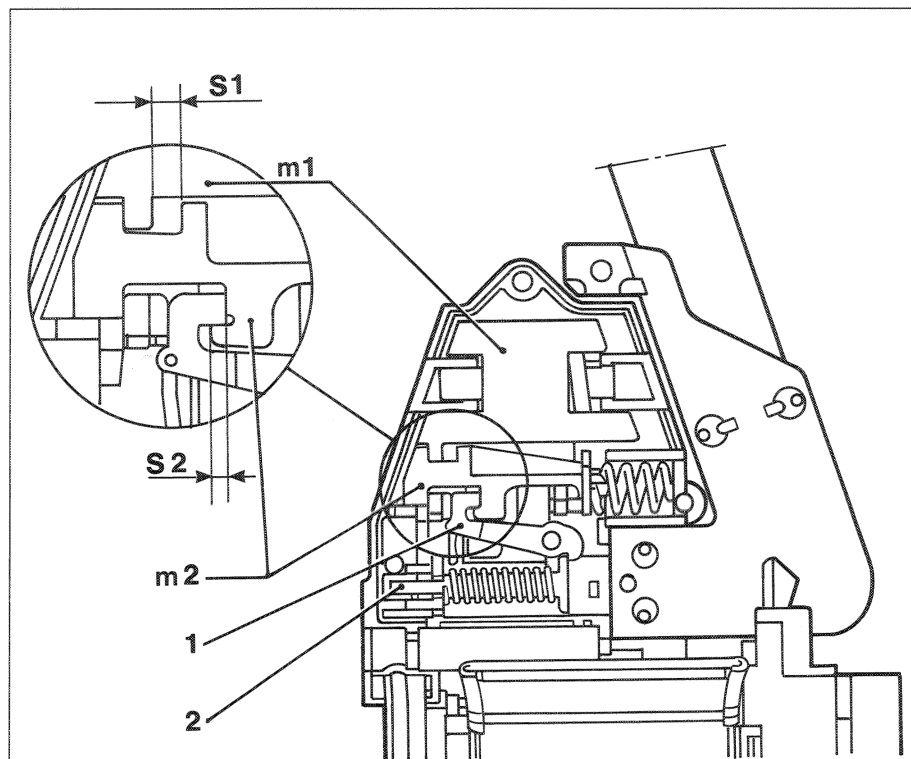
Electrical Equipment

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PRE-TENSIONER WITH "BILEVEL" MECHANICAL SENSOR

The Punto 97 range has a new type of pre-tensioner with a "BILEVEL" mechanical sensor; the differences compared with the previous versions are outlined below.

