

Problem:

- Thermal event originating in the headlamp/bucket area of vehicle

Effected Models:

- P4 New Cascadia
- RG history
 - No thermal issues
 - 68 lamps / 25 trucks (including 2 in Mexico) / 6.6M+ miles

Root Cause:

- Bulb installed incorrectly & may disengage from reflector/headlamp

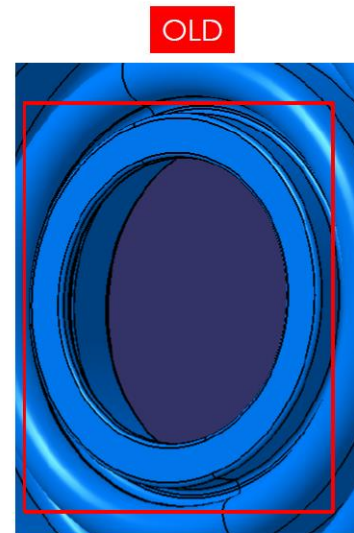
Field Containment: Nov 2019

- Driver manual update complete
- Service solution posted. CAL FTL 54005

Production Containment/Product Improvement:

- All TMPs modifying headlamps (remove boot - installed grommet) as of 12/10/19
 - CLE started 12/5/19
- ZKW implementation of grommet with parts to DTNA C/O - 3/23/2020
- Warning label implemented
- Splash shield P59939+01 implemented 3/23/2020

- ✓ **Zero** reported issues with correctly installed bulbs (OEM or aftermarket)
 - ✓ DTNA driver manual calls for OEM Osram H11 replacement
- “Rib” - seals the bulb/socket



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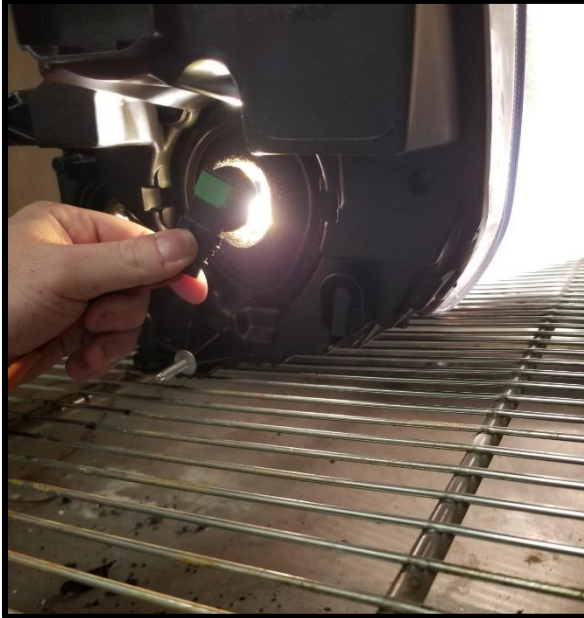
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P4 Halogen Headlamp



- Validation testing showing results of the foam boot with bulb purposely positioned to simulate **mis-installed** bulb
- The foam boot is doing its job to slow and stop the bulb from cutting into the lamp and surrounding parts of the truck.

P4 Halogen Headlamp

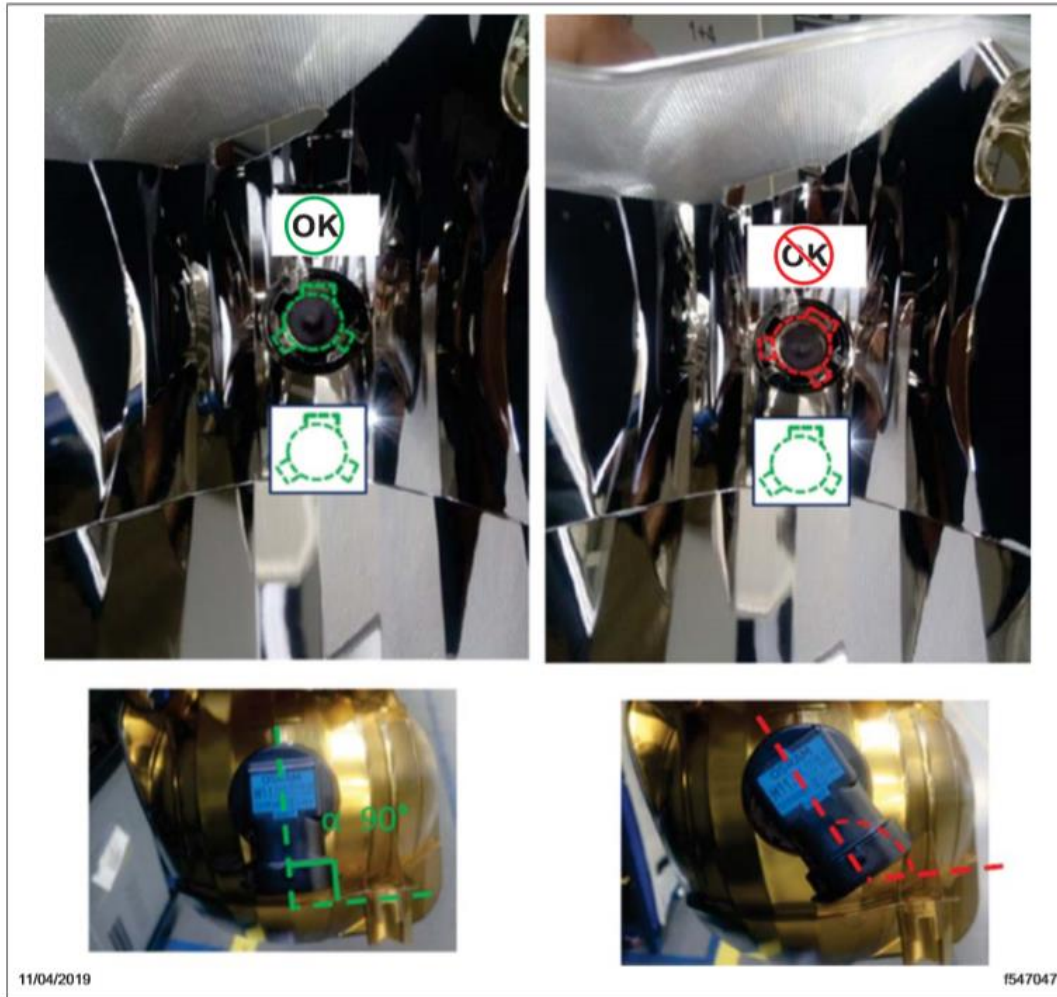


Fig. 11, View Through Headlamp Lens to Verify Bulbs are Fully Seated

- There are NO issues when bulbs are installed correctly
- Warnings, instructions, and system updates have been implemented to only help the operator
- Mis-installation IS detectable.
 - Inspection of bulb from the front (through lens)
 - Inspection of the bulb from the back
 - If mis-installed the light output on the road can be detected (dim, flickering)

Link to a video put together by a Freightliner customer:

<https://www.youtube.com/watch?v=SVubd4WJbTw&feature=youtu.be>