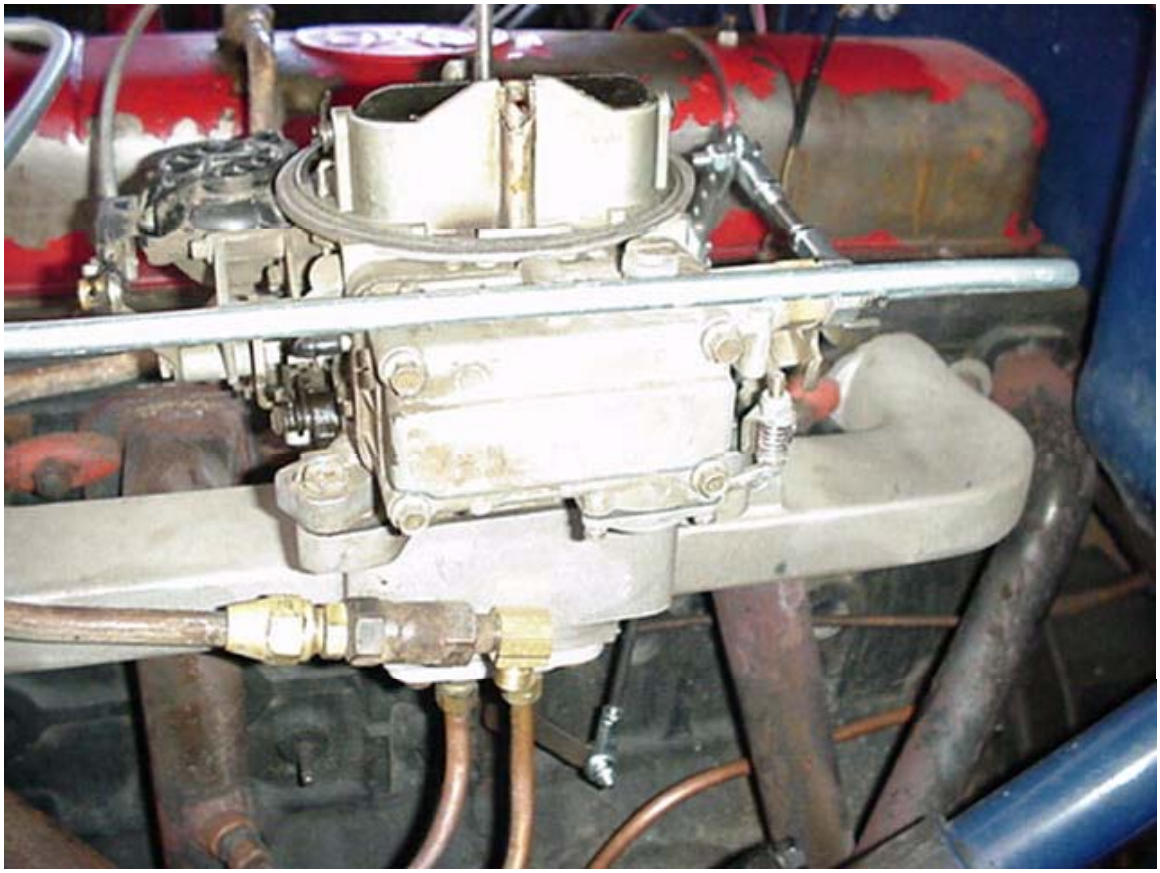
A 4-Barrel Throttle Linkage for GMC and Chevrolet Inline Engines



By

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Introduction

I had suffered with a cable-operated throttle and cumbersome spoon pedal for several years and finally decided to do it right. I searched the interned and didn't find many ideas. While there is a plethora of aftermarket pedals and cables, some of which claim to be "problems solvers," none seemed like an elegant solution. A setup was developed by Jack Halton, which used a cable connected to an aftermarket bell-crank on the engine. However, the cable stretched across the otherwise clean engine bay and it didn't appear that the carburetor could be arranged with the primary to the outside of the engine. I really wanted a way to keep the throttle linkage hidden from view. This paper will show you how to fabricate a fine throttle linkage that works well, is unobtrusive, and can be fabricated in your garage using hand tools.

Parts

The first step is to procure the parts. Many of the items can be found at your local hardware store. For the others, I used Speedway Motors (www.speedwaymotors.com) because they were the least expensive, have great service, and are near enough to be delivered next day using standard ground delivery.

