

The case of the un-damped Houdaille shock absorber

By Don Ratzlaff

It was a long, dreary, bumpy road which lay ahead of the lonesome little Model A Coupe. Yet the decision was made to begin the long treacherous journey to the fabled I-5 route to sunny California. As the little coupe bumped along the road the suspension components were in a state of constant oscillation. Something was wrong; very wrong. The four model A Houdaille shock absorbers were designed to work in unison while damping out the most serious oscillations. What could be happening? Could it be that one or more of the shock absorbers was not functioning as specified? The little coupe headed into the closest repair shop for diagnostic procedures! And so it was that the problem was determined to be that one shock absorber was found to be “un-damped”. Oh, the shame of it all; to be taken out of service for such an inconvenient condition.

But why; why would such a fine looking shock absorber become un-damped? Records indicated a recent overhaul had been accomplished and all had been declared functional. It was determined that perhaps this was the beginning of an epidemic, leading to widespread “un-damped” conditions within the model A community. It then became obvious that “invasive” diagnostic procedures would have to be carried out to determine the root cause of this “un-damped” condition. Knowing the cause could provide the basis for inoculation of the entire Houdaille shock absorber population.

At first the shock resisted all attempts at disassembly. Special tooling had to be made to remove the outer cover. Even after removal of the outer cover the shock absorber continued to resist further disassembly. Again special tooling was fabricated but, even with exaggerated leverage the inner chamber seal could not be broken. Use of a cycle of extreme heat followed by rapid quenching along with an ingenious arrangement of C-clamp leverage (figure 1) finally accomplished entrance into the inner chamber. Upon opening the inner chamber, there it was; the dreaded “loose ball and ball-cage” syndrome! One of the two “ball check valves” had fallen from its position in the chamber “fixed vanes” (figure 2). The absence of the check valve eliminates the restriction to fluid exchange between chambers thus obviating the “squeeze damping” effects and leading to the “un-damped” condition. This condition was determined to be a random event and fully repairable. No widespread epidemic of “un-damped” Houdaille shocks is anticipated. All is well and the little coupe will survive to bounce another day!

(Editors note: An interesting and great learning mid- day exercise that produced a working and non leaking [as of now!] shock absorber).

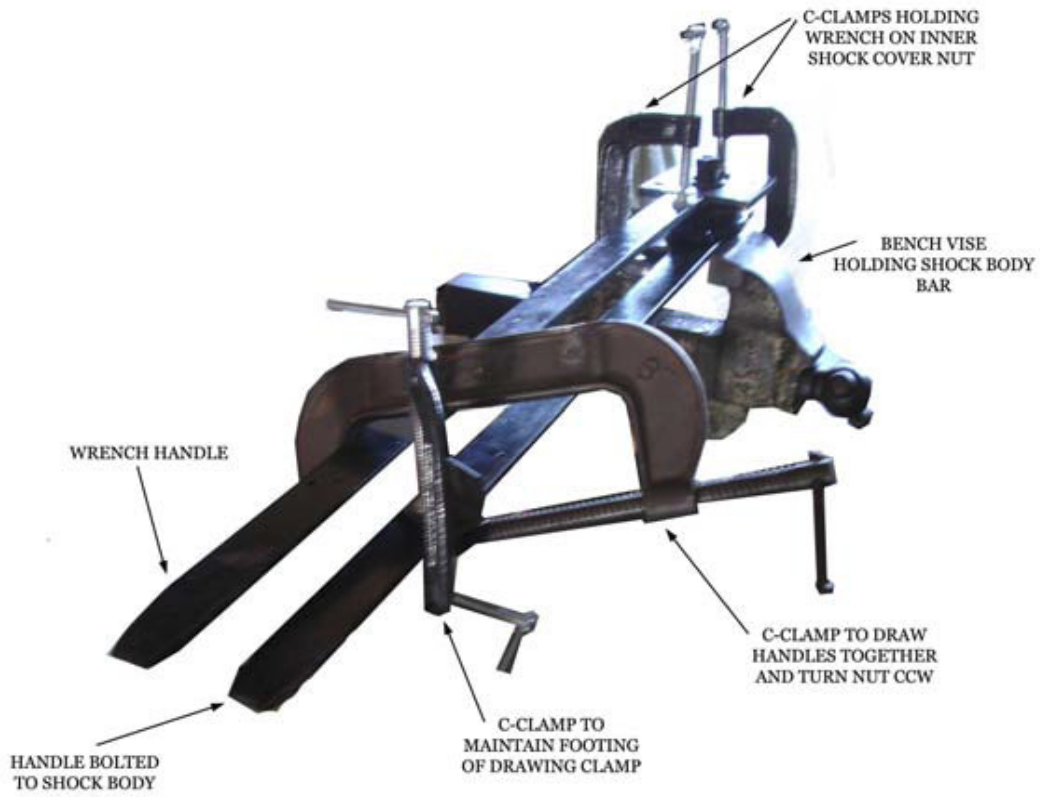


FIGURE 1



FIGURE 2