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HANDBOOK OF INSTRUCTIONS
WITH PARTS CATALOG

Models C532S and C5315S

(EARLY TYPE)

HOLLOW STEEL THREE BLADE PROPELLERS

(CURTISS)

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LIST OF REVISED PAGES ISSUED

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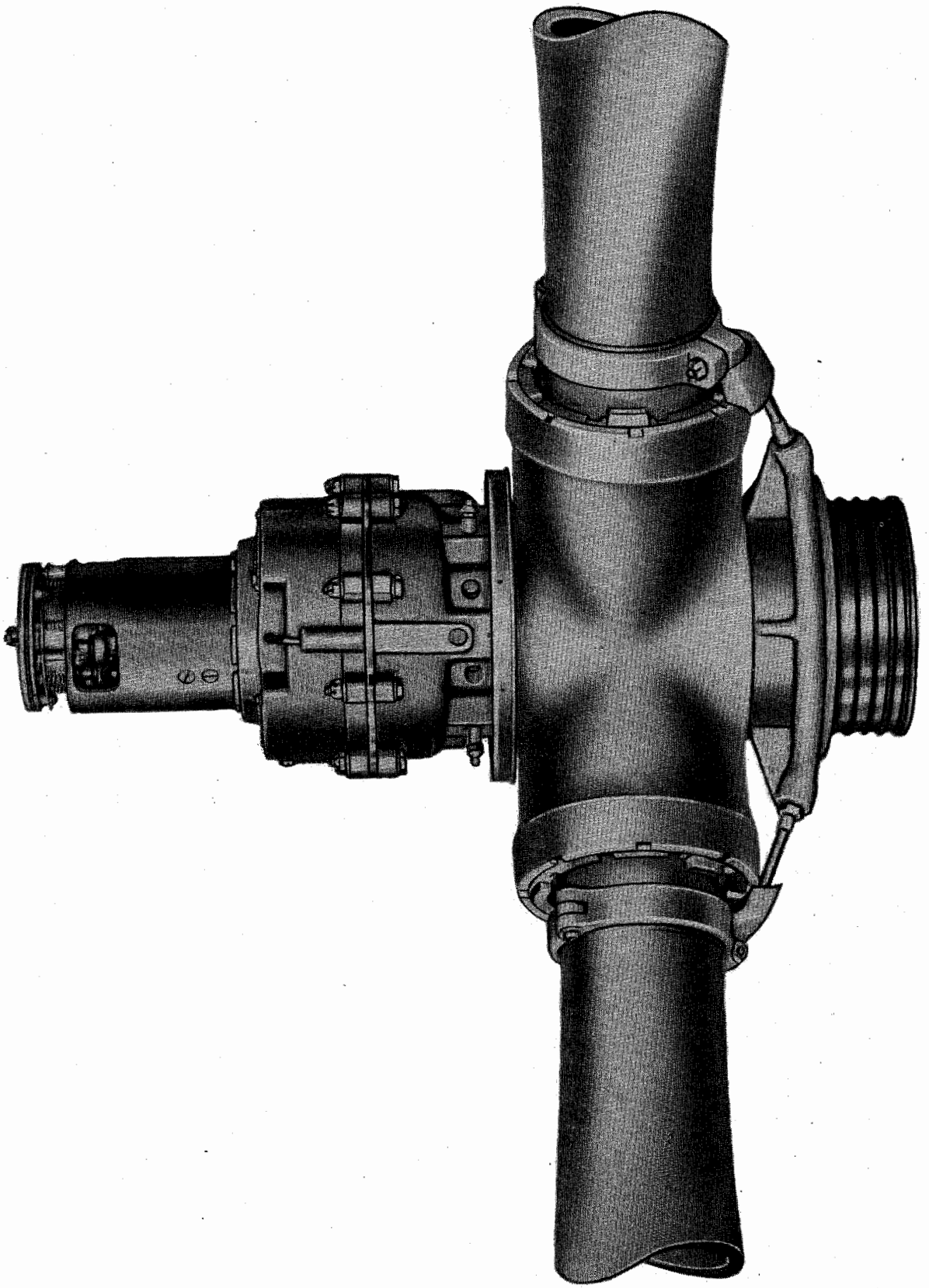


Figure 1—Propeller Assembly

SECTION I
INTRODUCTION

1. This Handbook is issued as the basic Technical Instructions for the equipment involved.
2. This Handbook contains descriptive data and instructions for the Installation, Operation, Maintenance, Overhaul, and Testing of the Model C5315S (Early Type) Three Blade Hollow Steel Propeller manufactured by the Curtiss Propeller Division, Curtiss-Wright Corporation, Caldwell, New Jersey, under Contracts W535 ac-14085, ac-16687, ac-16957, ac-17243, and ac-25000.

SECTION II
DESCRIPTION

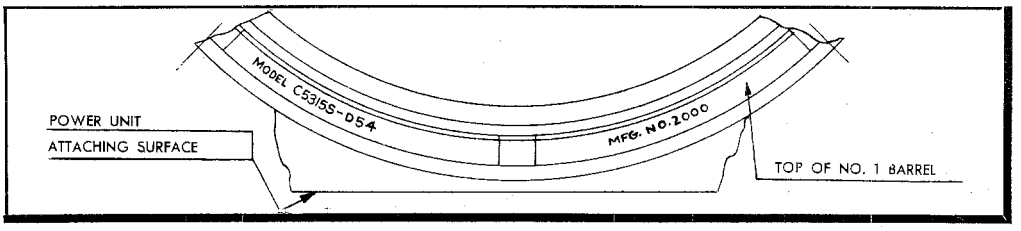


Figure 2—Propeller Designation

1. GENERAL DESCRIPTION.

The various models of the Electric Propeller are identified by combinations of numbers and letters stamped on the hub of the end of the number one blade barrel.

a. The first letter "C" signifies Curtiss as the manufacturer.

b. The first digit of the model number indicates the SAE standard spline shaft upon which the hub will fit. For example, the digit "5" indicates a No. 50 shaft, and "6" indicates a No. 60 shaft size.

c. The second digit indicates the number of blades.

d. The third, or third and fourth digits indicate the blade shank size. For example, the digit "2" indicates a No. 2 blade shank size; "15" indicates a No. 1½ blade shank size.

e. The letter immediately following the above digits indicates the material from which the blade is fabricated; namely, D for aluminum alloy, S for steel, W for wood.

f. Any additional letter included with, but after, the material designation letter indicates a special feature of the propeller. Example: C6315SH-C4 indicates a hollow shaft propeller; C5315SP-A2 indicates a pusher type propeller.

g. A suffix combination, consisting of a letter and one or two digits, indicates the general series to which the propeller belongs and identifies the complete propeller assembly. Early models lacked the suffix letter and digit combination.

h. The above example indicates a Curtiss Propeller with a No: 50 SAE standard spline, three blades, a No. 1.5 shank, blades of steel, general design series "D," specific assembly No. 54 of the preceding designations and Manufacturer's Serial No. 2000.

2. DETAILED DESCRIPTION.

a. HUB ASSEMBLY. *(See figure 3.)*

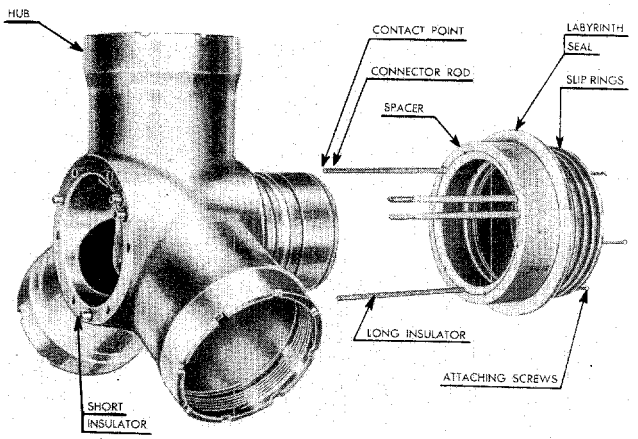


Figure 3—Hub Assembly

(1) The hub is machined from a single solid forging of alloy steel. On the rear of the hub are mounted four bronze slip rings insulated from the hub and from each other. Four insulated brass connector rods carry the electrical circuits through passages from the slip rings to contacts at the front face of the hub. The blade assemblies are inserted into the hub barrels and are held in place by retaining nuts.

(2) When specified, anti-icing equipment is included as a component part of the propeller assembly.

b. BLADE ASSEMBLY. *(See figure 4.)*

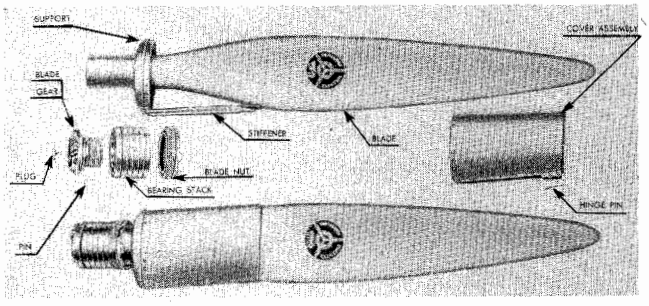


Figure 4—Blade and Cuff Assemblies

(1) The blade is made by welding together two formed sheets of a steel alloy processed in an electrical furnace. The shank and camber faces are formed from one sheet, and the thrust face from the other. Atomic hydrogen welding, which gives a high-strength and uniform weld, is used to join the two component plates along the leading and trailing edges in a seam that converges at the shank and extends to the root end of the blade. The root end of the blade is internally threaded to receive a spiral bevel gear which is pinned in place. A stack of angular-contact type, antifriction bearings is placed on the blade shank together with a retaining nut. The bearing stack permits free rotation of the blade in the hub under high centrifugal loads.

(2) Blade shank cuffs, designed to assist the distribution of air to radial engine cylinders, may also be placed on the blade. The cuff consists of a cast magnesium and a stiffener to which a formed sheet (cover assembly) is attached by screws. The entire cuff assembly is held in position by an integral shoulder on the blade.

(3) Blade markings on the cambered side of the hollow steel propeller blades will be as follows:

(a) Between the 18 and 24 inch stations the cambered side of each propeller blade will bear markings as described below. The size of the letters and numbers will be ½ inch.

1. Blade serial number.
2. Drawing number (Part No.).
3. Low blade angle at reference station.
4. High blade angle at reference station.

NOTE

The foregoing data will be painted or stenciled with black enamel. When the blade is camouflaged the data will be applied with yellow lacquer the same as applied to the tip section. The markings will be protected by a coat of clear lacquer or spar varnish. In no instance will such markings be indented or cut into the metal.

c. POWER GEAR ASSEMBLY.—The power gear is a bevel gear which meshes with the blade gears and is internally splined to engage with the low speed splined drive of the speed reducer. This power gear is equipped with an angular-contact type thrust bearing which absorbs the power gear thrust and is mounted in a steel adapter plate. The adapter plate also serves as a mounting for the power unit cover or propeller spinner, if such is used. (See figure 5.)

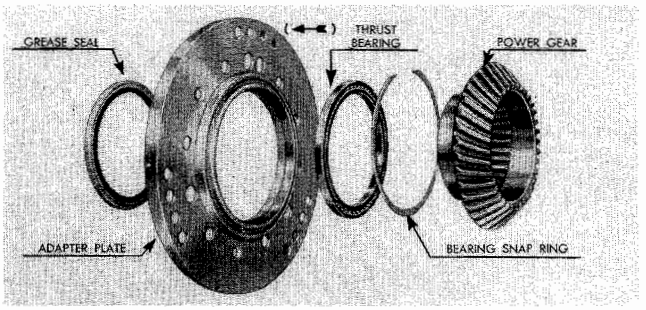


Figure 5—Power Gear Assembly

d. SPEED REDUCER ASSEMBLY.—The speed reducer consists of two stages of planetary-type reduction gearing contained within an aluminum-alloy housing. The rotating parts are fitted with ball bearings to provide maximum efficiency and also to facilitate assembly. The gear teeth are surface hardened to insure long service life. Gaskets between the front and rear housings and seals at each end make the unit oil-tight and eliminate the necessity for frequent lubrication of the enclosed parts. The unit is partially filled with an oil having an extremely low pour-point, thus providing a continuous oil bath for the speed reducer gears. The low pour-point oil insures unrestricted operation at the low operating temperatures encountered at high altitudes.

e. LIMIT SWITCH ASSEMBLIES.—At the hub end of the speed reducer are located blade angle limit switches which are operated by pivot arms riding on a cam attached to the low speed bell gear of the speed reducer. The limit switches, which are connected in the

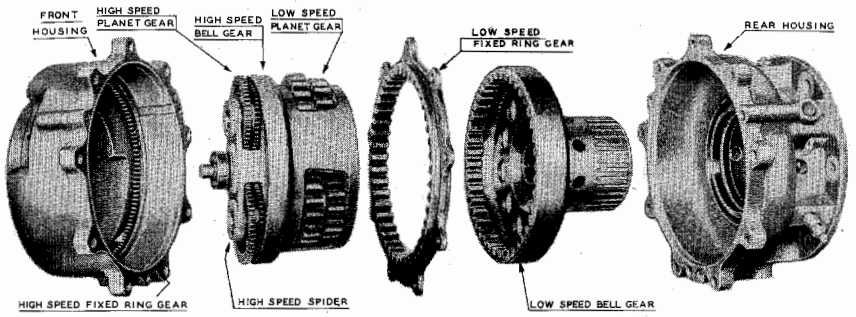


Figure 6—Speed Reducer Assembly

electric motor leads, are spring-loaded electrical contacts which, upon installation of the power unit, mate with the fixed contacts on the front face of the hub. As the switch arms ride on their respective cam lobes, the contacts are retracted and the circuits are opened. By their location, the cam lobes accurately control the LOW, HIGH, and FEATHER blade angle settings. Reverse thrust propellers have an additional limit switch to halt the pitch change at the NEGATIVE angle setting.

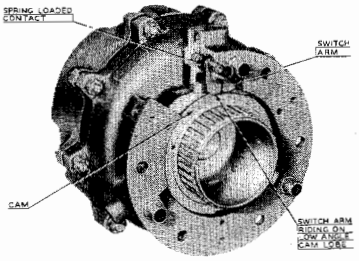


Figure 7— Limit Switch Assembly

f. MAGNETIC BRAKE ASSEMBLY. — The diaphragm type brake consists of a brake disc assembly keyed to the armature shaft, and a diaphragm assembly held against the brake disc by coil springs. The brake solenoid coil is located behind the diaphragm assembly and is connected in series with the motor. When the motor is operated, the solenoid is energized, thereby releasing the brake. When the motor is not operating, the solenoid is not energized; therefore, the brake is applied by the spring forces.

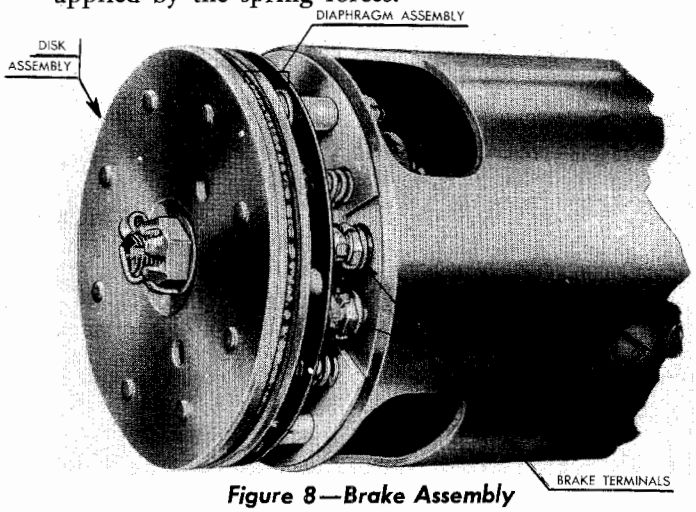


Figure 8—Brake Assembly

g. ELECTRIC MOTOR ASSEMBLY. — The pitch change motor is attached to the front housing of the speed reducer and the armature is fitted to the driving pinion of the high-speed stage of the speed reducer unit. The motor is of the series type and has two field windings which provide for rotation in either direction.

h. BRUSH AND HOUSING ASSEMBLIES. — An aluminum-alloy housing bolted to the nose section of the engine incorporates a mounting for the slip ring brush assembly, also called the brush cap. Quick removal of the brush holder from the housing is provided by trunk type latches. An electrical connector permits complete removal of the assembly from the airplane. The early type holder is mounted to the cap with vibration absorbing bushings. A later type holder of molded composition is attached directly to the cap without shock mounting.

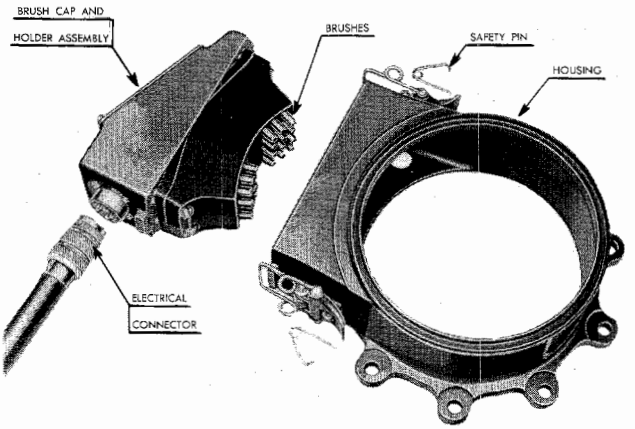


Figure 10—Brush and Housing Assemblies

i. UNIT CONSTRUCTION OF PROPELLER.—The unit type construction of the propeller greatly facilitates maintenance. The entire pitch change mechanism, known as the power unit, is readily interchangeable and can be removed and replaced as one compact unit. Spring-loaded electrical contacts in the speed reducer automatically complete the electrical connections between the motor and the hub when the power unit is attached to the hub. Blade assemblies can also be re-

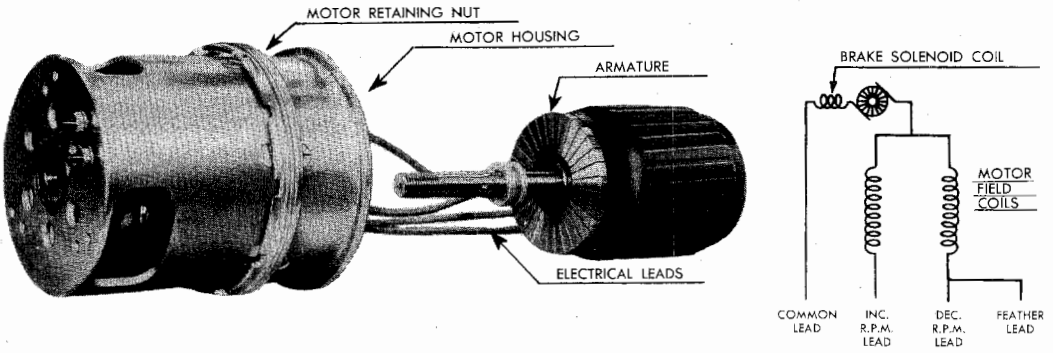


Figure 9— Motor Assembly

moved and installed as an assembly with very little effort. This type of construction simplifies maintenance and also lends itself to convenience in handling and transporting propellers.

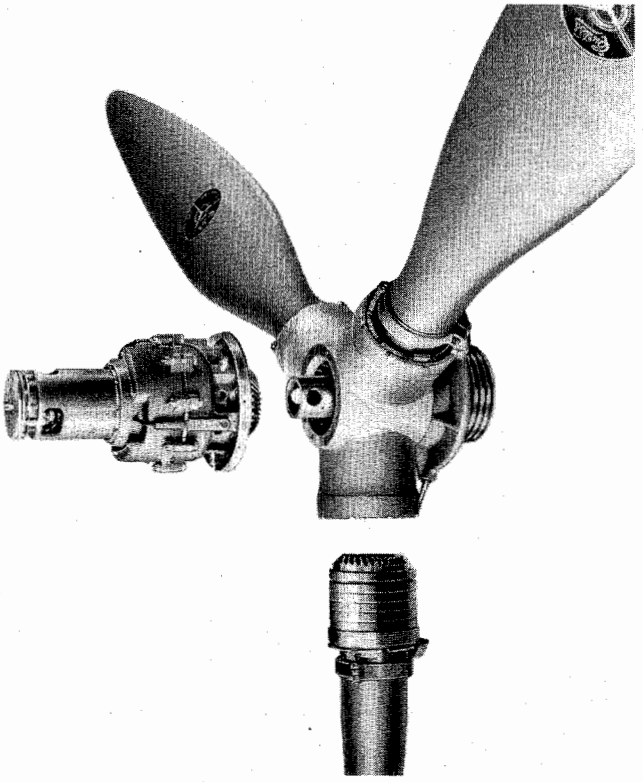


Figure 11—Unit Construction of Propeller

SECTION III
INSTALLATION

1. GENERAL.

a. Each propeller is fully assembled, balanced, and tested for proper functioning prior to shipment.

b. The propeller is shipped with the propeller shaft nut, the front cone, the retaining snap ring, the grease seal and spreader, and the power unit removed. The power gear assembly is attached to the power unit.

2. INSTALLATION.

a. BLADES.

NOTE

To conserve shipping space it is sometimes desirable to remove two blade assemblies from the hub. If this has been done, the propeller must be reassembled in the manner described below:

(1) Remove the hub with its one blade from the packing case and place the unit on any clean surface, the slip rings down. Although no table or spindle is necessary, such equipment, if available, will facilitate the work. (See figure 12.)

(2) Thoroughly clean the bearings and sockets and coat with hub lubricant, grease Specification No. AN-G-4, Grade AA.

(3) Place the gear backlash shims in the hub sockets with the chamfer toward the center of the hub.

(4) Make sure that the threads of the hub and blade nuts are free from metal chips and other extraneous matter and that the threads are thoroughly coated with a mixture of 70 percent white lead and 30 percent lubricating oil by volume (Specification No. AN-C-53).

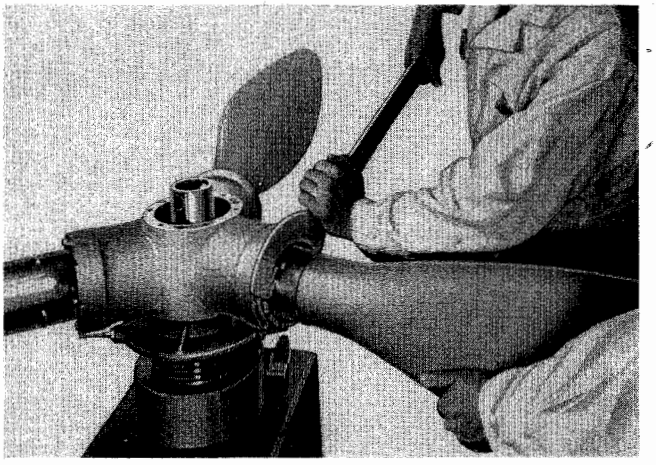


Figure 12—Assembly of Blade to Hub

(5) Remove the locking plates which have been temporarily installed on the nuts of the loose blades.

(6) Insert each blade into its proper socket. The blade assembly number is found stamped on the nut.

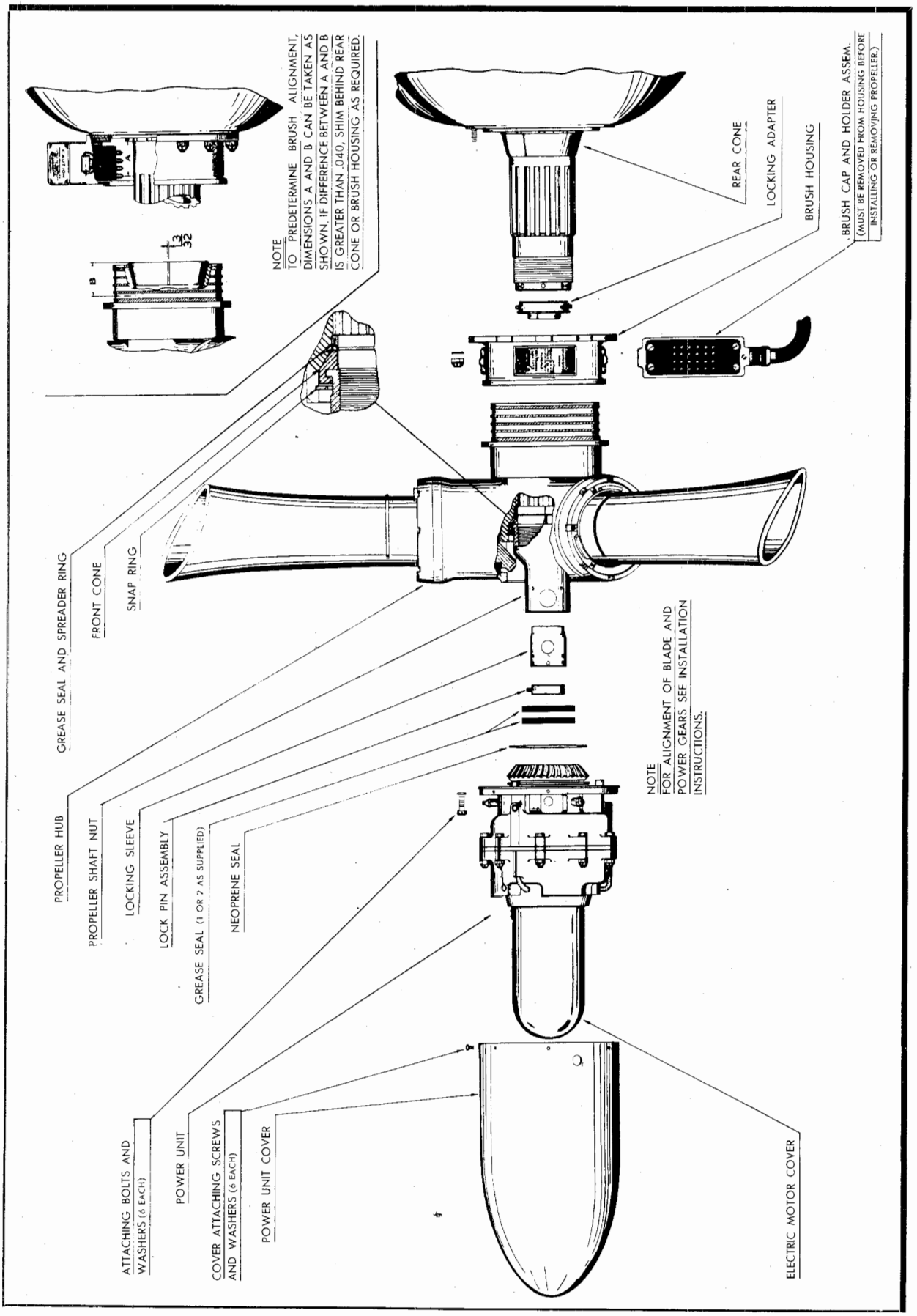


Figure 13—Installation of Curtiss Electric Propeller

The hub socket number is stamped on the end of each blade barrel.

(7) Screw each blade nut into the hub until one-half of the threads are engaged. Slide each blade assembly in and out sharply several times and finally pull it tightly against the blade nut. While exerting an outward pull on the blade, tighten the blade nut with the spanner wrench provided and a 10-pound brass hammer (or equivalent) until the paint marks on the nut and hub slots line up. If there are no paint marks, tighten the nut until it is barely possible to rotate the blade by hand.

(8) Install the lock and safety wire the attaching screw.

(9) Each propeller shipped disassembled is accurately balanced prior to shipment. A tag certifying this fact is attached to every unit and balancing is unnecessary if the blade assemblies are properly installed in their respective sockets. If the tag is missing or if there is any doubt as to the condition of the propeller, it should be balanced prior to installation merely as a precautionary measure.

b. PROPELLER. *(See figure 13.)*

(1) Check thrust nut on engine for tightness; clean shaft threads and splines thoroughly, removing all nicks, burrs, and galls from the shaft and the face of thrust nut. Care should be taken to note that the threads on the shaft are not burred or pulled.

(2) Remove nuts (and spacers or spacer ring if provided) from brush housing mounting studs on nose of engine and place brush housing on studs. Replace, tighten, and secure nuts.

NOTE

Except for the purpose of measuring for brush location as described below, the brush assembly must be left out of the housing until the propeller has been installed.

(3) In order to predetermine the location of the brush contact on the slip rings, it is necessary to measure as shown in figure 13. Measure the distance "A" between the face of the thrust nut and the center of the forward brush, and the distance "B" between the center of the front slip ring and the base of the rear cone which should be firmly held in the hub. If the difference between "A" and "B" is greater than .040 inch, shim behind rear cone or brush housing as required.

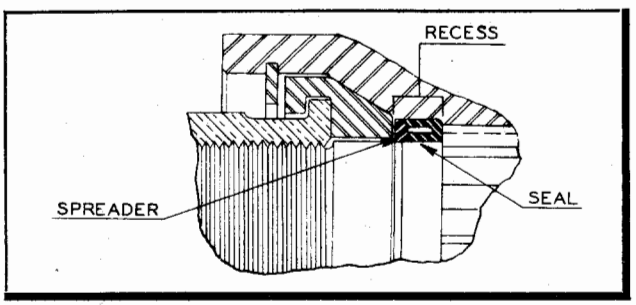


Figure 14—Section of Hub Showing Spline Recess for Grease Seal

(4) Install rear cone on the shaft.

(5) Place propeller shaft locking adapter in end of shaft.

(6) Clean thoroughly and coat the threads of the propeller shaft and nut with an antiseize compound Specification No. AN-C-53. Apply a light coating of engine lubricating oil to the splines. The rear cone should be left dry.

(7) To avoid the possibility of damaging the propeller shaft threads while installing the propellers, it is desirable to use a thread protector. To do this, proceed as follows:

(a) Screw thread protector on shaft. Tighten by hand only.

(b) Rotate blade assemblies (decrease pitch) until the cutaway portion of the blade gear is forward.

(c) Being careful not to damage the shaft or rear cone seat, locate and slide the propeller halfway back on the shaft.

