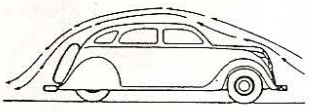
Tricks & Tips

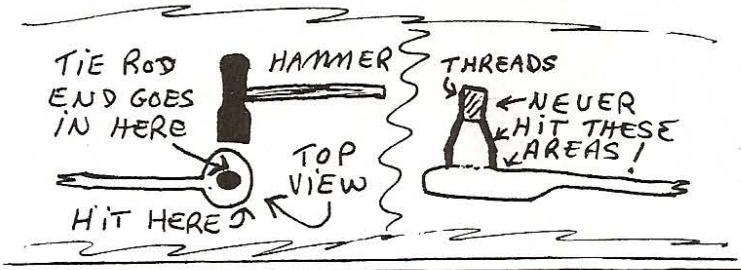


Removing Tapered Bolts on Tie Rod Ends and Shock Absorbers
by O.P. Higbee

Several months ago I completed the last major mechanical repair planned on my 1936 C-10 Chrysler. I replaced the four "new" shock absorbers that Don Seeley had previously rebuilt for me.

The rear pair presented no problem during removal and replacement. The front two presented a problem to remove because of the location of the nuts and bolts holding the shock units to the frame. The going was very slow due to the close quarters and the very tight nuts! I believe they were installed in the factory prior to body installation.

The linkages have a tapered fit like that of a tie rod end. Some mechanics and restorers use a tapered fork tool to remove such fittings. I do not because I believe too much pressure is placed on the linkage ends. I use two hammers. Each hammer is about two pounds in weight. Placing one hammer aside the piece that the tapered rod or bolt fits into, I then hit the opposite side with a very hard blow thereby causing the tapered piece to "jump" out of its tight grip. Please refer to the drawing.



RUSSELL STICKLER of Visalia, CA died on March 31, 1989, according to a note from his daughter Charlotte Weinberg. Russ was a friend to many - he is missed. Best thoughts to his family and friends...

SHOCK PROBLEMS ?

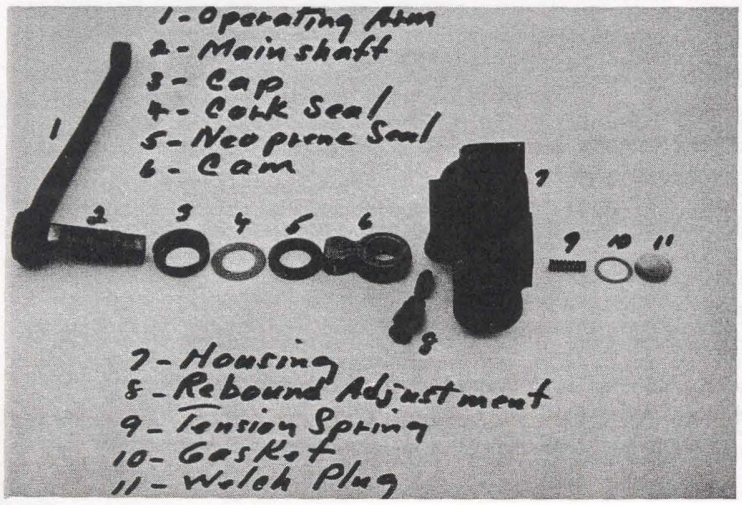
by
Don Seeley

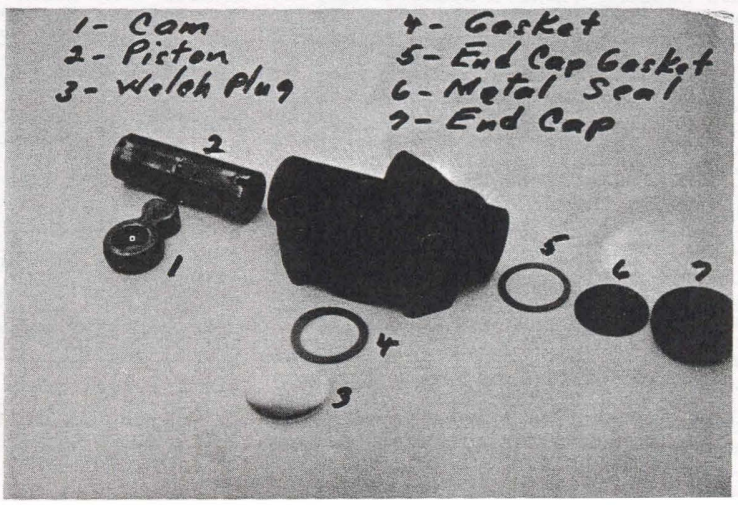
I suspect that the shocks on our Airflows are among the most neglected items. But like me, until recently at least, you are no doubt aware of the problem, if in fact there is a problem, but unable to do much about it. An experience several years ago while driving a CV to McCall, Idaho impressed on me the value of properly operating shocks. A situation developed while traveling between 55 and 60 on one of those truck grooved highways of Eastern Oregon where the right front wheel dropped abruptly into a particularly deep groove. Let me tell you that in a fraction of a second that Airflow was headed for the boonies. As a part of my short prayer of thanksfor an extended life I resolved to do something about those lousy shocks which I knew in advance were little more than useless appendages.

