



A600 HELICOPTER CONSTRUCTION MANUAL

Dear Customer,

Congratulations on what is likely to be the most rewarding project you have ever embarked upon – the building of your own ROTORWAY helicopter.

We at RotorWay have done our utmost to provide the best service possible from the first day we had contact with you, and you can be assured we will continue to do so.

Please study these manuals very carefully; it will save you hours of construction time if you understand what each step entails prior to beginning construction.

If you have any problems or questions, please do not hesitate to contact RotorWay. The staff here is always ready to be of service.

So from all of us here at RotorWay – ENJOY and have fun!

WARNING

The construction and operation of "Home-Built Aircraft" of this type is demanding and could inflict serious injury and possible death. No such operation, construction or undertaking should be initiated unless thorough and complete knowledge, preparation and instruction are available and utilized. The seller (and its agents, servants, employees, contractors, successors, and assigns) makes no warranties express or implied regarding the clarity or correctness of the plans, ease of construction or operation nor the safety of this aircraft or any part thereof. Furthermore, buyer (and his heirs, administrators and assigns) releases and holds said seller (and its agents, servants, employees, contractors, successors, and assigns) harmless from any and all liability, damages, and causes of action which may be incurred by buyer or any third party as a result of the purchase, use, construction and/or operation of said aircraft (or any part thereof) or plans for same. Buyer assumes all risk and responsibility relative to the construction and/or operation of said aircraft. Seller admits no liability by publication of this warning.

CONTENTS

INTRODUCTION

A600 numbering system; recommended building sequence; component numbering system list; construction prints list; template list.

SECTION 1: Standard Construction Procedures

Proper use of tools; general fitting and alignment procedures; aircraft (AN) hardware; working with 4130 steel; working with aluminum; working with plexiglass; working with fiberglass; working with plastic filler (Bondo); painting and finishing; plating and anodizing; Dzus fasteners and nut plates.

SECTION 2: Airframe and Landing Gear

Drill airframe bushings; mount front and rear landing gear; install skid tubes; tap body support adjustment pad bushings; fabricate retention straps for battery box.

SECTION 3: Lower Engine Mount

Drill airframe bushings; install lower engine mount and rubber ring; install fuel system mount tube.

SECTION 4: Ground Handling Wheels

Drill axles; assemble ground handling wheels; ground handling the aircraft.

SECTION 5: Disassemble, Paint, and Re-assemble

Disassemble, prep, and paint all assemblies completed up to this point, including airframe, landing gear, engine mount, support ring, fuel system mount tube, and ground handling wheels. Reassemble after painting.

SECTION 6: Tail Boom Installation

Install inspection covers; mount tail boom; fit and install winglets; install horizontal trim fins; install vertical trim fin.

SECTION 7: Ballast Weight Installation

Install ballast weight.

SECTION 8: Body Construction

Install main rotor shaft and foot pedal cross tube; fit and install tub, seat bulkhead, floor pan, body panels, windscreen, doghouse, seat back access panels, cyclic inspection panels; install cabin comfort system; construct and install doors.

SECTION 9: Body Check, Paint, and Interior Liners

Assemble body apart from airframe and check overall fit; remove tail boom; fit and install eyebrow windows; fit and install interior liners; prep and paint body and tail boom.

SECTION 10: Cyclic, Collective, and Directional Controls

Construct and install cyclic, collective, and directional controls.

SECTION 11: Drive Train Installation

Install main drive belts, upper fan drive belt and alternator belt; install main rotor shaft; mount main drive sprocket to hub; install secondary assembly; install fan and fan pulley; install secondary sprocket and locking assembly.

SECTION 12: Engine, Torque Link, and Clutch

Install upper engine mount cup; install engine; fit and install torque link; assemble and install idler arm, idler pulley, clutch tube and electric actuator; tension main drive belts.

SECTION 13: Tail Rotor Drive Installation

Install drive shafts and gearboxes; install drive belt and tensioner; fabricate and install tail rotor pitch actuator arms; install tail rotor control cable; fit tail rotor blade tip caps; assemble and balance tail rotor; install carriage slider; install tail rotor shaft into gearbox; measure and install slider to actuator arm clevis; fit and install tail cone cover and slider cover.