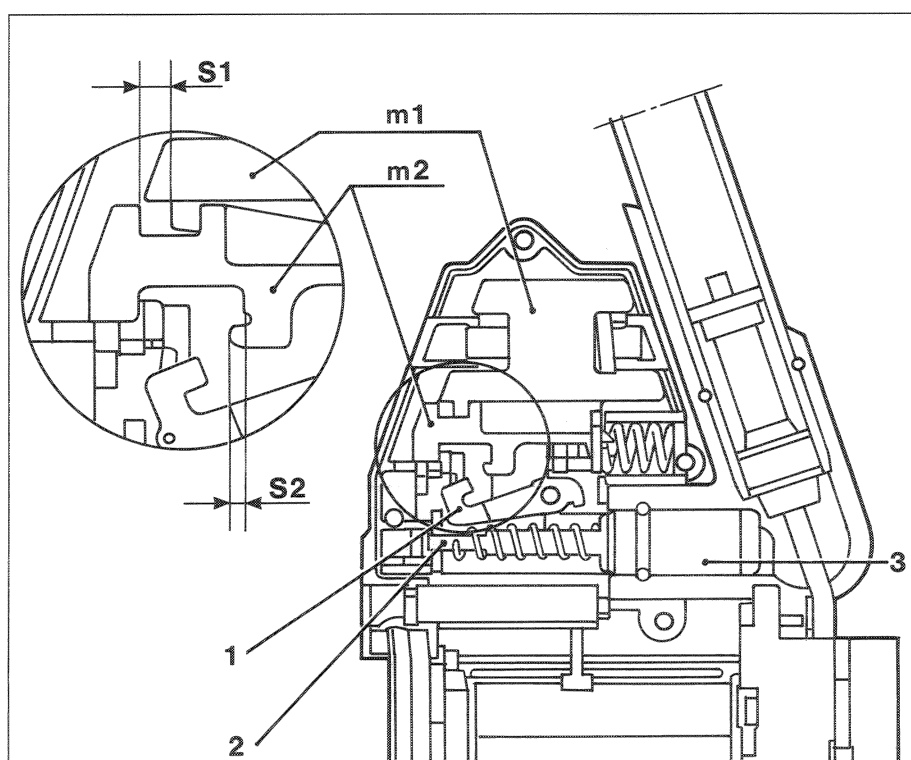
OPERATION



Sensor in rest position

The "BILEVEL" mechanical sensor comprises 2 masses, $m1$ and $m2$ and opposing springs. Mass $m1$ is very much bigger than mass $m2$.

In the case of an event which does not involve activation, the acceleration value creates a speed (of around 0.2 m/sec) at mass $m1$ which, after having travelled distance $S1$, is not sufficient to move the second mass $m2$ by distance $S2$ required to release the grille (1) and the striker (2) and thereby cause the activation of the pre-tensioner. The 2 masses $m1$ and $m2$ return to their original positions.



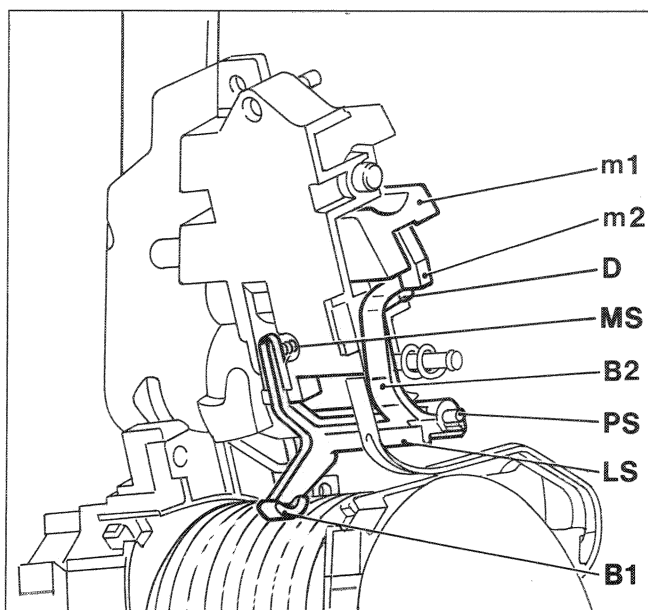
Sensor during operation

In the case of an event which involves activation, the acceleration value creates a speed (around 1.3 m/sec) at mass $m1$ sufficient to complete travel $S1$ and consequently thrust the second mass $m2$ to produce the movement $S2$. At the end of the movement $S2$ the second mass releases the grille (1) which frees the striker (2) which activates the pyrotechnic charge (3).

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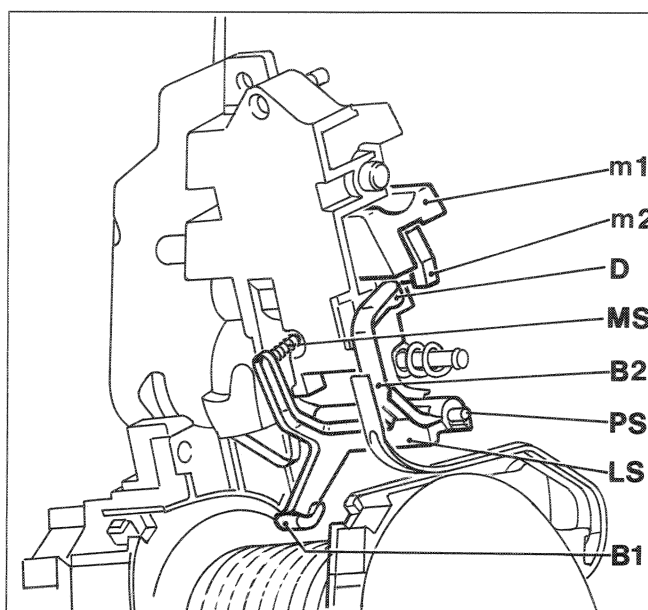
Second safety device

Rest position (seat belt not fastened)



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Working position (seat belt fastened)