(d) Remove thread protector.

(e) Install grease seal and spreader.

NOTE

On earlier models, the splines are not recessed to take the grease seal and spreader. These types make use of a felt seal in the slot of the rear cone.

(f) Install the nut, cone, and retaining snap ring. New cones may come in one piece, in which case it will be necessary to saw the halves apart and carefully remove the metal left in the split.

(g) Slide the propeller back on the shaft and carefully start the nut on the threads of the propeller shaft. Tighten nut with a force of 250 to 300 pounds on a 3½-foot bar placed through the holes in the nut. Hammering on the bar is unnecessary and should be avoided.

NOTE

If a thread protector is not available, extreme caution should be taken not to damage the cone seats and shaft threads during installation.

(8) To make a final check of brush alignment on the slip rings, apply a light coating of Prussian blue on the ends of the slip ring brushes and place them in the housing. Rotate the propeller back and forth slightly and remove the brush assembly. The brush track, as indicated by the Prussian blue, should be in the approximate center of the slip rings and not closer than .020 inch to the slip ring insulators. Shim behind rear cone or brush housing as required to obtain proper alignment. When the alignment is satisfactory, clean the brushes and install the brush assembly, locking the latches with safety pins.

NOTE

Do not use cleaning solvent on the brushes.

(9) Fit the locking sleeve to the adapter inside the

propeller shaft nut so that a lockpin hole lines up with a hole in the nut. If the holes do not line up on the first application of the locking sleeve, remove locking sleeve and change its position on adapter until a hole does line up. Place lockpin assembly in position and release lockpin. Note that it passes through both the locking sleeve and the shaft nut.

c. POWER UNIT.

(1) Remove the power gear assembly from the power unit by removing the three countersunk attaching screws and the snap ring at the end of the power unit splined shaft. Check to see that the low limit switch arm is just riding on the low limit lobe of the cam. If it is necessary to operate the power unit to properly locate the cam:

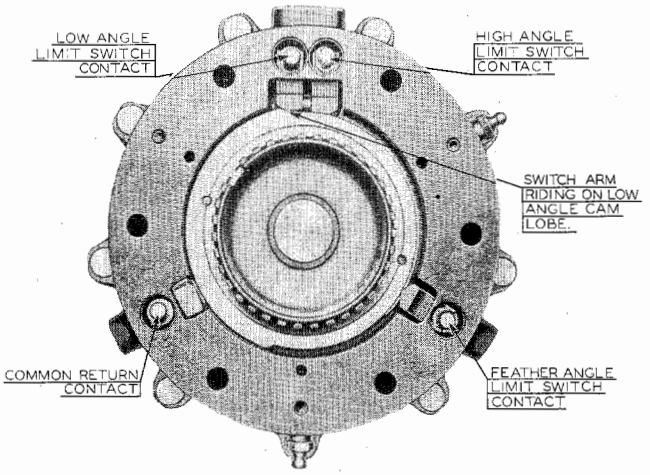


Figure 15—Limit Switches—R.H. Propeller

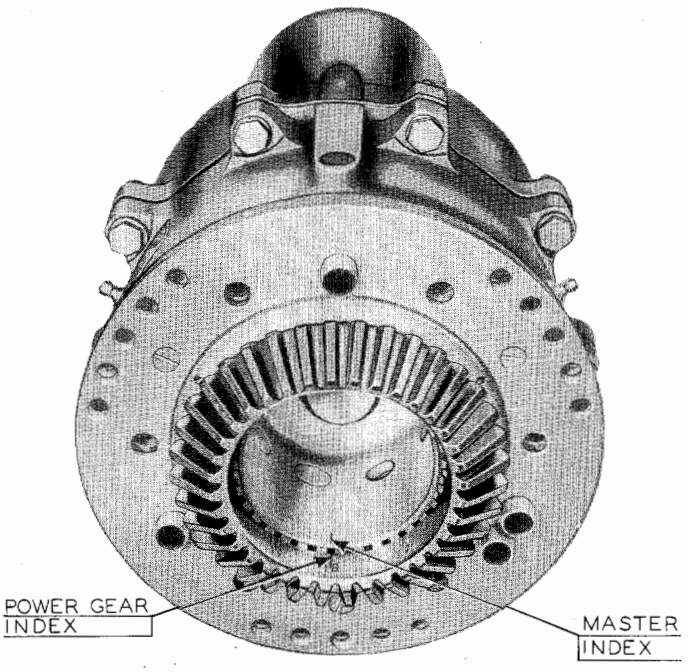


Figure 16—Indexing of Power Gear

(a) Remove the steel mechanical stop plug, which is held in place by two 3/16-inch hex-head bolts just forward of the adapter plate. This must be done to eliminate the possibility of damaging the speed reducer by running into the mechanical stop when it is operated independently of the hub.

(b) The cam may be rotated to the correct position by introducing a current through the proper two contacts on the face of the power unit.

NOTE

The power unit splined shaft has a master spline which is indicated by a mark on its end. The power gear is marked in increments of one degree. A decalcomania or etched lines on the blade when aligned with an index on the front of each blade socket indicate the blade angle. The blade angles of propellers are covered in Section VII.

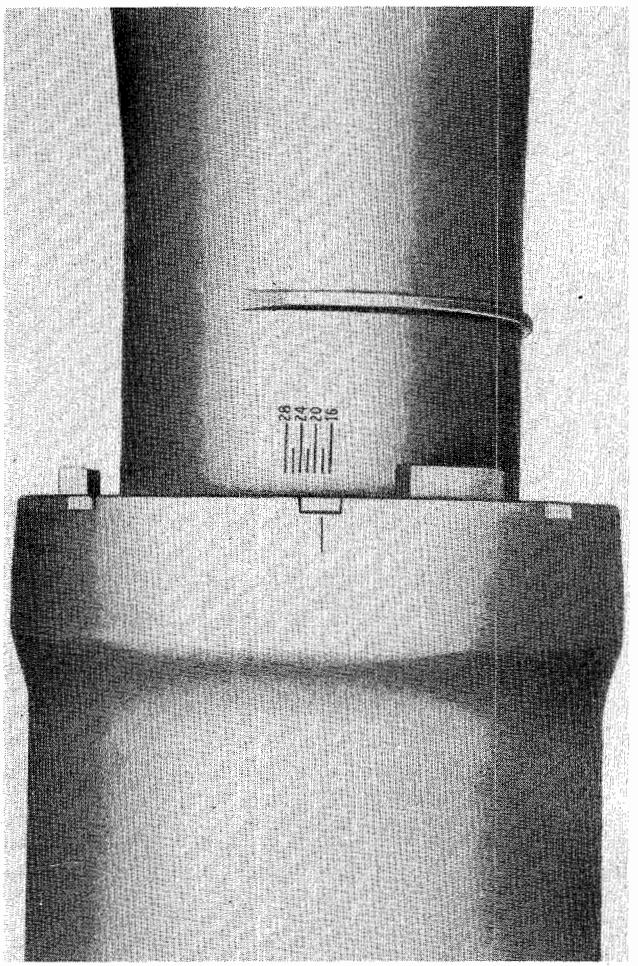


Figure 17—Indexing of Blade

(2) Replace the power gear, having the master spline in line with the mark indicating the desired low blade angle, then replace the three attaching screws and the snap ring.

(3) Rotate the blade assembly until the index on

the blade indicates the desired low blade angle (same angle as the power gear).

(4) Install felt grease seal or seals as supplied over propeller shaft nut and make sure that the nut is satisfactorily tightened and locked.

(5) Clean contacts on the face of hub and power unit.

NOTE

Do not use cleaning solvent on the contacts. Dirt may become lodged between the rattle contacts and must be blown out.

(6) Place the grease seal on the adapter plate. Place power unit on hub, aligning the contact points and bolt holes of the power unit hub. Push unit hard against the hub so that the power gear meshes with the blade gears. Secure the unit tightly to the hub with six attaching bolts and safety wire them.

(7) Lubricate as outlined in section V, paragraph 3.*b*.

(8) Replace mechanical stop plug in the proper position as indicated by the mark "O" stamped on the stop and housing. Inspect the blade shank indices to see that the blades are at the correct angle.

SECTION IV
OPERATION

1. PRINCIPLES OF OPERATION.

a. The blade angles of the Electric Propeller are controlled by means of a reversible electric motor. The electrical energy required for operating the motor is taken from the airplane power supply and passes through brushes mounted in a housing attached to the engine nose to slip rings which are fixed to the rear of the propeller hub. From the slip rings, the electrical energy passes through connector leads in the hub to leads in the speed reducer and thence to the motor. The motor changes the blade angles through a two-stage, planetary-type speed reducer which drives a master bevel gear. This gear meshes with a bevel gear attached to the shank of each blade. Thus, depending upon the direction of rotation of the motor, the angle of the blades is increased or decreased.

b. A brake is attached to the front end of the electric motor for the purpose of stopping its rotation when the pitch changing current is cut off. The brake also provides a definite lock which holds the blades in a fixed position when no angle change is desired.

c. Switches are provided in the hub end of the power unit to limit the low and high blade angles of the flight range and also to halt the pitch change at the feather setting. These switches are cam operated and are connected into their respective motor leads. Reverse thrust propellers have an additional switch which limits the angle to that required for such operation.

2. OPERATING INSTRUCTIONS.

For operating instructions, refer to the Handbook of Flight and Operating Instructions applicable to the airplane.

SECTION V
SERVICE INSPECTION, MAINTENANCE, AND LUBRICATION

1. SERVICE TOOLS.

For the required service tools, refer to T. O. No. 03-20B-15.

2. INSPECTION AND MAINTENANCE.

Column No. 28—Propellers and Accessories.

NOTE

In accordance with Technical Order No. 00-20A-2, a summary of periodic inspections prescribed herein will be entered in the Master Airplane Maintenance Instruction Form maintained in the back of form 41-B for the airplanes affected.

Preflight.

The mechanic will perform the following check:

The circuit breaker must be in the "ON" position. Engines may be started and warmed up with selector switch in "AUTOMATIC." To check selective fixed pitch control operation, open throttle to turn engine 1,000 to 1,200 rpm. Hold selector switch in "DECREASE RPM" position until a reduction of not more than 200 rpm in engine speed is noted, then hold in "INCREASE RPM" position until original engine rpm is obtained. When the engine rpm ceases to increase, the propeller has reached its low blade angle.

To test constant speed operation, place selector switch on "AUTOMATIC" and place the cockpit control lever in "TAKE-OFF" position. Open throttle until engine turns approximately 70 percent rated rpm, and pull the cockpit control lever back until a reduction of approximately 200 rpm in engine speed is noted. Return cockpit control lever to "TAKE-OFF" position,

noting that original rpm is resumed. Individual magnetic operation can be checked while the selector switch is in the "AUTOMATIC" position.

Pilots are urged to make the constant speed check given above prior to all take-offs and to regard this check as supplementary to the routine checks made by the ground crew.

NOTE

This preflight operation check will serve as added insurance against making a take-off with an inoperative propeller, which may be caused by an incorrect switch setting or possible mechanical difficulty.

Daily.

NOTE

The following instructions cover servicing of only the propeller. For control system maintenance, refer to Handbook covering the type of control system used.

Thoroughly clean and visually inspect hub and blades for damage or defects that may have occurred during previous operation. The blades are to be cleaned with a light lubricating oil and their inspection should include a careful check of the surfaces for damage such as bends, cracks, dents, and nicks. The full length of the leading and trailing edges as well as any dents or scars on the blade surface should be carefully examined for cracks. Each questionable scratch should be carefully examined to determine whether it is a scratch or crack. Raised edges of scratches, nicks, etc., which are likely to induce cracking, should be dressed off with a hand stone or emery cloth.

Test operation of the pitch changing mechanism by placing the selector switch in "DECREASE RPM," then "INCREASE RPM" position to check operation in both directions. On multi-engine planes, place feather switch to "FEATHER" position to determine that the propeller will feather and then return the switch to "NORMAL" position. On those installations employing reverse thrust operation, this circuit may be tested by placing the reverse safety switch to "ON" and the reverse switch to "REVERSE." The warning Tel-lite should be on until the reverse blade setting is reached. Return to normal by moving the reverse switch to "RETURN." The Tel-lite should be on until the low pitch setting is reached. As soon as the Tel-lite is off, the reverse switch must be moved to "NORMAL" and the reverse safety switch to "OFF."

25-Hour.

Remove the brush cap assembly from the housing by releasing the two latches. Inspect brushes and slip rings for wear. Brushes will be cleaned by wiping with a dry cloth. No solvent will be used on the brushes since they are impregnated with oil which is necessary for proper wearing characteristics. Cleaning solvent will dissolve this oil and accelerate wear of the brushes and slip rings. Wipe slip rings by holding cloth against the ring while propeller is being rotated. Brushes of the molded type holder are inscribed on the side with an arrow which points toward the front of the brush. When the point of wear reaches the tip of the arrow and beyond, the brush must be replaced. Brushes of the early type holder should extend ⅜ of an inch from the block. If they do not extend this distance, examine for worn brushes, permanently compressed springs, and dirty brush guides.

On multi-engine planes, place feather switch to "FEATHER" position to determine that the propeller will feather and then return the switch to "NORMAL" position.

100-Hour.

Remove the brush assembly from the housing by releasing the two latches. Remove block assembly from the cap, remove cover assembly, and remove brush assemblies from the block. Clean oil and carbon dust from the brush holder. Clean out brush guides with a small spiral hair brush or by drawing a cloth through. Brushes themselves will be cleaned by wiping with a dry cloth.

NOTE

Do not use cleaning solvent on the brushes.

Brush blocks of the molded type may be made arc-resistant to prevent shorting between metal brush guides by the application of varnish to the concave surface of the brush block. To accomplish this, sand the surface with number OO sandpaper until a smooth surface is obtained and scrape the ends of the brush guides clean. Preheat the block at 163°C (325°F) for a minimum of one hour. While the block still retains a heat of approximately 65.5° to 93.3°C (150° to 200°F) hold the concave surface in a downward position and brush on one coat of varnish. Inspect inside surfaces of brush guides for presence of varnish. Air dry the block for a minimum of one hour and place (concave surface downward) in an oven. Bake for two hours at 163°C (325°F).

Remove motor cover. Inspect the general condition of the electric motor. Check the brake clearance by using a feeler gage between the brake plate and the inner ring of the solenoid housing. The clearance should be between .010 to .020 inch. Clearance adjustments may be obtained by adding or removing shim laminations on the armature shaft, directly behind the brake disk assembly. After inspection, replace motor cover and safety.

3. LUBRICATION.

a. Lubricate the hub with grease, Specification No. AN-G-4, grade AA, soft, using a pressure gun on the Zerk fitting located on the speed reducer housing just forward of the front hub face until hub is full, as indicated by a flow of grease from the relief fitting.

b. Check the oil level in the speed reducer by removing the filler plug located near the front of the housing and rotating the propeller until the plug opening is

approximately 20 degrees below the horizontal plane when the airplane is at a ground angle of approximately 12 degrees, or 8 degrees below the horizontal when the airplane is leveled. The oil in the speed reducer should then be at the plug opening. If not, fill the gear assembly at this point, using oil, AAF Specification No. 3600.

SECTION VI

DISASSEMBLY, INSPECTION, REPAIR, AND REASSEMBLY

1. OVERHAUL TOOLS.

For the required overhaul tools, refer to T. O. No. 03-20B-15.

2. DISASSEMBLY.

a. GENERAL.—No propeller overhaul interval other than that specified by the operator is recommended, since the type of operation to which the propeller is subjected is the principal determining factor.

b. POWER GEAR.

NOTE

Before removing the power gear assembly from the power unit, mark or note the spline space on the power gear mating with the mark on the power unit splined drive. This indicates the low angle setting of the propeller.

(1) Remove the power gear assembly from the power unit by removing the three countersunk attaching screws and the snap ring from the splined end of the low speed bell gear.

(2) Remove the gasket and the insulator-lined steel bushings from the rear of the speed reducer housing.

(3) Press power gear, shims, and grease seal from the adapter plate, being careful not to damage the grease seal or the shims. Remove the snap ring and bearing.

c. BRAKE AND MOTOR ASSEMBLY.

(1) Remove motor cover.

(2) Unscrew the nut on the front end of the motor shaft and, by using a brake puller, remove the brake disc assembly. Then remove the brake disc locating key from the motor shaft.

(3) Disconnect the solenoid terminals and remove the three attaching bolts that secure the brake diaphragm assembly and solenoid.

(4) Unscrew the motor retaining ring nut from the front speed reducer housing.

(5) Pick the insulation from around the four motor terminal screws at the rear of the speed reducer housing and remove the screws, thereby disconnecting the motor leads.

(6) Using a puller, remove the motor from the speed reducer housing; at the same time, work the motor leads out of their passages in the housing.

NOTE

Extreme caution should be taken to prevent any side loads on the armature which might

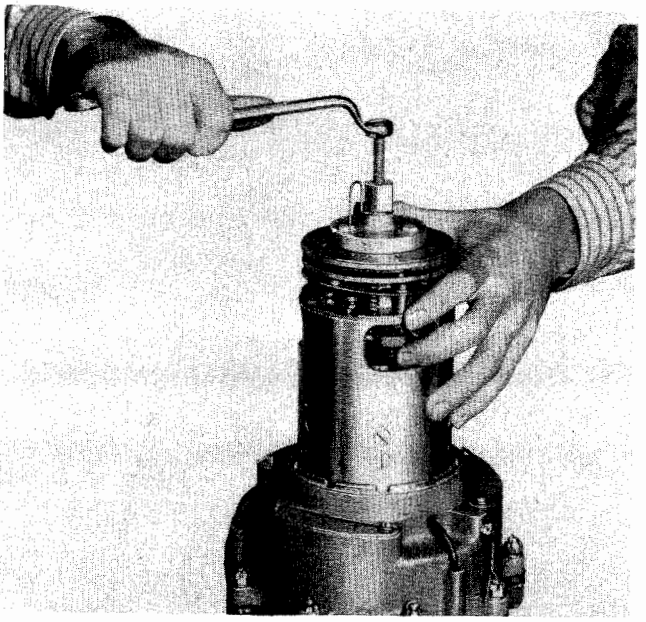


Figure 18—Removal of Brake Disk

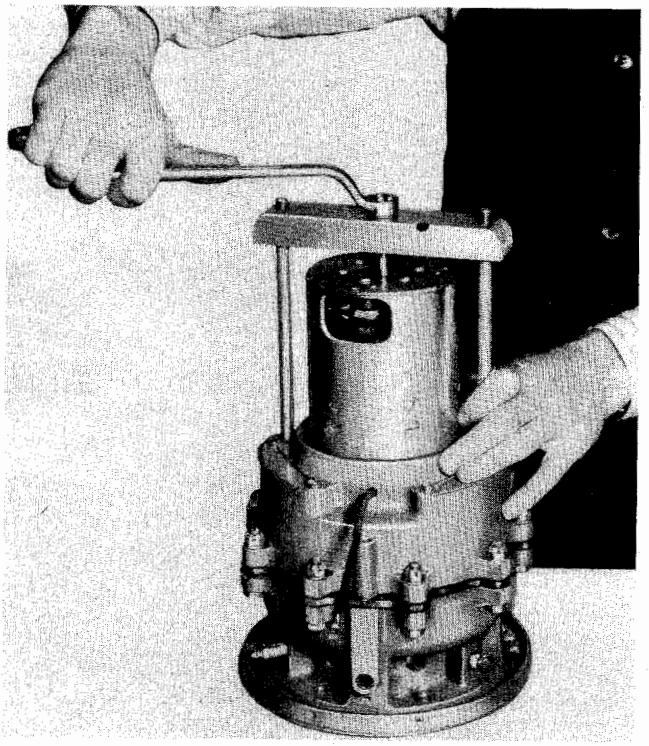


Figure 19—Removal of Motor

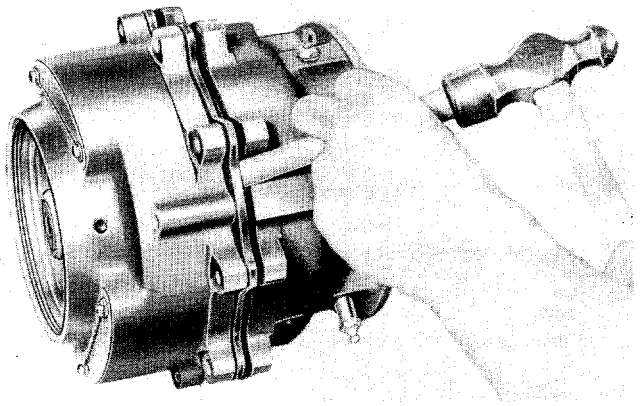


Figure 20—Separation of Housing

bend the shaft or crack the sleeve extending through the speed reducer oil seal.

(7) Press the armature from the motor housing.
(8) Press bearing from the motor housing.
(9) Remove the brushes from the brush holder.

d. SPEED REDUCER.

(1) Remove oil filler plug from speed reducer housing and drain the oil.

(2) Remove the nuts and bolts which hold the front and rear housings together.

(3) Using a hammer and a brass or wooden drift, tap the fixed ring gear from rear housing. The ring gear, the front housing, and the gear assembly will then separate from the rear housing.

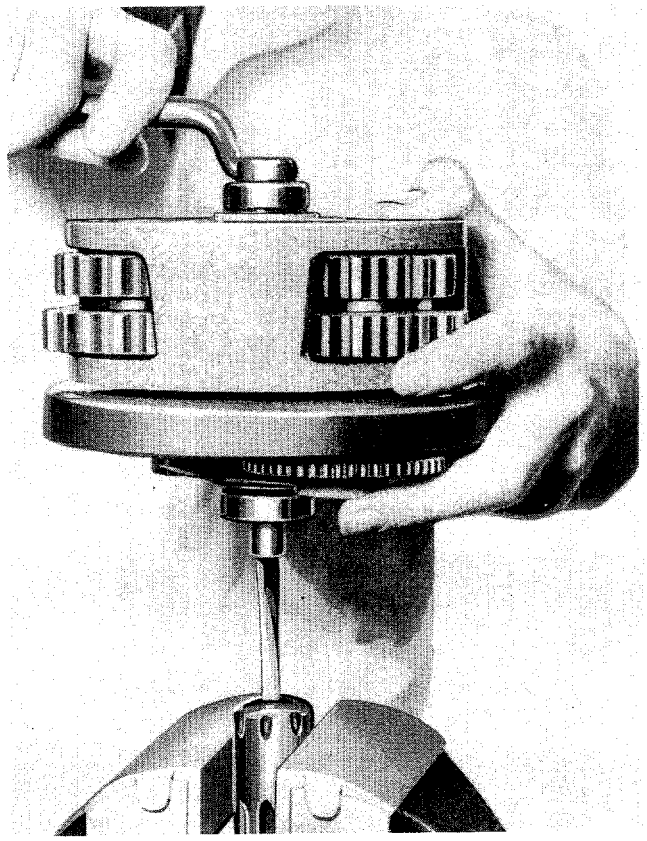


Figure 21—Removal of Drive Gear Nut

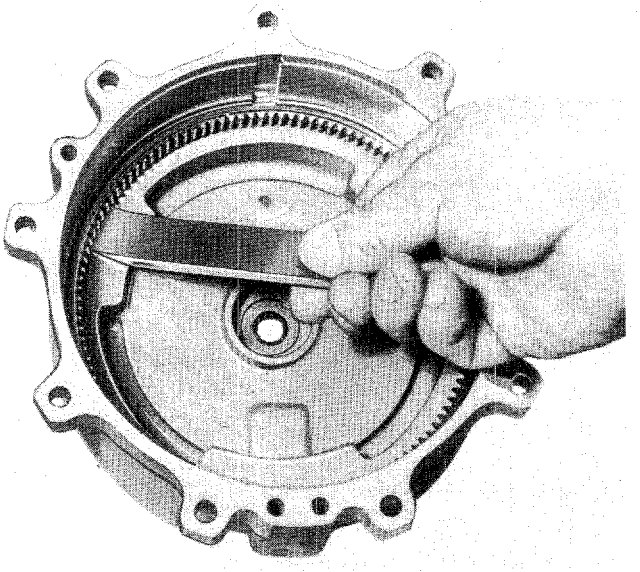


Figure 22—Removal of High Speed Fixed Ring Gear

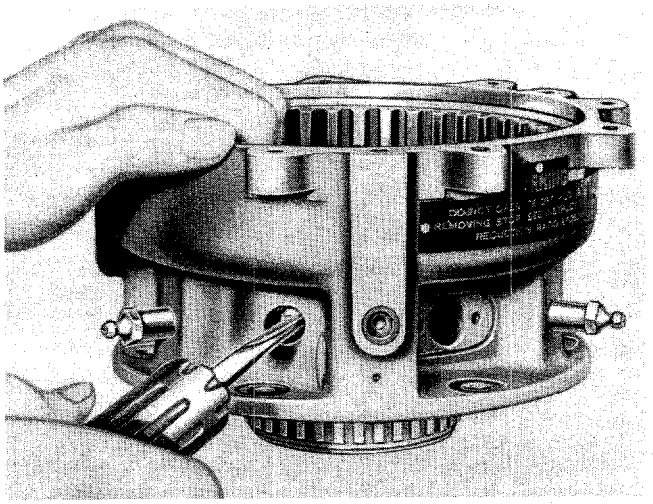


Figure 23—Removal of Mechanical Stop Segment

(4) Remove the gear assembly from the front housing. Disassemble it by removing the nut from the end of the shaft and removing gears, spiders, bearings, and spacers. Remove the gears from the high and low speed spiders.

(5) The front oil seal need only be removed if it is defective as ascertained by visual inspection.

(6) Remove the fixed gear snap ring from the front housing and carefully work out the fixed ring gear.

(7) Rotate low speed bell gear in the rear housing until cut-out cam and mechanical stop screws are visible through the breather holes. Insert a proper size screw driver and remove the screws. The screws holding the segment turn to the right when being removed and fall into the bell gear splined hub.

(8) Remove the cam attaching screws and then remove the cam by making use of two 10-32 screws, two inches long, as jack screws in the tapped holes provided in the cam.

(9) Push the bell gear out of the rear housing and remove the bearing, oil seal, and also the felt grease seal.

e. LIMIT SWITCHES.

(1) Remove the terminal studs from the limit switch assemblies.

(2) Remove clevis pins and switch arms.

(3) Remove limit switch assemblies from rear housing. The switch assemblies need not be disassembled further.

f. REMOVAL OF BLADES FROM HUB.

(1) Place the hub assembly slip rings down on a spindle.

(2) Remove the locks from the blade nuts, marking location of same on the hub and nut with paint. Unscrew the blade retaining nuts from their sockets.

(3) Remove each blade from its socket and place it on a clean assembly table with the bearings overhanging the edge.

g. CUFFS.

(1) Carefully tap the hinge pin out of the hinge and remove all cover attaching screws.

(2) Remove the trailing edge stiffener by driving out the dowel pin.

(3) Remove the two nuts which hold the support in place.

h. BLADES.

NOTE

Less trouble will be experienced when the propeller is reassembled if the individual parts of each blade assembly are kept together.

(1) Slide the retaining nut back over the blade shank.

(2) Using brass or aluminum blocks to cushion the blows, tap the bearings backward until the blade gear locking pin is accessible.

(3) By using a pin puller, remove the pin from the blade.

(4) Unscrew the gear from the blade and remove the bearings and nut. If the gear does not turn freely place it in a copper-jawed vise and rotate the blade with a paddle.

i. HUB.

NOTE

It is necessary to disassemble the hub only when the slip rings need replacing. It is not necessary to remove slip rings for magnaflux inspection of the hub.

(1) Remove the screws holding the slip ring assembly to the hub.

(2) Remove the slip ring assembly with its connector rods from the hub, taking care that rods are not damaged.

(3) Unscrew the connector rods from the slip ring assembly and remove their insulating tubes.

(4) Mark the slip rings so they can be reassembled in the proper order and position, then slide them off the insulating sleeve.

j. BRUSH HOLDER.

(1) Remove the warning plate.

(2) Disconnect the wires from the brush terminals.

(3) Unscrew the four screws which secure the brush holder to the mounting bushings in the brush cap and remove the holder.

(4) Remove the two screws which hold each brush terminal block in place. On the molded type holder it is only necessary to remove the cover.

(5) Remove the brushes from the holder.

(6) Unscrew the four attaching screws and remove the electrical connector socket.

3. INSPECTION AND REPAIR.

a. GENERAL.

(1) After disassembly all of the propeller parts should be inspected according to the following outline and necessary repairs and replacements made. Before inspection, the parts should be cleaned thoroughly and oiled to prevent oxidation.

CAUTION

DO NOT USE GASOLINE CONTAINING TETRAETHYL LEAD IN CLEANING.

(2) The hub, retaining nuts, gears, gear pins, and all other moving steel parts should be inspected by means of the magnaflux method.

(3) All bearings should be inspected for possible damage, wear, or roughness.

CAUTION

If one active bearing of a stack of blade bearings is found to be defective, all active bearings of the stack must be replaced. If the preload bearing is defective, it may be replaced provided that its inner race is not integral with that of the adjacent active bearing. If the inner race of the preload bearing is integral with that of the adjacent active bearing, the entire bearing stack must be replaced.

(4) All gears must be inspected for excessively worn or damaged teeth.

(5) All threads shall be free of nicks, distortions, wire edges, and roughness.

(6) All parts on which the plating is worn or corroded must be replated. During the replating operation, care must be taken not to plate bearing surfaces or threads.

b. MAGNETIC BRAKE.

(1) Test the solenoid with an ohmmeter or megger

for an open circuit or weak insulation. Test solenoid for resistance using the following table of specified resistance limits. Check for damaged coil terminals. If a brake winding is defective, it is desirable to replace the entire housing assembly, as installation of the winding in the housing is a highly specialized operation.

