

supplementary material

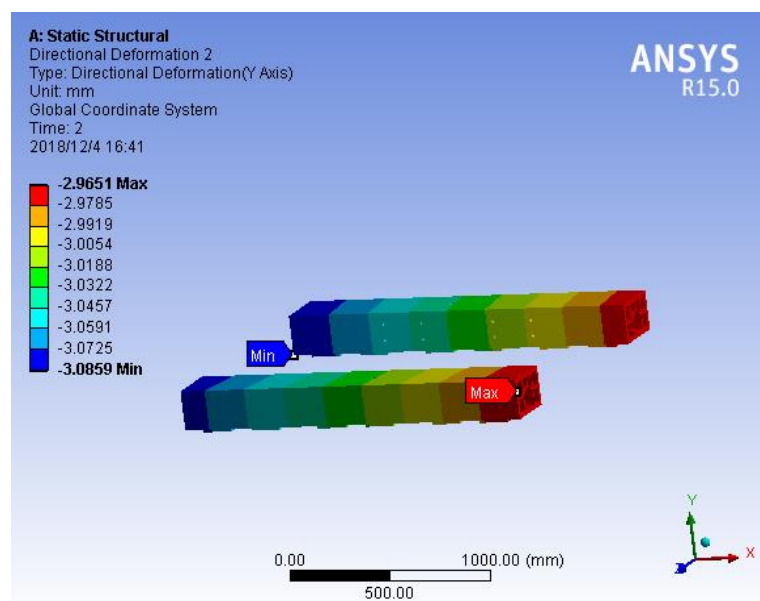


Figure S1. Deformation diagram of suspension frame under parking (suspension) state.

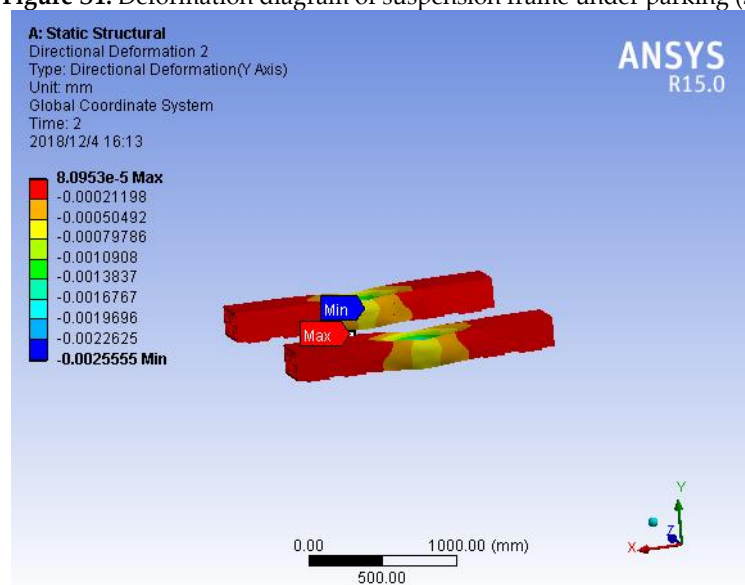


Figure S2. Deformation diagram of suspension frame when the support surface is fixed under parking (suspension) state.

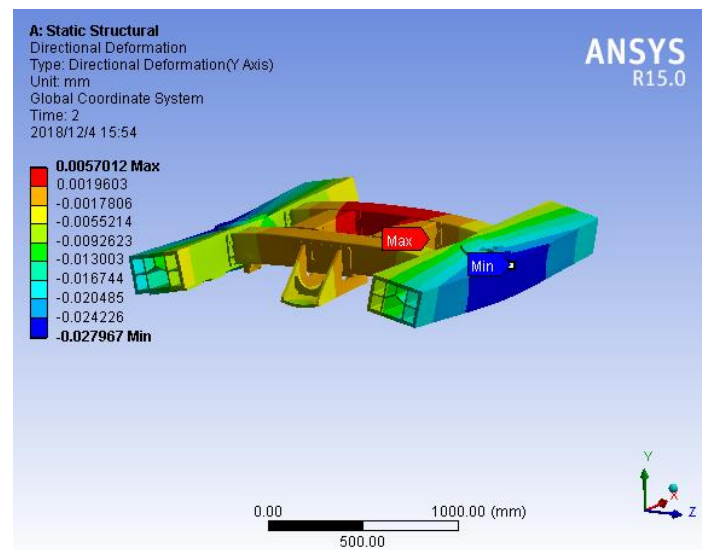


Figure S3. Deformation diagram of suspension frame under parking (support wheel support).