SECTION 14: Fan Drive, Water Pump, and Alternator

Install fan drive countershaft, water pump, and alternator.

SECTION 15: Cog Belt Drive

Procedures covered in this section:

Install and tension cog belt; install cog belt tensioner; fabricate and install main shaft safety spacer.

SECTION 16: Rotor Hub Assembly

Fabricate collective scissor mount; adjust slider ball clamp; position and drill control arm "G"; install collective spring; install cyclic control cables.

SECTION 17: Exhaust System

Apply heat wrap to headers; mount headers to engine.

SECTION 18: Cooling System

Fit and install fan shroud to radiator; install radiator; fit and install fan shroud ring; install cooling system hoses and components; install surge tank; fabricate sump strap and install oil sump/heat exchanger; install hose jackets and oil hoses.

SECTION 19: Heat Shielding and Muffler

Construct, fit and install heat shielding; fabricate muffler straps and install muffler.

SECTION 20: Fuel System

Open holes for fuel tank caps and sender; flush fuel tanks; install fuel tank strainer fittings, crossover fittings, and return fitting; install fuel tanks; fabricate and install retention straps and fuel drain cock mounting bracket; install fuel pumps, shut-off valve/filter assembly, fuel filter, fuel pressure regulator, and all fuel hoses with fire sleeve.

SECTION 21: Electrical System

Install instruments and instrument panel; install rotor tach sender, wiring harness, ignition modules, FADEC electrical components, spark plug wires, and overhead switch panel; fabricate inertia switch bracket and install inertia switches; install Enigma; electronics panel and components.

SECTION 22: Seat Belts, Cabin Comfort, and Pitot Tube

Install seat belts; fabricate and install radiator collector; connect cabin comfort hoses; install cabin comfort cables and fuel shut-off cable; fabricate and install seat back brace tube; install pitot tube.

SECTION 23: Final Body Installation and Skid Shorts

Final install body panels; install engine belly pan; mount fuel drain cock bracket to tub; cut holes for fuel tank filler caps; fit and install skid shorts; install seats.

SECTION 24: Main Rotor Blades

Sand wood filler blocks; make and install wood end plugs; install tip weights; check trailing edges; paint the blades; cut out and install pitch horns; install aligner blocks and thrust blocks; mount retention straps; mount blades on the helicopter and perform static lead/lag adjustment and static balance.

SECTION 25: Rigging Procedures

Review all prints and follow all details of this section thoroughly. Although many details may repeat previous instructions given throughout this manual, we feel that this is absolutely necessary to stress the importance of the rigging procedures.

SECTION 26: Inspection of a New Aircraft

Post-construction checklist; pre-flight briefing notes; dynamic test; tie down procedures; instruments; fuel tank dip hose; amateur built aircraft checklist.

INTRODUCTION

The documentation for building the RotorWay A600 helicopter consists of the following:

1. **Construction Manuals:** Consisting of 26 sections, the “See-Do” Manuals utilize a sequence of photos and text that walks the builder through each step of construction.
2. **Construction Prints** providing details and measurements from which the various components are fabricated or assembled.
3. **Construction Video Series:** Provides detailed video instructions to further clarify each step of construction.
3. **Templates** are provided for parts that require fabrication from raw materials.
4. **Operations Manuals:** To properly maintain and operate your A600 Helicopter, a Maintenance Manual, Engine Manual and Pilot Operating Handbook are provided.
5. **A600 Parts List:** A parts list is provided which contains a listing of every part required for completion of the helicopter.

IMPORTANT: When building your helicopter, do not rely ONLY on the Construction Videos. Instead, use all available documentation. The Construction Manuals and Prints contain the most up-to-date information and should be consulted first. The Video Series was created as a supplement to the manuals.

RECOMMENDED BUILDING SEQUENCE

The first thing each builder should do upon receipt of their A600 is to conduct a complete physical inventory of all parts shipped, compared against the A600 parts list provided with the shipment. If we have back ordered a part it should be noted on the parts list as B.O. and it should not be in the shipment.

If you find a part missing that we have not indicated as back ordered, contact the factory immediately so we can update our records. We request that this process be done within the first fifteen days from receiving the shipment. This time frame allows for discrepancies to be corrected while they are still fresh in everyone’s mind. This process will also provide the builder with a thorough understanding of what all the parts look like as they review each section prior to construction.

