

Maintenance Training The Robinson Way

A week-long course in helicopter maintenance training



By Steven Ells

Steven Ells has an A&P with IA. Based on the California coast, he can be reached at www.EllsAviation.com.

How does Robinson Helicopter Company (RHC) ensure its helicopters are maintained “the Robinson Way?” Provide a school, of course at the Torrance, CA, airport (KTOA). I attended the RHC maintenance course last November.

The week-long course covers maintenance on all three RHC airframes — the piston-powered two-place R22 and four-place R44, and the turbine-powered five-place R66. Classes started each day at 8 a.m. sharp and run past 5 p.m. most days, so don’t plan on catching a Friday afternoon flight home.

These classes fill quickly so plan ahead.

Students Kadir and Moseley inspecting an R22 flexplate.



All photos by Steven Ells.

Each day students spent about half their time in the classroom and the other half twisting wrenches, torquing nuts, measuring bolt stretch, and learning how to work their way through RHC specific tasks. These included adjusting coning friction and teeter (flapping) friction; checking and adjusting belt tension actuator; learning the methods and using tools used to check the clutch shaft angle and upper and lower sheave alignment; and adjusting track and balance of the main and tail rotors and balance the fan wheel.

The class was not dry; it was chock-full of real life maintenance shorts cuts and tips. Each of the 11 attendees was handed a class study book. Every morning they were given a test with questions based on their homework reading and class notes.

For instance, what part number lubricant does the free wheeling unit (sprag clutch) use? That question, as many other on the tests were designed to familiarize both new and experienced RHC techs with the RHC maintenance manual and illustrated parts catalog (IPC). The sound of turning pages rippled through the classroom during these tests.

Instructor Efrain Vargas led the classes. He is an experienced Robinson technician and teacher. He started at RHC in 1986 and worked alongside RHC founder Frank Robinson during R&D for the R44, the company’s second airframe. In addition to his years working at RHC, Vargas owns a Robinson dealership in Mexico and has directed maintenance on RHC helos operating off shore in the tuna fishing fleet. Besides his RHC duties, Vargas travels the world teaching Robinson airframe maintenance classes.

Day one

RHC unlocks the classroom door at 7:45 each day. International attendees included an Army sergeant from Estonia, a civil aviation maintenance inspector from Bangladesh, an experienced helicopter technician from the Philippine Islands, and a (female) aviation maintenance apprentice from an air tour company in China. Other attendees included experienced airframe and powerplant (A&P) helicopter technicians; one who said he was “from Tennessee but temporarily transplanted in Florida;” two from Texas; one from Alaska, one from Oregon; and one who got an early retirement after working on Apaches and Black Hawk helos in the Army.

This one, Eric Norman, worked in the Titusville, FL, training base for Bristow Academy. He was being prepped to take over maintenance management of Bristow’s growing fleet of Robinson helos. Lawrence Hromek, a Texan, was attending to fulfill one of the requirements to become a RHC Service Center. That required that he also attend the Lycoming piston engine maintenance and the Rolls-Royce turbine powerplant schools.

After introductions we went on a factory tour. Throughout the course Vargas dispensed tips and hints for RHC helo maintenance such as, “Wash your helo on a daily basis.” He defined clean by saying, “If you don’t dare lick it, it ain’t clean enough.” Other tips included, “Rebalance after all maintenance,” and “If there’s no instruction for a repair in the manual, call the factory.”

Vargas also advised the class to always get a component return authorization (CRA) before sending anything to the factory, and then said, “If you want credit for the returned parts, clean them up and treat surface corrosion before shipping.”

Here’s another one: shake the tail skid to check for loose bolts and elongated bolt holes at the forward



Students Norman, Lill, and Brown learn a main rotor mast maintenance task.

inboard leg of the R22 welded frame. It’s a common gripe.

The manuals

Vargas told the class that just because a part is not shown in the part book does not mean you can’t buy it.