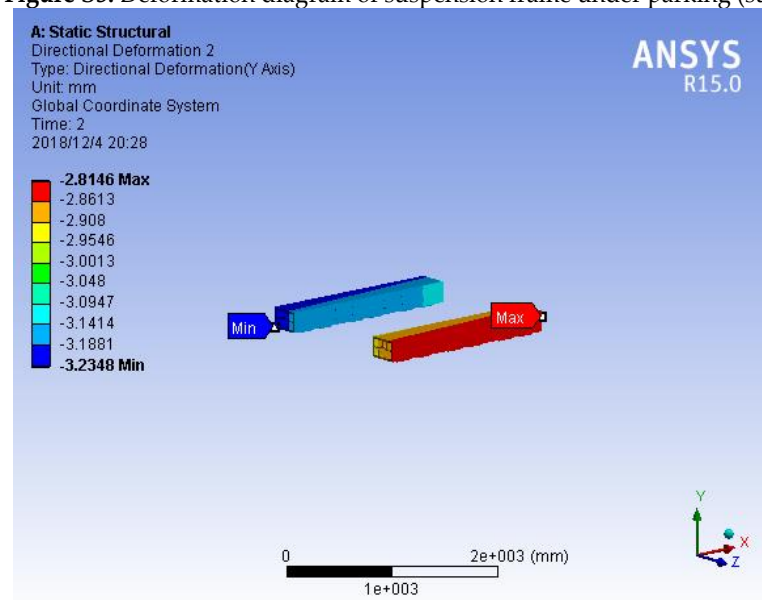


Figure S4. Deformation diagram of suspension frame under traction condition (condition 3).