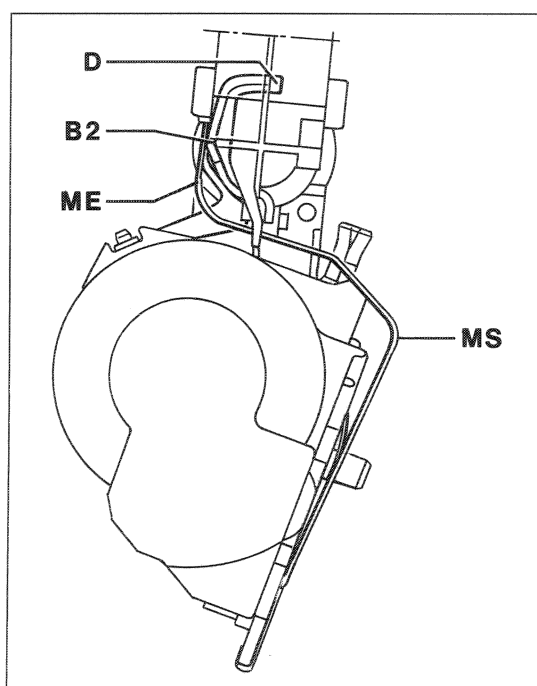


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The second safety device only allows the activation of the pre-tensioner when the seat belt is fastened. It comprises a safety lever (LS) hinged on the support pin (PS) and a spring (MS) which thrusts the arm B1 of the lever against the external diameter of the band.

When the value of the band diameter is maximum (seat belt not fastened) the tooth (D), located on the end of the lever (LS) arm (B1) places itself between the masses m1 and m2 preventing them from moving.

When the value of the band diameter decreases (seat belt fastened), the safety lever (LS), rotating on the support pin (PS), releases the masses allowing them to move for pre-determined vehicle deceleration values.



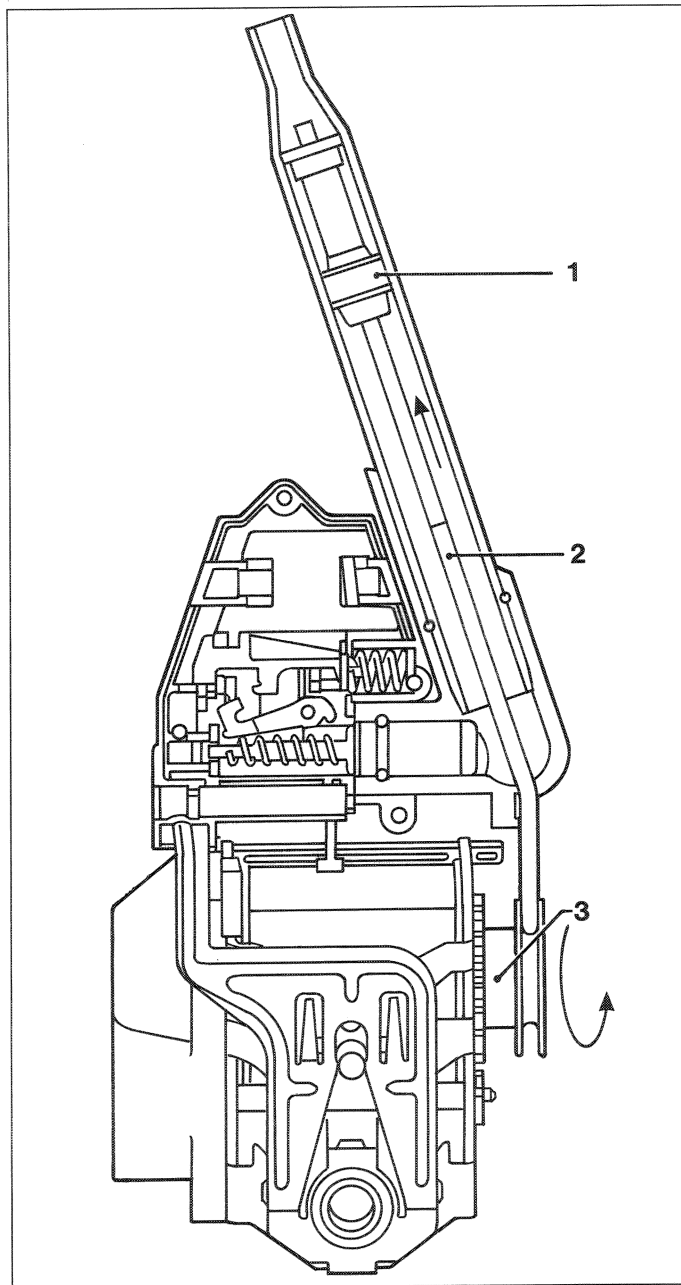
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Transport safety device

The transport safety device allows the movement of the seat belt without the risk of activating the pre-tensioner and comprises a spring (MS) fixed on the reel bracket. When the seat belt is not fitted on the vehicle the end (ME) of the spring (MS) keeps the tooth (D) for the second safety lever inside the sensor not allowing the masses to move.

