Table 1. Engine specifications.

Table 2. Bore and stroke values for different B/S ratio designs.

Table 3. Simulation conditions.

Figure 1. Layout of the BUSDIG engine, the definitions of design parameters of scavenge ports and their baseline values.

Figure 2. Schematic diagram of the exhaust valve lift and normalized scavenging area profiles of scavenge ports.

Figure 3. Mass flow rates at the outlets of scavenge ports for different B/S ratios.

Figure 4. Comparison of RGF in the cylinder and exhaust ports with B/S ratios of 0.66 and 1.3.

Figure 5. Section views of RGF distributions with B/S ratios of 0.66 and 1.3.

Figure 6. Effect of B/S ratios on SR, TR and CTR at 280 ⁰CA.

Figure 7. Evolutions of SR with crank angle for different B/S ratios.

Figure 8. Evolutions of DR with crank angle for different B/S ratios.

Figure 9. Evolutions of TE, SE and CE with DR for different B/S ratios.

Figure 10. DR, TE, SE and CE at the end of scavenging with different B/S ratios.

Figure 11. Effect of AIA on SR at 280 ⁰CA with different B/S ratios.

Figure 12. Evolutions of SR with AIA of 60⁰ and 90⁰, and B/S ratio of 0.66 and 1.3.

Figure 13. Comparison between the flow fields with AIA of 60⁰ and 90⁰, and B/S ratio of 0.66 and 1.3.

Figure 14. Effect of AIA on DR, TE, SE and CE with B/S ratio of 0.66.

Figure 15. Effect of AIA on DR, TE, SE and CE with B/S ratio of 1.3.

Figure 16. Comparison of RGF profiles in the cylinder and exhaust ports with AIA of 60⁰ and 90⁰, and B/S ratio of 0.66 and 1.3.

Figure 17. RGF distributions at 170 and 180 ⁰CA with AIA of 60⁰ and 90⁰, and B/S ratio of 0.66 and 1.3.

Figure 18. Evolutions of CE with DR for different AIAs and B/S ratios.

Figure 19. Effect of SOA on SR at 280 ⁰CA with different B/S ratios.

Figure 20. Effect of SOA on DR, TE, SE and CE with B/S ratio of 0.66.

Figure 21. Effect of SOA on DR, TE, SE and CE with B/S ratio of 1.3.

Figure 22. Comparison of RGF profiles in the cylinder and exhaust ports with SOA of 0⁰ and 31.5⁰, and B/S ratio of 0.66 and 1.3.

Figure 23. RGF distributions at 170 and 180 ⁰CA with SOA of 0⁰ and 31.5⁰, and B/S ratio of 0.66 and 1.3.

Figure 24. Evolutions of CE with DR for different AIAs and B/S ratios.

Figure 25. Effect of AIA on DR, TE, SE and CE with B/S ratio of 0.8.

Figure 26. Effect of AIA on DR, TE, SE and CE with B/S ratio of 1.

Figure 27. Effect of SOA on DR, TE, SE and CE with B/S ratio of 0.8.

Figure 28. Effect of SOA on DR, TE, SE and CE with B/S ratio of 1.