



Smart Material Actuators for Automobile Applications

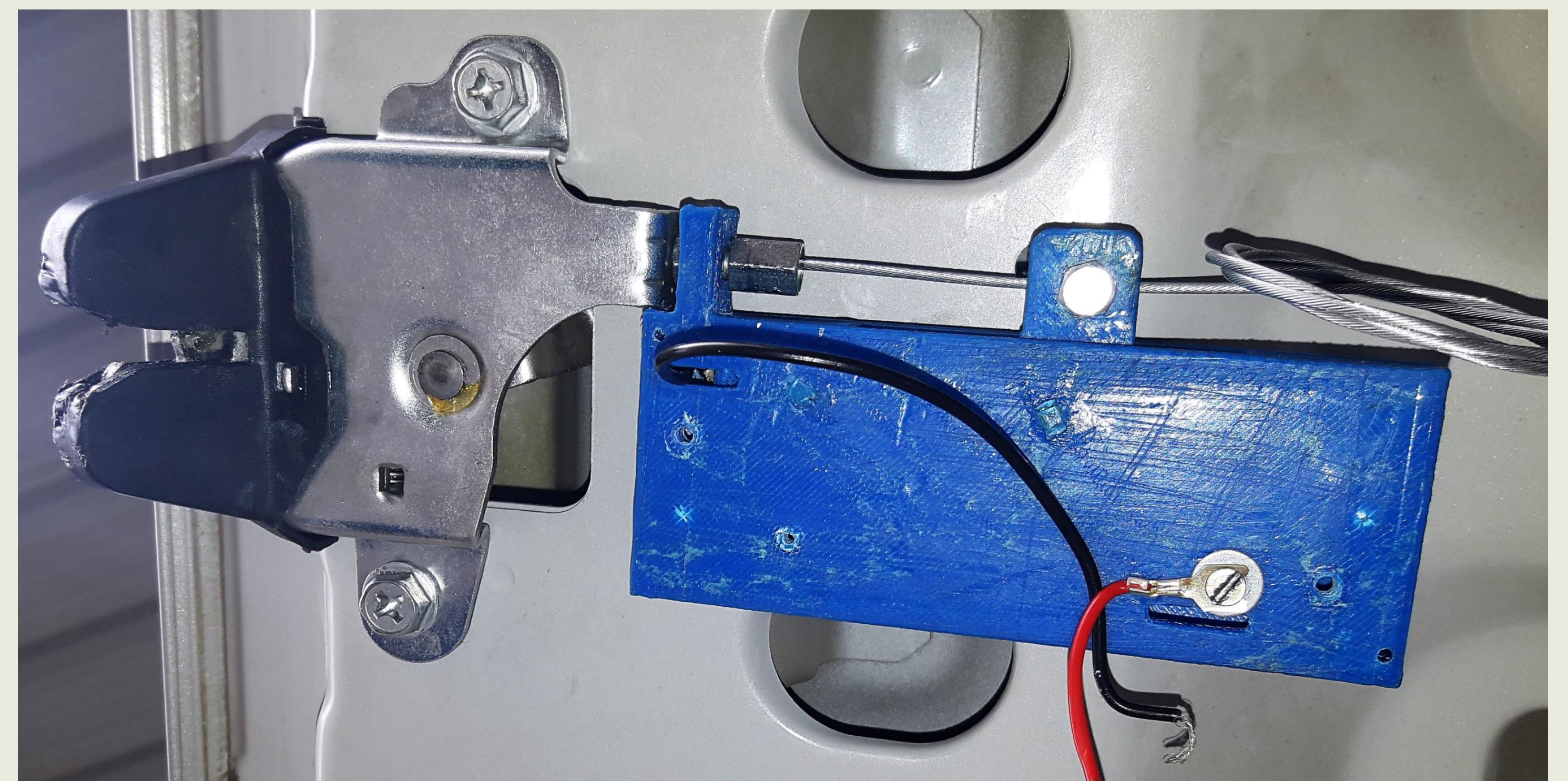


INTRODUCTION

Shape memory alloy (SMA) is a smart material that has the ability to return to its predetermined shape when heated above the transformation temperature. When the wire is heated above their transformation temperature, a large mechanical force is exerted with strain (displacement) recovery due to transformation in its phases. This strain recovery with force can be used to design and developed an actuator for mechanical actuation. The SMA transformation temperature is achieved by the resistive/Joule heating by DC pulsating current(PWM) and separate trigger switches (OPEN/CLOSE) are provided for smooth operation of the actuator.

APPLICATIONS : To lock-unlock the doors, open dickey and fuel filler door

PROTOTYPE FIXED AT DICKEY & DOOR



Specifications for door lock-unlock actuator

- Max Pull/Push Force : 1500g
- Transform Temp. : 70-90°C
- Stroke Length : ≈ 8-15 mm
- Activation
 - PWM
 - Frequency : 1-4Hz
 - Duty Cycle : 10-80%
 - Power Supply : 12 V DC, 1.5A
- Actuation Time : ~ 600ms
- Reset time interval : ~1 Second

ADVANTAGES

- ❖ Simplicity of control and Smooth operation
- ❖ Low cost
- ❖ Modular design
- ❖ Clean and silent operation
- ❖ High power-to-weight ratio
- ❖ Low maintenance

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