Assembly No.	*Voltage*	*Specification*
101379-1	12V	.029 to .035 ohms
101379-2	24V	.117 to .143 ohms
108665-1	12V	.035 to .043 ohms
108665-2	24V	.117 to .154 ohms
108065-1, -3	12V	.036 to .042 ohms
108065-2	24V	.126 to .154 ohms

(2) A glazed surface on the brake facing may be removed with sandpaper. Badly worn facing should be replaced. Inspect springs to make sure that they are not permanently compressed. Inspect diaphragm for possible cracks or loose rivets.

c. ELECTRIC MOTOR.

(1) Check trueness of armature shaft in a lathe.

(2) If the commutator of the armature is cut or burned it should be resurfaced in a lathe and the mica undercut to a depth of approximately one-sixteenth inch.

(3) Try the armature circuits with a growler or light and visually inspect the windings for broken insulation. If the insulating varnish on the armature is chipped or deteriorated, clean thoroughly and apply two coats. Inspect the serving of the winding leads to the commutator of the armature. If there is any sign of looseness, the serving must be replaced and thoroughly coated with insulating varnish.

(4) Any damage or excessive wear of the spline or keyway and tang of the armature shaft is cause for replacement of the armature.

(5) If a motor brush is less than one-half inch in length, replace the brush and spring assembly.

(6) Check tightness of brush rigging. To eliminate any movement, straighten three retaining bolt lock washers and tighten brush holder retaining bolts. On early type motors the brush rigging assembly is attached by means of flathead screws mounted through the motor case. These screws should be inspected for tightness and the general condition of the brush rigging noted. Inspect motor leads for broken or damaged insulation and splice on new leads if necessary. Damaged insulation may be served with linen cord and coated with insulating varnish.

(7) Carefully inspect the motor housing and front speed reducer housing for signs of chafing. Inspect locking key on motor cover for loose rivets.

d. SPEED REDUCER.

(1) Inspect all bearing seats to be sure that the outer bearing races do not rotate in the bearing seats.

(2) Inspect the housings and spiders for possible cracks or damage.

(3) Inspect the cam lobes and limit switch arms for wear or damage.

(4) If switch contacts are corroded or pitted they should be smoothed with a stone. If it is found necessary to replace the contact or the contact spring, the whole contact assembly should be replaced.

(5) Replace worn grease and oil seals and gaskets.

(6) Inspect wire connections for broken or damaged insulation.

e. POWER GEAR.—Should the grease seal be deteriorated or damaged, it should be replaced.

f. HUB.

(1) A slight amount of galling, and scratches caused by removal of blade assemblies may be found in the blade sockets. Unless excessively deep, these need not be cause for rejection. Removal of metal should be held to a minimum. Remove only raised edges and radius the bottom of scratches with a stone.

(2) Inspect the cone seats. If metal has been picked up from the rear cone, it should be cleaned out and the seat lapped with a fixture made for that purpose.

(3) If it is found necessary to replate the hub, protect the cone seats, threads, and ground surfaces of the blade sockets against plating.

g. SLIP RINGS.

(1) Inspect all slip rings for excessive wear. They should be replaced if the outside diameter is less than 6.094 inches (No. 50 SAE spline shaft) after they have been turned and smoothed as outlined in section VI, paragraph 3.*a.*(7).

(2) Inspect connector rods for damaged threads and contact points for smoothness. The contact points can be smoothed with a stone.

h. BRUSH HOLDER.

(1) The brushes should have no frayed or broken leads and should slide freely in the holder.

(2) The brushes of the molded type holder must be replaced if the point of wear has reached or gone beyond the tip of the arrow inscribed on the brush. The brushes of the laminated type holder should extend three-eighths inch from the block. If they do not extend this distance, examine for worn brushes or permanently compressed springs.

i. BLADES.—With the exception of the removal of small nicks and bruises, as outlined below, all repair of blades should be accomplished by an authorized depot or agency.

(1) CARE OF BLADES AT OVERHAUL.

(a) All sharp, raised edges of scratches and nicks must be dressed off with a hand stone or emery cloth. However, small shallow dents which are smooth and have no sharp corners need not be removed. In reworking nicks, all edges should have small radii to conserve metal in the damaged section. This procedure varies from that employed on dural blades where the nick may be blended into the contour of the blade without weakening it structurally.

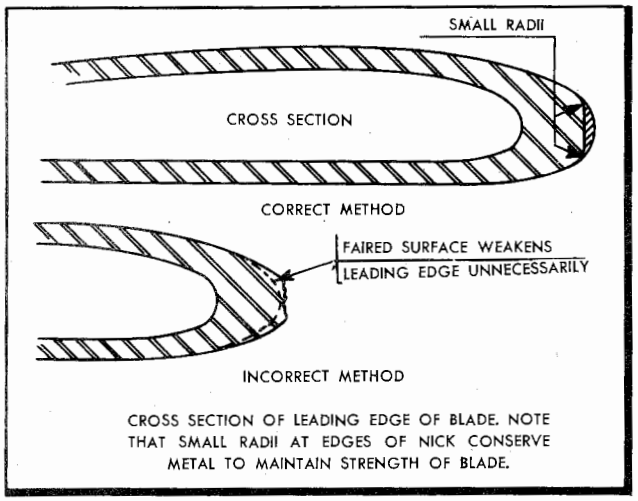


Figure 24—Section View

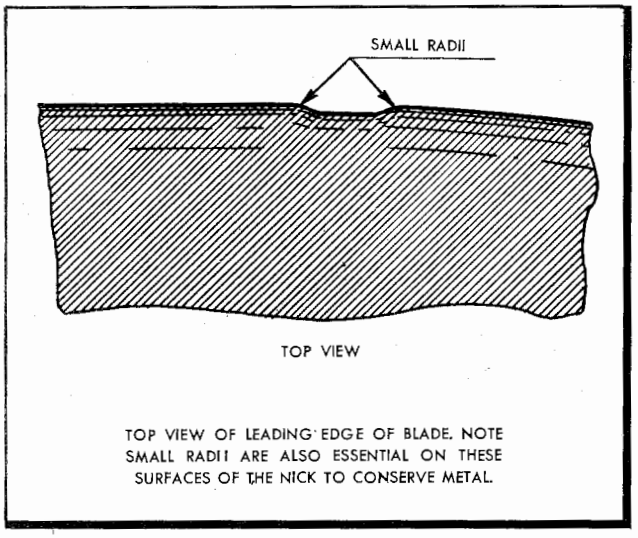


Figure 25—Top View

(b) If it is necessary to remove more than the following amounts of metal to repair defects, the blade is unsafe and must not be used for flight.

1. As seen in figure 26, the blade may be divided into three regions: region "A," the solid metal of the leading edge; region "B," the solid metal of the trailing edge; and region "C" which includes the hollow portion of the blade and extends one-eighth inch into the solid portion of the blade.

2. For the outer two-thirds radius of the blade, metal can be removed in region "A" to a depth of .125 inch and in region "B" to a depth of .190 inch without impairing the strength of the blade. For the inner one-third radius of the blade, metal can be removed in regions "A" and "B" to a depth of .030 inch. The number and relative location of repairs made to a maximum allowable depth should be considered in deciding the serviceability of a blade.

3. When a nick or bruise is to be removed in region "C," great care must be exercised so that metal

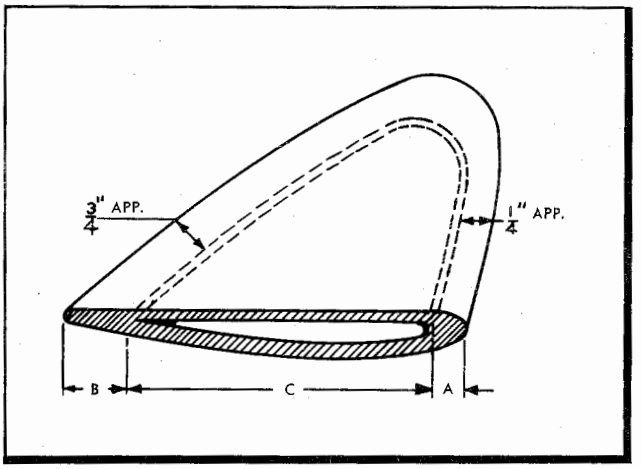


Figure 26—Cross Section of Blade

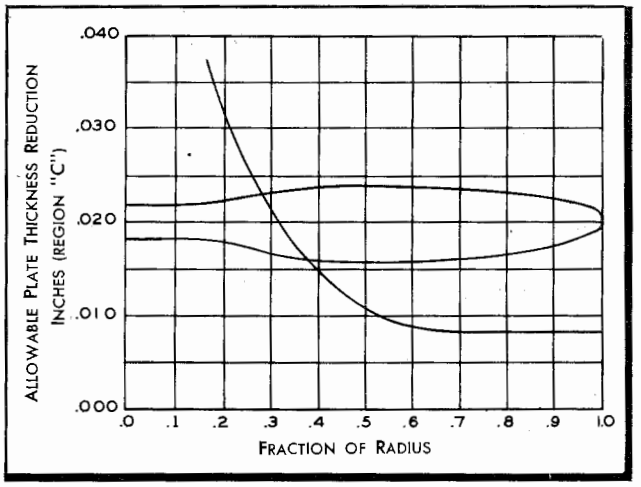


Figure 27—Allowable Plate Thickness Reduction

is not removed to a depth greater than is indicated on the chart. A record should be kept of any considerable removal of metal from this region for the purpose of future reference.

4. If the blade is corroded or shows signs of oxidation, the affected areas may be polished with steel wool or fine emery cloth. Periodic coating of the blade with Specification No. AN-C-52 (Whiz Compound) will suffice to prevent further corrosion and oxidation.

(c) At major overhaul, or whenever their condition is doubtful, blades shall be inspected by means of the magnaflux system. This inspection should be accomplished as follows:

1. Remove paint from blade.

2. Mount the blade in a magnaflux machine. Should the equipment be too small to accommodate the blade, clamps connected to the power supply may be attached to the tip and butt of the blade. Extreme caution should be taken to insure proper electrical contact so that the blade will not be burned. In order to insure against a large current drop, the leads to the contact clamps should be as short as possible and the diameter of the connector should be approximately five-eighths inch.

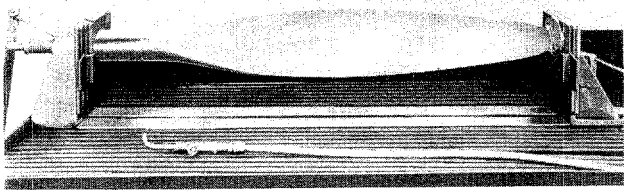


Figure 28—Magnaflux Inspection

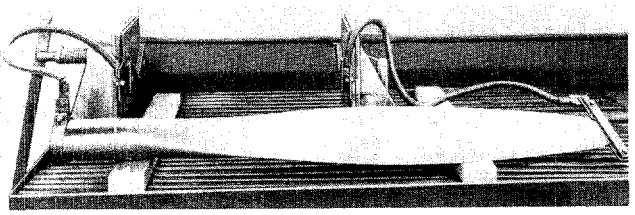


Figure 29—Magnaflux Inspection

3. Using a power supply of 3,000 to 4,000 amperes at 6 volts, magnetize the blade by rapidly making and breaking the circuit 2 or 3 times.

NOTE

Best results can be obtained if the magnaflux solution is poured over the blade at the same time that the blade is being energized.

4. Examine the entire blade, especially the leading and trailing edges in the area of the weld, the pinhole, and the threads. Any crack is cause for immediate rejection of the blade from service.

5. Upon completion of the magnetic inspection, demagnetize the blade.

(2) REJECTION OF BLADES FROM SERVICE. —A blade which has any of the following defects shall be immediately removed from operation:

(a) A crack of any kind.

(b) A bend of any description.

(c) A bullet hole.

(d) A deep cut or scar that is likely to induce cracking.

(e) A nick that should be removed to prevent the blade from cracking, but the removal of which would result in the blade's failing to meet the minimum thickness requirements as listed in paragraph 3.*i.*(1)*(b)* of this section.

(f) An out of track condition that exceeds permissible limits.

With the exception of *(a)* and *(c)*, it is possible to repair the defects listed above if they are not too severe.

j. CUFFS.

(1) Inspect the support, stiffener, and cover for possible cracks.

(2) Make sure that all rivets are tight and that the chafing strips have not deteriorated.

k. BLADE RETAINING PARTS.

(1) Inspect bearings as outlined in paragraph 3.*a.*(3) of this section. Wash bearings carefully and pack with hub lubricant Specification No. AN-G-4, Grade AA.

(2) Inspect the blade nut threads for smoothness.

(3) Note that the grease seal has not been damaged or deteriorated and that the garter spring is in place.

l. PROPELLER SHAFT ATTACHING PARTS.

(1) Inspect the propeller shaft nut seal or seals and replace if deteriorated.

(2) Inspect propeller shaft seal and spreader for possible damage and replace if necessary.

(3) Inspect the propeller shaft nut locking adapter and locking pin assembly for wear or damage. Make sure that the plungers are operating freely.

4. REASSEMBLY.

a. HUB.

(1) Assemble the slip rings and insulator rings on the insulator tube.

(2) Install the labyrinth seal on the front end of the slip ring mounting sleeve and coat the joint with Copaltite or some similar suitable sealing compound.

(3) Install the six insulator bushings into the holes provided for the attaching screws.

(4) Insert the long insulator bushings in place. Coat the threads of the connector rods with litharge and screw each into its proper slip ring.

(5) After coating both sides of the slinger ring or spacer with a sealing compound, mount it on the slip ring assembly and press the assembly in place on the hub. Tighten and lock wire the six attaching screws.

(6) Check the contact points to be sure they are either flush with, or not exceeding minus .005 inch from, the front face hub. To adjust, add or remove shims directly under head of removable contact. On final setting, coat threads of contact with litharge.

(7) Mount the hub assembly on a balancing mandrel or an equivalent form of arbor that will run true in a lathe. With a dial indicator, check the trueness of the mandrel in the lathe centers. Cone seats should be clean and smooth before mounting the hub on the mandrel. Rotate the hub by an angle bolted to the face plate of the lathe, so as to engage with several power unit attaching bolts screwed into the hub.

(8) With a straight cutting tool approximately one-sixteenth inch wide, remove sufficient material from the surface of each slip ring to remove all irregular surfaces. The final cut should be made very lightly and with a very slow feed. Care should be taken not to remove more material than is necessary since the slip ring must be replaced if its outside diameter is less than 6.094 inches (SAE No. 50 spline shaft propeller). The diameters of the slip rings need not be alike but must be concentric with the cone seats within .003 inch total indicator reading. A strip of coarse cloth

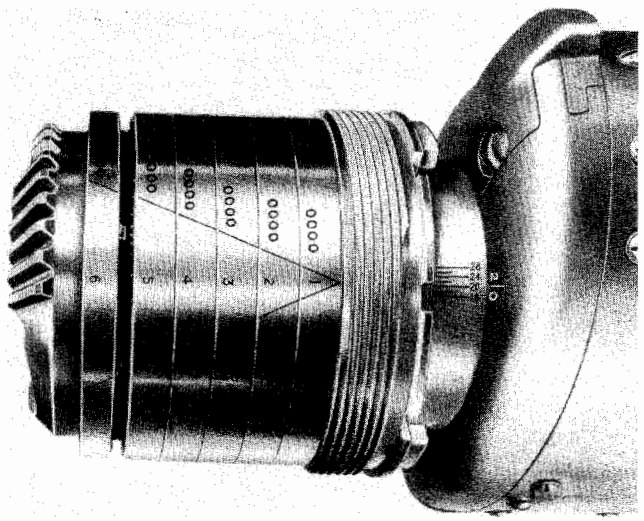


Figure 30—Blade Bearing Assembly

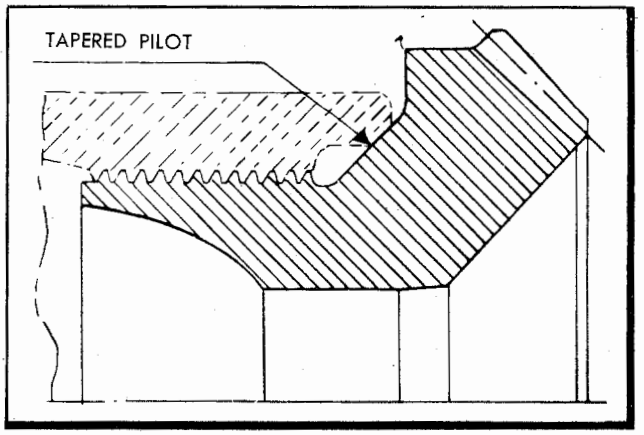


Figure 31—Tapered Pilot Gear

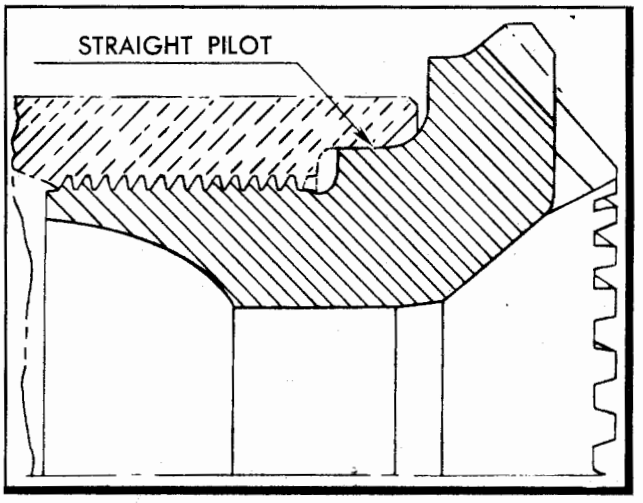


Figure 32—Straight Pilot Gear

such as the back of emery cloth may be used for polishing the rings. Check and, if necessary, true up slip ring separators in a like manner, removing as little material as possible to bring concentricity within .005 inch total indicator reading. The distance from the slip rings to the top of the separators shall not be less than .060 inch. The same cutting tool can be used for both slip rings and slip ring separators.

b. BLADES.

(1) Place the blade on a clean assembly bench with the shank overhanging the edge.

(2) Place blade nut (with its grease seal and garter spring) and blade bearings on the shank of blade in order named.

NOTE

It is essential that the bearings of a stack be kept together. Individual bearings of stacks, copper plated on the outer diameter, may be identified by means of a serial number etched on the shoulder of the outer race of each bearing. This serial number is the same for all bearings in a stack. The serial and individual bearing number of those stacks which are not copper plated are etched on the outer diameter of each bearing.

(3) Screw the proper blade gear into each blade. Each gear is stamped with a number which should correspond with the number stamped on the shank end of its blade.

NOTE

In the interest of efficiency, serviceability, and maintenance, it has been found necessary to change several details of the blade assemblies. The most important change made was in the design of the pilot used on the blade gears.

(a) The pilot on the early type gear was tapered. This gear was individually fitted to its blade before the pinhole was drilled and reamed and is, therefore, not interchangeable. Although replacement is usually a factory operation, this gear may be fitted and drilled by a shop which has the proper equipment and approved fixtures.

(b) The later type gear, however, has a straight pilot and is completely interchangeable with other gears bearing the same part number. The pinhole of a replacement gear must be checked while it is in the blade by using a fixture approved by the manufacturer. Should this check prove that the pinholes of the gear and blade are not in perfect alignment, or not of the same size, the pinholes must be reamed to the next oversize as described in paragraph (4) below.

(c) Upon assembly, taper pilot gears are preloaded by tightening the gear against the shoulder of the blade until the pinholes line up. Straight pilot gears are located axially by hand and preloaded with proper tool.

(d) It is imperative that exact pinhole alignment be obtained in order that service failures may not occur. The pinholes must be free from all metallic pick-up. If a hole has picked up slightly, it may be

cleaned with crocus cloth or emery paper. If a pin has picked up, it should be replaced. The pin fit must be from .0000 inch to .0005 inch tight.

(4) If it is found advisable to use an oversize pin, proceed as follows:

(a) Place the checking fixture on the blade shank and tighten the assembly bolts so that the fixture can be moved freely but without play.

(b) Locate the fixture bushing visually concentric over the blade shank hole.

(c) Insert the tapered blade shank locating pin and press steadily downward until it is no longer possible to move, in either direction, the fixture on the blade.

(d) Tighten the fixture bolts firmly but not so much as to cause the gear to bind.

(e) Remove the tapered pin and locate the gear hole visually concentric with the blade shank hole.

(f) Insert the blade gear locating pin. This pin will permit a slight amount of backlash in the gear which can be measured by a dial indicator attached to the fixture. Rotate the gear to the extreme left and move the dial indicator to zero. Then rotate the gear to extreme right and note indicator reading. By rotating the gear to the left one-half the total indicated reading, the blade shank and gear holes will be perfectly aligned.

(g) Preload the gear with a torque force of 50 foot-pounds applied to the screw of the proper preload tool, part No. ST1074.

(h) Insert the proper size reaming bushing in the fixture and ream blade and gear holes to one size above the existent blade shank hole size. Use following table in selecting correct oversize pin and reamer.

Size of Pin Removed	*Next Oversize Pin*	*Reamer Size*
		+.001
.3755	101814-1	.3815—.000
		+.001
.3825	101814-2	.3901—.000
		+.001
.3911	101814-3	.3980—.000

(i) Remove the fixture and preload tool.

(j) Remove the gear and remove all pick-ups and rough edges from around the blade shank and gear holes.

(5) Install the blade nut and bearings as described in paragraph 4.*b.*(2).

(6) Install the gear and enter the proper size pin (threaded hole outward) in the blade shank hole. Tap the pin very lightly until the gear cannot be rotated in either direction.

(7) Preload the gear with a torque force of 65 to 70 foot-pounds and drive the pin flush or below the blade shank surface.

(8) Slide the bearings and blade nut against the blade gear.

(9) Make certain that the gear plug and gear mating surfaces are absolutely clean and dry. Then, using a soft metal drift with a fiber adapter facing to protect the anodized plating of the gear plug, drive the plug securely into the gear.

c. BLADES IN HUB.

(1) With the slip rings down, place the hub on a propeller table or some other suitable spindle.

(2) At this time, carefully reinspect the hub barrel and blade nut threads for wide edges, pick-ups, and other imperfections, making sure that they are absolutely clean. Coat the blade sockets and bearings with Specification No. AN-G-4, Grade AA; coat the threads of the blade nuts and barrels with a white lead mixture Specification No. AN-C-53 (70 percent white lead and 30 percent lubricating or castor oil by volume).

(3) Place a shim in the bottom of each blade socket. The chamfer side of the shim should face the center of the hub.

(4) Insert each blade assembly in its proper socket. Usually the blade with the lowest manufacturing number goes into socket No. 1, the next highest into socket No. 2, the highest numbered blade into socket No. 3.

(5) Screw each blade nut into the hub until one-half of the threads are engaged. Slide each blade assembly in and out sharply several times and finally pull it tightly against the blade nut. The nut must be tightened by striking the wrench with a 10-pound brass hammer until the nut and hub locking slots, which have been marked during disassembly, line up. When properly assembled, it will barely be possible to rotate the blades by hand. However, a check should be made with a wooden blade wrench to make sure the blades will rotate.

d. CUFFS.—Each cuff assembly has a serial number which is stamped on the support, the stiffener, and the cover. Since these parts are not readily interchangeable every part of the cuff must bear the same serial number.

(1) Place the support around the shank of the blade with the groove of the support over the blade shank shoulder.

(2) On those supports secured by two bolts, insert the bolts so that their heads face the flat side of the blade. On the supports secured by a bolt and stud, insert the bolt so that its head faces the hub.

(3) Line up the 20-degree mark stamped on the camber half of the support with the corresponding degree mark on the blade shank index.

(4) Tighten the two bolts, or bolt and stud by applying a torque of 50 to 75 inch-pounds.

(5) Place the stiffener in place. Tap the dowel pin into place until it is centered between the halves of the support.

(6) Attach cover. It may be necessary to clamp or strap the cover in place in order to line up the screw holes.

(7) Tap the hinge pin in place, making certain that the flat side of the pinhead is against the stiffener.

When checked with a feeler gage between the bearing surface of the chafing strip and the blade surface, the cuff must fit within the following dimensions:

Flat Side of Blade..... .030 inch
Camber Side of Blade..... .020 inch
Leading Edge and Trailing Radii.. .010 inch

e. SPEED REDUCER.

(1) Install oil seal and felt grease seal in the rear housing.

(2) Place the mechanical stop segment in the breather section of the rear housing.

(3) Press the low speed bell gear bearing onto the shoulder of the bell gear, so that the thrust face of the outer race is away from the bell gear.

(4) Press bell gear into place in the rear housing, being careful to avoid damage to the oil seal. A slightly tapered sheet-metal sleeve, fitting over the splines, may be used to guide the spline shaft through the oil seal.

(5) From the inside of the bell gear, insert the two screws which hold the stop segment in place. Tighten the two screws by inserting a screw driver through a breather hole in the housing. The screws should be staked in place.

(6) Install cut-out cam by pressing it into place and installing the screws and lock washers through the breather holes in the housing. The smaller attaching lug of the cam fits into the recess in the mechanical stop segment.

(7) If removed, press the oil seal in front housing and stake in place.

(8) Install high speed fixed ring gear with its keys and retaining snap ring in front housing, making certain that the snap ring is in such a position that keys can not work out.

(9) Assemble both the high and low speed spider assemblies.

(10) Assemble the internal gearing having the index marks on the planet gears lined up on the center lines of the spiders. Make sure that the nut on the end of the shaft is tight and cottered so as not to interfere with the bearing or housing.

(11) Using a new gasket (shellac unnecessary), install the low speed fixed ring gear in place on the rear speed reducer housing. While turning the gear assembly, mesh it in place in the rear housing. If the gears have been properly indexed, they will mesh with the low speed bell gear without difficulty.

(12) Insert a second gasket (shellac unnecessary) on the top of the fixed ring gear and install the front housing, being careful to guide the shaft through the front oil seal without damaging it.

(13) Place the bolts which hold the front and rear housings together into position so that the head of each bolt faces the rear of the speed reducer. Install and tighten the nuts, applying a torque of 180 to 250 inch-pounds. While tightening, turn speed reducer with screw driver. If the unit binds, it should be disassembled and checked for improper assembly.

(14) Pour one pint of speed reducer oil AAF Specification No. 3600 through the plug opening in the front housing and secure plug.

