The Yamazaki inland fault zone in southwestern of Japan currently has a high potential for producing a large damaging earthquake. We applied seismic tomographic inversion to determine detailed the three-dimensional P- and S-wave velocity structures around the Yamasaki fault zone. We selected ~16,000 high quality small earthquakes data including ~170,000 P- and ~150,000 S-wave arrival times organized by Abuyama and Tottori Observatories, Research Center for Earthquake Prediction (RCEP), Disaster Prevention Research Institute (DPRI), Kyoto University, and Japan Meteorological Agency (JMA) for the tomographic inversion in this study. The velocity model clearly images a low velocity and high Vp/Vs anomaly in the lower crust beneath the Yamasaki fault zone at a depth of ~15 to 20 km. This anomaly may be associated with the existence of the partially melt minerals region that can contribute to change the long term stress concentration in the seismogenic zone above it.