Next we recommend you take time to open all the construction plans and templates to familiarize yourself with them as you read through the See-Do photo manuals. By taking the time to review all the documentation before you start on the actual construction, you will have a better understanding of the relationship of the individual components you construct, relative to their function in the completed helicopter.

You will notice that Section 1 of this manual contains Standard Construction Procedures that should be utilized during the construction of an aircraft. Builders should take time to review these procedures and ensure they are followed throughout the fabricating and assembling of the helicopter.

After you have completed your inventory of parts and familiarized yourself with all the documentation, you are ready to begin construction of your A600. If you require assistance with anything regarding building, please call our customer service department. If you require any additional parts due to construction error, please call our parts department. When ordering parts, we request that you always identify the part you want by its specific PART NUMBER and not by just the description alone. This will help ensure that you get the correct part that you ordered.

A600 HELICOPTER NUMBERING SYSTEM

A numbering system is used for every individual part and group of parts in the helicopter. The helicopter has been divided into several component sections. Each component has an identification number of seven characters. An example is E09-2000 Tail Boom. The first three characters of the number (E09) indicates that this part is in the tail boom component, and the last four numbers identify a specific part within that component. For example, part number E09-3120 is the tail boom inspection door.

The exception to this rule is that all hardware in the helicopter has been given an E00- part number. Any E00-numbered hardware could be used in various places within the helicopter. An example is E00-2300, which is an AN3-4A (3/16" X 1/2") bolt.

COMPONENT NUMBER	DESCRIPTION
E00-0000	HARDWARE
E09-2000	TAIL BOOM
E10-2000	AIRFRAME
E11-2000	LANDING GEAR
E12-2000	AIRFRAME BRACKETS
E13-2000	LOWER ENGINE MOUNT
E14-2000	CYCLIC CONTROL
E15-2000	COLLECTIVE CONTROL
E16-2000	DIRECTIONAL CONTROL
E17-2000	TAIL ROTOR
E18-2000	TAIL ROTOR DRIVE
E20-2000	MAIN ROTOR BLADES
E22-2000	BALLAST WEIGHT
E23-2000	SECONDARY DRIVE
E24-2000, A24-2000.....	ENGINE
E25-2000	FUEL SYSTEM
E27-2000	CLUTCH AND TORQUE LINK
E28-2000	OIL SYSTEM
E29-2000	WATER PUMP
E30-2000	RADIATOR AND FAN SHROUD
E31-2000	FAN DRIVE
E32-2000	BODY, SEATS, FLOOR PAN
E34-2000	COOLING SYSTEM, HOSES
E35-2000	WIRING
E36-2000	INSTRUMENTS
E37-2000	GROUND HANDLING WHEELS
E41-2000	DOORS
E42-2000	ALTERNATOR
E45-2000	SKID PANTS
E48-2000	TURBOCHARGER
E49-2000	ROTOR SYSTEM
E54-2000	CABIN COMFORT SYSTEM

A600 CONSTRUCTION PRINTS LIST

PRINT NUMBER DESCRIPTION

E09-2000.....	TAIL BOOM ASSEMBLY
E09-2001.....	TRIM FINS
E10-2000.....	AIRFRAME, LANDING GEAR
E13-2000.....	ENGINE MOUNT
E14-2000.....	CYCLIC CONTROL
E15-2000.....	COLLECTIVE CONTROL
E16-2000.....	DIRECTIONAL CONTROL
E17-2000.....	TAIL ROTOR
E17-2001.....	TAIL ROTOR DETAILS
E20-2000.....	MAIN ROTOR BLADES
E22-2000.....	BALLAST WEIGHT
E23-2000.....	SECONDARY DRIVE, ROTOR TACH SENDER MT, COLLECTIVE SPRING AND SCISSOR MOUNT
E25-2000.....	FUEL TANKS AND MUFFLER
E25-2001.....	FUEL SYSTEM
E27-2000.....	ENGINE, TORQUE LINK, ELECTRIC CLUTCH
E30-2000.....	FAN SHROUD, RADIATOR, OIL COOLER
E31-2000.....	FAN DRIVE COUNTERSHAFT, WATER PUMP AND ALTERNATOR MOUNTING
E32-2000.....	A600 BODY DETAILS
E37-2000.....	GROUND HANDLING WHEELS, OIL SYSTEM, COOLING SYSTEM
E41-2000.....	DOORS
E49-2000.....	ELASTOMERIC ROTOR HUB
E49-2001.....	MAIN SHAFT, UPPER ENGINE MOUNT
E49-2002.....	ELASTOMERIC SWASH PLATE
E35-8030-1.....	HARNES, ENGINE, FADEC, A600
E35-9003.....	HARNES, AIRFRAME, A600
E35-9014.....	ASSY, OVERHEAD SWITCH PANEL, A600
E35-9025.....	HARNES, INSTRUMENT A600 - MGL (IEFIS LITE)

