

Vintage Textbooks for the Waco Restorer

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As more young Waco enthusiasts get into buying and restoring long neglected, and perhaps “basketcase” Wacos over 65-75 years old, there is a sore need for well illustrated and authoritative “how to” books that define the terminology, the tools, the processes, and the fundamental skills involved in bringing an FAA-certified Waco back into fully airworthy condition. The currently published books for training Airframe & Powerplant (A&P) Mechanics virtually ignore the all-important procedures needed for wooden airframe structures, welded steel tubular fuselage frames, and installations of radial engines. And the senior A&P experts who were properly trained in these skills are now an endangered species. Even our best engineering universities are turning out very bright “aerospace engineers” who have no actual knowledge of the detailed design and manufacturing processes of any aircraft, let alone a “rag and tube” vintage Waco.

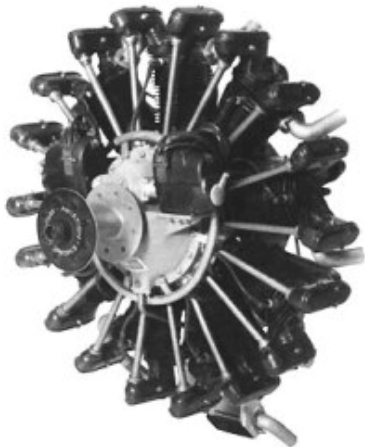
Our salvation is now relying on the fairly wide selection of second-hand technical manuals and textbooks that were published during the booming “golden age” of aviation of the late 1920s, all of the 1930s, and throughout WW II. Today, these books can still be purchased in good usable condition from yard sales, estate sales, aviation memorabilia dealers, and in the Internet markets like *eBay.com* and *Amazon.com*. Prices vary widely from pennies to a just under a hundred dollars. (“*The price of any antique is determined by two fools, the buyer and the seller.*”)

Having had the good fortune of acquiring a sizable library of these old technical aviation publications over the past 40 years, I wish to offer my recommendation as to which are the better ones to look for when it comes to learning the skills needed for proper restoration of your Waco project. They follow here, with mini overviews of their contents. All are hardbound and at least 300 pages. They were the “bibles” of the aircraft industry when Wacos were in production in Troy, Ohio.



- AIRCRAFT MAINTENANCE by Brimm & Boggess, Pitman Publishing Corp., 1939, 1940, 1950, 1958, 1962. Originally published in 1939 as one of two volumes, the second is listed next. This uses abundant line drawings and photographs to walk you through basic reading of engineering drawings, selection and use of hand tools, and power tools, selection and grading of aircraft materials (wood and metal), repairing steel tube framework, wooden wing construction skills, sheet metal fabricating, systems buildup and installation, instrument function and mounting, rigging of biplanes, and fabric covering.
- AIRCRAFT ENGINE MAINTENANCE by Brimm & Boggess, Pitman Publishing Corp., 1939. Companion to the above listing, this one starts with the basic

mechanics of 4-cycle piston engine operation, basic electricity, hand tools, and testing equipment needed for the overhaul and maintenance of radial aircooled engines. Also included are extensive drawings and photos showing proper fabrication and installation of fuel systems, all engine accessories, how magnetos work, and the inner workings of all instruments related to engine condition monitoring. Propeller maintenance is well treated for both wood, Curtiss–Reed, Hamilton Standard ground adjustable as well as constant speed props, plus the inner workings of prop governors. Radial engine tear down, overhaul, buildup and installation are well treated.