LIST OF TOLERANCES—POWER UNIT ASSEMBLY

Reference Number	*Description*	*Max.*	*Min.*
1	Fit of brake disc on motor shaft—diameter	.005	.000
2	Motor shaft end play	.010	.005
3	Fit of key in motor shaft and brake disc—side clearance	.0020L	.0005T
4	Fit of bearing on motor shaft—diameter	.0005L	.0005T
5	Thickness of brake facing	.198	.125
6	Spring load—pounds at .750 height	9 lbs.	8 lbs.
7	Fit of bearings on high speed planet gear shaft—diameter	.0005L	.0004T
8	Fit of high speed planet gear on shaft—diameter	.0006L	.0002T
9	Fit of bearings in high speed spider—diameter	.0010L	.0004T
10	Backlash of high speed planet gear with high speed fixed ring gear	.015	.002
11	Backlash of high speed planet gear with high speed movable ring gear	.015	.003
12	Fit of bearings in high speed spider—diameter	.0015L	.0005T
13	Fit of bearing in high speed movable ring gear—diameter	.0015L	.0001T
14	Fit of high speed movable ring gear in low speed spider bushing—large diameter	.006	.002
15	Backlash of low speed planet gear with low speed fixed ring gear and high and low speed movable ring gears	.020	.002
16	Fit of low speed planet gear on shaft—diameter	.0005L	.0004T
17	Fit of bearings in low speed spider—diameter	.0015L	.0005T
18	Fit of bearings on low speed spider shaft—diameter	.0005L	.0004T
19	Fit of seal in housing—diameter	Press fit	

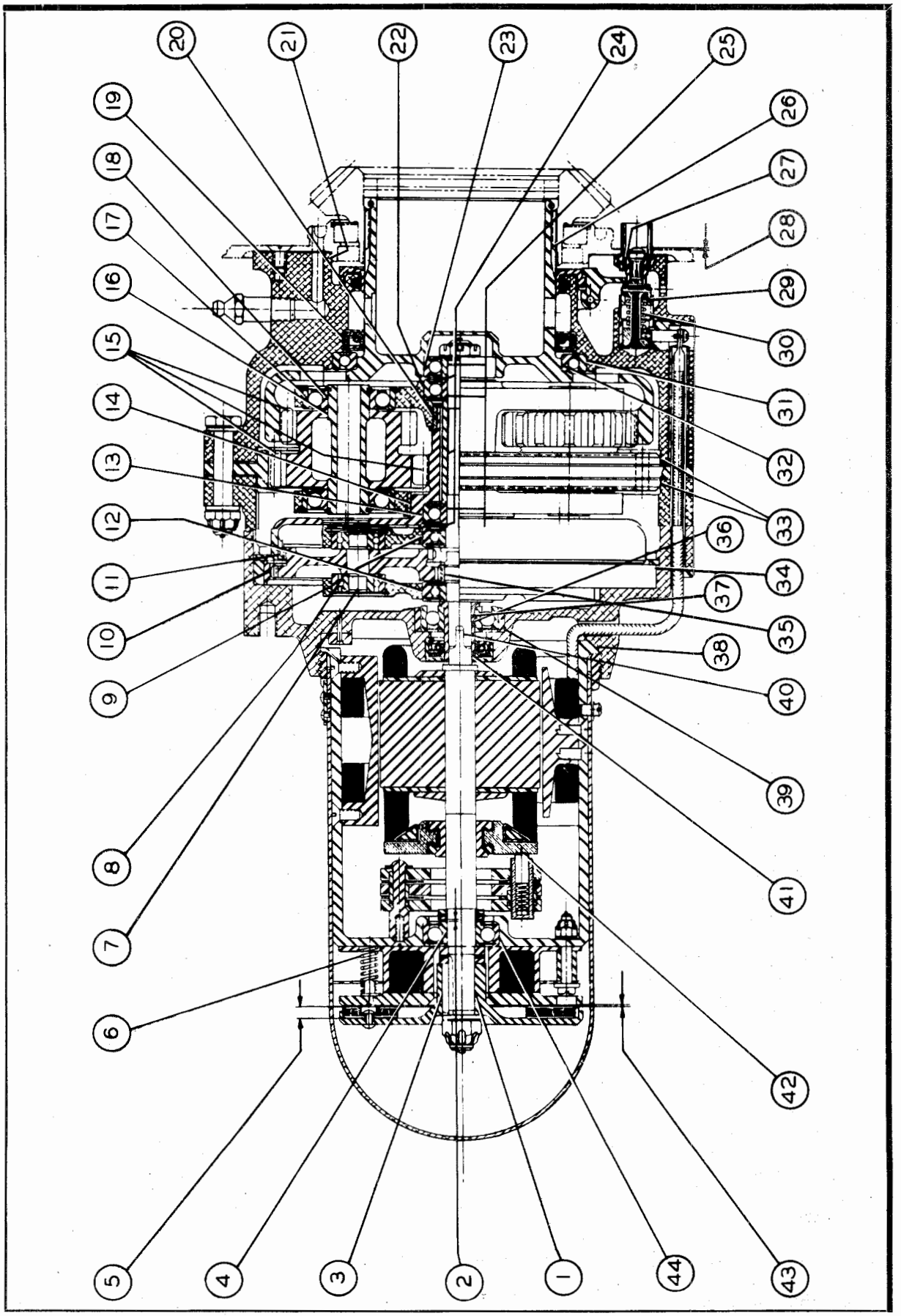


Figure 33—Power Unit Assembly Tolerances

Reference Number	*Description*	*Max.*	*Min.*
20	Fit of high speed movable ring gear in low speed spider bushing—small diameter	.005	.001
21	Fit of adapter plate pilot in housing—diameter	.007	.001
22	Fit of bearing in low speed spider—diameter	.0015L	.0005T
23	Fit of bearing in low speed movable ring gear—diameter	.0015L	.0001T
24	Length of spacers—Short	.031	.027
	Length of spacers—Long	1.742	1.738
25	Fit of bearings on drive shaft—diameter	.0005L	.0003T
26	Fit of power gear splines on movable ring gear splines—side clearance	.0080	.0005
27	Fit of contact point insulator in connector insulator—diameter	.040	.005
28	When contact is in extended position contact point should extend 1/16 inch plus or minus 1/32 inch past rear face of adapter plate		
29	Fit of pigtail insulator in housing insulator—diameter	.040	.001
30	Spring load—Pounds at .562 height	7 lbs.	6 lbs.
31	Fit of bearing in housing—diameter	.0020L	.0003T
32	Fit of bearing on low speed movable ring gear—diameter	.0020L	.0009T
33	Fit of low speed fixed ring gear in front and rear housings—diameter	.006	.000
34	Fit of high speed fixed ring gear in housing—diameter	.002T	.002L
35	Backlash of drive gear with high speed planet gear	.015	.002
36	Fit of sleeve on speed reducer drive shaft—diameter	.0008T	.0000
37	Fit of bearing on sleeve—diameter	.0005L	.0005T
38	Fit of motor housing in speed reducer housing—diameter	.006	.001
39	Fit of bearing in housing sleeve—diameter	.0010L	.0001T
40	Fit of motor shaft tang in speed reducer drive shaft—side clearance	.006	.000
41	Fit of sleeve on motor shaft—diameter	.0010T	.0000
42	Length of brush	.760	.500
43	Brake gap	.020	.010
44	Fit of bearing in motor end shield—diameter	.0015L	.0002T

LIST OF TOLERANCES—HUB ASSEMBLY

Reference Number	*Description*	*Max.*	*Min.*
1	Fit of pin in blade root and gear—diameter	.0005T	.0000
2	Fit of blade gear shoulder in blade root—diameter	.0050	.0010
3	Permissible wear on power gear and blade gear teeth to be measured by comparison with unworn teeth		
	Permissible wear on power gear teeth	.003	
	Permissible wear on blade gear teeth	.003	
4	Fit of bearing on power gear—diameter	.0020L	.0014T
5	Fit of seal in adapter plate—diameter	Press fit	
6	Fit of bearing in adapter plate—diameter	.0020L	.0009T
7	Face of contact from face of hub	.005	.000
8	Fit of seal in blade nut—diameter	Press fit	
9	Fit of bearings in hub diameter	.0041	.0014
10	Fit of bearings on blade root—diameter	.0037	.0003
11	Area of contact cones in hub		75%
12	Separator diameter No. 50 shaft	6.385	6.281
13	Slip ring diameter No. 50 shaft	6.198	6.094
14	Width of spline spaces in hub No. 50 shaft	.379	.376
15	Runout of slip rings with respect to cone seat—must be turned and polished on hub	Within .003 full indicator reading	
16	Distance between front and rear cone seat gage—diameter	6.791	6.688
17	Fit of adapter plate pilot in hub—diameter	.006	.001
18	Permissible out of Round of Bearing Bores in Hub	.0020	.0000

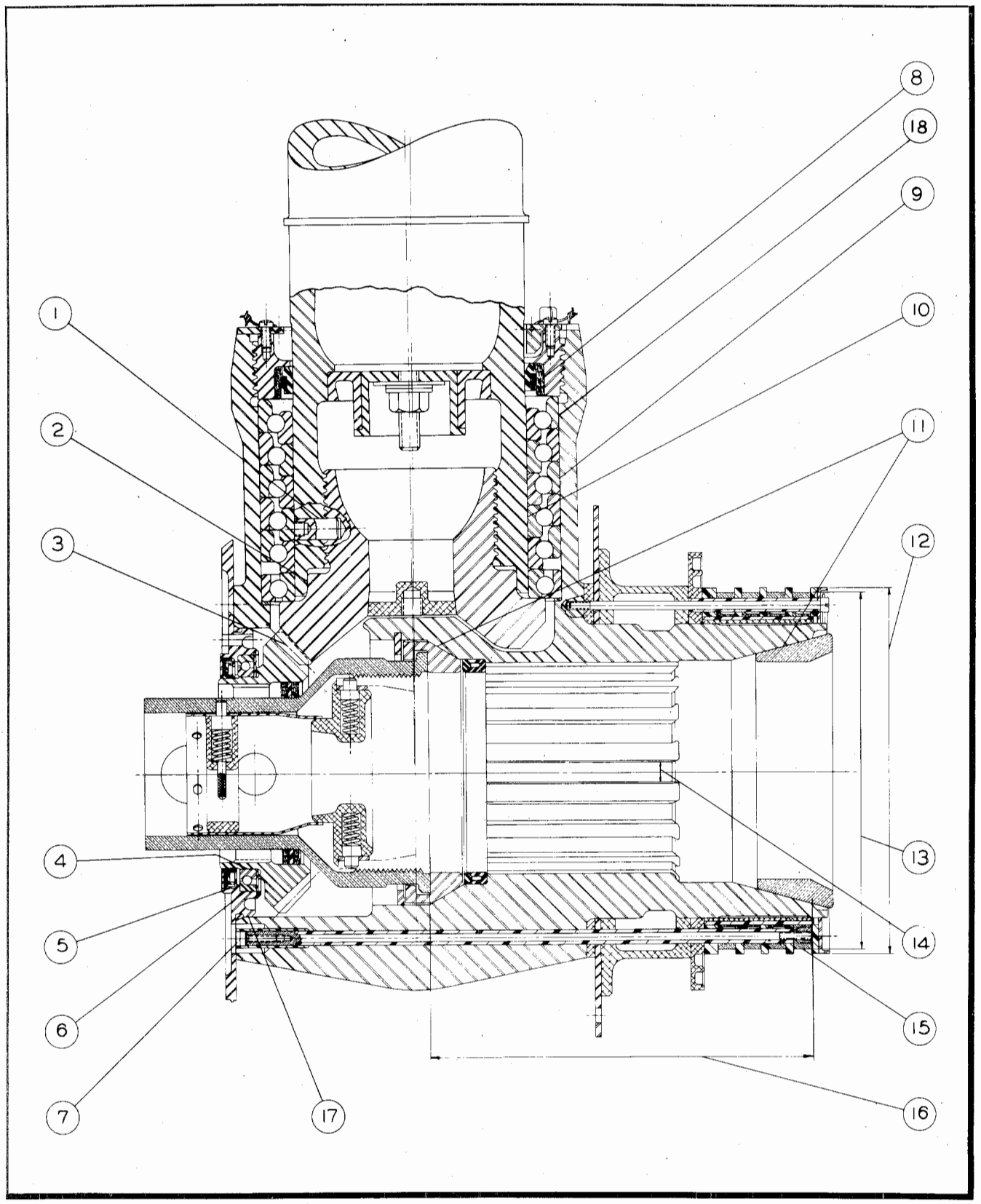


Figure 34—Hub Assembly Tolerances

f. MOTOR AND BRAKE.

(1) Place electric motor brush assemblies in brush holder.

(2) Fit the armature into speed reducer high speed drive shaft. Set speed reducer housing on blocks so as to allow the low speed drive gear free movement. Tap end of armature shaft until it is tight in the speed reducer shaft and until the speed reducer gearing is forced as far as it will go toward the low speed end of the housing.

(3) Slip motor housing over armature, feeding the motor leads through the holes in the front speed reducer housing. Be certain that the motor housing keyway aligns with the key riveted to the front housing.

(4) Coat motor retaining nut threads with thread lubricant and screw in place with properly fitting wrench. To tighten thoroughly, clamp speed reducer in vise. Apply a torque of 250 foot-pounds then line up the lug and screw holes of motor cover line up with the slot in the nut and screw holes in motor housing respectively. Never back up nut to line up lug and screw holes.

(5) Install two spacers and shims in place on armature shaft to provide .005 inch to .010 inch between the top of the shims and spacers and the bottom of the bearing seat in motor housing as indicated in "A," figure 42. This is necessary since it eventually controls the end play in the speed reducer assembly.

(6) Install bearing in front of motor housing.

(7) Place solenoid assembly in position and attach leads to terminal posts on motor housing. Make certain that the winding terminals lie flat on their posts, with no tendency to be forced either up or down when the nuts are tight.

(8) Attach the diaphragm assembly with its coil springs, spacers, and bolts. Thoroughly tighten attaching screws. Locate spacers and shims, insert locating key in armature shaft, and install the brake disc, followed by the plain washer and nut.

(9) Check brake clearance by using a feeler gage between the brake plate and the inner ring of the solenoid housing. The clearance should be between .010 inch and .020 inch. Clearance adjustments may be obtained by adding or removing shim laminations on the armature shaft directly behind the front brake disc.

(10) Install the motor cover. The motor cover must be tried with the locking key in each slot in the ring nut, until one is found which allows the screw holes in the motor cover to line up with the threaded holes in the motor housing. Do not loosen the motor retaining nut to align these holes.

g. LIMIT SWITCHES.

(1) Install limit switch assemblies, switch arm, and screw terminals in place. Making sure that the limit switch arms do not ride on cam lobes, install gasket, and screw the adapter plate in place. Using a depth gage, determine the distance which the limit switch contacts extend through the adapter plate. The contacts must extend 1/16 inch to 3/32 inch from the face of the plate. When retracted by the cam lobes the contacts must retract a minimum of 1/8 inch below the face of the adapter plate.

(2) Attach the motor leads to the limit switch terminals, using spring washers under screw heads.

(3) Seal the motor terminal connectors in the rear housing with beeswax.

h. POWER GEAR.

(1) Pack bearing with grease, Specification No. AN-G-4, grade AA.

(2) Slip the power gear laminated shim on the shoulder of the power gear.

(3) Press bearing into adapter plate, being careful to have thrust face of outer race against adapter plate and install the bearing snap ring.

(4) Place grease seal in the adapter plate; press power gear into the bearing, being careful not to damage the seal.

SECTION VII
TEST PROCEDURE

1. PRELOAD ADJUSTMENT.

a. Place the propeller on a checking table and set the blades at the specified low angle.

b. Make certain that the ring seal is removed from the adapter plate. Mount the power gear assembly on the hub and bolt tightly, using regular power unit attaching bolts with spacers under them.

c. Remove the bolts and, while holding the power gear assembly firmly in place, measure the clearance between it and the face of the hub. The clearance should be from .002 inch to .005 inch.

d. If the proper clearance is not had, laminations may be added to, or removed from the power gear shim between the gear and bearing.

2. ADJUSTMENT OF ANGLE RANGE.

If it is desired to raise or lower the low angle setting, proceed in the following manner:

a. Run the power unit until the low limit switch cuts out.

b. Remove the power unit from the hub and the power gear assembly from the power unit. Before replacing the power gear assembly, index the desired low blade angle setting with the master spline on the power unit drive.

EXAMPLE

If it is desired to change the low blade angle setting from 20 degrees to 18 degrees, replace the power gear with the 18-degree mark op-

posite the master mark on the spline. It will be noticed that changing the setting in this manner raises or lowers all blade angle settings alike.

NOTE

A change in low blade angle setting should always be accomplished by changing the indexing of the power gear. However, should a change in any setting other than the low blade angle be desired, an adjustment can be made by filing or welding the cam lobe.

c. In case a replacement cam is installed, the angles should be carefully checked. Manufacturing tolerances will cause some variation in angular limits even though the replacement cam may have the same part number as the original. It will also be necessary to measure the angular difference between the low angle setting and the point where the mechanical stop becomes effective. This difference may be ascertained by the following method:

(1) Mount the propeller on a checking table.

(2) Making certain that the fixed stop is removed, mount the power unit on the hub.

(3) Attach a brush assembly to the slip rings. Connect a battery to the brush assembly and energize the "DECREASE RPM" circuit so that the blade angle is increased a few degrees.

(4) Energize the "INCREASE RPM" circuit until the propeller reaches the electrical low limit.

(5) Measure the blade angle with a protractor at the 42-inch station of the blade.

(6) Bypass the low limit switch by introducing a current through the "INCREASE RPM" motor terminal at the rear of the speed reducer housing.

(7) Operate the motor until the movable stop segment on the bell gear can be seen through the mechanical stop hole in the speed reducer housing.

(8) Insert one of the fixed stop attaching bolts in the tapped hole of the fixed stop.

(9) Using the bolt as a finger grip, insert the stop in its hole and ascertain, by touch, if the side of the fixed stop touches the side of the movable stop segment.

(10) If the fixed stop does not touch the movable segment, remove the stop and operate the motor (as in paragraph (6)), for a few revolutions.

CAUTION

DO NOT OPERATE THE MOTOR WHILE THE FIXED STOP IS IN PLACE.

(11) Repeat the procedure given in paragraph (9), above, until the fixed and movable stops are touching.

(12) Measure the blade angle and compare it with the low blade angle. The difference in angles should be 1.6 degrees ± .4 degree. In the event that the mechanical stop angle is not within the above specified limits, the low pitch cam lobe must be adjusted by filing or welding as required.

3. BALANCING.

a. Mount the propeller on a balancing mandrel. The blades should be set at an angle approximately in the center of the angle range and held in this position by bolting the power gear assembly in place.

b. Mount the propeller on an accurate knife edge balance fixture and test balance with each blade in the horizontal and vertical positions. When the propeller is correctly balanced, it will have no tendency to rotate when placed in any position.

c. If only slightly out of balance, one or more balancing weights may be added to the blade nut locking slots. These weights should be located so that vertical and horizontal balance is obtained.

d. Should it not be possible to balance the propeller by means of external weights, add putty or modeling clay to the hub barrel of the light blade until the propeller balances correctly. The putty should be placed in the vicinity of the hub barrel index mark so that its position will correspond to that of the balancing material placed on the blade.

e. Mark the light blade and weigh the putty.

f. Place propeller on spindle of a checking table. Remove the light blade.

g. Remove the gear plug from the gear and the nut and lock washer from the stud. Balancing washers, equal in weight to the putty used in the test balance, should be placed on the stud. Replace lock washers, nut, and gear plug.

h. Reassemble propeller, replace and lock wire blade nut locking plates, and check for balance as in paragraphs *b.* and *c.* above.

4. OPERATIONAL INSPECTION.

a. Place the propeller on a checking table and set the blades at the specified low angle.

b. With the fixed stop removed and the low limit switch arm just riding the low limit lobe of the cam, place the power gear assembly on the power unit. Make sure that the specified low blade angle index mark of the power gear is lined up with the indexed spline of the low speed bell gear.

c. Mount the power unit to the hub.

d. Attach a battery of the proper voltage to the slip rings, using a brush assembly strapped to the slip rings. An ammeter must be included in the circuit so that the amperage used in operation can be measured.

e. Load each blade to 5,400 inch-pounds and complete the "DECREASE RPM" circuit until the ammeter shows a fairly constant reading within the following limits:

Part No. of Motor	*Volts*	*Amperes Drawn*
100222	12	20
106800	12	24
106800	24	12
102890	24	10
108951	24	13

NOTE

Make sure that the battery is fully charged before taking these readings.

f. Should more than the specified amperage be drawn, the brake clearance should be inspected as outlined in section VI, paragraph 4.*f.*(9), and the procedure of paragraph *e.* above, repeated.

g. Complete the "INCREASE RPM" circuit until the low blade angle limit switch becomes effective and remove the weights.

h. Determine that all blade angle settings are properly adjusted. It should be borne in mind that when applying boosted voltage during feather or reverse operation, an overrun of between 2.5 degrees to 3.5 degrees will occur.

i. Remove the power unit from the hub.

j. Make certain that the motor and blade retaining nuts, as well as all screws and bolts, are properly tightened and secured with lock wire, cotter keys, or lock washers as required.

SECTION I

INTRODUCTION

1. This catalog is used as the basic catalog covering the Parts List for the Model C5315S-D Curtiss Electric Propellers. The interchangeability of parts or assemblies may be easily determined by referring to the Propeller Group Assembly Parts List, Section II.

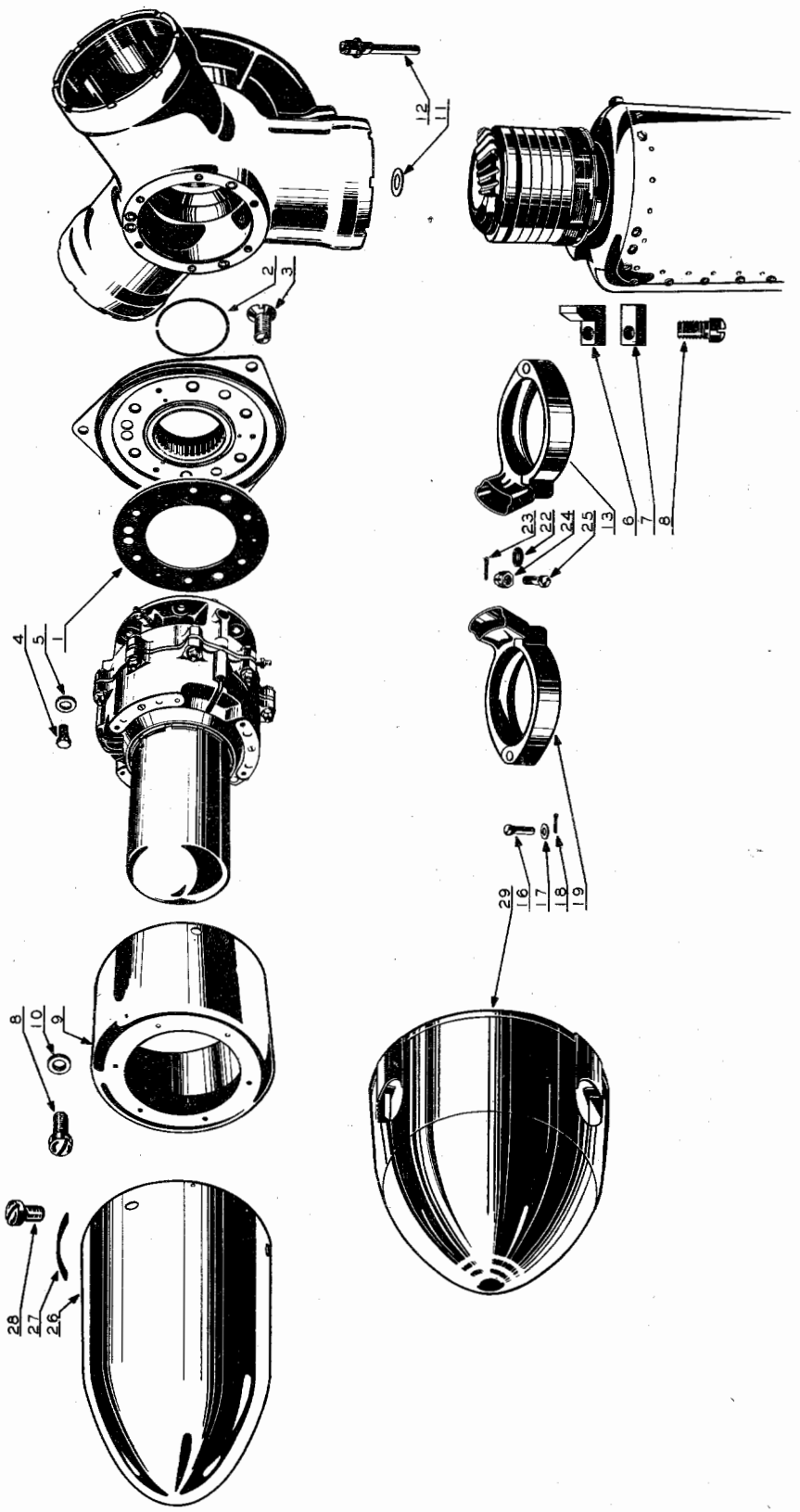
2. When ordering spare parts, the model of the propeller for which the request is made should be furnished. When ordering power unit assemblies, speed reducer assemblies and/or rear housing assemblies, the complete cam designation must be given. (See page 53.)

3. Some of the items included in the illustrations shown may be procured as complete assemblies only. These items are given an index number on the Group Assembly Parts List, Section II, but they are not indexed on the illustration. Parts which are not furnished individually and which must be ordered with complete assemblies have no index numbers. Part numbers are used for identification purposes only.

4. The Numerical Parts List, Section III, shows all part numbers used in this catalog and should be used in conjunction with Group Assembly Parts List, Section II, for proper identification of parts. The quantities shown in the Numerical Parts List, Section III, are the total quantities required for installation and are directly indexed to the page number in the Group Assembly Parts List, Section II, on which they may be found. The quantities shown in the Standard Parts List, Section IV, are the total quantities required for installation.

5. Symbols and abbreviations used in this catalog are:

@	indicates note at bottom of page
*	indicates a part is not procurable
ar	indicates quantity "as required"
x	indicates blade angles at the 42-inch station
#	indicates parts used on figures 47 and 48
##	indicates parts used on figure 47
###	indicates parts used on figure 48
(†)	numbers in parentheses placed next to an assembly or part numbers refer to the series of notes covering "Cuff Assemblies"

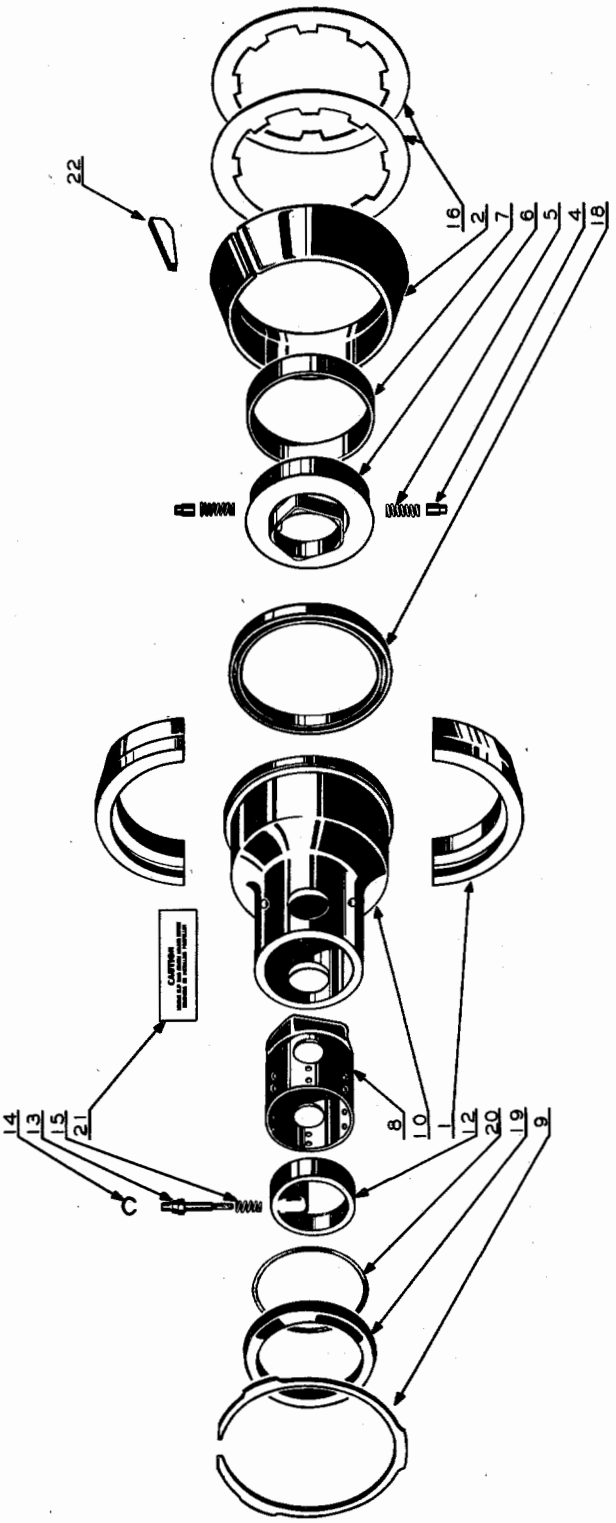


PROPELLER ASSEMBLY
FIGURE 35

SECTION II—GROUP ASSEMBLY PARTS LISTS

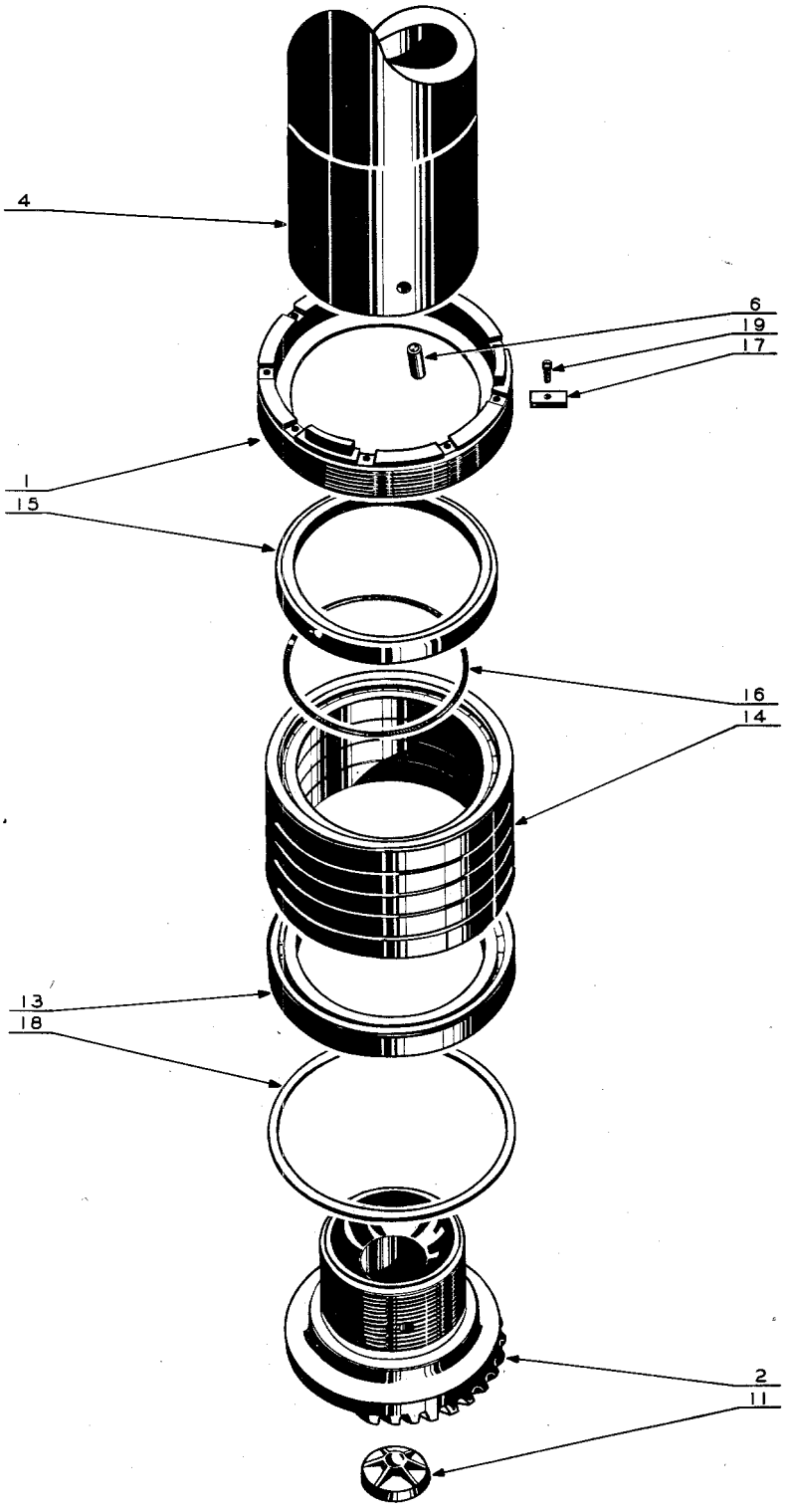
GROUP Aircraft Accessories
MAJOR ASSEMBLY Propeller Assemblies

