

# Toyota Camry

## Plastic PRNDL



### The challenge

In designing the interior console of their new Camry, Toyota needed a gear shift indicator (also known as a PRNDL) that matched the sleek design of the car. Because the PRNDL part design was comprised of many complex and highly polished surfaces, the manufacturing processes needed to build it would be very complicated. Not only did Toyota want the part to have a high gloss piano black finish, but they also wanted it to support daytime and nighttime colored backlight illumination. The project called for the production of hundreds of thousands of parts, which meant that the manufacturing processes needed to be both accurate and repeatable over the life of the program.

### Project goals

- Achieve high gloss piano black finish without blemish
- Establish a repeatable process for graphic and color registration within microns
- Provide a solution for reverse image graphic marking and color matching for backlit illumination

### The solution

**1,600**  
PARTS  
PRODUCED  
PER DAY

When GM Nameplate and its plastics manufacturing division, GMN Plastics, were brought into this project, the manufacturing processes needed to produce this PRNDL part were unclear. Toyota and their tier one supplier knew that they needed a black colored part with backlighting, but weren't sure what capabilities were needed to achieve these requirements. As GMN Plastics became involved in the project, it was clear that this part would be difficult to

CASE STUDY

produce in terms of the molding, masking, painting, etching, and assembling processes because of the complex shape and high polish. Because several of the manufacturing processes needed were relatively advanced, the project presented a great opportunity for the further development of the automotive business.

To achieve the piano black color and optical depth required by Toyota, GMN invested in an automated robotic spray system to offer a streamlined production process. The spray system can paint parts more quickly and cleanly than other paint processes. It was decided that laser etching should be utilized in order to create an image in the paint that would have crisp lines and allow light to pass through the black coating. The paint and laser etching processes required several phases of development because while the paint needed to be thick enough to prevent light leaks, the paint layer also needed to be etched cleanly enough to let light through without burning the part.

**STREAMLINED  
PRODUCTION  
PROCESS**

In an effort to successfully meet Toyota's colored backlight requirements, GMN developed a printed label to apply to the backside of the part. Through several iterations of color applications including sequencing, color thickness, and the associated testing, artwork was developed that met all the specifications. A pick and place robot was purchased and programmed to aid in the precision placement of the label and adhesive on the part.

After development in processes and design options, GMN is able to provide a high volume-part that met that met the exacting aesthetic requirements of the customer.