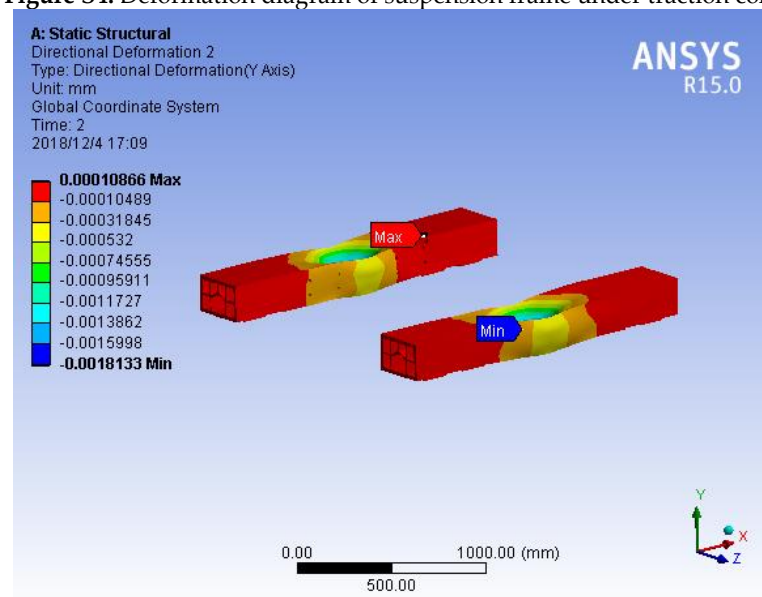
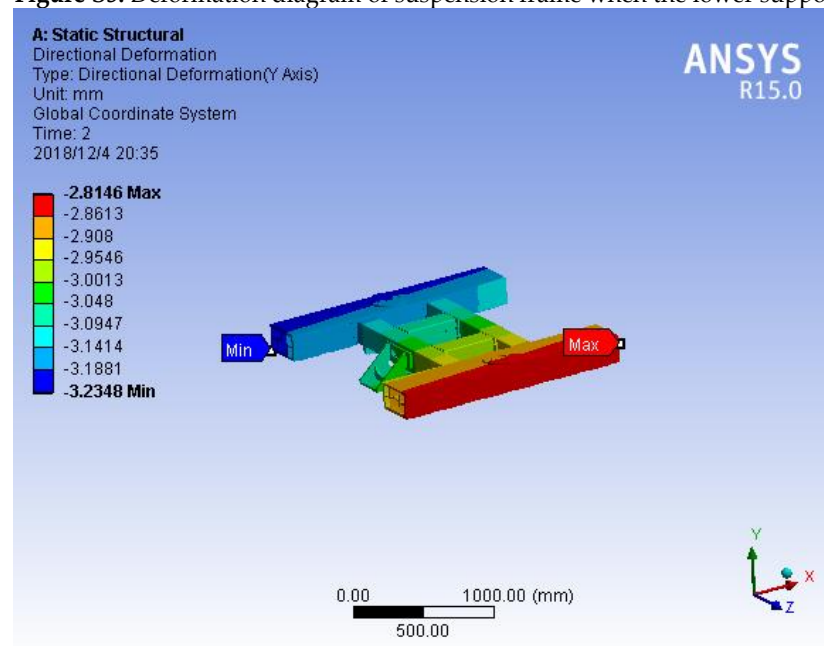
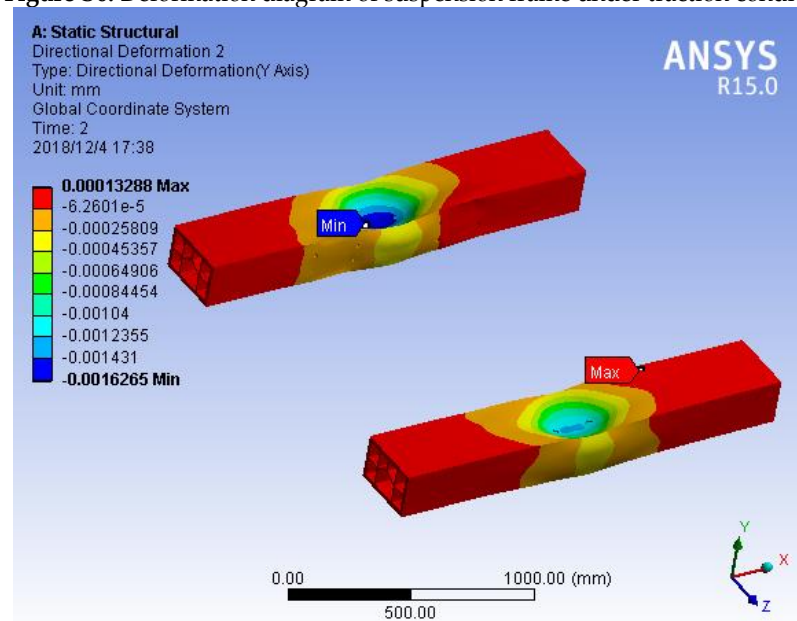


Figure S5. Deformation diagram of suspension frame when the lower support surface is fixed.**Figure S6.** Deformation diagram of suspension frame under traction condition (condition 4).**Figure S7.** Deformation of suspension frame when the lower support surface is fixed under traction condition (condition 4).