After the reel has been fitted, the spring, pressed between the reel bracket and the support bracket, moves away from the second safety lever allowing it to move freely if the seat belt is fastened.

Reel during operation



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During combustion the pyrotechnic charge produces a gas which creates pressure exerting a force which pushes the piston (1) upwards.

The upwards linear movement of the piston (1), on which a cable (2) is fitted with one end fixed to the coil (3) flange, transforms the rotary movement of the actual coil, rewinding the band by several centimetres.

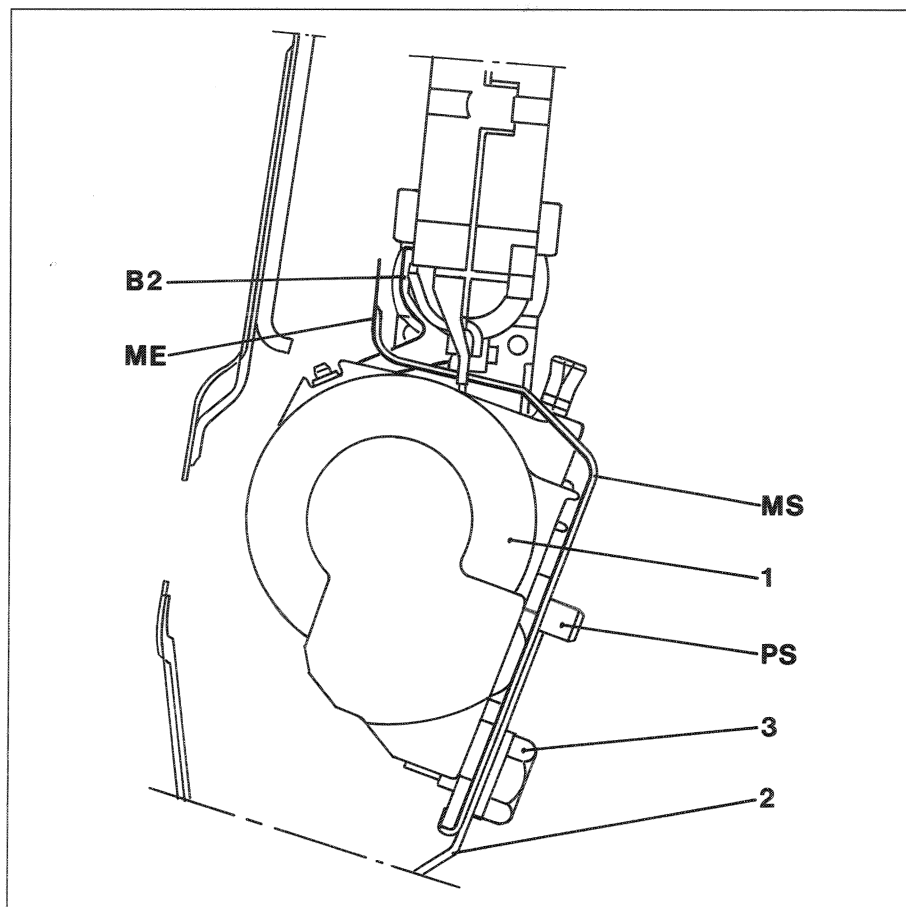
At the end of the operation, the belt remains locked showing that activation has taken place.



After each impact, which has resulted in the activation of the pre-tensioner, the belt cannot be used and should be replaced.

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Arming the system



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Fit the pre-tensioner (1), checking that the reference pin (PS) is centered in the corresponding housing for the central pillar (2) mounting bracket, then tighten the bolt (3) to the recommended torque (4 daNm).

NOTE When the bolt (3) is tightened, the system is automatically reinforced.