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
35										Propeller Assembly - C5315S-D3, D4, D18, D20, D21, D22, D24, D26	1	1	1	1	1	1	1	1			
35	1		101418							Gasket - Power unit	1	1	1	1	1	1	1	1		03-A	125M/
35	2		101719							Ring - Power gear retaining	1	1	1	1	1	1	1	1		03-A	125M/
35	3		AN510-10-6							Screw - Flat head	3	3	3	3	3	3	3	3		29	128/
35	4		88126							Bolt - Power unit attaching	6	6	6	6	6	6	6	6		03-A	125M/
35	5		AN960-616							Washer - Plain	6	6	6	6	6	6	6	6		04-A	128/
35	6		101728							Weight - Propeller balance - heavy	ar	ar	ar	ar	ar	ar	ar	ar		03-A	125M/
35	7		101187							Weight - Propeller balance - light	ar	ar	ar							03-A	125M/
35	8		AN502-8-6							Screw - Fillister head	ar	ar	ar	ar	ar	ar	ar	ar		04-A	128/
35	9		104057							Cover - Speed reducer				1			1			03-A	125M/
35	10		AN960-8							Washer - Plain				6			6			04-A	128/
35	11		104349							Washer - Plain					ar	ar	ar	ar		03-A	125M/
35	12		101245							Tube Assembly - Deicer slinger					3	3		3		03-A	125M/
35	13		106664-1							Collector Assembly - LH propeller					3					03-A	125M/
35			*106664-3							Ring - Male					1					03-A	125M/
35			*106664-4							Ring - Female					1					03-A	125M/
35	16		AN394-33							Pin					1					04-A	128/
35	17		AN960-416							Washer					1					04-A	128/
35	18		AN380C2-3							Pin - Cotter					1					29	128/
35	19		106664-2							Collector Assembly - RH propeller						3		3		03-A	125M/
35			*106664-5							Ring - Male						1		1		03-A	125M/
35			*106664-6							Ring - Female						1		1		03-A	125M/
35	16		AN394-33							Pin						1		1		04-A	128/
35	17		AN960-416							Washer						1		1		04-A	128/
35	18		AN380C2-3							Pin - Cotter						1		1		29	128/
35	22		AN960-516							Washer - Plain					6	6		6		04-A	128/
35	23		AN380C2-2							Pin - Cotter					3	3		3		29	128/
35	24		AN310-5							Nut - Castle					3	3		3		04-A	128/
35	25		AN5-7							Bolt - Aircraft					3	3		3		04-A	128/
35	26		106963							Cover Assembly - Power unit								1		03-A	125M/
35	27		108060							Band - Rubber covered - single piece cover								3		03-A	125M/
35	28		AN502-10-6							Screw - Fillister head								6		04-A	128/
35	8		AN502-8-6							Screw - Fillister head				6			6			04-A	128/
35	29		SP190							Spinner Assembly (Air Associates Inc) Bendix, N.J.)			1							03-A	125M/
36			101858-3							Attachment Assembly	1	1								03-A	125M/
36			104269-3							Attachment Assembly			1	1	1	1	1	1		03-A	125M/
36	1		100951							Cone - No. 50 shaft propeller hub - front	1	1	1	1	1	1	1	1		03-A	125M/
36	2		100952							Cone - No. 50 shaft propeller hub - rear	1	1	1	1	1	1	1	1		03-A	125M/
36			100806							Adapter Assembly - 3 1/16 in. I.D. crankshaft	1	1	1	1	1	1	1	1		03-A	125M/
36	4		55931-2							Pin - Crankshaft adapter	2	2	2	2	2	2	2	2		03-A	125M/
36	5		55932							Spring - Crankshaft adapter	2	2	2	2	2	2	2	2		03-A	125M/
36	6		55930							Adapter - Propeller shaft	1	1	1	1	1	1	1	1		03-A	125M/
36	7		89859							Ring - Crankshaft adapter	1	1	1	1	1	1	1	1		03-A	125M/
36	8		89897							Lock - Crankshaft nut	1	1	1	1	1	1	1	1		03-A	125M/
36	9		89146							Ring - Hub puller snap	1	1	1	1	1	1	1	1		03-A	125M/
36	10		101795							Nut - Propeller shaft - bronze - short	1	1	1	1	1	1	1	1		03-A	125M/

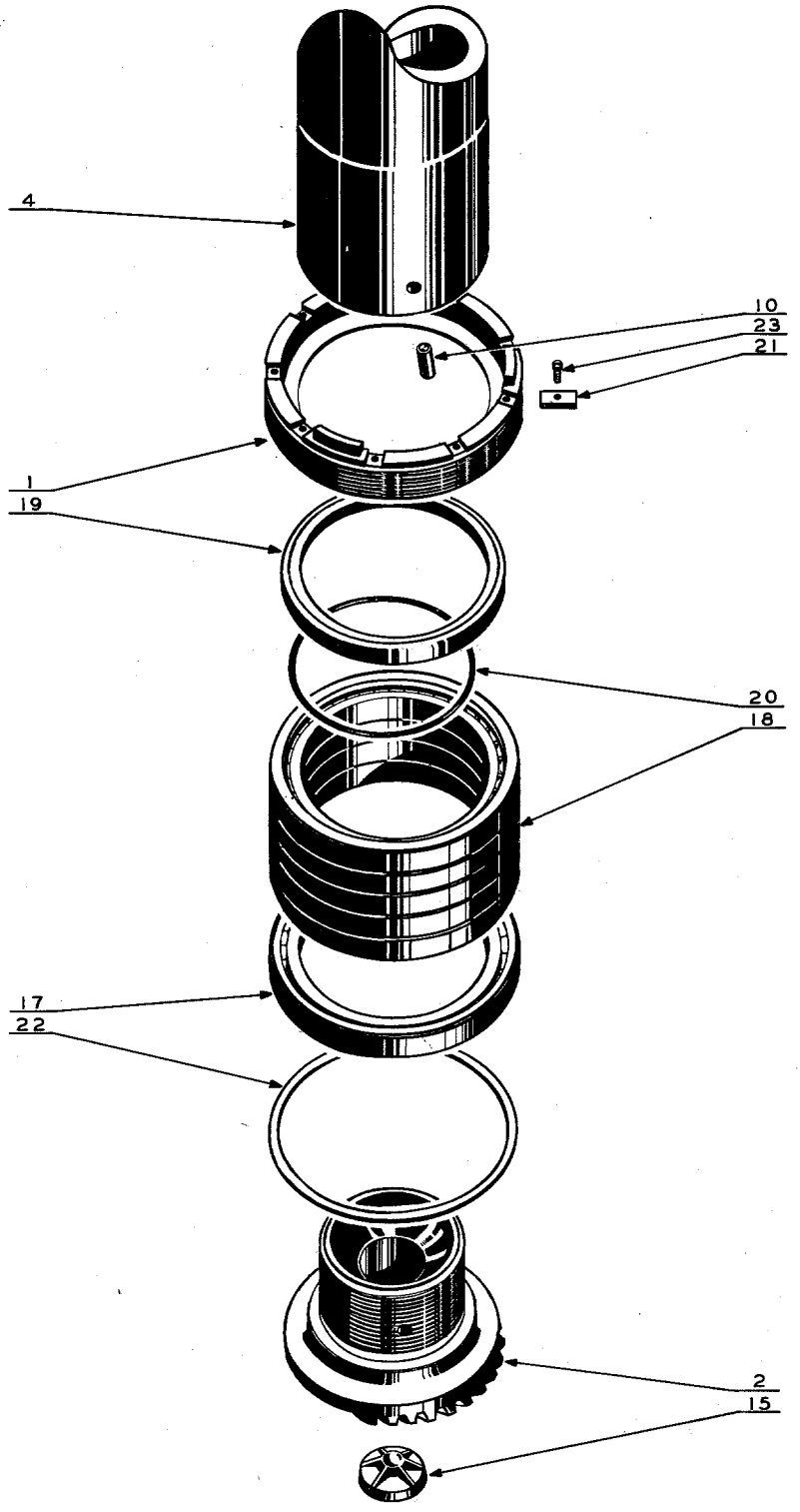


ATTACHMENT ASSEMBLY

FIGURE 36

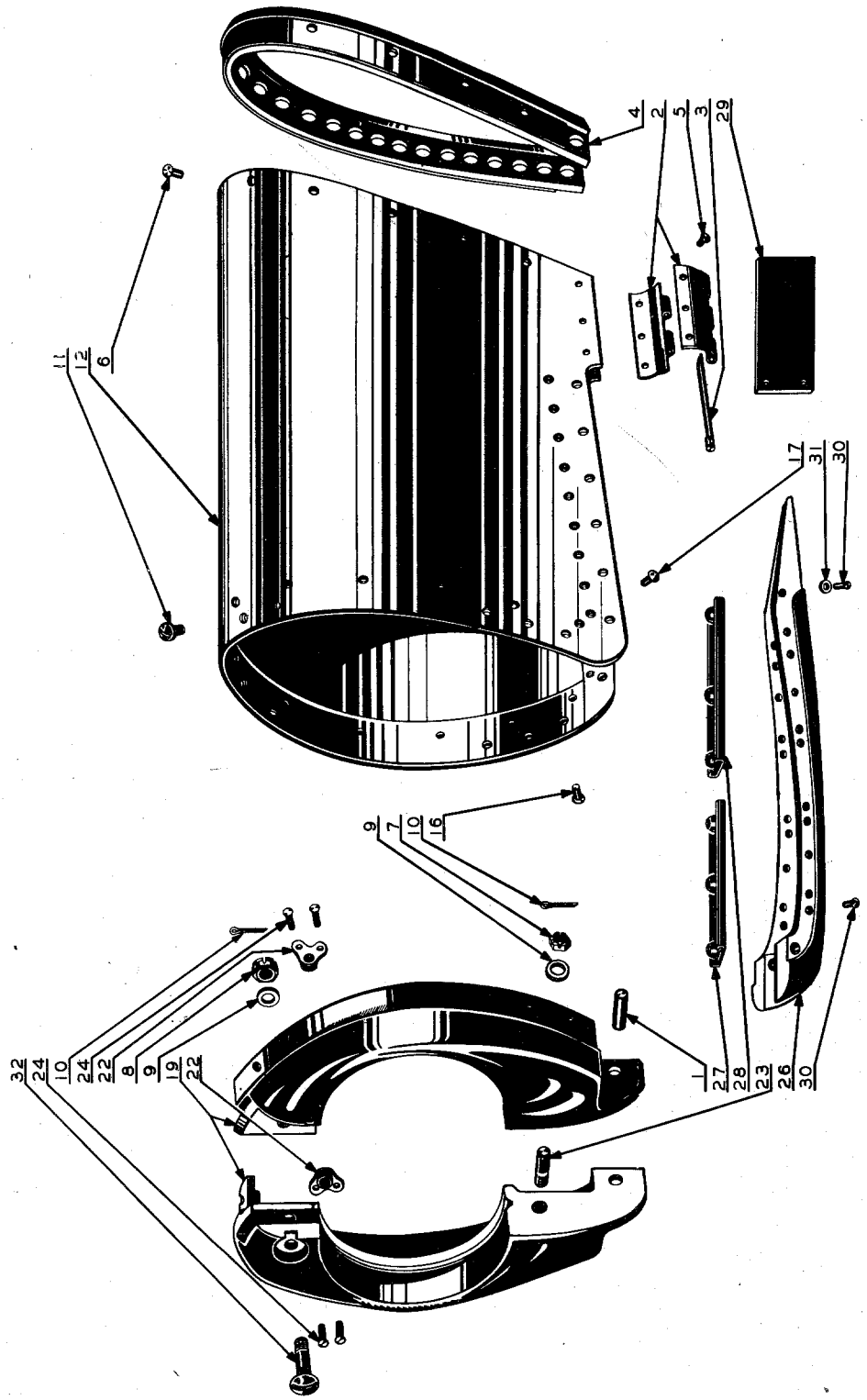


BLADE ASSEMBLY
FIGURE 37



BLADE ASSEMBLY
FIGURE 38

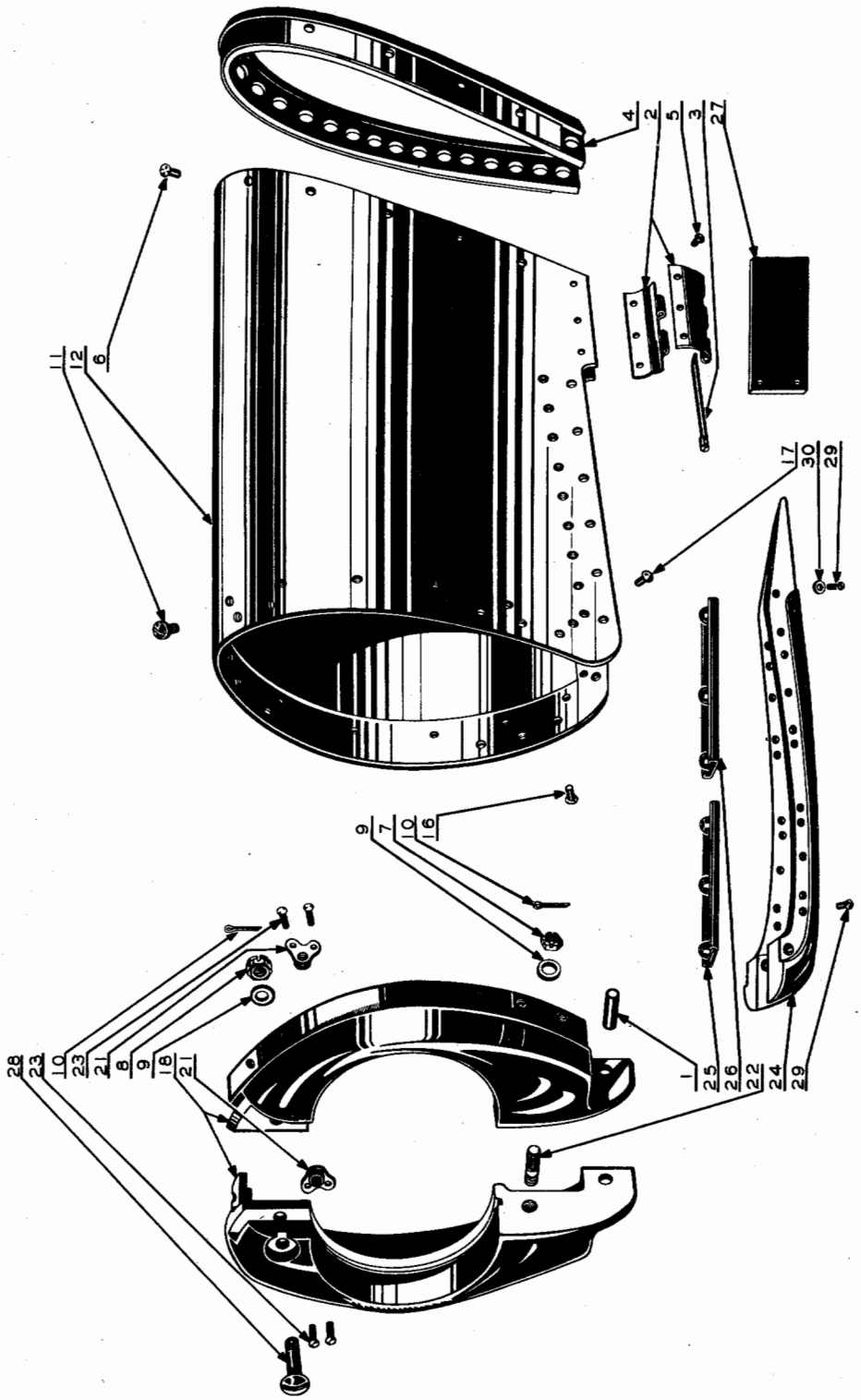
FIG. NO.	INDEX NO.	STOCKED	GROUP: Aircraft Accessories / MAJOR ASSEMBLY: Propeller Assemblies — PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY: C53155S-D3	C53155S-D4	C53155S-D18	C53155S-D20	C53155S-D21	C53155S-D22	C53155S-D24	C53155S-D26	PROPERTY CLASSIFICATION: U. S. NAVY	U. S. ARMY	BRITISH
36			100525			Lock Pin Assembly - Crankshaft nut					1	1	1	1	1	1	1	1		03-A	125M/
36	12		100526				Housing - Crankshaft nut lock				1	1	1	1	1	1	1	1		03-A	125M/
36	13		100527				Pin - Crankshaft nut lock				1	1	1	1	1	1	1	1		03-A	125M/
36	14		100528				Snap Ring - Crankshaft nut lock				1	1	1	1	1	1	1	1		03-A	125M/
36	15		100871				Spring - Lock pin - crankshaft nut				1	1	1	1	1	1	1	1		03-A	125M/
36	16		89487-2				Spacer - Propeller hub rear cone				1	1	1	1	1	1	1	1		03-A	125M/
36	16		89487-4				Spacer - Propeller hub rear cone				1	1	1	1	1	1	1	1		03-A	125M/
36	18		112287				Seal - No. 50 crankshaft						1	1	1	1	1	1		03-A	125M/
36	19		112323				Seal - Shaft nut oil				1	1	1	1	1	1	1	1		03-A	125M/
36	20		112324				Spring Assembly - Tension				1	1	1	1	1	1	1	1		03-A	125M/
36	21		111668				Decal - Brush removal - warning - straight				2	2	2	2	2	2	2	2		03-A	125M/
36	22		101259				Seal - Rear cone grease				1	1								03-A	125M/
37			101857-1			Blade Assembly - Interchangeable gear - LH					3									03-A	125M/
37			101857-2			Blade Assembly - Interchangeable gear - RH						3								03-A	125M/
37	1		55737				Nut - Blade retaining				1	1								03-A	125M/
37			101811-1				Machining Assembly - LH blade				1									03-A	125M/
37			101811-2				Machining Assembly - RH blade					1								03-A	125M/
37	2		102826				Gear - Blade - LH				1									03-A	125M/
37			101812				Gear - Blade - RH					1								03-A	125M/
37	4		615cc1.5-6				Blade - 11 ft 6 in.				1									03-A	125M/
37			614cc1.5-6				Blade - 11 ft 6 in.					1								03-A	125M/
37	6		101814				Pin - Blade gear (.3755 in.)				1	1								03-A	125M/
37	6		101814-1				Pin - Blade gear (.3825 in.)				ar	ar								03-A	125M/
37	6		101814-2				Pin - Blade gear (.3911 in.)				ar	ar								03-A	125M/
37	6		101814-3				Pin - Blade gear (.3990 in.)				ar	ar								03-A	125M/
37	6		101814-4				Pin - Blade gear (.4068 in.)				ar	ar								03-A	125M/
37	11		108355				Plug - Blade gear				1	1								03-A	125M/
37			101490				Bearing Assembly - Offset race				1	1								03-A	125M/
37	13		101490-1				Bearing - Preload				1	1								03-A	125M/
37	14		101490-2				Bearing - Active (set of 5)				1	1								03-A	125M/
37	15		108796				Seal - Blade retaining nut				1	1								03-A	125M/
37	16		108797				Spring - Blade retaining nut seal				1	1								03-A	125M/
37	17		55927				Key - Blade nut lock				1	1								03-A	125M/
37	18		89144				Shim - Blade preload bearing				1	1								03-A	125M/
37	19		AN502-8-6				Screw - Fillister head				1	1								04-A	128/
38			104928-1			Blade Assembly - Interchangeable gear - LH									3					03-A	125M/
38			104928-2			Blade Assembly - Interchangeable gear - RH							3	3		3	3	3		03-A	125M/
38	1		55737				Nut - Blade retaining						1	1	1	1	1	1		03-A	125M/
38			104927-1				Machining Assembly - Interchangeable blade and gear - LH								1					03-A	125M/
38			104927-2				Machining Assembly - Interchangeable blade and gear - RH						1	1		1	1	1		03-A	125M/
38	2		104932				Gear - Blade - LH								1					03-A	125M/
38			104923				Gear - Blade - RH						1	1		1	1	1		03-A	125M/



CUFF ASSEMBLY

FIGURE 39

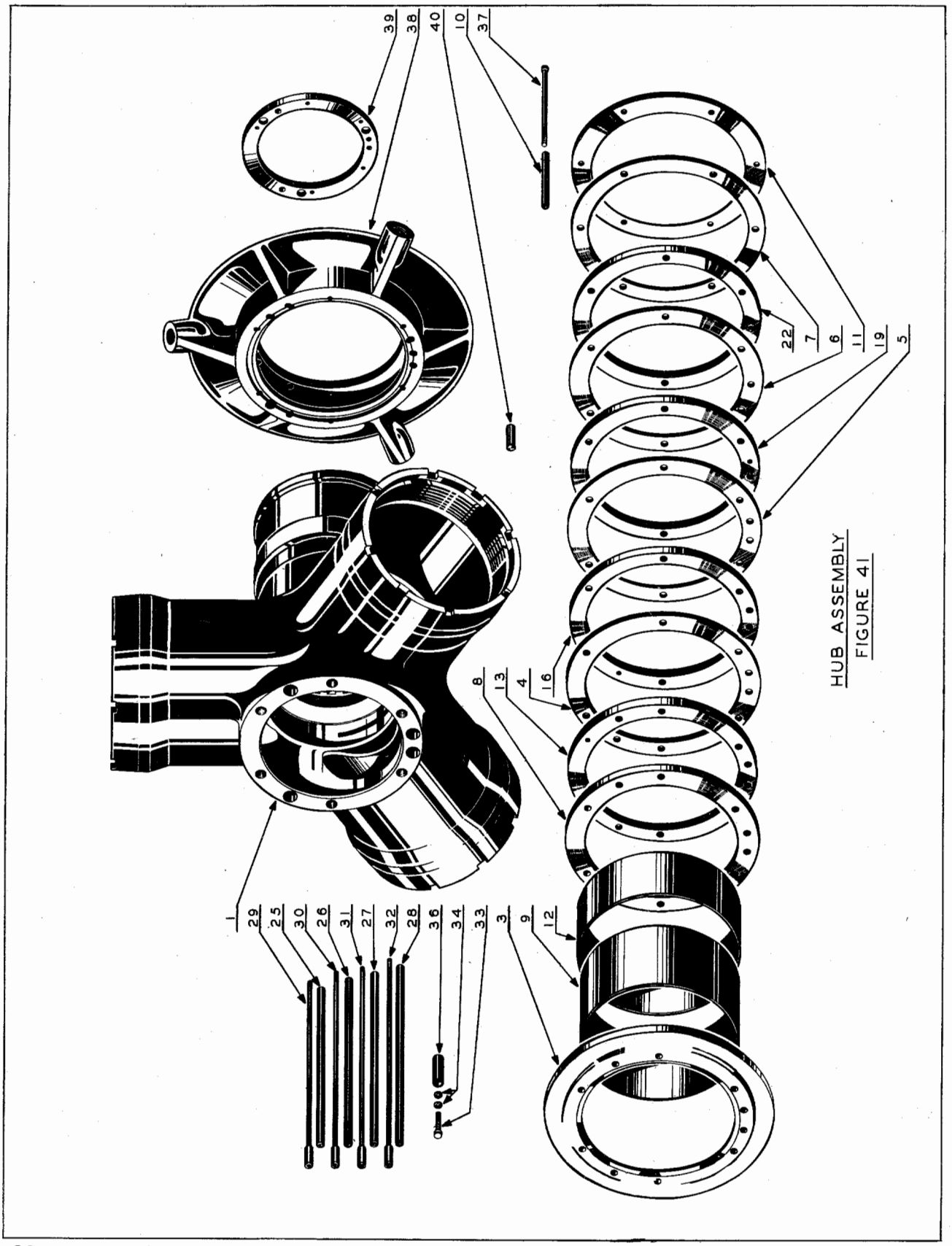
FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
38	4		615-1cl.5-6							Blade - (11 ft 6 in.)					1					03-A	125M/
38			614-1cl.5-6							Blade - (11 ft 6 in.)						1				03-A	125M/
38			512-1cl.5-9							Blade - (10 ft 3 in.)			1							03-A	125M/
38			614-1cl.5-24							Blade - (10 ft 0 in.)				1						03-A	125M/
38			512-1cl.5-15							Blade - (9 ft 9 in.)							1			03-A	125M/
38			652-1cl.5-6							Blade - (11 ft 6 in.)								1		03-A	125M/
38	10		101814							Pin - Blade gear (.3755 in.)			1	1	1	1	1	1		03-A	125M/
38	10		101814-1							Pin - Blade gear (.3825 in.)			a/r	a/r	a/r	a/r	a/r	a/r		03-A	125M/
38	10		101814-2							Pin - Blade gear (.3911 in.)			a/r	a/r	a/r	a/r	a/r	a/r		03-A	125M/
38	10		101814-3							Pin - Blade gear (.3990 in.)			a/r	a/r	a/r	a/r	a/r	a/r		03-A	125M/
38	10		101814-4							Pin - Blade gear (.4068 in.)			a/r	a/r	a/r	a/r	a/r	a/r		03-A	125M/
38	15		108355							Plug - Blade gear			1	1	1	1	1	1		03-A	125M/
38			101490							Bearing Assembly - Offset race			1	1	1	1	1	1		03-A	125M/
38	17		101490-1							Bearing - Preload			1	1	1	1	1	1		03-A	125M/
38	18		101490-2							Bearing - Active (set of 5)			1	1	1	1	1	1		03-A	125M/
38	19		108796							Seal - Blade retaining nut			1	1	1	1	1	1		03-A	125M/
38	20		108797							Spring - Blade retaining nut seal			1	1	1	1	1	1		03-A	125M/
38	21		55927							Key - Blade nut lock			1	1	1	1	1	1		03-A	125M/
38	22		89144							Shim - Blade preload bearing			1	1	1	1	1	1		03-A	125M/
38	23		AN502-8-6							Screw - Fillister head			1	1	1	1	1	1		04-A	128/
39			104344-2 (1)							Cuff Assembly - Blade			3				3			03-A	125M/
39	1		101739-2							Pin - Hinge cuff assembly			1				1			03-A	125M/
39	2		104335-1							Hinge - Trailing edge - blade cuff			1				1			03-A	125M/
39	3		104336-1							Pin - Trailing edge - blade cuff			1				1			03-A	125M/
39	4		104185-3 (5)							Strip Assembly - Chafing			1				1			03-A	125M/
39	5		109901-1							Rivet - Brazier head			6				6			03-A	125M/
39	6		AN425D3-4							Rivet - 78° angle countersunk head			10				10			29	128/
39	7		AN310-5							Nut - Castle			1				1			04-A	128/
39	8		AN320-5							Nut - Shear			1				1			04-A	128/
39	9		AN960-516							Washer - Plain			2				2			04-A	128/
39	10		AN380C2-2							Pin - Cotter			2				2			29	128/
39	11		525-10-10							Screw - Washer head			22				22			29	128/
39	12		104344-8 (2)							Sheet Assembly - RH			1				1			03-A	125M/
39			*104344-7							Sheet			1				1			03-A	125M/
39			*104344-5							Rib			1				1			03-A	125M/
39			*104344-6							Spacer - Flat side			2				2			03-A	125M/
39	16		673D4-4							Rivet - Countersunk head			12				12			01-C	126HB/
39	17		673D4-3½							Rivet - Countersunk head			37				37			01-C	126HB/
39			101767-1 (3)							Support Assembly - Non-deicing - blade cuff			1				1			03-A	125M/
39	19		104095							Support Detail Assembly			1				1			03-A	125M/
39			*104095-1							Support - Camber			1				1			03-A	125M/
39			*104095-2							Support - Flat			1				1			03-A	125M/
39	22		101763							Nut - Elastic stop			10				10			03-A	125M/
39	23		101738							Stud - 5/16 in x 1 11/32 in.			1				1			03-A	125M/
39	24		AN425D3-7							Rivet - 78° angle countersunk head			20				20			29	128/