Some of the materials you will need:

- Universal throttle bell-crank (Speedway part number 5501523)
- Stock throttle bell-crank from a 216 Chevy (salvage yard)
- ¼" standard heim joint right hand thread (Speedway part number 1750201)
- ¼" cold rolled steel rod (local hardware store)
- Miscellaneous ¼" bolts, metal locknuts, and jam nuts (local hardware store)
- ¼" fine thread die (local hardware store)
- ¼" and 5/16" drill bits (local hardware store)

A couple of notes about parts selection:

The first thing that you may notice is that I am using heim joints at all pivot points. While you may be able to get away with using the factory style attachment method (pushrods bent 90° held with cotter pins), I don't believe that it is as safe or reliable. Another advantage is

that with heim joints you have an easily replaceable wear point. Anyway, heim joints are inexpensive and much cleaner in appearance.

I used all-metal lock nuts in this installation since nylon lock nuts may melt near hot exhaust components.

I used all right handed heim joints. This was done for two reasons. First, I didn't want to buy a left hand die. Second, the throttle rod can unscrew and fall out when using left and right-handed heim joints, while it cannot with all right hand thread.

Procedures

The first thing that I did was to install a bell-crank from a 216 Chevy. I used this bell-crank because it is more robust than the GMC piece. I also wanted serviceability; the 216 Chevy bell-crank can be reamed and bushed when worn out whereas the GMC cannot.

The next step was to install the heim joint on the pedal pushrod. I threaded a bolt into the heim joint to determine the depth of the threads since I want the pedal pushrod to be fully threaded into the heim joint. From this measurement and the length of the original pedal pushrod, I cut and threaded the pedal pushrod, and installed the heim joint and jam nut (Figure 1.)

Next, you need to fabricate a bracket to mount the universal bell-crank. As far as layout, remember that the carburetor shaft and universal bell-crank pivot points need to be at the same height and in the same plane for proper operation. I used two pieces of 0.090" "L" shaped aluminum stock (Figure 2). The first goes lengthways on top of the carburetor mounting feet and is held by the carburetor mounting bolts/studs (Figure 3.) The bell-crank is attached to a second piece of aluminum stock attached at a right angle to the first using ¼" fine thread bolts and all-metal locknuts (Figure 4.)

The remaining pushrods are cut to length, threaded, and installed with jam nuts. The two arms of the bell-crank are set at 90° from each other. The intermediate pushrod is connected to the third hole from the end (the end of the bell-crank was trimmed for clearance) while the

carburetor pushrod was connected to the second hole from the end of the arm (Figure 5.) Note that the arms of the universal bell-crank will need to be drilled out to ¼". The heim joint is attached to the large hole (1/2") of the carburetor arm which is bushed down to ¼" to fit the ¼" bolts used to attach the heim joint.

The spring on the carburetor is adequate to return the engine to idle indicating that friction in the linkage is minimal. If yours doesn't, check to make sure that nothing is binding. I had to trim the floor mat pad. In the end, I would recommend that you use an extra throttle return spring for safety.

I built this for a GMC using a Holley carburetor; you may have to use trial and error to find a setup that fits your engine, manifold, and carburetor. I am sure that there is room for improvement but this will at least give you an idea of what can work. If you have any questions, comments, or recommendations, let me know at jandcstern@dtgnet.com.