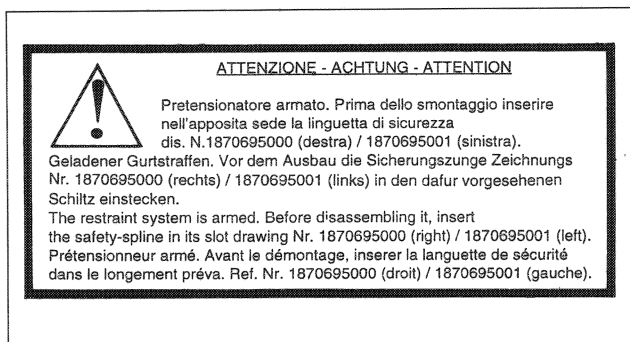
DO NOT USE PERCUSSION TOOLS.

Complete the refitting, suitably reversing the order of the operations carried out for the removal.

Disarming the system

After having carried out the preliminary dismantling operations, undo the bolt (3) and extract the pre-tensioner (1) from the centre pillar (2).

NOTE When the bolt (3) is loosened, the system is automatically disarmed. This state can be checked by observing that the end of the spring (ME) is pressing the arm (B2) of the second safety device lever towards the inside of the sensor (see diagram on previous page).



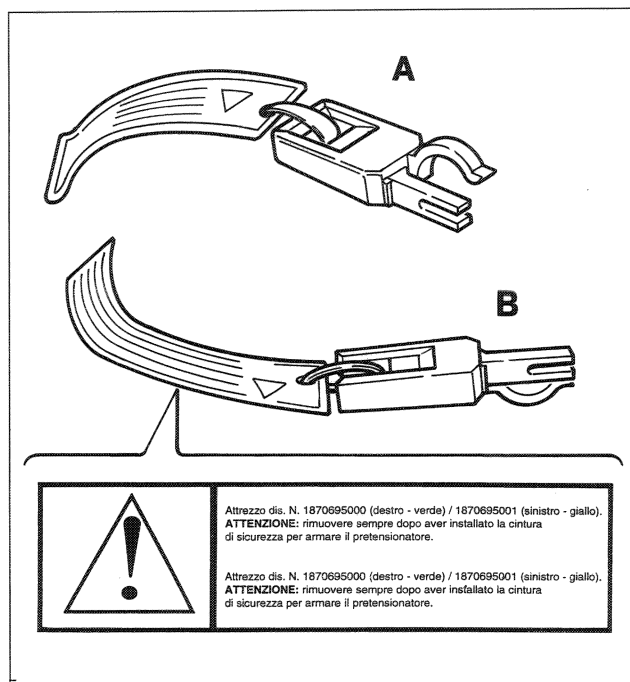
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REMOVING-REFITTING PRETENSIONER WITH MECHANICAL BI-LEVEL SENSOR

Removing

- Remove the seat belt upper and lower attachments, then remove the interior trim to allow access to the pretensioner as described in Section 55 - Electrical equipment - Seat belt pretensioner in volume 2 of the "Punto" Workshop Manual;



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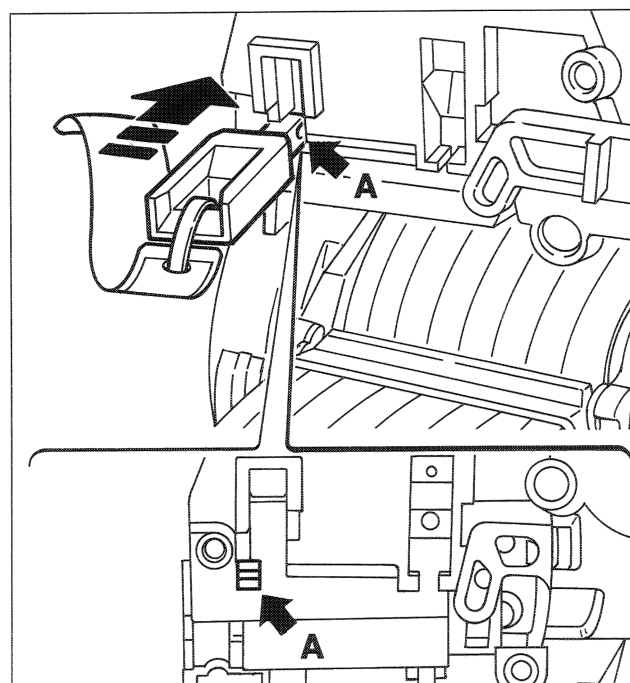


- carefully read the instructions shown on the pretensioner plate and adhere to them strictly;



*When removing-refitting, use **ONLY** the tools shown in the figure. These are **NECESSARY TO DE-ACTIVATE** the pretensioners so that they can be handled in accordance with safety regulations (see Section 55 - Electrical equipment - Seat belt pretensioner).*