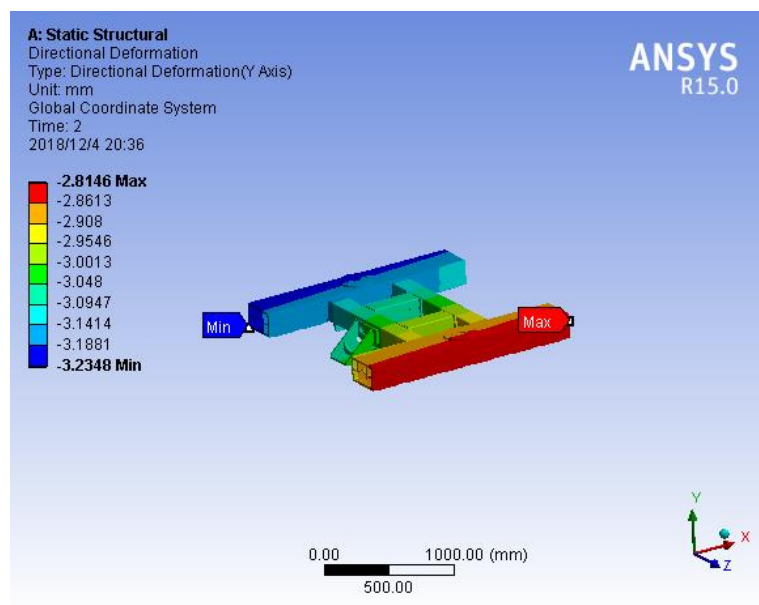


Figure S8. Deformation of suspension frame under traction condition (condition 5).

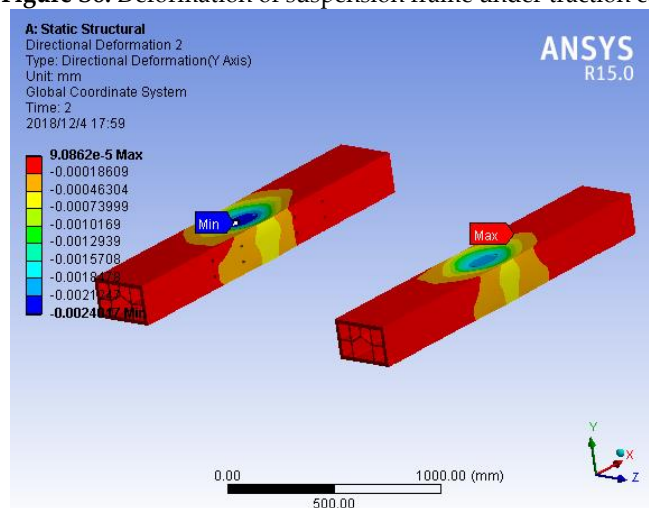


Figure S9. Deformation diagram of suspension frame when the lower support surface is fixed under traction condition (condition 5).

