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Study on decreasing ignition voltage of mercury-free HID lamps for automotive headlamps TADAO UETSUKI, TAKAHUMI OTA, Tsuyama National college of Technology, MASAYA SHIDO, TOSHIAKI TSUDA, YUKIO ONODA, Koito Manufacturing Co., Ltd. — Recently the HID lamps for automotive headlamps have gradually changed from the mercury containing HID lamps to the mercury-free. Filling gas pressure of the mercury-free HID lamps is much higher than that of the mercury containing, because luminous flux and run-up speed of the mercury-free HID lamps are much lower than that of the mercury containing if filling gas pressure is the same. High filling gas pressure also leads to high ignition voltage of the mercury-free HID lamps and it makes their ballast (include ignition circuit) bigger and heavier to keep reliability of the ignition. Therefore it is important to decrease ignition voltage of the mercury-free HID lamps. We studied influence of outer filling gas type and pressure on ignition voltage. As the result, we found that they have strong influence on ignition voltage, for instance nitrogen is a very effective gas for decreasing ignition voltage. We also found that a streamer path of ignition tends to be longer as ignition voltage decreases. In this study we discuss these measurement results.

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