CUFF ASSEMBLY

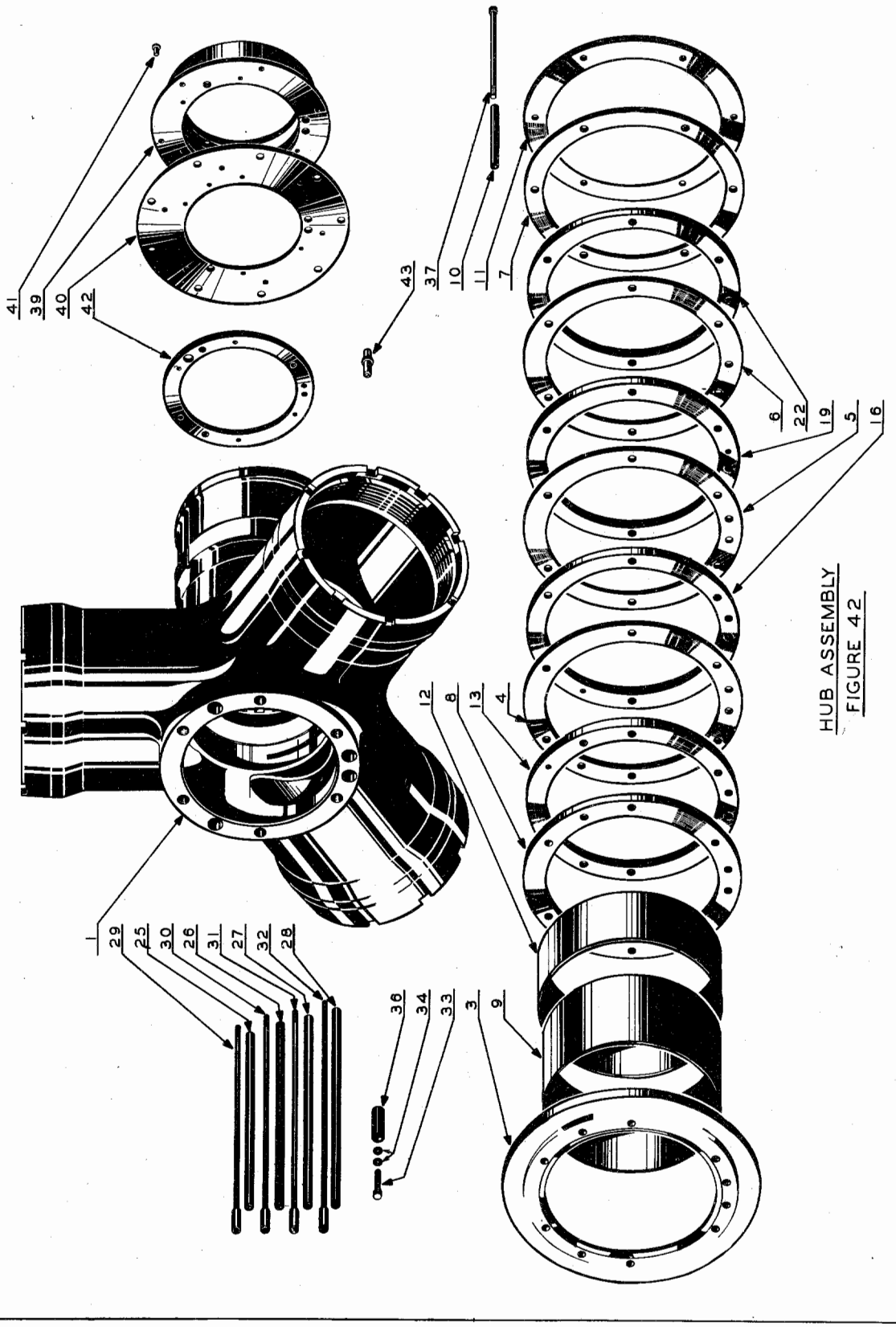
FIGURE 40

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
GROUP Aircraft Accessories																					
MAJOR ASSEMBLY Propeller Assemblies																					
	25		104525-2				Stiffener Assembly						1				1			03-A	125M/
39	26		101700 (4)				Stiffener - Blade cuff						1				1			03-A	125M/
39	27		101789				Nut - No. 10-32 elastic stop - gang 1 3/4 in. spacing						3				3			03-A	125M/
39	28		101790				Nut - No. 10-32 elastic stop - gang 2 in. spacing						1				1			03-A	125M/
39	29		104233-3				Pad - Trailing edge - stiffener						1				1			03-A	125M/
39	30		AN425D3-6				Rivet - 78° angle countersunk head						11				11			29	128/
39	31		AN960-3				Washer - Plain						2				2			04-A	128/
39	32		AN25-18				Bolt - Clevis						1				1			04-A	128/
			The number of Cuff Assembly components shown are for one cuff assembly only.																		
40			104684-2 (1)				Cuff Assembly - Blade - RH - non-anti-icing							3						03-A	125M/
40	1		101739-2				Pin - Hinge - cuff assembly							1						03-A	125M/
40	2		104335-1				Hinge - Trailing edge - blade cuff							1						03-A	125M/
40	3		104336-1				Pin - Trailing edge - blade cuff							1						03-A	125M/
40	4		104185-3 (5)				Strip Assembly - Chafing							1						03-A	125M/
40	5		109901-1				Rivet - Brazier head							6						03-A	125M/
40	6		AN425D3-4				Rivet - 78° angle countersunk head							12						29	128/
40	7		AN310-5				Nut - Castle							1						04-A	128/
40	8		AN320-5				Nut - Shear							1						04-A	128/
40	9		AN960-516				Washer - Plain							2						04-A	128/
40	10		AN380C2-2				Pin - Cotter							2						29	128/
40	11		525-10-10				Screw - Washer head							22						29	128/
40	12		104684-8 (2)				Sheet Assembly - RH - blade cuff							1						03-A	125M/
40			*104684-4				Sheet - Blade cuff							1						03-A	125M/
40			*104684-5				Rib - Blade cuff							1						03-A	125M/
40			*104684-6				Spacer - Blade cuff							2						01-C	126HB/
40	16		673D4-4				Rivet - Countersunk head							12						01-C	126HB/
40	17		673D4-3½				Rivet - Countersunk head							18						03-A	125M/
40	18		101760 (3)				Support Detail Assembly - RH - non-anti-icing							1						03-A	125M/
40			*101760-1				Support - Camber - cuff							1						03-A	125M/
40			*101760-2				Support - Flat - cuff							1						03-A	125M/
40	21		101763				Nut - No. 10-32 elastic stop							10						03-A	125M/
40	22		101738				Stud - 5/16 in. x 1 11/32 in.							1						03-A	125M/
40	23		AN425D3-7				Rivet - 78° angle countersunk head							20						29	128/
40	24		104685-2 (4)				Stiffener - RH - cuff							1						03-A	125M/
40	25		101789				Nut - No. 10-32 elastic stop - gang							2						03-A	125M/
40	26		101790				Nut - No. 10-32 elastic stop - gang							2						03-A	125M/
40	27		104233-1				Pad - Trailing edge - stiffener							1						03-A	125M/
40	28		AN25-18				Bolt - Clevis							1						04-A	128/
40	29		AN425-D3-6				Rivet - 78° countersunk head							12						29	128/
40	30		AN960-3				Washer - Plain							2						04-A	128/
			The number of Cuff Assembly components shown are for one cuff assembly only.																		



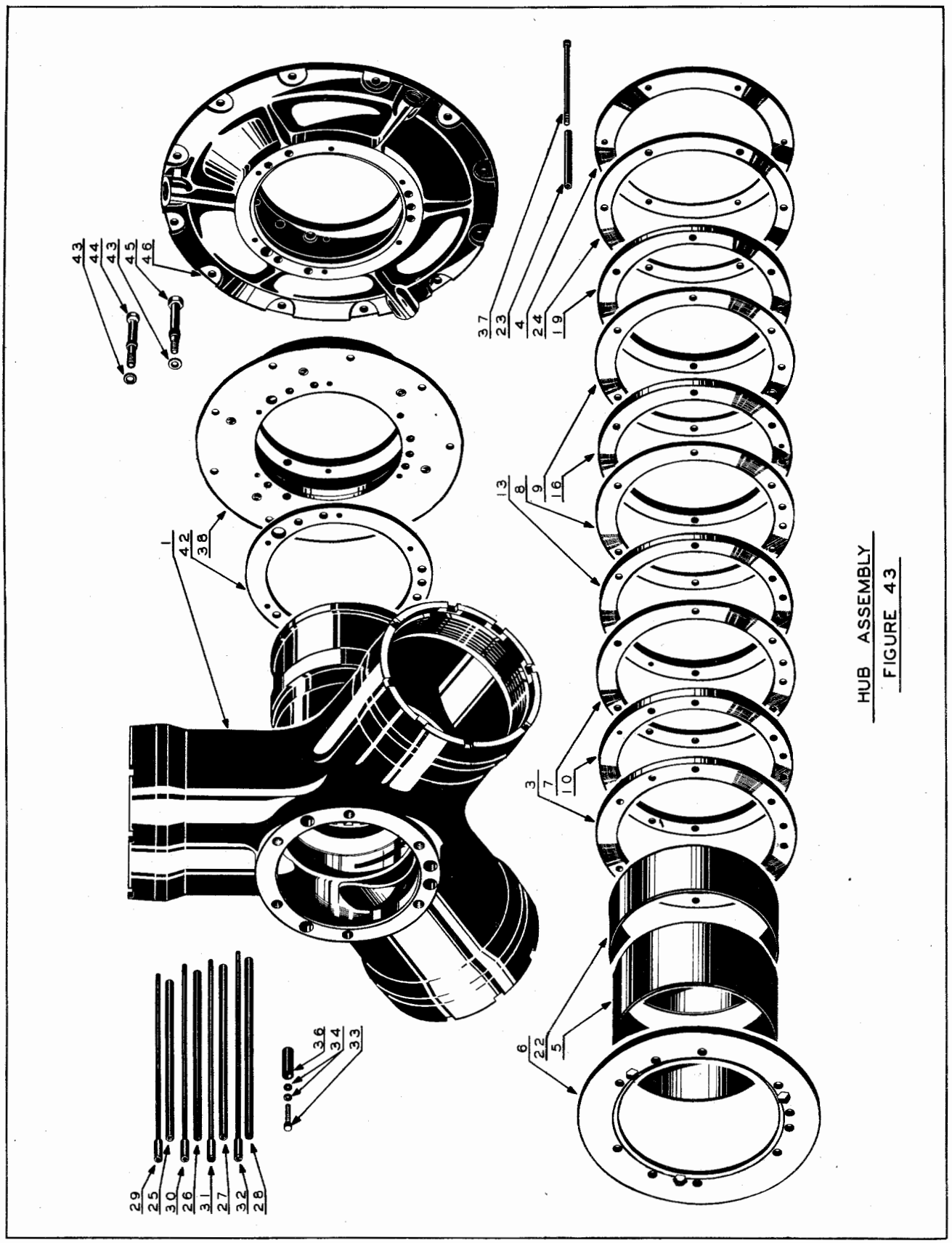
HUB ASSEMBLY
FIGURE 41

FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
			Cuff Assembly Notes																		
			(1) Cuff Assembly - will be supplied as a complete unit fabricated with the 104715 chafing strip assembly.																		
			(2) Sheet Assembly - supplied only undrilled and not fitted but with all ribs and trailing edge reinforcement strips riveted or welded in place.																		
			(3) Support Detail Assembly - supplied machined except for attachment screw holes and elastic stop nut rivet holes.																		
			(4) Stiffener Detail Assembly - supplied machined except for attachment screw holes, gang nut rivet holes and pad attachment rivet holes.																		
			(5) 104185 Type Chafing Strip Assembly - supplied for replacement of chafing strips on existing cuffs in the field which initially fabricated with the 104185 type strip.																		
			When it is found necessary to refit existing cuffs to new blades in the field and/or replace chafing strips on cuffs not fitted to their respective blades, the 104715 thick chafing strip will be supplied.																		
41			101880-2			Hub Assembly - Anti-icing - no spinner flange													1		03-A	125M/
41	1		101787			Hub - Propeller													1		03-A	125M/
41	2		102213			Slip Ring Assembly													1		03-A	125M/
41	3		88666			Seal - Ring - slip ring													1		03-A	125M/
41	4		88255-1			Separator - Slip ring													1		03-A	125M/
41	5		88255-2			Separator - Slip ring													1		03-A	125M/
41	6		88255-3			Separator - Slip ring													1		03-A	125M/
41	7		88258			Insulator - Slip ring													1		03-A	125M/
41	8		88257			Insulator - Front - slip ring													1		03-A	125M/
41	9		102211			Sleeve - Slip ring mounting													1		03-A	125M/
41	10		88260			Bushing - Slip ring													6		03-A	125M/
41	11		102212			Ring - Lock													1		03-A	125M/
41	12		88261			Tube - Slip ring insulator													1		03-A	125M/
41	13		88256-1			Ring And Block Assembly													1		03-A	125M/
41			*88256-5			Ring													1		03-A	125M/
41			*88259			Block - Slip ring													1		03-A	125M/
41	16		88256-2			Ring And Block Assembly													1		03-A	125M/
41			*88256-6			Ring													1		03-A	125M/
41			*88259			Block - Slip ring													1		03-A	125M/
41	19		88256-3			Ring And Block Assembly													1		03-A	125M/
41			*88256-7			Ring													1		03-A	125M/
41			*88259			Block - Slip ring													1		03-A	125M/
41	22		88256-4			Ring And Block Assembly													1		03-A	125M/
41			*88256-8			Ring													1		03-A	125M/
41			*88259			Block - Slip ring													1		03-A	125M/



HUB ASSEMBLY
FIGURE 42

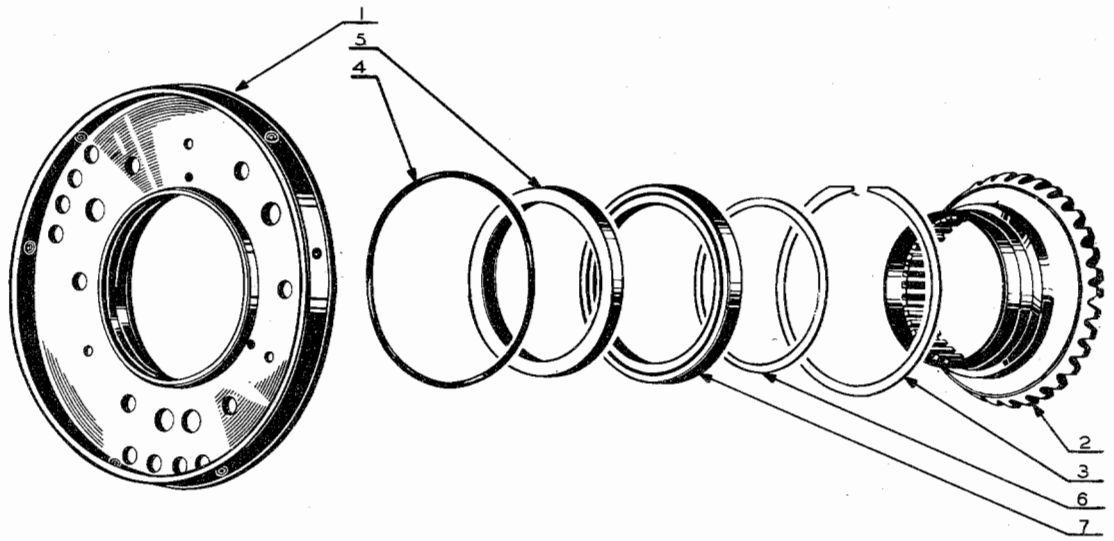
FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
41	25		88606-5				Tube	-	Connector rod insulator								1		03-A	125M/
41	26		88606-6				Tube	-	Connector rod insulator								1		03-A	125M/
41	27		88606-7				Tube	-	Connector rod insulator								1		03-A	125M/
41	28		88606-8				Tube	-	Connector rod insulator								1		03-A	125M/
41	29		88140-24				Rod	-	Hub connector								1		03-A	125M/
41	30		88140-25				Rod	-	Hub connector								1		03-A	125M/
41	31		88140-26				Rod	-	Hub connector								1		03-A	125M/
41	32		88140-27				Rod	-	Hub connector								1		03-A	125M/
41	33		111590-2				Point	-	Power unit cutout switch contact								4		03-A	125M/
41	34		89107				Shim	-	Contact point								ar		03-A	125M/
41	34		89107-1				Shim	-	Contact point								ar		03-A	125M/
41	36		100461				Tube	-	Hub contact insulator								4		03-A	125M/
41	37		88263-4				Screw	-	Special - slip ring attaching								6		03-A	125M/
41	38		101215				Slinger										1		03-A	125M/
41	39		101282				Spacer	-	De-icer slinger								1		03-A	125M/
41	40		101714-4				Dowel	-	Spinner attaching								1		03-A	125M/
42			101880-3			Hub	Assembly	-	Non-anti-icing - spinner flange	1	1								03-A	125M/
42	1		101787				Hub	-	Propeller	1	1								03-A	125M/
	2		102213				Slip Ring	Assembly		1	1								03-A	125M/
42	3		88666					Seal	- Ring - slip ring	1	1								03-A	125M/
42	4		88255-1					Separator	- Slip ring	1	1								03-A	125M/
42	5		88255-2					Separator	- Slip ring	1	1								03-A	125M/
42	6		88255-3					Separator	- Slip ring	1	1								03-A	125M/
42	7		88258					Insulator	- Slip ring	1	1								03-A	125M/
42	8		88257					Insulator	- Front - slip ring	1	1								03-A	125M/
42	9		102211					Sleeve	- Slip ring mounting	1	1								03-A	125M/
42	10		88260					Bushing	- Slip ring	6	6								03-A	125M/
42	11		102212					Ring	- Lock	1	1								03-A	125M/
42	12		88261					Tube	- Slip ring insulator	1	1								03-A	125M/
42	13		88256-1					Ring And Block	Assembly	1	1								03-A	125M/
42			*88256-5						Ring	1	1								03-A	125M/
42			*88259						Block - Slip ring	1	1								03-A	125M/
42	16		88256-2					Ring And Block	Assembly	1	1								03-A	125M/
42			*88256-6						Ring	1	1								03-A	125M/
42			*88259						Block - Slip ring	1	1								03-A	125M/
42	19		88256-3					Ring And Block	Assembly	1	1								03-A	125M/
42			*88256-7						Ring	1	1								03-A	125M/
42			*88259						Block - Slip ring	1	1								03-A	125M/
42	22		88256-4					Ring And Block	Assembly	1	1								03-A	125M/
42			*88256-8						Ring	1	1								03-A	125M/
42			*88259						Block - Slip ring	1	1								03-A	125M/
42	25		88606-5				Tube	-	Connector rod insulator	1	1								03-A	125M/
42	26		88606-6				Tube	-	Connector rod insulator	1	1								03-A	125M/
42	27		88606-7				Tube	-	Connector rod insulator	1	1								03-A	125M/
42	28		88606-8				Tube	-	Connector rod insulator	1	1								03-A	125M/
42	29		88140-24				Rod	-	Hub connector	1	1								03-A	125M/
42	30		88140-25				Rod	-	Hub connector	1	1								03-A	125M/
42	31		88140-26				Rod	-	Hub connector	1	1								03-A	125M/
42	32		88140-27				Rod	-	Hub connector	1	1								03-A	125M/
42	33		111590-2				Point	-	Power unit cutout switch contact	4	4								03-A	125M/
42	34		89107				Shim	-	Contact point	ar	ar								03-A	125M/
42	34		89107-1				Shim	-	Contact point	ar	ar								03-A	125M/
42	36		100461				Tube	-	Hub contact insulator	4	4								03-A	125M/
42	37		88263-4				Screw	-	Special - slip ring attaching	6	6								03-A	125M/



HUB ASSEMBLY
FIGURE 43

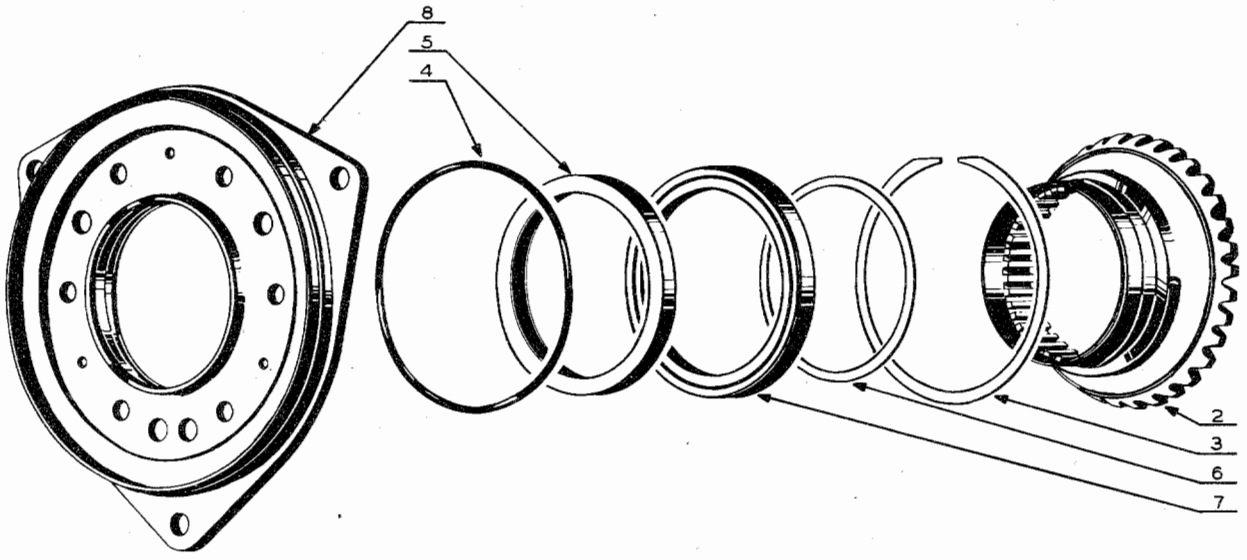
GROUP: Aircraft Accessories
MAJOR ASSEMBLY: Propeller Assemblies

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5215S-D3	C5215S-D4	C5215S-D18	C5215S-D20	C5215S-D21	C5215S-D22	C5215S-D24	C5215S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
42			100791							Spacer Assembly - Slip ring flanged	1	1								03-A	125M/
42	39		100790							Spacer - Slip ring - flanged - spinner	1	1								03-A	125M/
42	40		100792							Flange - Slip ring spacer - bolting	1	1								03-A	125M/
42	41		AN430-6-10							Rivet - Round head	6	6								29	128/
42	42		100793							Spacer - Slip ring	1	1								03-A	125M/
42	43		101267							Dowel - Spinner attaching	1	1								03-A	125M/
43			101880-6							Hub Assembly - Spinner flange - non anti-icing			1	1			1			03-A	125M/
43			101880-7							Hub Assembly - Spinner slinger - anti-icing					1	1				03-A	125M/
43	1		101787							Hub - Propeller			1	1	1	1	1			03-A	125M/
	2		104871							Slip Ring Assembly			1	1	1	1	1			03-A	125M/
43	3		88257							Insulator - Front slip ring			1	1	1	1	1			03-A	125M/
43	4		102212							Ring - Lock			1	1	1	1	1			03-A	125M/
43	5		102211							Sleeve - Slip ring mounting			1	1	1	1	1			03-A	125M/
43	6		104836							Seal - Slip ring			1	1	1	1	1			03-A	125M/
43	7		88255-1							Separator - Slip ring			1	1	1	1	1			03-A	125M/
43	8		88255-2							Separator - Slip ring			1	1	1	1	1			03-A	125M/
43	9		88255-3							Separator - Slip ring			1	1	1	1	1			03-A	125M/
43	10		88256-1							Ring And Block Assembly			1	1	1	1	1			03-A	125M/
43			*88256-5							Ring			1	1	1	1	1			03-A	125M/
43			*88259							Block - Slip ring			1	1	1	1	1			03-A	125M/
43	13		88256-2							Ring And Block Assembly			1	1	1	1	1			03-A	125M/
43			*88256-6							Ring			1	1	1	1	1			03-A	125M/
43			*88259							Block - Slip ring			1	1	1	1	1			03-A	125M/
43	16		88256-3							Ring And Block Assembly			1	1	1	1	1			03-A	125M/
43			*88256-7							Ring			1	1	1	1	1			03-A	125M/
43			*88259							Block - Slip ring			1	1	1	1	1			03-A	125M/
43	19		88256-4							Ring And Block Assembly			1	1	1	1	1			03-A	125M/
43			*88256-8							Ring			1	1	1	1	1			03-A	125M/
43			*88259							Block - Slip ring			1	1	1	1	1			03-A	125M/
43	22		88261							Tube - Slip ring insulator			1	1	1	1	1			03-A	125M/
43	23		88260							Bushing - Slip ring			6	6	6	6	6			03-A	125M/
43	24		88258							Insulator - Slip ring			1	1	1	1	1			03-A	125M/
43	25		88606-5							Tube - Connector rod insulator			1	1	1	1	1			03-A	125M/
43	26		88606-6							Tube - Connector rod insulator			1	1	1	1	1			03-A	125M/
43	27		88606-7							Tube - Connector rod insulator			1	1	1	1	1			03-A	125M/
43	28		88606-8							Tube - Connector rod insulator			1	1	1	1	1			03-A	125M/
43	29		88140-24							Rod - Hub connector			1	1	1	1	1			03-A	125M/
43	30		88140-25							Rod - Hub connector			1	1	1	1	1			03-A	125M/
43	31		88140-26							Rod - Hub connector			1	1	1	1	1			03-A	125M/
43	32		88140-27							Rod - Hub connector			1	1	1	1	1			03-A	125M/
43	33		111590-2							Point - Power unit cutout switch contact			4	4	4	4	4			03-A	125M/
43	34		89107							Shim - Contact point			ar	ar	ar	ar	ar			03-A	125M/
43	34		89107-1							Shim - Contact point			ar	ar	ar	ar	ar			03-A	125M/
43	36		100461							Tube - Hub contact insulator			4	4	4	4	4			03-A	125M/
43	37		88263-4							Screw - Special - slip ring attaching			6	6	6	6	6			03-A	125M/
43	38		104887							Spacer Assembly - Spinner			1	1			1			03-A	125M/
43			104888							Spacer - Spinner			1	1			1			03-A	125M/
43			104889							Flange - Spinner			1	1			1			03-A	125M/
43			AN430-6-10							Rivet - Round head			6	6			6			29	128/
43	42		104890							Spacer - Slip ring spinner			1	1			1			03-A	125M/
43	43		104835							Washer - Spinner attaching			3	3	3	3	3			03-A	125M/
43	44		104758-1							Screw - Spinner attaching			3	3			3			03-A	125M/
43	45		104758-3							Screw - Spinner attaching					3	3				03-A	125M/
43	46		106892							Slinger - Anti-icing					1	1				03-A	125M/



POWER GEAR ASSEMBLY

FIGURE 44

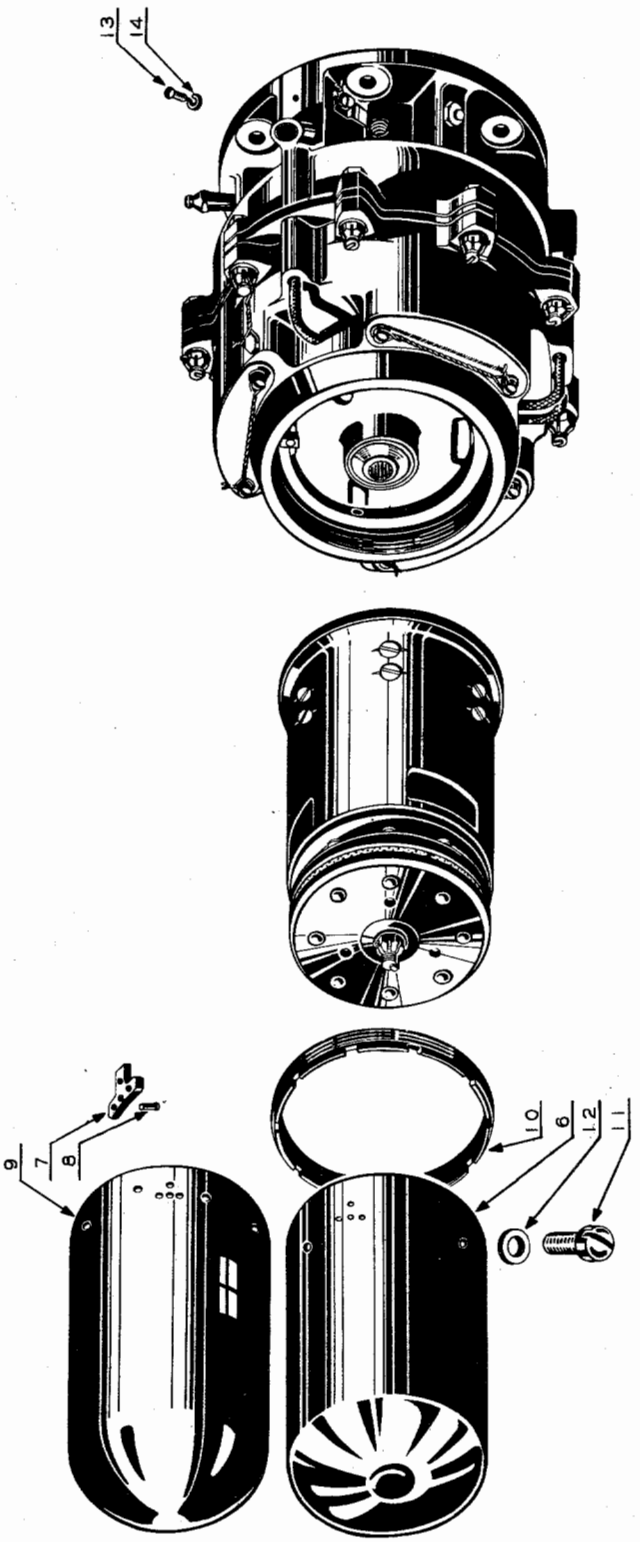


POWER GEAR ASSEMBLY

FIGURE 45

SECTION II—GROUP ASSEMBLY PARTS LISTS

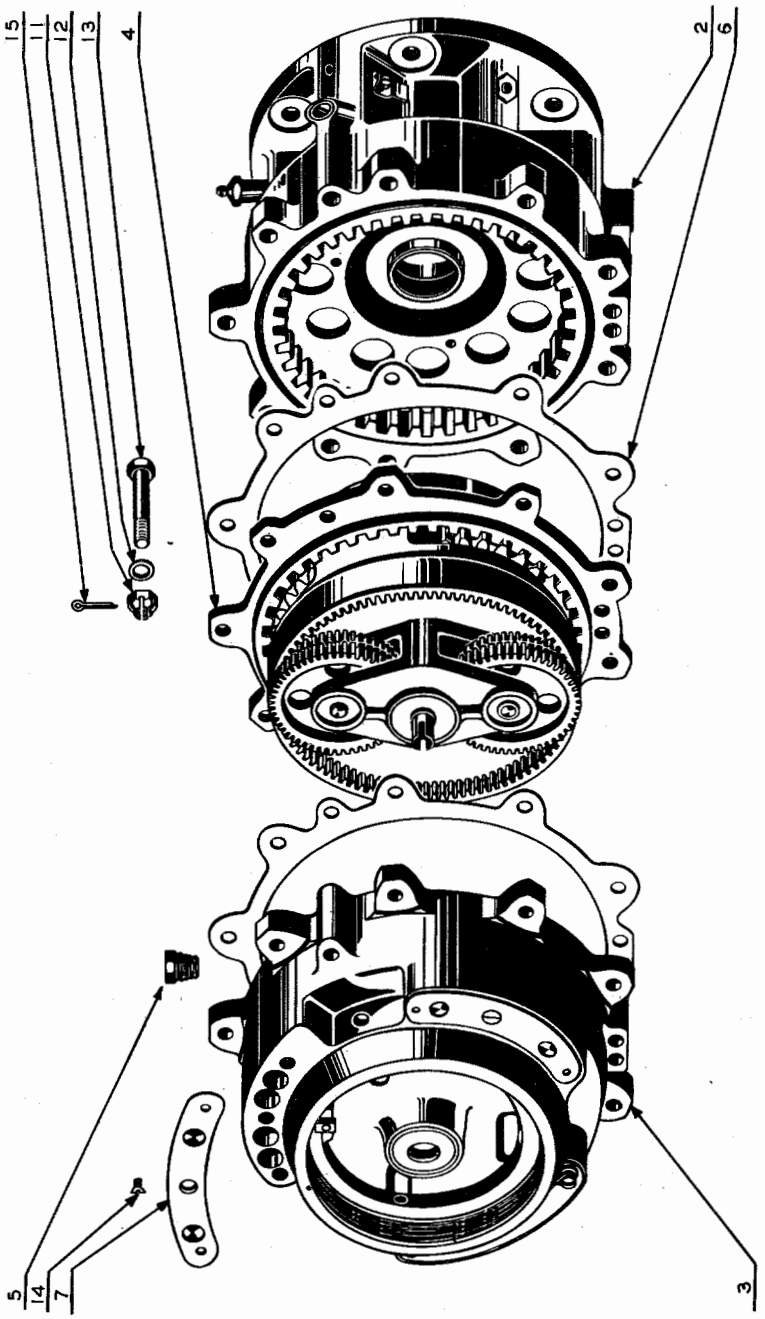
FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
44			104266-2							Gear Assembly - Power								1		03-A	125M/
44	1		102349							Adapter - Speed reducer								1		03-A	125M/
44	2		101841-2							Gear - Power spiral bevel								1		03-A	125M/
44	3		101705							Ring - Power gear bearing lock								1		03-A	125M/
44	4		101425							Seal - Ring - Adapter grease								1		03-A	125M/
44	5		100970							Seal - Speed reducer adapter								1		03-A	125M/
44	6		55948							Shim - Power unit bevel gear								1		03-A	125M/
44	7		55936							Bearing - Power unit								1		03-A	125M/
45			106794-1							Gear Assembly - Power	1				1					03-A	125M/
45			106794-2 @							Gear Assembly - Power		1	1	1		1	1			03-A	125M/
45	8		106632							Adapter - Speed reducer	1	1	1	1	1	1	1			03-A	125M/
45			101841-1							Gear - Power spiral bevel	1				1					03-A	125M/
45	2		101841-2							Gear - Power spiral bevel		1	1	1		1	1			03-A	125M/
45	3		101705							Ring - Power gear bearing lock	1	1	1	1	1	1	1			03-A	125M/
45	4		101425							Seal - Ring - adapter grease	1	1	1	1	1	1	1			03-A	125M/
45	5		100970							Seal - Speed reducer adapter	1	1	1	1	1	1	1			03-A	125M/
45	6		55948							Shim - Power unit bevel gear	1	1	1	1	1	1	1			03-A	125M/
45	7		55936							Bearing - Power unit	1	1	1	1	1	1	1			03-A	125M/
			@ Same as 106794-1 Gear Assembly except for indexing of gear.																		
46			102600-12							Power Unit Assembly - RH - 12 volt				1			1			03-A	125M/
46			101773-4							Speed Reducer Assembly - RH - (Ref.)				1			1			03-A	125M/
46			100222-2							Motor Assembly - Power unit electric - 12 volt (Ref. see page 57)				1			1			03-A	125M/
46			101375-1							Brake Assembly - Diaphragm type - 12 volt (Ref. see page 59)				1			1			03-A	125M/
46			102600-16							Power Unit Assembly - RH - 12 volt			1					1		03-A	125M/
46			101773-8							Speed Reducer Assembly - RH - (Ref.)			1					1		03-A	125M/
46			100222-2							Motor Assembly - Power unit electric - 12 volt (Ref. see page 57)			1					1		03-A	125M/
46			101375-1							Brake Assembly - Diaphragm type - 12 volt (Ref. see page 59)			1					1		03-A	125M/
46			104044-7							Power Unit Assembly - LH - 24 volt	1									03-A	125M/
46			101773-7							Speed Reducer Assembly - RH - (Ref.)	1									03-A	125M/
46			100581-1							Motor Assembly - Power unit electric - LH - (Ref. see page 55)	1									03-A	125M/
46			101375-2							Brake Assembly - Diaphragm type - (Ref. see page 59)	1									03-A	125M/