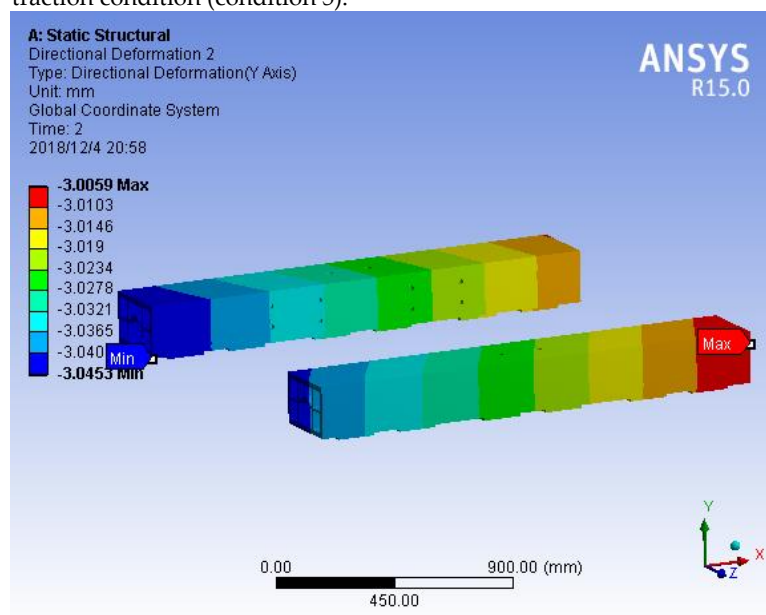
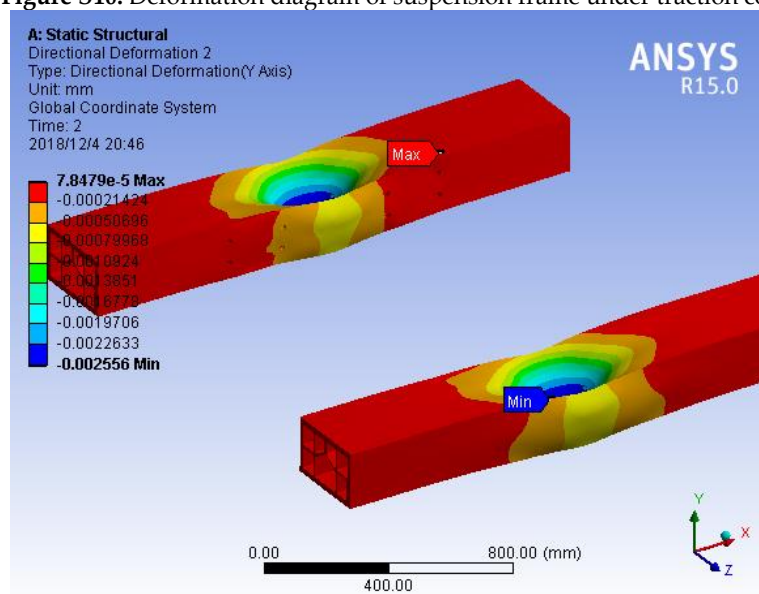
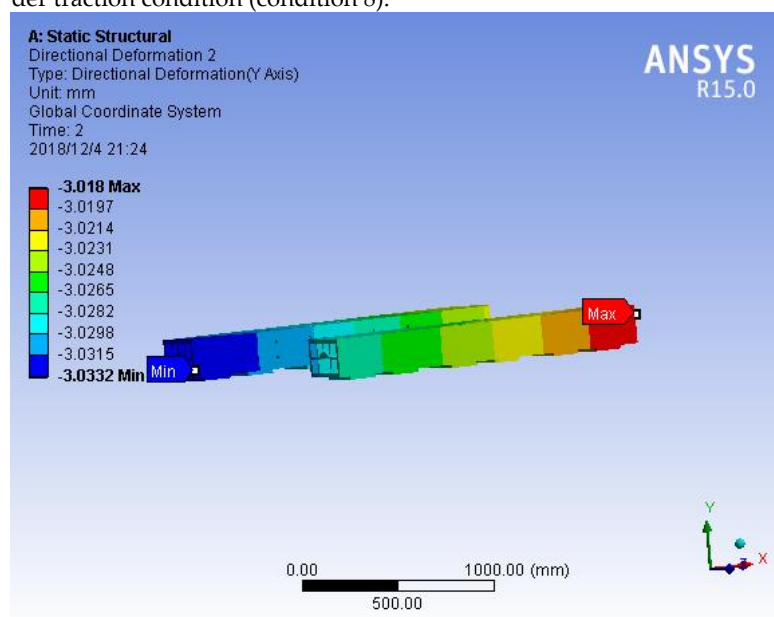


Figure S10. Deformation diagram of suspension frame under traction condition (condition 8).**Figure S11.** Deformation diagram of suspension frame when the lower support surface is fixed under traction condition (condition 8).**Figure S12.** The deformation of suspension frame under braking condition.

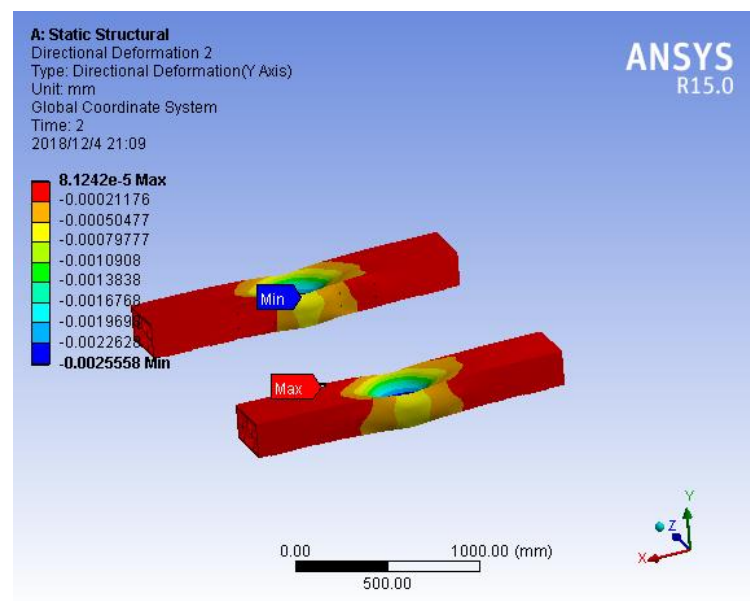


Figure S13. Deformation of suspension frame when the support surface is fixed under braking conditions.

