A REAR UNDERRUN PROTECTION ASSEMBLY OF A VEHICLE AND A VEHICLE THEREOF

IITM Technology Available for Licensing

PROBLEM STATEMENT

- Heavy vehicles with **high ground clearance pose a significant risk** to road traffic safety, as they may jam during rear collisions, potentially causing catastrophic injuries to the **smaller vehicle's driver and passengers**.
- **Rear underrun protection devices (RUPD)** protect vehicles from rear collisions, but small vehicle pillars can break during impact, posing a serious threat to drivers and passengers.
- **Conventional RUPDs fail to reduce impact/forces**, causing collisions between heavy vehicles and smaller ones, posing a risk to passenger safety.
- The disclosure **aims to address any limitations or issues linked to conventional mechanisms.**

TECHNOLOGY CATEGORY/ MARKET

Technology: A Rear Underrun Protection Assembly of a Vehicle and a Vehicle Thereof
Category: Automobile & Transportation
Industry: Automotive
Application: Safety Mechanism for Heavy vehicles
Market: The global market size is estimated to be **USD 82.80 Billion in 2017** and is projected to grow to **USD 169.46 Billion by 2025**, at a **CAGR of 9.36%**

INTELLECTUAL PROPERTY

IITM IDF Ref. 2590 ,Patent No: IN 548892

TRL (Technology Readiness Level)

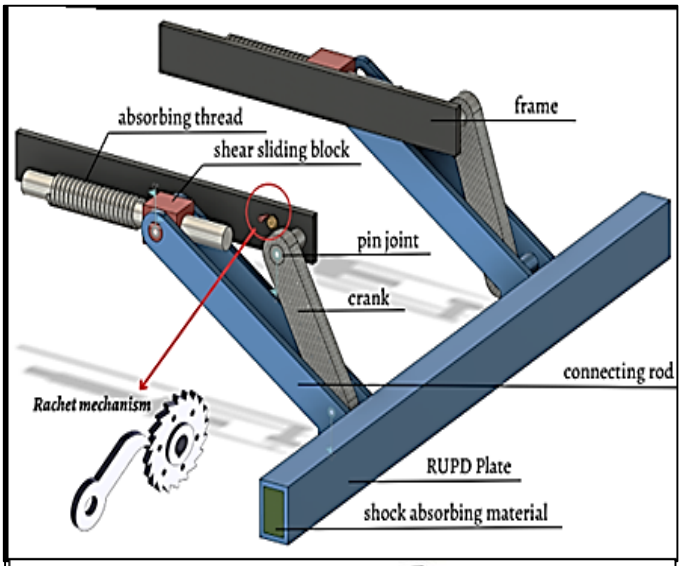
TRL- 2, Technology concept formulated

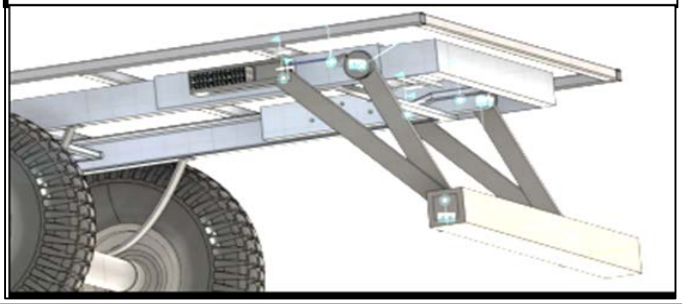
Research Lab

Prof. Jayaganthan, Dept. of Eng Design

TECHNOLOGY

- The **RUP assembly** includes a displacement mechanism connected to the vehicle's chassis.
- The **mechanism includes a housing**, damping member, and plunger, mounted in the vehicle's lengthwise direction.
- The **housing accommodates a shock-absorbing material** and has a linkage mechanism that pivots the RUP relative to the chassis and displaces the plunger to absorb shock.
- The **RUP also includes a resilient member and a height adjustment mechanism** that adjusts the RUP's height relative to the chassis.
- The **mechanism is operable by a handle connected to the chassis**.