Figure 1. Stock 216 Chevy Bell-crank

Figure 2. Throttle bell-crank mounting bracket

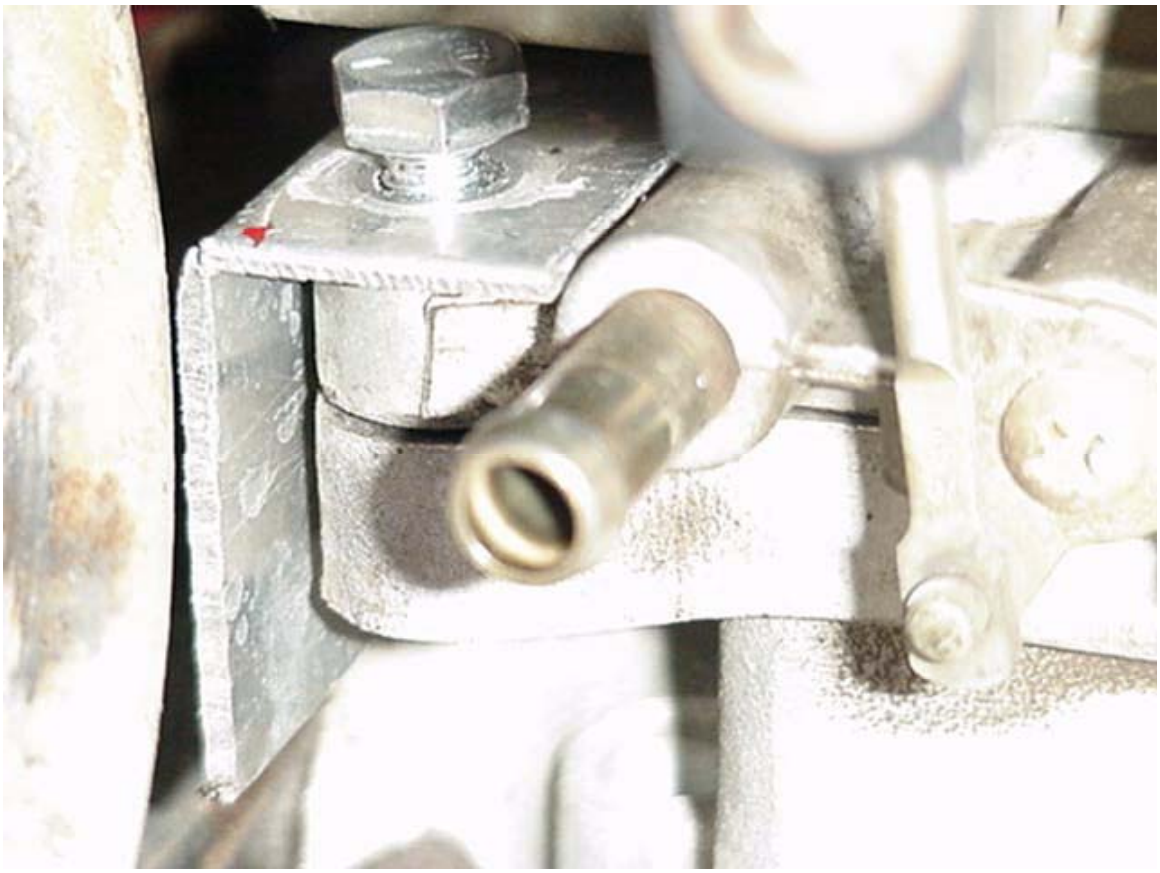

Figure 3. Throttle bell-crank mounting bracket side view