The message that was often repeated was to *always* read instructions completely *before* beginning a task. And always call the factory customer support people when unsure of the procedural steps or at any other time there’s a question.

We were also told that the RHC IPC was not a maintenance reference book; and to always refer to the maintenance manual.

The blades

Main rotor blades were also discussed in some depth. Vargas said it’s possible to install a R44 blade on a R66 so make sure that both main rotor blades are the correct (and same) part number.

Older blades had a stainless-steel spar/leading edge; newer parts are aluminum. The bond between the skin and the spar is critical. Airworthiness directive (AD) 2011-12-10 requires a daily preflight inspection for exposed (bare metal) of the spar-to-skin joint area on the lower surface of some main rotor blades. This inspection can be signed off by the pilot. RHC provided each class member with a maintenance record appendix for the AD. The kit to aid technicians outline the area required by this inspection is available from RHC.

We were shown how to detect hard landings by measuring the distance from the floor to the tailskid on each model.

Shop time

Beginning the second day of class we met in the shop area after lunch. There, each team — the class was divided into three teams — worked its way through the following tasks on the main rotor assembly: removal and replacement of the hub bearings; swashplate tilting friction adjustment; and teeter friction and coning friction adjustments. Each team had a MR assembly to work on.

After that the following tasks on the drive train were worked through: upper and lower V-belt sheave alignment — there are four possible adjustments on the R22 and three on the R44. Others tasks included engine height adjustment; clutch shaft angle measurement and V-belt actuator adjustment time.

Through the week

Powerplant service information such as Lycoming engine service bulletin SB388C “Procedure to Determine Exhaust Valve and Guide Condition” was briefly discussed. Each class study book included



Robinson Helicopter maintenance students in the blade and hub learning area.

reprints of applicable service information on engines and accessories. Lycoming and Rolls-Royce service class information is listed on the RHC web site under the “Courses” tab.

Other hands-on shop tasks included the tail rotor drive shaft run out check, a check of the tail rotor static balance; fan wheel remove and replace (R&R) and lubrication of the lower bearing; blade boot R&R including servicing; and a throttle correlation check. Even though the class stayed busy, shop talk pokes such as, “If you got time to lean, you got time to clean,” were heard from time to time.

Costs of education

Robinson classes are already

full into the second half of 2013. Vargas and CEO Kurt Robinson say there’s been talk of adding additional courses in 2013. RHC classes are a bargain at \$550.

Every month in 2013, Lycoming offers its four-day Engine Service School in Williamsport, PA; cost \$725. Lycoming also has a three-day disassembly/assembly class — scheduled immediately following the Service school — priced at \$700.

The Rolls-Royce powerplant maintenance schools for the RR300 are conducted in Indianapolis, IN. The five-day course costs \$2,000. Shops that opt to become Rolls-Royce service centers must attend a seven-day course costing \$2,800.

RHC lists a variety of nearby accommodations on its web

site; the Ramada Torrance has a special rate for RHC attendees that includes a (carbo-rich) breakfast. There are a wide variety of restaurants within walking distance.

The Torrance airport is located 11 miles south of Los Angeles International (LAX).

Eric Norman, who came to the civil helo world from the U.S. Army, told me that he used to hate Robinson helicopters when he first started working on them.

“Everything was small and some things were hard to get to,” he said. “Now I love them because once you know one you know them all.”

Norman attended the RHC class because his employer — Bristow Academy — was increasing the size of its Robinson fleet.

RHC has produced more than 10,000 helicopters since that first R22 was approved on March 16, 1979. Production numbers were quoted at nine per week in November 2012. There are more than 300 back orders for the R66. Two-thirds of RHC helicopters are shipped overseas.

For less than \$1,000 for lodging, meals, and tuition, the RHC education is a bargain. Not only do attendees learn “The Robinson Way,” they graduate with the assurance that Robinson-proficient technicians are needed throughout the world. **AMT**