CONTACT US
Dr. Dara Ajay, Head TTO
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
https://ipm.icsr.in/ipm/

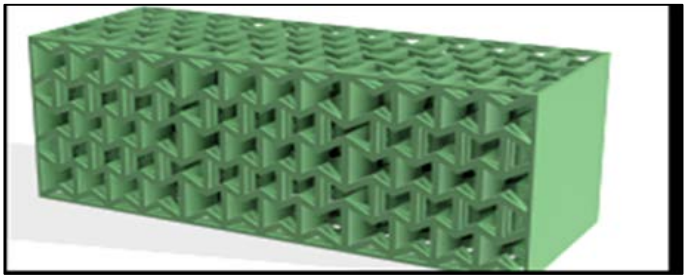
Email: headtto-icsr@icsrpis.iitm.ac.in
tto-mktg@icsrpis.iitm.ac.in
Phone: +91-44-2257 9756/ 9719

IIT MADRAS
Indian Institute of Technology Madras

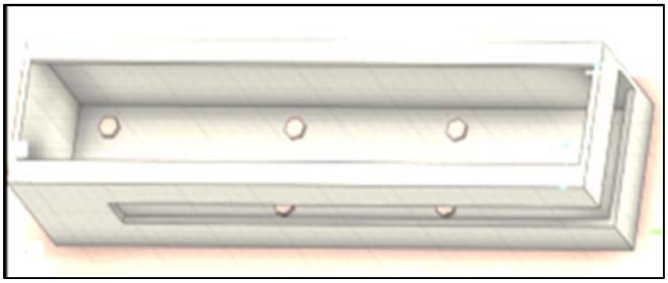
Technology Transfer Office
TTO - IPM Cell

Industrial Consultancy & Sponsored Research (IC&SR)

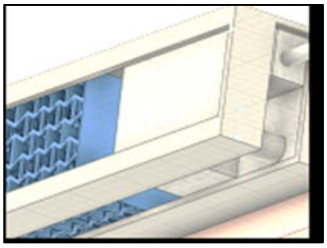
Re-entrant auxetic hexagonal cuboidal structure



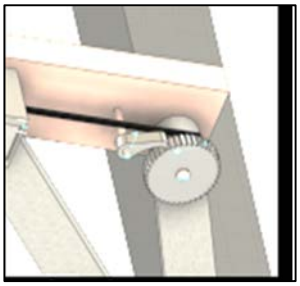
Easy to attach-Bolted easily



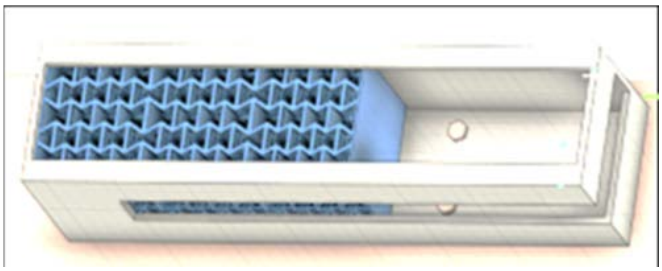
Slider made of high grade steel



Ratchet mechanism



Auxetic block,can be removed easily after accident



Key Features / Value Proposition

Displacement Mechanism Overview

- Housing
- Damping member
- P plunger

Housing Design for Damping Member

- Engages and deforms damping member.
- Connects rear underrun protection member to chassis.
- Accommodates shock-absorbing material

Linkage Mechanism in Cars

- P pivots rear underrun protection member.
- Displaces plunger for shock absorption.

Resilient Member Connection

- Connected to first link end.
- Part of plunger

Height Adjustment Mechanism

- Coupled to first link.
- Adjusts rear underrun protection member's height.
- Relative to chassis.

Resilient Member in Plunger Assembly

- Restrictes plunger displacement to predetermined tension.
- Connects to chassis on both sides.

CONTACT US

Dr. Dara Ajay, Head TTO
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
https://ipm.icsr.in/ipm/

Email: headtto-icsr@icsrpis.iitm.ac.in
tto-mktg@icsrpis.iitm.ac.in

Phone: +91-44-2257 9756/ 9719