Mechanical Steering Column Lock Assembly with Deadlock Mechanism

Field of the invention

The present invention relates to an antitheft device for a vehicle, and more particularly, to a mechanical steering column lock assembly with a deadlock mechanism for the vehicle.

Background of the invention

Generally, a mechanical lock assembly for steering column includes a housing enclosing a latch lock, a stator assembly and a rotor assembly rotably secured into the stator assembly. When the lock assembly is broken by using a screwdriver or similar lock breaking tool, the rotor assembly is pulled out from the lock housing thereby providing an access to the latch lock and hence to the steering release mechanism.

To address this issue, the lock assembly of the prior art is provided with dowel pins, a break point and a hard plate. Although, the dowel pins prevents pullout of the broken rotor and stator assembly from the lock housing, their use adds to working part of the locking assembly and also increases cost of the assembly. The hard plate in the lock assembly is a disc-like locking plate of a hard plastic material formed with a series of blind holes therein for receiving the end of a locking bolt. However, use of the hard plate again adds to the cost of the assembly. The break point is configured in the rotor assembly for providing security to the vehicle from theft. Specifically, when the door lock is broken, the portion of the rotor assembly from the breaking point falls inside the vehicle, which prevents the door from being opened. However, it is observed during Thatcham testing, that after breakage of the rotor assembly at the break point,

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the rotor is pushed into the door providing easy access to the door opening links/latch lock of the vehicle.

Accordingly, there is a need of an antitheft mechanism for a mechanical steering column lock assembly of a vehicle that overcomes above-mentioned drawbacks.

Objects of the invention

An object of the present invention is to protect a vehicle from unauthorized steering shaft release.

Another object of the present invention is to provide a locking mechanism that becomes dead/ inaccessible when a barrel unit is removed during theft.

Brief description of drawings

Figure 1 shows a perspective view of a mechanical steering column lock assembly having a latch lock unit and a lock housing, in accordance with the present invention;

Figure 2 shows another perspective view of the mechanical steering column lock assembly of figure 1 showing parts of the latch lock unit and the lock housing;

Figure 3a show a sectional view of the latch lock unit of the mechanical steering column lock assembly of figure 1 in a disengaged position; and

Figure 3b shows an engaged position of the latch lock unit of the mechanical steering column lock assembly of figure 1 that makes the latch lock release mechanism dead.

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Detailed description of the invention

The foregoing objects of the present invention are accomplished and the problems and shortcomings associated with the prior art, techniques and approaches are overcome by the present invention as described below in the preferred embodiment.

The present invention provides a mechanical steering column lock assembly with a deadlock mechanism for a vehicle. The mechanical steering column assembly becomes inaccessible when a lock assembly is removed during theft so as to prevent the vehicle from unauthorized steering shaft release.

The present invention is illustrated with reference to the accompanying drawings, throughout which reference numbers indicate corresponding parts in the various figures. These reference numbers are shown in bracket in the following description.

Referring now to figures 1 – 3b, a mechanical steering column lock assembly with a deadlock mechanism (100) (hereinafter, 'the lock assembly (100)'), in accordance with the present invention is shown. The lock assembly (100) comprises a latch lock unit (90) and a lock housing (95). The latch lock unit (90) is adapted to occupy an engaged position and a disengaged position. The latch lock unit (90) includes a latch lock (20), an insert body (40) and a lever (60) as shown in figures 3a and 3b.

The latch lock (20) has an opening (22). The latch lock (20) is configured inside the insert body (40). The insert body (40) is provided with an indentation (not numbered) on a surface thereof. The indentation is adapted to receive the lever (60). In an embodiment, the insert body (40) is made of a raw material for example, zamak.

The lever (60) is configured with a pin (62), a spring (64) and a detent device (66). The pin (62) and the detent device (66) are configured on a second top side (not numbered) of the lever (60). The spring (64) is positioned on an inner side (not numbered) of the lever (60). The pin (62) connects the lever (60) to the insert body

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(40). The spring (64) and the detent device (66) helps the lever (60) to fit and lock into the opening (22) of the latch lock (20). In an embodiment, the pin (62) is an axis pin.

The latch lock unit (90) is fixed inside the lock housing (95). The lock housing (95) is accessible using a vehicle key (not shown). The lock housing (95) includes a barrel unit (80). The barrel unit (80) is attached to a blocking plate (70). The barrel unit (80) is adapted to push the blocking plate (70) towards the lever (60) thereby pushing the spring (64) towards the insert body (40). The connection between the above mentioned components of the lock assembly (100) are achieved by a suitable means known in the art.

When a vehicle is parked, the lock unit (90) remains in the disengaged position as the lever (60) is not attached to the latch lock (20) (refer to figure 3a).

During theft, when a tool such as a hand tool or any screwdriver is inserted into the lock housing (95), the barrel unit (80) comes out of the lock housing (95) thereby pushing the blocking plate (70) towards the lever (60). The lever (60) is further pushed by the spring (64) towards the insert body (40) thereby attaching the lever (60) into the opening (22) of the latch lock (20) by the detent body (66). As a result, the latch lock unit (90) undergoes a change in the position from the disengaged position to the engaged position and becomes inaccessible (refer to figure 3b).

Advantages of the invention

1. The lock assembly (100) protects the vehicle from steering shaft release during theft by making the latch lock (20) release mechanism dead.
2. The lock assembly (100) makes the latch lock (20) inaccessible when the barrel unit (80) is removed during theft.

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The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the present invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the present invention and its practical application, to thereby enable others skilled in the art to best utilize the present invention and various embodiments with various modifications as are suited to the particular use contemplated. It is understood that various omission and substitutions of equivalents are contemplated as circumstance may suggest or render expedient, but such are intended to cover the application or implementation without departing from the spirit or scope of the present invention.

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