- A. Tool 1870695000 for green right-hand pretensioner with warning plate
- B. Tool 1870695001 for yellow left-hand pretensioner with warning plate

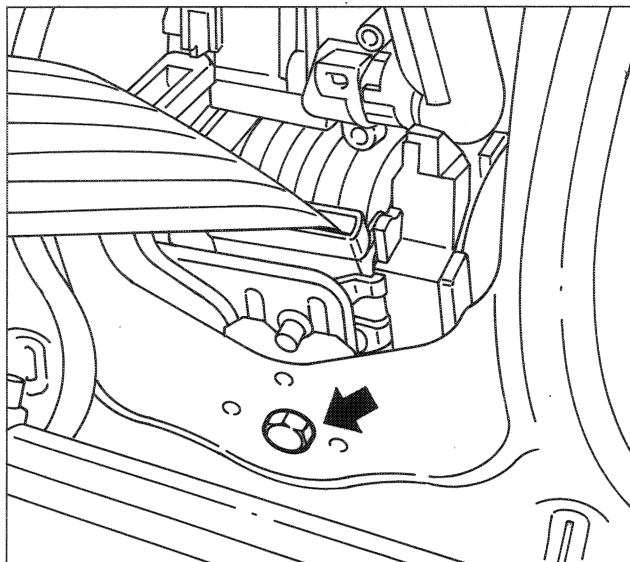


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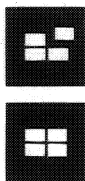


- insert tool 1870695000 (green for right-hand pretensioner) or 1870695001 (yellow for left-hand pretensioner) into seat (A) on the pretensioner cover as shown in the box;

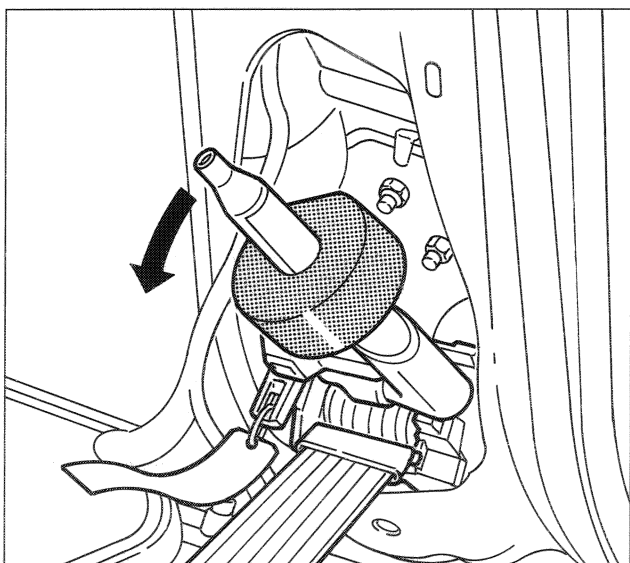
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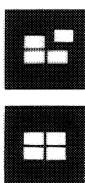
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- unscrew screw retaining and remove the right-hand pretensioner from its housing;



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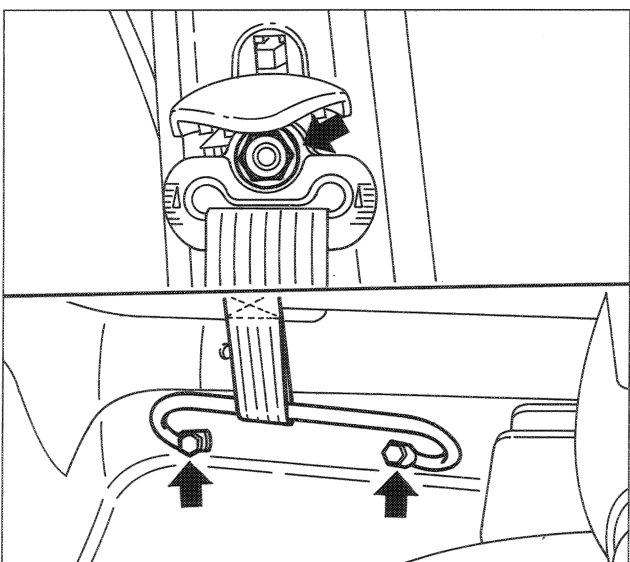


- angle the pretensioner in the arrowed direction and remove from the car. Hold correctly by the handle as described in the safety regulations.