A600 TEMPLATE LIST

NOTE: The size of the templates may vary slightly because of the process used to print them. To compensate for this, some templates have been marked with dimensions. Observe these dimensions when cutting and drilling the parts to ensure the proper fit.

TEMPLATE NUMBER	QTY.	PART NUMBER	PART NAME	LOCATED ON SHEET
E09-1	1 EACH	E09-3252	Vertical trim fin bracket, front.....	E01-1210
E09-2	1 EACH	E09-8330	Vertical trim fin bracket, rear	E01-1210
E13-1	1 EACH	E13-3190	Lower/raise engine mount shims.....	E01-1220
E14-1	4 EACH	E14-6120	Cyclic control cable "T"	E01-1220
E16-1	1 EACH	E16-3120	Scissor beam (pilot).....	E01-1240
E16-2	1 EACH	E16-3150	Scissor beam (passenger)	E01-1240
E17-1	2 EACH	E17-8250	Tail Rotor actuator arm.....	E01-1240
E24-1	1 EACH	E24-9782	Exhaust heat shield top (passenger)	E01-1260
	1 EACH	E24-9783	Exhaust heat shield top (pilot)	E01-1260
	1 EACH	E24-9791	Lower front shield	E01-1260
	1 EACH	E24-9830	Upper heat shield (pilot)	E01-1260
	1 EACH	E24-9831	Upper heat shield (passenger)	E01-1260
E24-2	1 EACH	E24-9822	Exhaust heat shield side (pilot)	E01-1270
	1 EACH	E24-9823	Exhaust heat shield side (passenger)	E01-1270
E25-1	1 EACH	E25-4550	Fuel drain cock mounting bracket	E01-1250
E25-2	1 EACH	E25-4770	Fuel pump inertia switch bracket.....	E01-1250
E27-1	1 EACH	E27-8651	Microswitch bracket.....	E01-1250
E30-1	1 EACH	E24-9850	Upper front shield	E01-1300
	1 EACH	E30-3161	Radiator rear shield	E01-1300
	1 EACH	E54-3022	Radiator collector.....	E01-1300
	1 EACH	E54-3031	Collector collar	E01-1300
E32-1	1 EACH	E32-6131	Seat back lower panel (passenger).....	E01-1280
	1 EACH	E32-6151	Seat back upper panel (passenger)	E01-1280
	1 EACH	E32-6161	Seat back lower panel (pilot)	E01-1280
	1 EACH	E32-6170	Seat back upper panel (pilot)	E01-1280
	2 EACH	E32-6180	Seat back doubler.....	E01-1280
	1 EACH	E35-8100	ECU mounting plate	E01-1280
E32-2	1 EACH	E32-3122	Heel plate (passenger)	E01-1290
	1 EACH	E32-3123	Heel plate (pilot)	E01-1290
	1 EACH	E32-6121	Seat bottom access panel	E01-1290
E35-1	1 EACH	E35-4036	Ignition module backing plate.....	E01-1210
E36-1	1 EACH	E36-3431	Shelf, Compass & Horizon Indicator	E01-1310
E36-2	1 EACH	E36-8315	MeFiCAN Bridge Mount	E01-1320
E41-1	3 EACH	E41-1170	Door latch (left).....	E01-1230
	3 EACH	E41-1180	Door latch (right).....	E01-1230
	4 EACH	E41-3110	Door hinge	E01-1230
	4 EACH	E41-3120	Body hinge.....	E01-1230