POWER UNIT ASSEMBLY

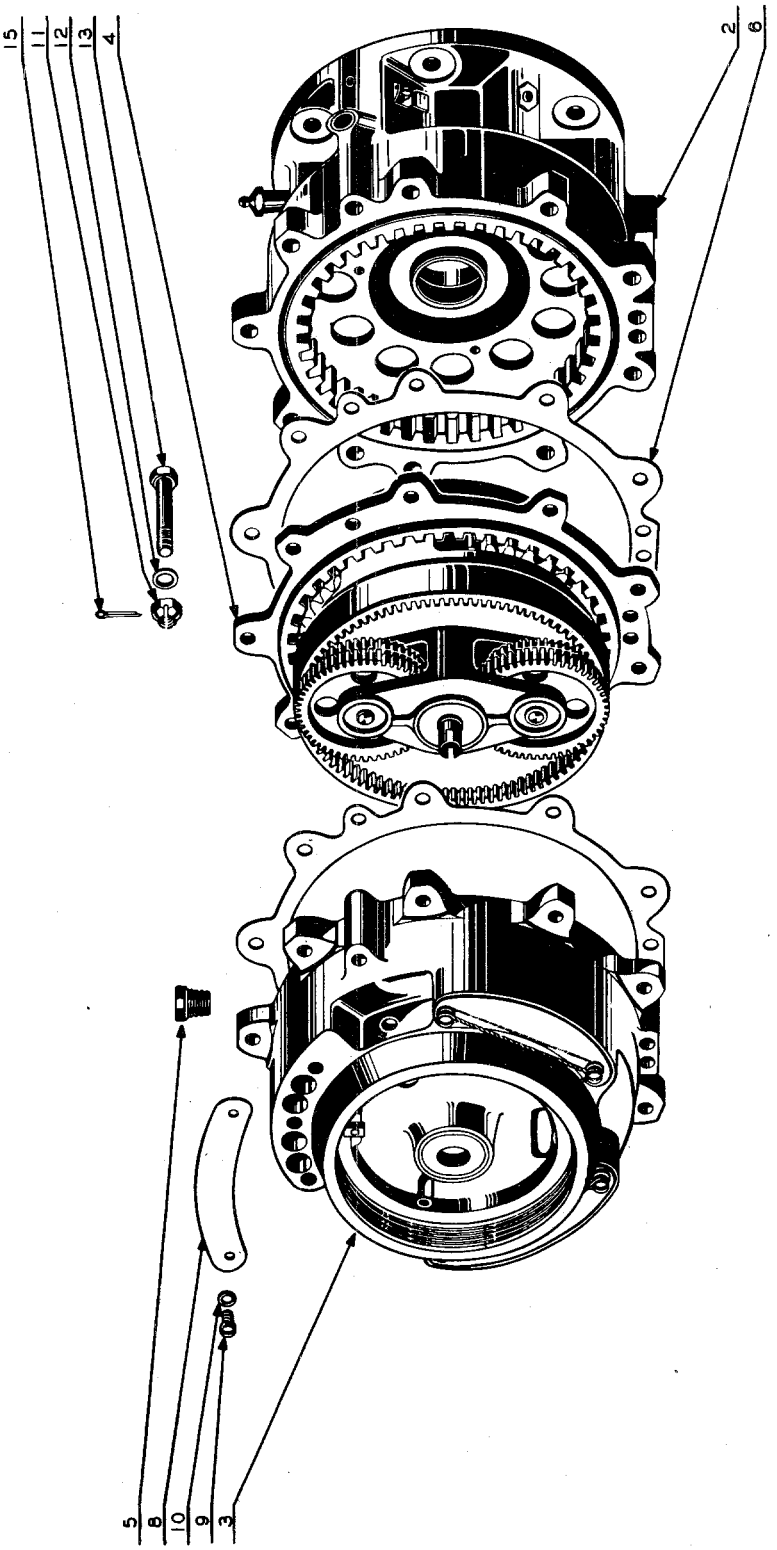
FIGURE 46

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
GROUP Aircraft Accessories																					
MAJOR ASSEMBLY Propeller Assemblies																					
46			104044-8			Power Unit Assembly - RH - 24 volt						1									03-A	125M/
46			101773-8			Speed Reducer Assembly - RH - (Ref.)						1									03-A	125M/
46			100581-2			Motor Assembly - Power unit electric - RH - (Ref. see page 55)						1									03-A	125M/
46			101375-2			Brake Assembly - Diaphragm type - (Ref. see page 59)						1									03-A	125M/
46			108328-7			Power Unit Assembly - LH - 24 volt										1					03-A	125M/
46			101773-7			Speed Reducer Assembly - LH - (Ref.)										1					03-A	125M/
46			102890-1			Motor Assembly - Power unit electric - LH - (Ref. see page 59)										1					03-A	125M/
46			101375-2			Brake Assembly - Diaphragm type - (Ref. see page 59)										1					03-A	125M/
46			108328-8			Power Unit Assembly - RH - 24 volt											1				03-A	125M/
46			101773-8			Speed Reducer Assembly - RH - (Ref.)											1				03-A	125M/
46			102890-2			Motor Assembly - Power unit electric - RH - (Ref. see page 59)											1				03-A	125M/
46			101375-2			Brake Assembly - Diaphragm type - (Ref. see page 59)											1				03-A	125M/
			The following parts are common to the preceding Power Unit Assemblies.																		
46			102888			Cover Assembly - Electric motor - blunt nose						1	1			1	1				03-A	125M/
46	6		104660			Cover - Electric motor - blunt nose						1	1			1	1				03-A	125M/
46	7		100407			Lug - Electric motor cover						1	1			1	1				03-A	125M/
46	8		100550			Rivet - Electric motor cover lug						4	4			4	4				03-A	125M/
46			89887			Cover Assembly - Electric motor and timer								1	1			1	1		03-A	125M/
46	9		104662			Cover - Electric motor								1	1			1	1		03-A	125M/
46	7		100407			Lug - Electric motor cover								1	1			1	1		03-A	125M/
46	8		100550			Rivet - Electric motor cover lug								4	4			4	4		03-A	125M/
46	10		88119			Nut - Motor housing retainer						1	1	1	1	1	1	1	1		03-A	125M/
46	11		AN502-8-4			Screw - Fillister head						3	3	3	3	3	3	3	3		04-A	128/
46	12		AN960-8			Washer - Plain						3	3	3	3	3	3	3	3		04-A	128/
46	13		AN520B5-4			Screw - Round head						4	4	4	4	4	4	4	4		29	128/
46	14		AN935-6			Washer - Medium spring lock						4	4	4	4	4	4	4	4		29	128/
			One pint of Curtiss Speed Reducer Oil No. 2 will be supplied with each of the above Power Unit Assemblies.																		



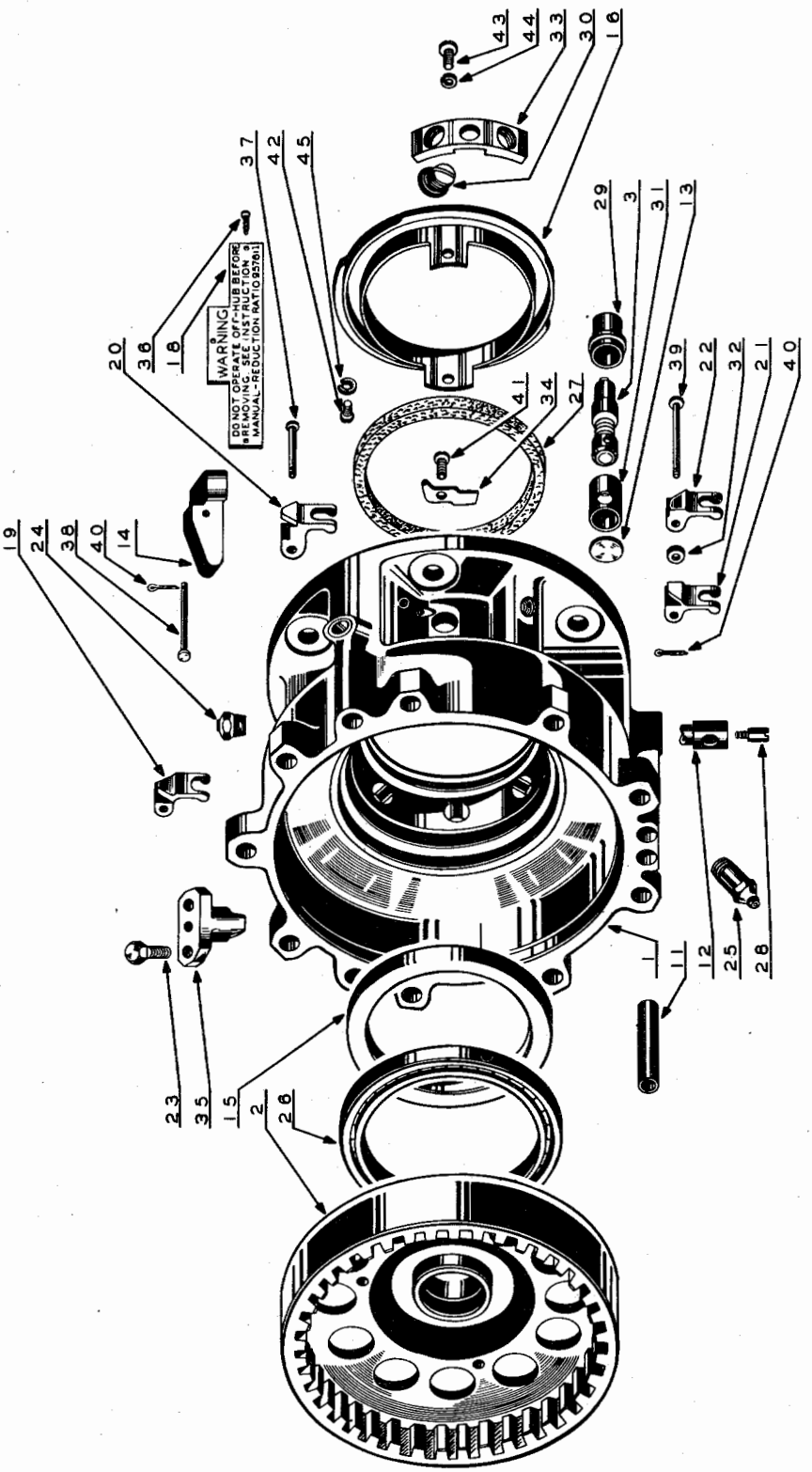
SPEED REDUCER ASSEMBLY

FIGURE 47



SPEED REDUCER ASSEMBLY

FIGURE 48



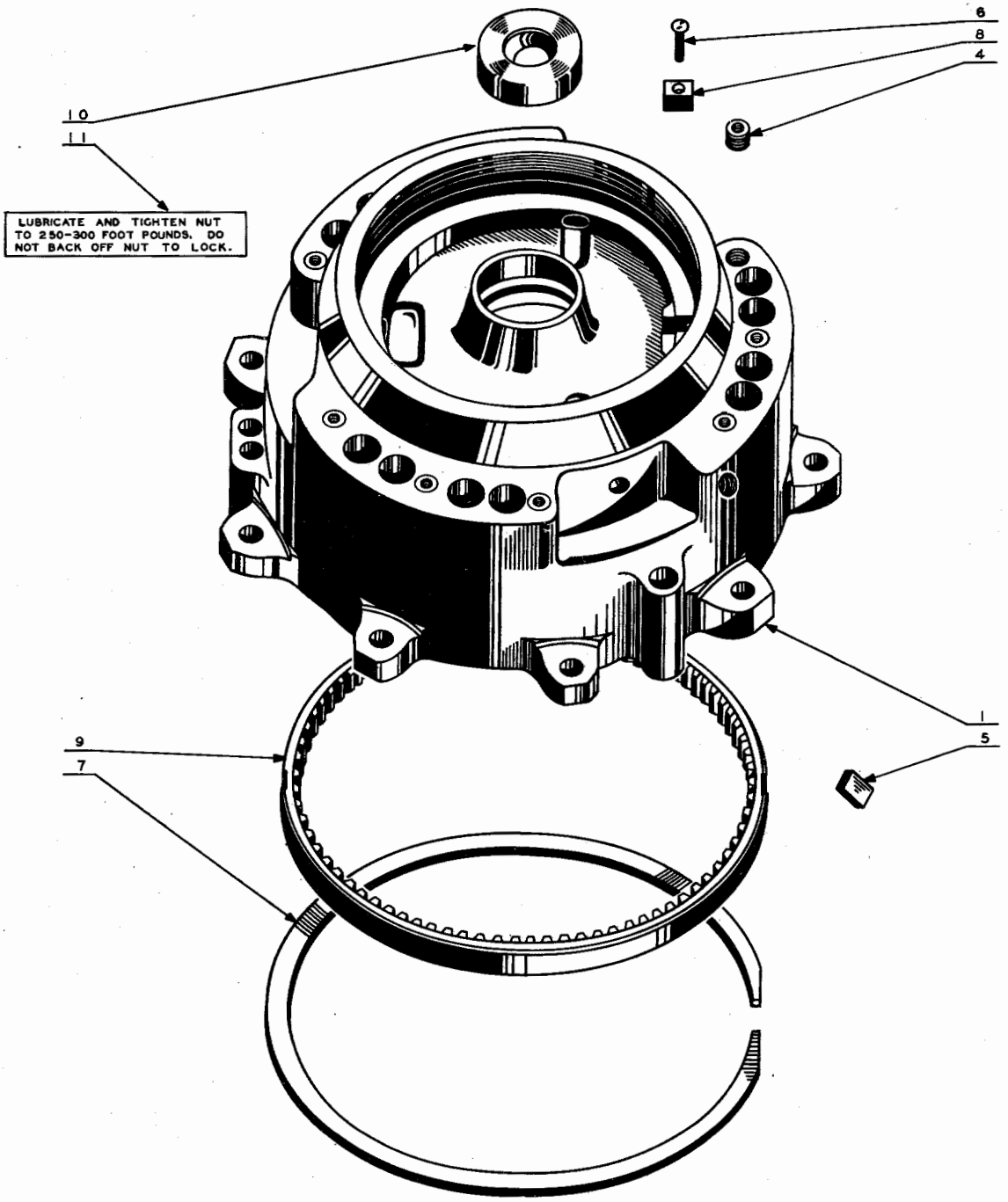
REAR HOUSING ASSEMBLY

FIGURE 49

SECTION II—GROUP ASSEMBLY PARTS LISTS

GROUP: Aircraft Accessories
MAJOR ASSEMBLY: Propeller Assemblies

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
47			101773-4				Speed Reducer Assembly - RH							1			1			03-A	125M/
47	2		101704-4				Housing Assembly - Speed reducer - rear							1			1			03-A	125M/
47	3		101423				Housing Assembly - Speed reducer - front							1			1			03-A	125M/
47	4		101478				Gear Assembly - Speed reducer							1			1			03-A	125M/
48			101773-7				Speed Reducer Assembly - LH				1				1					03-A	125M/
48	2		101704-3				Housing Assembly - Speed reducer - rear				1				1					03-A	125M/
48	3		101423				Housing Assembly - Speed reducer - front				1				1					03-A	125M/
48	4		101478				Gear Assembly - Speed reducer				1				1					03-A	125M/
48			101773-8				Speed Reducer Assembly - RH					1	1			1		1		03-A	125M/
48	2		101704-4				Housing Assembly - Speed reducer - rear					1	1			1		1		03-A	125M/
48	3		101423				Housing Assembly - Speed reducer - front					1	1			1		1		03-A	125M/
48	4		101478				Gear Assembly - Speed reducer					1	1			1		1		03-A	125M/
			The following parts are common to the above Speed Reducer Assemblies.																		
#	5		101316				Plug - Pipe - speed reducer oil filler				1	1	1	1	1	1	1	1		03-A	125M/
#	6		101417				Gasket - Speed reducer housing				2	2	2	2	2	2	2	2		03-A	125M/
##	7		101718-1				Retainer - Counterweight - speed reducer							3			3			03-A	125M/
###	8		102504-1				Retainer - Counterweight - speed reducer				3	3	3		3	3		3		03-A	125M/
###	9		AN502-8-6				Screw - Fillister head				6	6	6		6	6		6		04-A	128/
###	10		AN960-8				Washer - Plain				6	6	6		6	6		6		04-A	128/
#	11		AN310-5				Nut - Castle				9	9	9	9	9	9	9	9		04-A	128/
#	12		AN960-516				Washer - Plain				18	18	18	18	18	18	18	18		04-A	128/
#	13		112374				Bolt				9	9	9	9	9	9	9	9		03-A	125M/
##	14		AN510-8-7				Screw							3			3			29	128/
#	15		AN380C2-2				Pin - Cotter				8	8	8	8	8	8	8	8		29	128/
			# These items appear on figures 47 and 48 ## These items appear on figure 47 ### These items appear on figure 48																		
49			101704-3				Housing Assembly - Speed reducer - rear				1				1					03-A	125M/
49			101704-4				Housing Assembly - Speed reducer - rear					1	1	1		1	1	1		03-A	125M/
49	1		101373				Housing - Speed reducer - rear				1	1	1	1	1	1	1	1		03-A	125M/
49	2		101443				Gear - Movable ring - low speed				1	1	1	1	1	1	1	1		03-A	125M/

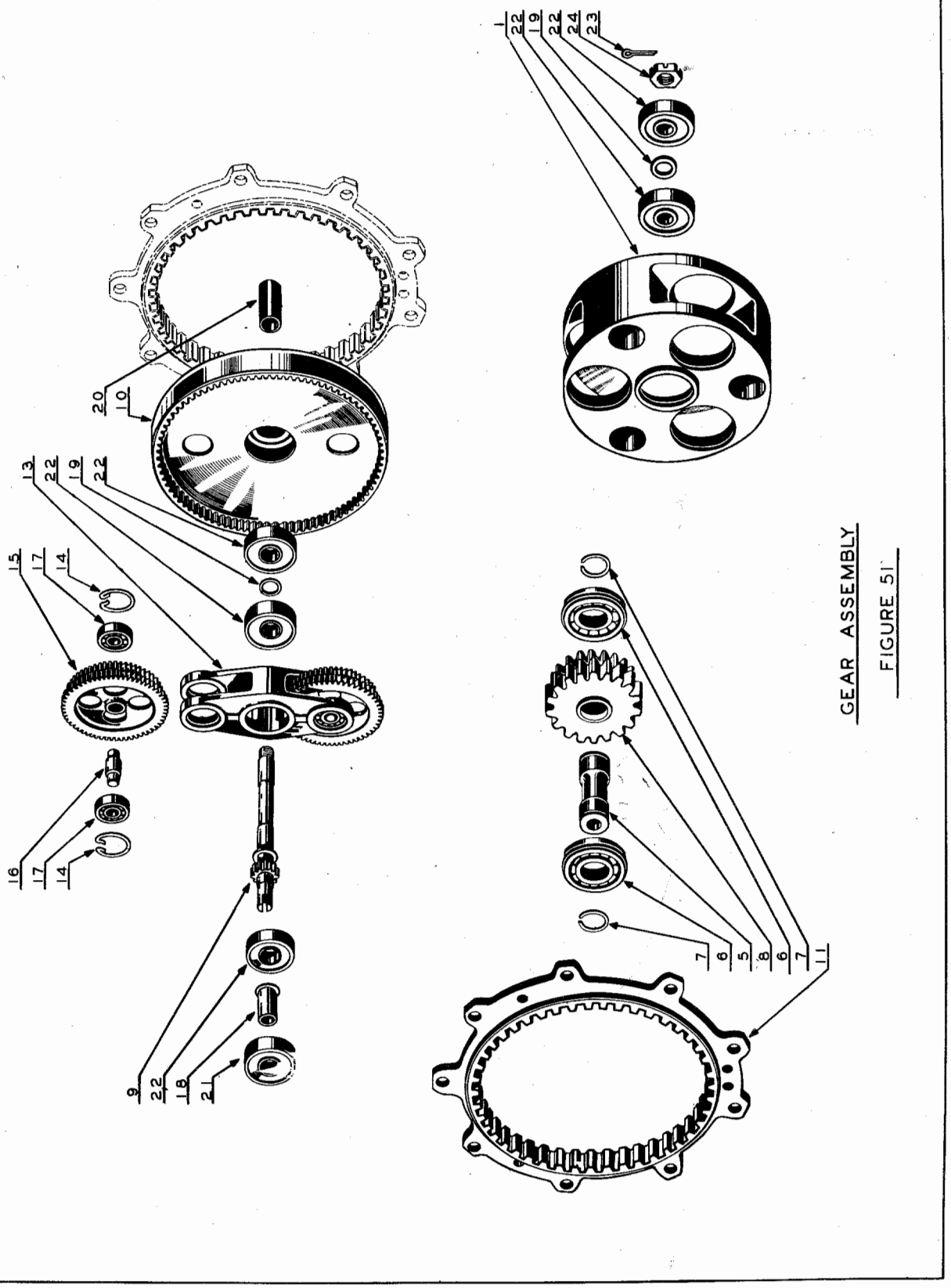


FRONT HOUSING ASSEMBLY

FIGURE 50

FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies — PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
49	3		109809							Point Assembly - Power unit cutout switch contact	4	4	4	4	4	4	4	4		03-A	125M/
49			*111958-1							Point - Power unit cutout switch contact	1	1	1	1	1	1	1	1		03-A	125M/
49			*109192							Insulator - Power unit cutout switch contact point	1	1	1	1	1	1	1	1		03-A	125M/
49			*109185							Point - Cutout switch floating contact	1	1	1	1	1	1	1	1		03-A	125M/
49			*102572							Plate - Power unit cutout switch arm bearing	1	1	1	1	1	1	1	1		03-A	125M/
49			*88141-2							Terminal - Power unit connector	1	1	1	1	1	1	1	1		03-A	125M/
49			*102576							Pigtail - Power unit cutout switch	1	1	1	1	1	1	1	1		03-A	125M/
49			*109084							Spring - Power unit cutout switch	1	1	1	1	1	1	1	1		03-A	125M/
49	11		100268							Insulator - Power unit motor lead	4	4	4	4	4	4	4	4		03-A	125M/
49	12		101484							Insulator - Power unit motor lead connector stud	4	4	4	4	4	4	4	4		03-A	125M/
49	13		100460							Plate - Insulator - speed reducer connector	4	4	4	4	4	4	4	4		03-A	125M/
49	14		102351							Weight - Balance - speed reducer		1	1	1		1	1	1		03-A	125M/
49	15		101420							Seal - Oil	1	1	1	1	1	1	1	1		03-A	125M/
49	16		109876	@						Cam - Power unit cutout switch - LH	1				1					03-A	125M/
49			109874-	@						Cam - Power unit cutout switch - RH		1	1	1		1	1	1		03-A	125M/
49	18		101296-1							Plate - Speed reducer warning	1	1	1	1	1	1	1	1		03-A	125M/
49	19		109873							Arm - Cutout limit switch - feathering	1				1					03-A	125M/
49	20		109872							Arm - Cutout limit switch - feathering		1	1	1		1	1	1		03-A	125M/
49	21		109871							Arm - Cutout limit switch - short	1	1	1	1	1	1	1	1		03-A	125M/
49	22		109870							Arm - Cutout limit switch - long	1	1	1	1	1	1	1	1		03-A	125M/
49	23		101735							Bolt - Special	2	2	2	2	2	2	2	2		03-A	125M/
49	24		104426							Fitting - Speed reducer relief	1	1	1	1	1	1	1	1		03-A	125M/
49	25		102604							Lubricator	2	2	2	2	2	2	2	2		03-A	125M/
49	26		55936							Bearing - Power unit	1	1	1	1	1	1	1	1		03-A	125M/
49	27		55870							Seal - Speed reducer	1	1	1	1	1	1	1	1		03-A	125M/
49	28		88143							Stud - Connector - power unit	4	4	4	4	4	4	4	4		03-A	125M/
49	29		88136-1							Insulator Assembly - cutout switch	4	4	4	4	4	4	4	4		03-A	125M/
49	30		101744							Bolt - Mechanical stop segment	2	2	2	2	2	2	2	2		03-A	125M/
49	31		89358							Insulator - Cutout switch pigtail - front terminal	4	4	4	4	4	4	4	4		03-A	125M/
49	32		89298							Spacer - Cutout switch arm	1	1	1	1	1	1	1	1		03-A	125M/
49	33		89375							Stop - Low speed ring gear - speed reducer	1	1	1	1	1	1	1	1		03-A	125M/

@ See page 53 for blade angles and complete cam designations.