Refitting



Tool 1870695000 - 1870695001 must be removed from the pretensioner ONLY AFTER FASTENING THE PRETENSIONER/INERTIA REEL UNIT TO THE CAR PILLAR to prevent injury to personnel.



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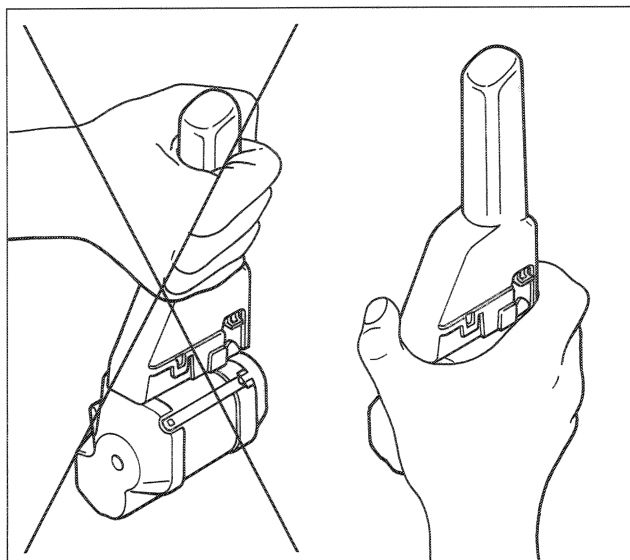


- Refit the pretensioner in its seat and tighten the retaining bolt to a torque of 4 daNm, then remove the above tool.

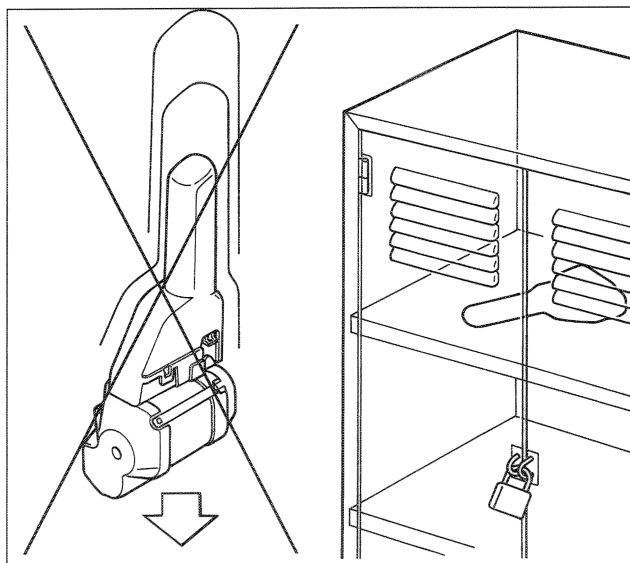


Do not use percussion screwdrivers.

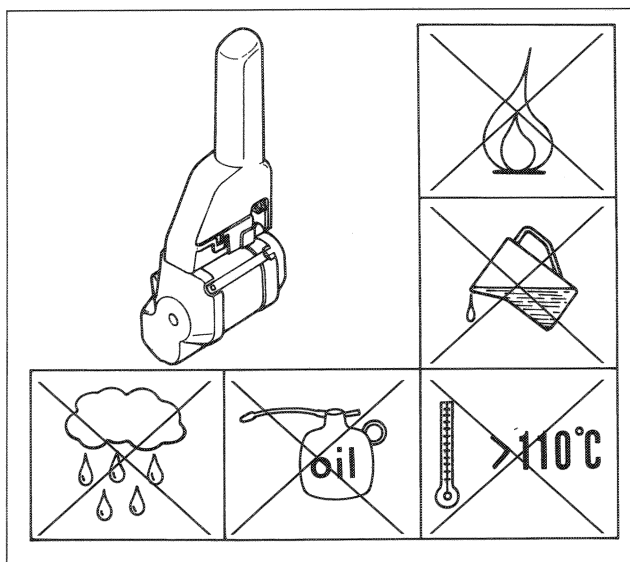
- Finish refitting by carrying out removal instructions in reverse order. Ensure belt upper and lower attachment retaining bolt is tightened to a torque of 4 daNm.