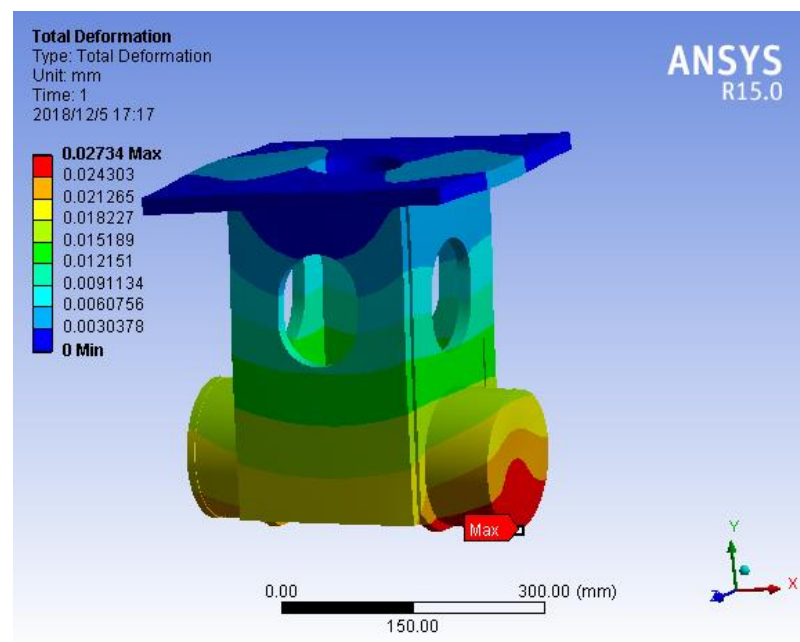


Figure S14. Deformation of traction seat.

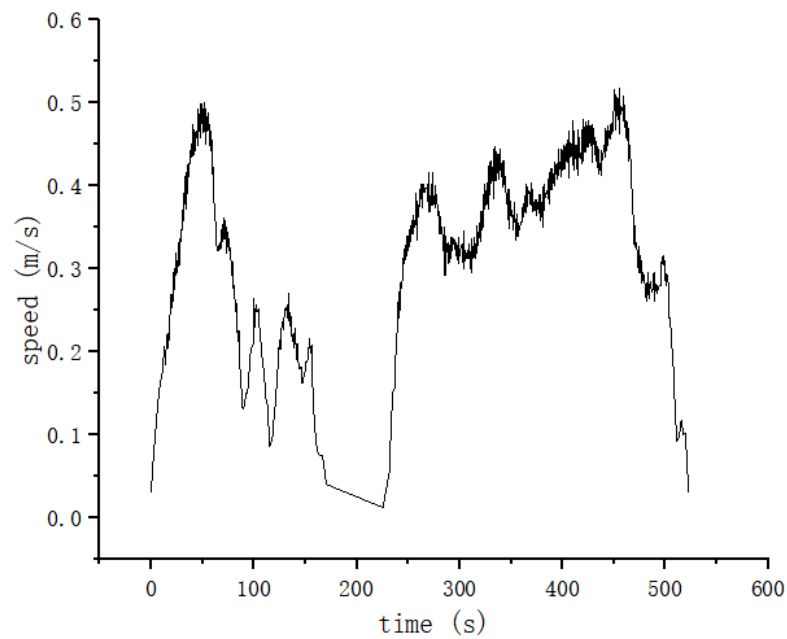


Figure S15. The maximum speed of the train is 0.5m/s, and the schematic diagram of the speed during the train running.