In pursuit of this project I soon discovered that there was a limited amount of technical information available on the subject, and none, at least to me, available on their repair. Mainly by experimentation and the sacrificing of a couple of units I did eventually learn how to disassemble them see how the various parts functioned and what new parts would be required to repair them. Armed with this information I found a place that would manufacture the necessary set of dies so as to stamp out a full set of gaskets and seals along with the various caps and plugs that were required. I gave up the idea of having the more complex parts manufactured, valves, springs, mainshaft, etc., when I discovered that the financial strain would have seriously affected my lifestyle. My first overhaul effort was on a set for the C-17 which was subsequently driven to Laramie. Allowing for the fact that the C-17 no doubt had better handling characteristics built into it, much of the credit for the vast improvement I experienced in handling must be given to shocks that were operating properly. Encouraged by other Airflow Club members I decided to submit my experiences and whatever knowledge I have gained to the Newsletter in hopes that this information might be useful to those of you who might want to take on such a project.

Some discussion of terminology and principle should be useful at this point. In general the function of a shock is to resist upward and downward movement of the wheel to which it is attached. In the developemnt of the automobile several methods have been used to accomplish this, but for the Airflow this resistance is created by hydralic fluid. On some of the less expensive cars of the Airflow era the shocks were designed toresist only the downward movement of the wheel and were consequently called single-acting. Airflow shocks are of the double-acting design which means that there is resistance to both the upward and downward movements. The reaction of a shock to the upward movement of the wheel is called compression while the reaction to a downward movement is called rebound. By resisting the up and down movement of the wheels shocks add significantly to improved riding quality through their ability to dampen the natural oscillations of the springs. More than that, they are an improtant safety factor in the operation of the car. As I experienced with the CV, wheels without some means of inhibiting their vertical movement are subject to control problems. The Airflow with its solid front axle is particularly prone to this sort of thing. A front wheel dropping quickly will tilt the front axle causing a corresponding tilt to the oposite front wheel. These events particularly at high speeds can happen quickly, resulting in a strong veering action and an invitation to disaster. Shocks with good rebound action will significantly retard this action while giving the driver a chance to react.

Before getting into the mechanical details I wish to call your attention to the fact that I am talking Chrysler Airflow which uses a Delco-Lovejoy with basic numbers (numbers can be found on the end caps) reading 1735 (front) and 1733 (rear). These basic numbers can be followed by A (34s), D (35s) and DX on the 36s and 37s. The differences signified by the letters are slight, But I should point out that on the 34s you will most likely find an internal rather than an external rebound valve - to be explained later. If examine the exterior of one of the units you will see in addition to the basic casting two end caps, a filler plug, two welch plugs, a tube-like appendage protuding gradually from the housing whose end is capped by either a plug (34s) or a finger adjustable valve,an operating arm linked to the axle and a shaft that extends from the hub of the operating arm through a cap and into the housing. The last item will be called the mainshaft. Internally the mainshaft uses the housing as its bearing surfaces and splines into a cam which can be clearly seen by removing the top welch plug and not so clearly seen by looking at the accompanying photographs (sorry about that). The cam in turn is nested between two pistons which are linked by springs so as to keep them snugly in contact with the cam. The piston, of course, operates in a cylinder and through the linkage system the piston indirectly responds to the movement of the wheels. As the pistons are forced toward the extremities of the cylinder they trap and pressurize hydralic fluid, thereby setting up a resistance. Sets of valves built into the ends of the pistons control hydralic pressure as well as allow the fluid (oil) to flow freely from one pressure chamber to the other. The center section of the shock acts as a reservoir for the fluid. There are three types of valves in the system, a compression valve which controls the hydralic pressure under a compression movement of the operating arm, a rebound valve that performs the same function for the rebound movement and two by-pass valves which open inwardly to the reservoir under the action of a very light vacume. The by-pass valves are easily recognized by their light control springs. At the compression end of the piston both the compression and the by-pass valves are combined into one unit. At the rebound end, with the exception of the A-type, there will be only a by-pass valve. For the D and DX types the rebound valve wil be found just behind the external finger adjusting mechanism. By removing that adjusting mechanism from the housing the rebound valve will generally fall out, but in case it sticks insert a small punch





through the oil passage hole that can be observed by looking through the open end of the cylinder on the rebound end. Unless there is evidence of oil leaking from around the mainshaft cap there would be no reason for further disassembly. If at this point an examination shows that there are no broken valves or springs - a likely possibility - clean the unit thoroughly internally, install new gaskets and welch plugs, fill with clean hydralic or jack oil after assembly and they will probably work very well. While assembling it may be wise to use a permatex #2 under the welch plugs and around the welch plug gaskets. A word of caution: when spreading the welch plugs for sealing purposes, an undue amount of pounding or pressure can split the housing. I can supply you with the necessary gaskets and plugs for a full set of shocks for $22.00 postpaid. When contacting me include the number on the shock and refer to this as Kit #1. If upon disassembly you find excessive amounts of rust internally, in all probability the valves and springs will be unusable and require that you find a replacement shock.