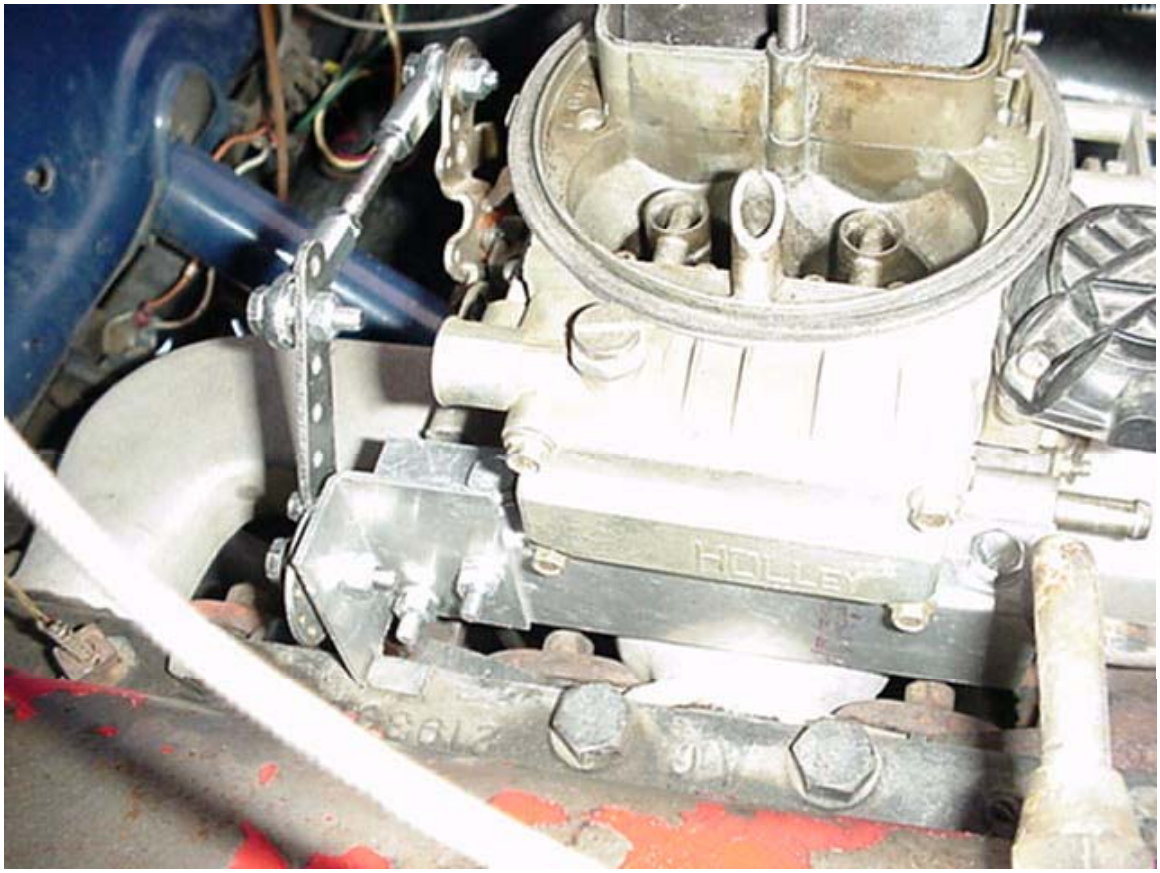

Figure 4. Throttle bell-crank mounting bracket back view

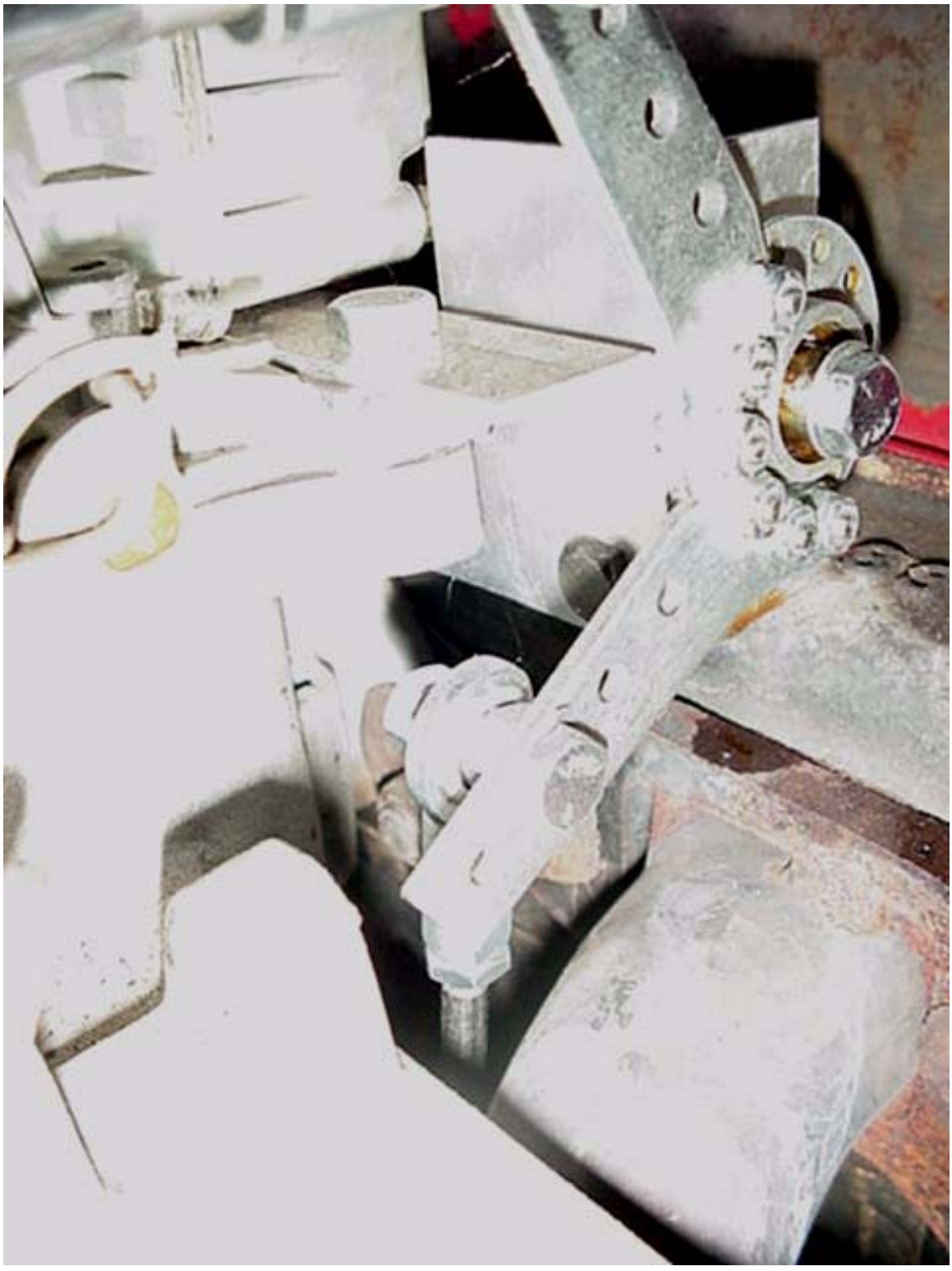

Figure 1. Closeup of universal bell-crank