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SAFETY REGULATIONS TO BE OBSERVED WHEN HANDLING PRETENSIONERS



*Pretensioners may be removed and refitted **ONLY** by skilled, authorised technical personnel. The following regulations must **ABSOLUTELY** be observed to ensure the safety of operators and prevent damage to the seat belt and pretensioner assembly.*

- When handling a seat belt and pretensioner unit, hold the assembly as shown in the figure alongside;
- **NEVER** hold the unit by the rod;
- always fit safety spline 1870695000 (right-hand side) or 1870695001 (left-hand side) to **DEACTIVATE** the pretensioners;
- never allow the unit to fall or subject to impacts;
- when repairs to the car require temporary removal, place the pretensioner in a locked steel cabinet which complies with legal requirements;
- do not repair pretensioners but take the car to the Service Network to replace them;



The pretensioner does not require any maintenance and must not be lubricated under any circumstances. The unit's efficiency cannot be guaranteed if its original condition is altered in any way.

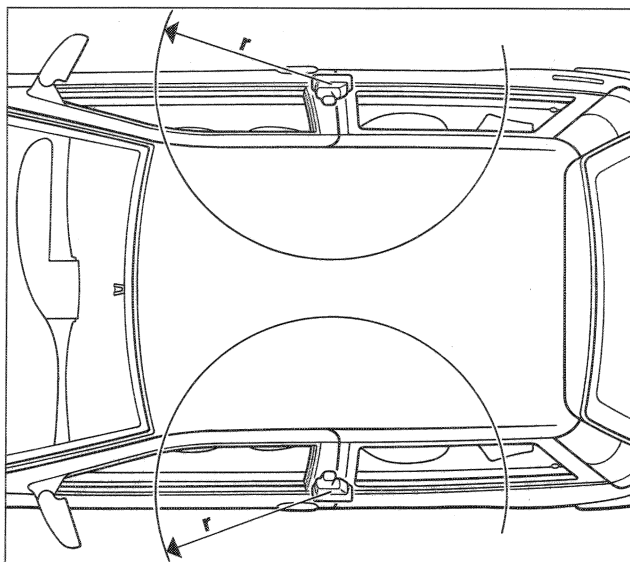
- use polythene gloves and safety goggles if an activated device needs to be removed;
- if a device has been activated, **ALWAYS** wait at least 20 minutes after activation before carrying out any repairs;
- wash hands with soap and water after handling the device.



The device must absolutely be replaced if due to exceptional atmospheric conditions (floods, high tides etc.), water and mud reach the height of device components.

- do not bring naked flames, fluids, solvents or lubricants near the device;
- do not expose to temperatures higher than 110 °C;

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- Do not subject the area surrounding the pretensioner (60-70 cm radius) to high impact loads during body repair work (e.g. by using a hammer). If necessary, remove the inertia reel - pretensioner assembly (see Section 70 - Bodywork).
- if repairs are carried out on the car in areas other than those described above, simply fit tool 1870695000 or 1870695001 and proceed as described on the previous pages;
- if radiant lamps are used in the area surrounding the pretensioner during painting work, remove the inertia reel - pretensioner unit (see Section 70 - Bodywork).

PROCEDURE FOR SCRAPPING AND REPLACING UNACTIVATED PRETENSIONERS (due to defects or expiry of warranty term)

- IT IS STRICTLY FORBIDDEN TO DISMANTLE THE PRETENSIONERS INTO THEIR COMPONENT PARTS.
- Any system component that has not been activated during an accident SHOULD BE CONSIDERED STILL ACTIVE. Any inactive parts that must be removed from the vehicle (due to defects, expiry of warranty term or other reasons) must be returned to the appropriate centre (in Italy, GECMA of Chivasso - TO) indicating on the delivery note PRETENSIONER DEVICE CONTAINING EXPLOSIVE CHARGE FOR DEACTIVATION.
- Local legal requirements must be met in the case of overseas markets.
- Devices may only be returned in the packs/boxes in which the parts were received. If these are not available, the pack alone may be ordered from PARTS.
- If the pretensioners are replaced, it is advisable to keep the original pack for use when forwarding defective or inactive devices.
- Inactive pretensioners contain substances dangerous to the health that may cause personal injury if their sealed container is damaged during disposal.
- Failure to dispose of pretensioners in accordance with these instructions may constitute a breach of current legislation.

ORDERING PROCEDURE

Pretensioners may be ordered when required from the Volvera Parts Aftersales Department. The VOR procedure must be used because Dealers must not maintain stocks of these parts. In any case, an incoming and outgoing log must be kept where module identification numbers and car identification data (chassis number, registration date, model etc.) are recorded.