The repair job becomes more complicated and expensive if there is evidence of oil leaking from around the mainshaft cap. This would mean more than likely that the seal is faulty, the mainshaft is galled or both. The seals are located under the mainshaft cap, one of relatively thin cork and the other of neoprene. Access to the seals requires that the mainshaft be pressed from the housing. This press will require between six and ten tons of pressure, so unless you are fortunate enough to have such a piece of equipment it's off to the local machine shop. In developing a procedure for this press work the machinist and I managed to crack the housing on two shocks (rendering them useless, of course) because the initial support points were placed too far away from the mainshaft. As a result I had him design and machine what I call a press plate, a split device constructed so as to fit snugly around the mainshaft without having to remove the operating arm. To fit the press plate into position the mainshaft cap must carefully be cut free from the housing (I have successfully used a small sharp cold chiselfor this purpose). Before the mainshaft is pressed out the position of the mainshaft with respect to the cam must be clearly marked so that the two can be reassembled in their original position. If the original position is not maintained you run the risk of breaking the shock. To do this, move the operating arm and therefore the piston to the extreme rebound position. While in this position cut with a hacksaw a shallow groove in both the hub of the operating arm and that portion of the housing around the top welch plug. When reassembling be sure and move both the operating arm and piston into that same extreme position so that the marks line up.Once you have pressed the mainshaft out of the housing the seals can be replaced. Unless the unit has been operating without oil the bearing surfaces of both the housing and mainshaft will more than likely be okay. You will, however, probably find some wear on the mainshaft where it makes contact with the seal.Unless the galling of the mainshaft is of major proportions a reasonably good seal can be obtained by worling the galled area on the mainshaft down with a fine file and crocus cloth.If you encounter deep grooving either the area will have to be built up or you simply find yourself another shock.

For this more extensive overhaul I can supply for $45.00 a Kit #2 which in addition to the contents of Kit #1 will have new mainshaft seals and replacement caps for the ones that were cut away.

When reassembling press the cap containing the seals - cork goes in first - onto the housing. A vice works well here. The inside edges of the caps may have to be beveled slightly to get them started as they are a press fit. Lubricate the seal and the mainshaft well before inserting the mainshaft into the seal. The mainshaft can now be pressed into the cam with the reminder that you first make sure that the piston and operating arm are in the extreme rebound position and that the marks are lined up. When assembly is complete and oil is being added (use only shock or jack oil) work the operating arm back and forth a number of times so as to expell the air from the cylinder. You will feel the resistance build up gradually.

By experimentation I have developed some guidelines for checking proper operation. By design the rebound movement will offer more resistance than the compression movement due to the fact that the resistance to the compression movement is assisted by the springs. When filled with oil, clamp the shock in a vise in a normal upright position - they will not operate properly while lying flat - and apply about 100 lbs. of torque to the end of the operating arm. It should take about 4 to 6 seconds to complete a full compression arc. On rebound with the same torque it should take about 9 to 12 seconds to complete the arc keeping in mind that on rebound, with the exception of the A-type, the resistance can be varied by the external adjustment.

Most of you will be able to complete a Kit #1 type overhaul and substantially improve the operation of your shocks as a result. I would not recommend, however, that you attempt a type #2 overhaul unless you are a pretty fair mechanic with a good selection of basic tools available and a press. For the latter you will need my press plate of which I have only one. Since I have a considerable sum of money invested in this plate I feel justified in asking for a $100.00 deposit which should be included with the price of Kit #2. The $100.00, of course, will be returned upon the return of the plat in good condition. If you are prepared in advance I would think that I should have the plate back within three weeks of the time it is mailed. I have no idea what the demand for these kits might be, but in all fairness to those who might be waiting for it I would feel free, if there is a waiting list, to charge a penalty of $1.00 per day for each day over the basic twenty-one day period. I can't guarantee an immediate response to a request for the plate, but I will send it out in the order the requests are received.

My Airflows are now equipped with good shocks and I feel the result has certainly justified the effort. It is my hope that the contents of this article will contribute to safer and better riding Airflows for all of us.

Sincerly,
Don Seeley
Seattle, WA

Dear Mr. James Hellmann,

Enclosed is my check for my renewal to the Airflow Club and also an added amount for a metal club emblem and a club emblem patch. I would also like two 50th Anniversary pins but I do not recall the cost when I purchased some items at Hershey.

Enclosed are pictures of my 1936 Chrysler Airflow C-9 and my 1934 Plymouth but I have no picture of my 1972 Chrysler Imperial Hardtop 4-door with original 46,500 miles in #2 condition, original owner. The 1934 Plymouth was located two years ago. It took me a full year of negotiations before the old folks would part with it. This car has not been registered previously with any club and outside of the repaint was maintained by the owner. I added the whitewalls and the horn trumpets. The Plymouth 4 & 6 Cylinder Club informs me that only seven models of this car are registered with them for the 1934 year.

Ernest C. Fodor
Clifton, N.J.