INTISARI

Kebutuhan akan *lean, premixed combustor* sangat vital untuk penerapan dalam *gas engine* karena emisi gas buang berupa NO_x rendah. Namun dengan menggunakan *combustor* seperti itu dapat mengalami kerusakan karena adanya *auto-ignition* atau *flashback* yang dapat memicu gelombang detonasi pada *manifold intake* mesin sehingga perlu pengendalian detonasi agar mengurangi kerusakan yang terjadi.

Eksperimen ini meneliti *arrester* mana yang cocok untuk mengurangi dampak dari *flashback.* Gelombang detonasi CNG-Oksigen dilewatkan model *arrester* dengan variasi panjang 30, 50, dan 70 mm. Model *arrester* dimasukkan ke dalam *housing* yang diletakkan sejauh 2000 mm dari *igniter*. Pipa uji yang digunakan dengan total panjang 3000 mm, bagian *driver* sepanjang 1000 mm dan bagian *driven* 2000mm dipisahkan oleh *mylar film*. Bagian *driver* diisi gas gas inisiasi berupa *premixed* hidrogen-oksigen dengan tekanan 100 kPa. Bagian *driven* diisi gas uji stoikiometrik CNG-Oksigen dengan tekanan 10-100 kPa. Gelombang detonasi yang merambat akan melewati *arrester* dan pada *downstream* tekanan dan perambatan *flame front* akan direkam oleh sensor tekanan dan *ion probe*.

Dari eksperimen ini dihasilkan bahwa detonasi mulai terbentuk pada tekanan 20 kPa. Untuk ketiga *arrester* menghasilkan tiga jenis karakter perambatan yaitu *flame quenching, detonation quenching, dan detonation reinitiation*. Lebih lanjut didapatkan *arrester* Panjang 70 mm menjadi yang aling efektif meredam detonasi karena memiliki jarak reinisiasi yang besar.

Kata kunci: *Arrester*, *Detonation Quenching*, Reinisiasi Detonasi, Jarak Reinisasi

ABSTRACT

The need for lean, premixed combustors is vital for the application in the gas engine because the exhaust emissions are low NOx. However, using such combustors can be damaged due to auto-ignition or flashback that can trigger detonation wave in the intake manifold of the engine, so detonation controlling is needed to reduce damage.

This experiment examined which arrester is suitable to reduce the impact of flashback. CNG-Oxygen detonation waves were passed arrester models with variations in length 30, 50, and 70 mm. The arrester model was inserted into the housing that was placed as far as 2000 mm from the igniter. The test pipe used was a total length of 3000 mm, the driver section was 1000 mm and the driven part was 2000mm separated by mylar film. The driver section was filled with gas initiation gas in the form of premixed hydrogen-oxygen with a pressure of 100 kPa. The driven part was filled with a CNG-Oxygen stoichiometric test gas with a pressure of 10-100 kPa. Detonation waves that propagate would pass through the arrester and at pressure downstream and flame front propagation would be recorded by pressure sensors and ion probes.

From this experiment it was produced that detonation began to form at a pressure of 20 kPa. For all three arresters, there were three types of propagation characters, namely flame quenching, detonation quenching, and detonation reinitiation. Further obtained the 70 mm long arrester was the most effective in reducing detonation because it had a large reinitiation distance.

Keywords: Arrester, Detonation Quenching, Reinitiation Detonation, Reinitiation Distance