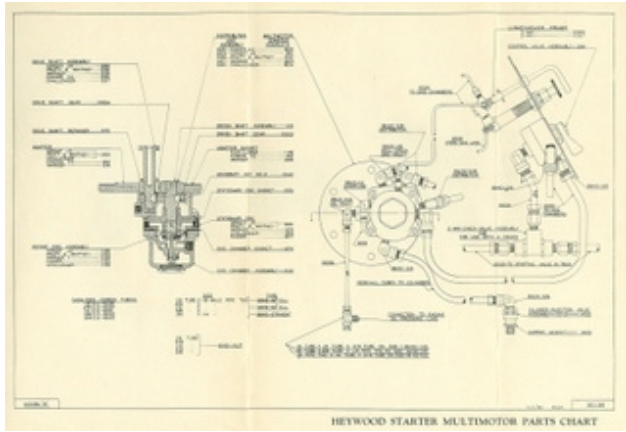


- AIRCRAFT ENGINE INSTRUCTOR by Dyke, published by Goodheart-Willcox Co. Inc., 1928. This is without doubt the *Holy Grail* of old airplane engine technical books. It is beautifully printed on slick paper and full of 2-color illustrations and schematics of the inner workings of the Curtiss OX-5, the Hisso V-8s, the Wright J-5 and the original Pratt & Whitney R-1340 “Wasp” engines plus others. Full overhaul procedures for each of these engines are included in a format better than those in the manufacturers own manuals. The 1928 government regulations are included for all aspects of aviation, including the dimensioned marking

of aircraft with registration numbers on the wings and rudder. Expect to pay at least \$75 for one of these in fair condition. It is well worth it, particularly if you have a Waco 9, 10, Straightwing, or Taperwing using original make and model engines and accessories, including instruments. I found my first copy in a New Jersey old bookstore for ten cents in 1966.

- MODERN AIRCRAFT by Page, Henley Publishing Co., 1928. This is a classic that is a bit too “dated” for many later model Wacos, but does present an abundance of priceless technical drawings and photographs of the inner workings of vintage engines, accessories, instruments, and related aircraft hardware of the 1920s. It even walks you through the well-illustrated proper procedures for uncrating and rigging your new war surplus Curtiss *Jenny*. This is another good one for those with pre-1932 Wacos.
- MODERN AIRCRAFT ENGINES by Page, Henley Publishing Co., 1929. If you face working with an OX-5, Hisso, or Wright J-5, this is a must have. It is chock-full of scale drawings and photos of the inner workings of not only those three engines but also other water-cooled engines from the WW I era that you probably have never heard of let alone seen. This gut-buster weighs in at 976 pages.
- AIRPLANE SERVICING MANUAL by Page, Henley Publishing Co., 1938. Exit the Curtiss *Jenny* and enter the DC-3 in this much more contemporary reference for Waco owners of the 1930-1942 models. This one compares well to the above texts by Brimm & Boggess, but goes beyond them by treating airline shop setup and practices as well. Abundant scale drawings and photos of old airplane components and maintenance equipment appear throughout

the 987 pages in this one. A very good treatment on biplane assembly and rigging is a high point in this one also.



- AIRCRAFT HANDBOOK by Colvin, McGraw-Hill Book Co., 1928. 1929, 1942. I love this book. This is not so much a how-to instructional text but more a reference handbook listing the dimensions and specs of virtually everything the Waco Company had to buy from other manufacturers, including every engine made during the 1927-1942 era (in the latest edition), all engine accessories, instruments, wheels, props, fasteners, etc. The original SAE and government standards are included for all the AN series fasteners we use on all our Wacos, plus those for tapered prop shafts, wooden prop hubs, and interfaces between brake assemblies and landing gears, accessory mounting face dimensions, instrument case dimensions, etc. Even instrument overhaul procedures are well detailed and illustrated. If you have a post-1929 Waco, go for the 1942 edition, by all means. The earlier editions are nonetheless priceless for their content.

The aviation tradesmen of the golden age of aviation who used these books in their training classes as well as in their shops are now in their retirement years and are clearing their shelves of these priceless books everyday. Typically, they do not own home computers and do not comprehend modern markets like *eBay* and *Amazon*. Widows are routinely trashing this stuff, except for the few who have the awareness to contact aviation memorabilia dealers. My favorite dealer, Steve Maciag in Sussex, NJ, regularly buys whole estate sale libraries from these widows in the NY-NJ region, where aviation manufacturing thrived in the 1930s, and has almost disappeared now (just like in Los Angeles). Buy them now if you can. They will never be reprinted with all that “obsolete” data that we all must have for Waco restorations and maintenance.