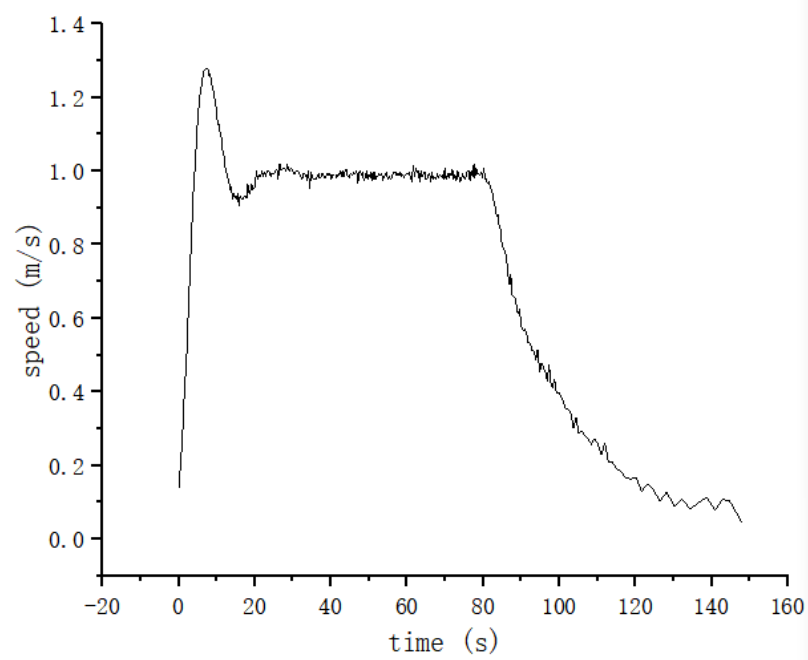


Figure S16. The maximum speed of the train is 1m/s, and the schematic diagram of the speed during the train running.

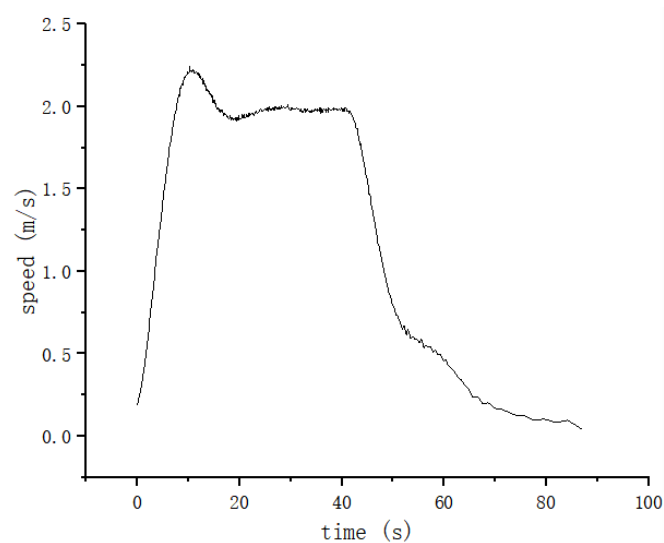


Figure S17. The maximum speed of the train is 2m/s, and the schematic diagram of the speed of the train during running.

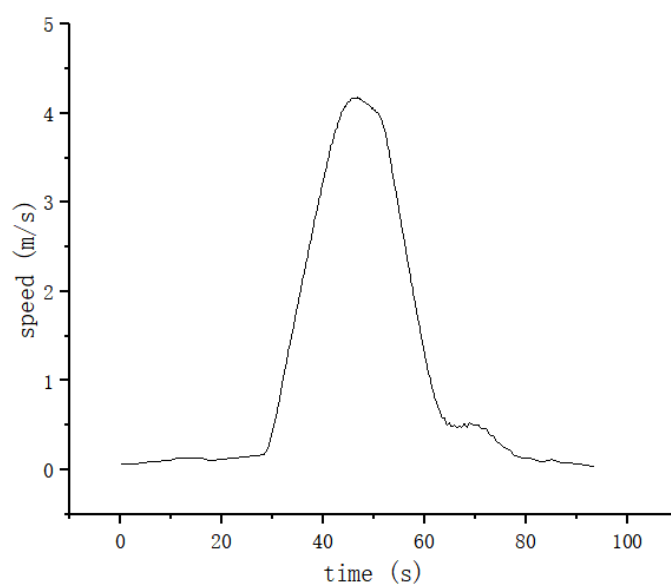


Figure S18. The maximum speed of the train is 4m/s, and the schematic diagram of the speed during the train running.