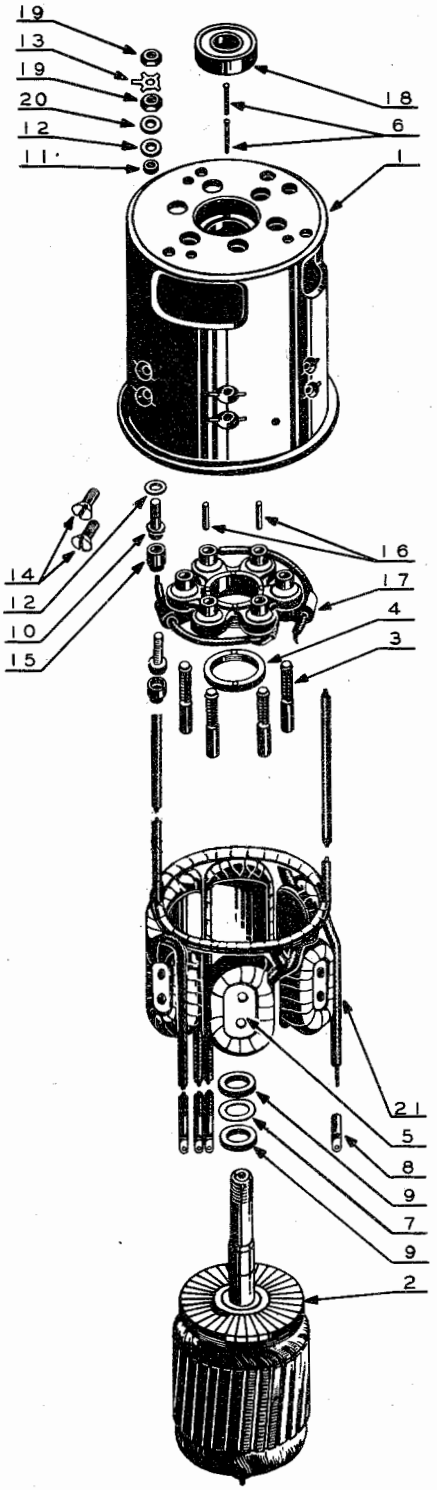


GEAR ASSEMBLY

FIGURE 51

GROUP Aircraft Accessories
MAJOR ASSEMBLY Propeller Assemblies

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5215S-D3	C5215S-D4	C5215S-D18	C5215S-D20	C5215S-D21	C5215S-D22	C5215S-D24	C5215S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
49	34		101840							Plate - Switch arm pin locking	1	1	1	1	1	1	1	1		03-A	125M/
49	35		89295							Stop - Rear housing - speed reducer	1	1	1	1	1	1	1	1		03-A	125M/
49	36		AN535-0-2							Screw - Drive - Round head	3	3	3	3	3	3	3	3		29	128/
49	37		AN392-27							Pin - Flat head	1	1	1	1	1	1	1	1		04-A	128/
49	38		AN392-39							Pin - Flat head	1	1	1	1	1	1	1	1		04-A	128/
49	39		AN392-55							Pin - Flat head	1	1	1	1	1	1	1	1		04-A	128/
49	40		111488-1							Pin - Cotter	2	2	2	2	2	2	2	2		03-A	125M/
49	41		500A10-5							Screw - Fillister head	1	1	1	1	1	1	1	1		29	128/
49	42		AN520-10-5							Screw - Round head	1	1	1	1	1	1	1	1		29	128/
49	43		AN520-8-5							Screw - Round head	1	1	1	1	1	1	1	1		29	128/
49	44		AN935-8L							Washer - Medium spring lock	1	1	1	1	1	1	1	1		29	128/
49	45		AN935-10L							Washer - Medium spring lock	1	1	1	1	1	1	1	1			
			Following are the complete cam designations for subject model propeller																		
49	16		109876-55.5-164.5							Cam - Power unit cutout switch	1									03-A	128/
49	16		109874-55.5-162							Cam - Power unit cutout switch		1								03-A	128/
49	16		109874-44-203.5							Cam - Power unit cutout switch			1	1			1			03-A	128/
49	16		109876-55.5-163.5							Cam - Power unit cutout switch					1					03-A	128/
49	16		109874-55.5-161							Cam - Power unit cutout switch						1				03-A	128/
49	16		109874-40.5-165.5							Cam - Power unit cutout switch								1		03-A	128/
			Blade Angles at the 42 in. station																		
			Low: 22.5°							High: 57.5° Feather: 88.0°	x	x								03-A	128/
			22.3°							46.0° 46.0°			x							03-A	128/
			26.0°							49.8° 49.8°				x						03-A	128/
			21.5°							56.5° 88.0°					x	x				03-A	128/
			21.2°							45.0° 45.0°							x			03-A	128/
			26.7°							46.7° 88.6°								x		03-A	128/
50			101423							Housing Assembly - Speed reducer - front	1	1	1	1	1	1	1	1		03-A	128/
50	1		106648							Housing - Bushing Assembly - front	1	1	1	1	1	1	1	1		03-A	128/
50			*101400							Housing - Speed reducer - front	1	1	1	1	1	1	1	1		03-A	128/
50			*104695							Bushing - Thick - front housing	1	1	1	1	1	1	1	1		03-A	128/
50	4		100383							Bushing - Screw - front housing	9	9	9	9	9	9	9	9		03-A	128/
50	5		101300							Key - Power unit motor	1	1	1	1	1	1	1	1		03-A	128/
50	6		AN420-3-10							Rivet - Countersunk head	1	1	1	1	1	1	1	1		29	128/
50	7		101702							Ring - High speed fixed ring gear retaining	1	1	1	1	1	1	1	1		03-A	125M/
50	8		88164							Key - Speed reducer high speed fixed ring gear	2	2	2	2	2	2	2	2		03-A	125M/
50	9		101885							Gear - High speed fixed ring	1	1	1	1	1	1	1	1		03-A	125M/
50	10		106837							Seal - Oil - speed reducer front housing	1	1	1	1	1	1	1	1		03-A	125M/
50	11		112845							Decal. - Front housing	1	1	1	1	1	1	1	1		03-A	125M/

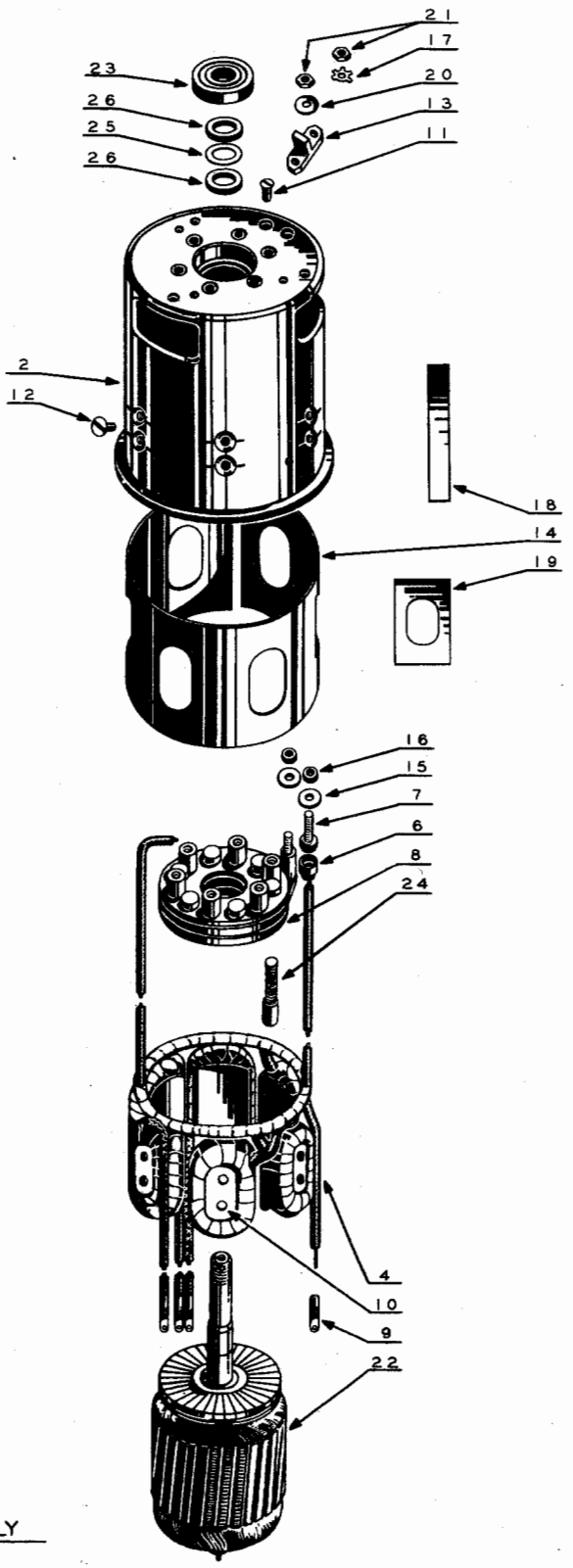


MOTOR ASSEMBLY
FIGURE 52

SECTION II—GROUP ASSEMBLY PARTS LISTS

GROUP Aircraft Accessories
MAJOR ASSEMBLY Propeller Assemblies

FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
51			101478							Gear Assembly - Speed reducer - drive	1	1	1	1	1	1	1	1		03-A	125M/
51			101477							Gear Assembly - Low speed	1	1	1	1	1	1	1	1		03-A	125M/
51	1		101429							Spider Assembly - Low speed	1	1	1	1	1	1	1	1		03-A	125M/
51			*88656							Bushing - Low speed - speed reducer	1	1	1	1	1	1	1	1		03-A	125M/
51			*108925							Spider - Low speed (optional 101427)	1	1	1	1	1	1	1	1		03-A	125M/
51			*101428							Bushing - Low speed spider - small	1	1	1	1	1	1	1	1		03-A	125M/
51	5		101424							Pin - Low speed planet gear	3	3	3	3	3	3	3	3		03-A	125M/
51	6		88654							Bearing - Low speed - speed reducer	6	6	6	6	6	6	6	6		03-A	125M/
51	7		88629							Ring - Snap - low speed	6	6	6	6	6	6	6	6		03-A	125M/
51	8		101415							Gear - Low speed planet	3	3	3	3	3	3	3	3		03-A	125M/
51	9		101434							Gear - Speed reducer drive	1	1	1	1	1	1	1	1		03-A	125M/
51	10		101421							Gear - Movable ring - high speed	1	1	1	1	1	1	1	1		03-A	125M/
51	11		101406							Gear - Speed reducer - low speed fixed ring	1	1	1	1	1	1	1	1		03-A	125M/
51			101401							Gear Assembly - High speed	1	1	1	1	1	1	1	1		03-A	125M/
51	13		101407							Spider - High speed	1	1	1	1	1	1	1	1		03-A	125M/
51	14		101413							Ring - High speed planet gear bearing retainer	4	4	4	4	4	4	4	4		03-A	125M/
51	15		101414							Gear - High speed planet	2	2	2	2	2	2	2	2		03-A	125M/
51	16		101416							Pin - High speed planet gear	2	2	2	2	2	2	2	2		03-A	125M/
51	17		111262							Bearing - Ball	4	4	4	4	4	4	4	4		03-A	125M/
51	18		88169							Sleeve - Speed reducer drive gear	1	1	1	1	1	1	1	1		03-A	125M/
51	19		100401-1							Spacer - Drive gear bearing	2	2	2	2	2	2	2	2		03-A	125M/
51	20		100401-3							Spacer - Drive gear bearing	1	1	1	1	1	1	1	1		03-A	125M/
51	21		108133							Bearing - Ball	1	1	1	1	1	1	1	1		03-A	125M/
51	22		108128							Bearing - Ball	5	5	5	5	5	5	5	5		03-A	125M/
51	23		111488-2							Pin - Cotter	1	1	1	1	1	1	1	1		03-A	125M/
51	24		AN320-6							Nut - Shear	1	1	1	1	1	1	1	1		04-A	128/
52			100581-1							Motor Assembly - Power unit - electric - LH	1									03-A	125M/
52			100581-2							Motor Assembly - Power unit - electric - RH		1								03-A	125M/
52	1		88692							Housing - Electric motor	1	1								03-A	125M/
52	2		100587							Armature Assembly - Electric motor	1	1								03-A	125M/
52	3		88664							Brush - Electric motor	6	6								03-A	125M/
52	4		100192							Nut - Electric motor brush holder clamping	1	1								03-A	125M/
52	5		100191							Pole - Piece - electric motor	6	6								03-A	125M/
52	6		88659							Pin - Brush holder locking	2	2								03-A	125M/
52	7		88706							Shim - Laminated motor and brake	2	2								03-A	125M/
52	8		88137							Terminal - Power unit	4	4								03-A	125M/
52	9		88707							Spacer - Magnetic brake	2	2								03-A	125M/
52	10		101177							Post - Brake binding	2	2								03-A	125M/
52	11		100166							Insulator - Brake binding post	2	2								03-A	125M/

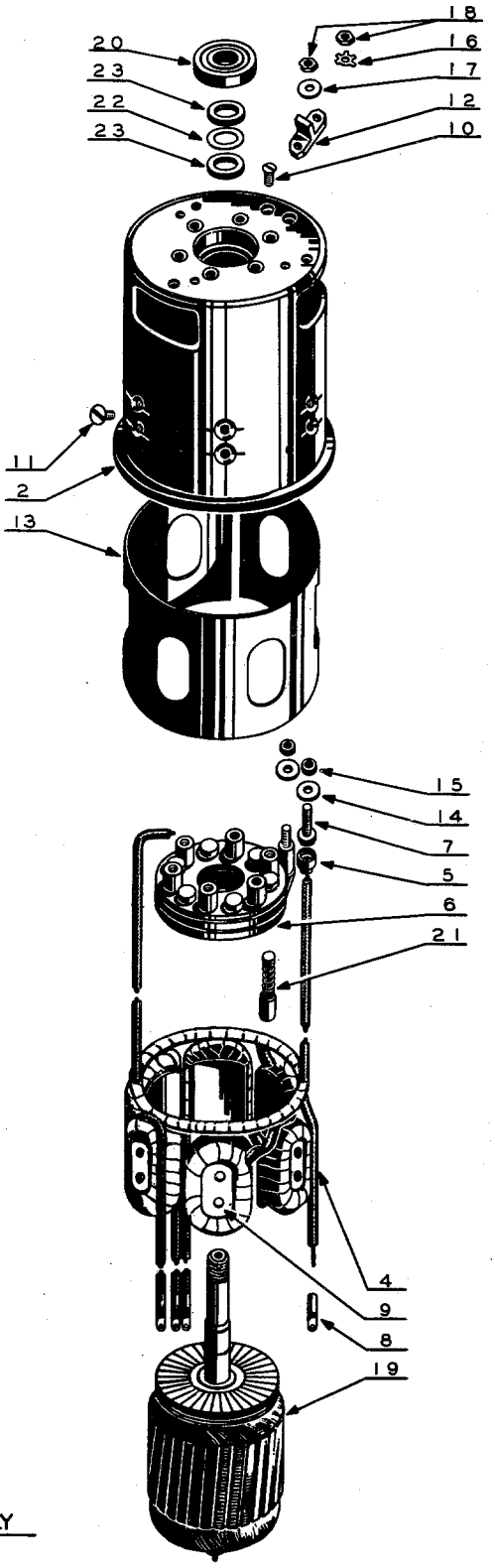


MOTOR ASSEMBLY
FIGURE 53

SECTION II—GROUP ASSEMBLY PARTS LISTS

GROUP Aircraft Accessories
MAJOR ASSEMBLY Propeller Assemblies

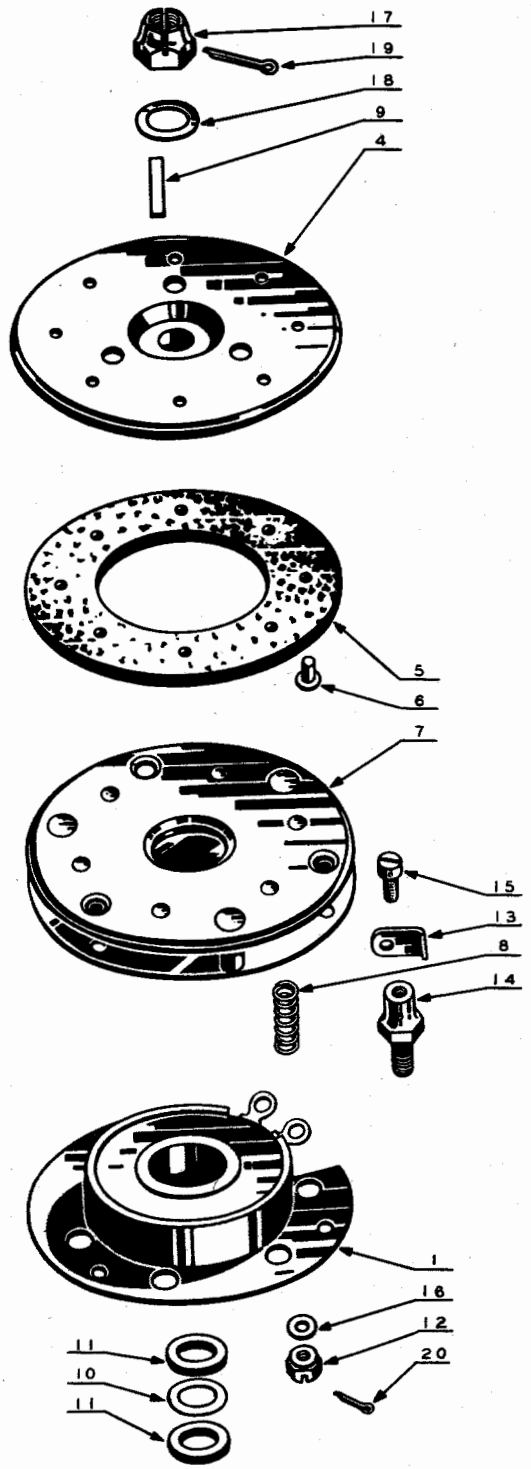
FIG. NO.	INDEX NO.	STOCKED	PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
52	12		100168							Washer - Brake binding post	4	4								03-A	125M/
52	13		100206							Washer - Binding post lock	2	2								03-A	125M/
52	14		100213							Screw - Pole piece	12	12								03-A	125M/
52	15		100237							Sleeve - Binding post	2	2								03-A	125M/
52	16		100488							Pin - Brush holder lock	2	2								03-A	125M/
52	17		100189							Holder Assembly - Brush	1	1								03-A	125M/
52	18		108133							Bearing - Ball	1	1								03-A	125M/
52	19		AN345B8							Nut - Hex	4	4								29	128/
52	20		AN960B8							Washer - Plain	2	2								04-A	128/
52	21		108915-1							Field Coil Complete Assembly	1									03-A	125M/
52			108915-2							Field Coil Complete Assembly		1								03-A	125M/
53			100222-2							Motor Assembly - Power unit electric - RH - 12 volt			1	1			1	1		03-A	125M/
53			109952-2							Housing Assembly - 12 volt - RH			1	1			1	1		03-A	125M/
53	2		102889							Housing - Electric motor			1	1			1	1		03-A	125M/
53			*109943-2							Winding Assembly - RH			1	1			1	1		03-A	125M/
53	4		109938-2							Field Coil Complete Assembly - RH			1	1			1	1		03-A	125M/
53			*108971							Lead Assembly - "P" and "T"			1	1			1	1		03-A	125M/
53	6		100237							Sleeve - Electric motor binding post			1	1			1	1		03-A	125M/
53	7		101177							Post - Electric motor brake binding			1	1			1	1		03-A	125M/
53	8		102891							Holder Assembly - Brush			1	1			1	1		03-A	125M/
53	9		88137							Terminal - Power unit			4	4			4	4		03-A	125M/
53	10		100191							Pole Piece - Motor brush			6	6			6	6		03-A	125M/
53	11		108711							Screw - Electric motor			6	6			6	6		03-A	125M/
53	12		100213							Screw - Pole piece			12	12			12	12		03-A	125M/
53	13		108733							Block - Brake terminal insulating			1	1			1	1		03-A	125M/
53	14		108818							Insulator - Electric motor			1	1			1	1		03-A	125M/
53	15		100168							Washer - Electric motor brake binding			2	2			2	2		03-A	125M/
53	16		100166							Insulator - Electric motor brake binding			2	2			2	2		03-A	125M/
53	17		100206							Washer - Binding post lock			2	2			2	2		03-A	125M/
53	18		110871							Insulator - Pole piece			6	6			6	6		03-A	125M/
53	19		110870							Insulator - Pole piece			6	6			6	6		03-A	125M/
53	20		AN960B8							Washer - Plain			2	2			2	2		04-A	128/
53	21		AN345B8							Nut - Hex			4	4			4	4		29	128/
53	22		110106							Armature Assembly - Electric motor			1	1			1	1		03-A	125M/
53	23		108133							Bearing - Ball			1	1			1	1		03-A	125M/
53	24		106980							Brush Assembly - Electric motor			6	6			6	6		03-A	125M/
53	25		88706							Shim - Laminated - motor and brake			2	2			2	2		03-A	125M/
53	26		88707							Spacer - Brake			2	2			2	2		03-A	125M/



MOTOR ASSEMBLY

FIGURE 54

FIG. NO.	INDEX NO.	STOCKED	GROUP / MAJOR ASSEMBLY / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY 05315S-D3	05315S-D4	05315S-D18	05315S-D20	05315S-D21	05315S-D22	05315S-D24	05315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
			GROUP Aircraft Accessories																		
			MAJOR ASSEMBLY Propeller Assemblies																		
54			102890-1			Motor Assembly - Power unit electric - LH									1					03-A	125M/
54			102890-2			Motor Assembly - Power unit electric - RH										1				03-A	125M/
54			108715-1			Housing Assembly - LH									1					03-A	125M/
54			108715-2			Housing Assembly - RH										1				03-A	125M/
54	2		102889			Housing - Electric motor									1	1				03-A	125M/
54			*108713-1			Winding Assembly - LH									1					03-A	125M/
54			*108713-2			Winding Assembly - RH										1				03-A	125M/
54	4		108915-1			Field Coil Complete Assembly - LH									1					03-A	125M/
54			108915-2			Field Coil Complete Assembly - RH										1				03-A	125M/
54	5		100237			Sleeve - Electric motor binding post									1	1				03-A	125M/
54	6		102891			Holder Assembly - Brush									1	1				03-A	125M/
54	7		101177			Post - Electric motor brake binding									1	1				03-A	125M/
54	8		88137			Terminal - Power unit									4	4				03-A	125M/
54	9		100191			Pole Piece - Motor brush									6	6				03-A	125M/
54	10		108711			Screw - Electric motor									6	6				03-A	125M/
54	11		100213			Screw - Pole piece									12	12				03-A	125M/
54	12		108733			Block - Brake terminal insulating									1	1				03-A	125M/
54	13		108818			Insulator - Electric motor									1	1				03-A	125M/
54	14		100168			Washer - Brake binding									2	2				03-A	125M/
54	15		100166			Insulator - Electric motor brake									2	2				03-A	125M/
54	16		100206			Washer - Binding post lock									2	2				04-A	128/
54	17		AN960B8			Washer - Plain									2	2				29	128/
54	18		AN345B8			Nut - Hex									4	4				03-A	125M/
54	19		100587			Armature Assembly - Electric motor									1	1				03-A	125M/
54	20		108133			Bearing - Ball									1	1				03-A	125M/
54	21		106980			Brush Assembly									6	6				03-A	125M/
54	22		88706			Shim - Laminated - motor and brake									2	2				03-A	125M/
54	23		88707			Spacer - Brake									2	2				03-A	125M/
55			101375-1			Brake Assembly - Diaphragm type - 12 volt				1	1			1	1					03-A	125M/
55			101375-2			Brake Assembly - Diaphragm type - 24 volt	1	1				1	1							03-A	125M/
55	1		108665-1			Housing Assembly - Magnetic brake				1	1			1	1					03-A	125M/
55			108665-2			Housing Assembly - Magnetic brake	1	1				1	1							03-A	125M/
55			102157			Disc Assembly - Movable	1	1	1	1	1	1	1	1	1	1				03-A	125M/
55	4		101886			Disc - Movable	1	1	1	1	1	1	1	1	1	1				03-A	125M/
55	5		101037			Facing - Magnetic brake	1	1	1	1	1	1	1	1	1	1				03-A	125M/
55	6		AN445D4-6			Rivet - Brazier head	8	8	8	8	8	8	8	8	8	8				29	128/



BRAKE ASSEMBLY

FIGURE 55

FIG. NO.	INDEX NO.	STOCKED	GROUP Aircraft Accessories / MAJOR ASSEMBLY Propeller Assemblies / PART NUMBER	1	2	3	4	5	6	NOMENCLATURE	UNITS PER ASSY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	PROPERTY CLASSIFICATION U. S. NAVY	U. S. ARMY	BRITISH
55	7		101754							Diaphragm Assembly - Magnetic brake	1	1	1	1	1	1	1	1		03-A	125M/
55	8		101376							Spring - Magnetic brake	6	6	6	6	6	6	6	6		03-A	125M/
55	9		101093							Key - Magnetic brake shaft	1	1	1	1	1	1	1	1		03-A	125M/
55	10		88706							Shim - Laminated - motor and brake	2	2	2	2	2	2	2	2		03-A	125M/
55	11		88707							Spacer - Magnetic brake	2	2	2	2	2	2	2	2		03-A	125M/
55	12		AN310-4							Nut - Castle	3	3	3	3	3	3	3	3		04-A	128/
55	13		110986							Washer - Brake diaphragm hold down bolt	3	3	3	3	3	3	3	3		03-A	125M/
55	14		109092							Spacer - Brake diaphragm	3	3	3	3	3	3	3	3		03-A	125M/
55	15		109093							Screw - Brake diaphragm	3	3	3	3	3	3	3	3		03-A	125M/
55	16		AN960-416L							Washer - Plain	3	3	3	3	3	3	3	3		04-A	128/
55	17		AN310-7							Nut - Castle	1	1	1	1	1	1	1	1		04-A	128/
55	18		AN960-716							Washer - Plain	1	1	1	1	1	1	1	1		04-A	128/
55	19		111488-5							Pin - Cotter	1	1	1	1	1	1	1	1		03-A	125M/
55	20		AN380C2-1							Pin - Cotter	3	3	3	3	3	3	3	3		29	128/

SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY								PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY							
		C53158-D3	C53158-D4	C53158-D18	C53158-D20	C53158-D21	C53158-D22	C53158-D24	C53158-D26			C53158-D3	C53158-D4	C53158-D18	C53158-D20	C53158-D21	C53158-D22	C53158-D24	C53158-D26
SP190	27			1						100793	41	1	1						
100166	55,57,59	2	2	2	2	2	2	2	2	100806	27	1	1	1	1	1	1	1	1
100168	57,59	4	4	2	2	2	2	2	2	100871	31	1	1	1	1	1	1	1	1
100189	57	1	1							100951	27	1	1	1	1	1	1	1	1
100191	55,57,59	6	6	6	6	6	6	6	6	100952	27	1	1	1	1	1	1	1	1
100192	55	1	1							100970	43	1	1	1	1	1	1	1	1
100206	57,59	2	2	2	2	2	2	2	2	101037	59	1	1	1	1	1	1	1	1
100213	57,59	12	12	12	12	12	12	12	12	101093	61	1	1	1	1	1	1	1	1
100222-2	43,57			1	1			1	1	101177	55,57,59	2	2	1	1	1	1	1	1
100237	57,59	2	2	1	1	1	1	1	1	101187	27	ar	ar						
100268	51	4	4	4	4	4	4	4	4	101215	39								1
100383	53	9	9	9	9	9	9	9	9	101245	27					3	3		3
100401-1	55	2	2	2	2	2	2	2	2	101259	31	1	1						
100401-3	55	1	1	1	1	1	1	1	1	101267	41	1	1						
100407	45			1	1			1	1	101282	39								1
100460	51	4	4	4	4	4	4	4	4	101296-1	51	1	1	1	1	1	1	1	1
100461	39,41	4	4	4	4	4	4	4	4	101300	53	1	1	1	1	1	1	1	1
100470	45	1	1			1	1			101316	49	1	1	1	1	1	1	1	1
100488	57	2	2							101373	49	1	1	1	1	1	1	1	1
100525	31	1	1	1	1	1	1	1	1	101375-1	43,59			1	1			1	1
100526	31	1	1	1	1	1	1	1	1	101375-2	43,45,59	1	1			1	1		
100527	31	1	1	1	1	1	1	1	1	101376	61	6	6	6	6	6	6	6	6
100528	31	1	1	1	1	1	1	1	1	*101400	53	1	1	1	1	1	1	1	1
100550	45	4	4	4	4	4	4	4	4	101401	55	1	1	1	1	1	1	1	1
100581-1	43,55	1								101406	55	1	1	1	1	1	1	1	1
100581-2	45,55		1							101407	55	1	1	1	1	1	1	1	1
100587	55,59	1	1			1	1			101413	55	4	4	4	4	4	4	4	4
100790	41	1	1							101414	55	2	2	2	2	2	2	2	2
100791	41	1	1							101415	55	3	3	3	3	3	3	3	3
100792	41	1	1							101416	55	2	2	2	2	2	2	2	2

SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY C53158-D3	C53158-D4	C53158-D18	C53158-D20	C53158-D21	C53158-D22	C53158-D24	C53158-D26
101417	49	2	2	2	2	2	2	2	2
101418	27	1	1	1	1	1	1	1	1
101420	51	1	1	1	1	1	1	1	1
101421	55	1	1	1	1	1	1	1	1
101423	49,53	1	1	1	1	1	1	1	1
101424	55	3	3	3	3	3	3	3	3
101425	43	1	1	1	1	1	1	1	1
*101428	55	1	1	1	1	1	1	1	1
101429	55	1	1	1	1	1	1	1	1
101434	55	1	1	1	1	1	1	1	1
101443	49	1	1	1	1	1	1	1	1
101477	55	1	1	1	1	1	1	1	1
101478	49,55	1	1	1	1	1	1	1	1
101484	51	4	4	4	4	4	4	4	4
101490	31,33	3	3	3	3	3	3	3	3
101490-1	31,33	3	3	3	3	3	3	3	3
101490-2	31,33	3	3	3	3	3	3	3	3
101700	35			3				3	
101702	53	1	1	1	1	1	1	1	1
101704-3	49	1				1			
101704-4	49		1	1	1		1	1	1
101705	43	1	1	1	1	1	1	1	1
101714-4	39								1
101718-1	49				3			3	
101719	27	1	1	1	1	1	1	1	1
101728	27	ar	ar	ar	ar	ar	ar	ar	ar
101735	51	2	2	2	2	2	2	2	2
101738	33,35			3	3			3	
101739-2	33,35			3	3			3	
101744	51	2	2	2	2	2	2	2	2
101754	61	1	1	1	1	1	1	1	1
101760	35				3				
*101760-1	35				3				
*101760-2	35				3				
101763	33,35			30	30			30	
101767-1	33			3				3	
101773-4	43,49				1			1	
101773-7	43,45,49	1				1			
101773-8	43,45,49		1	1			1		1
101787	37,39,41	1	1	1	1	1	1	1	1
101789	35			9	6			9	
101790	35			3	6			3	
101795	27	1	1	1	1	1	1	1	1
101811-1	31	3							
101811-2	31		3						
101812	31		3						
101814	31,33	3	3	3	3	3	3	3	3
101814-1	31,33	ar	ar	ar	ar	ar	ar	ar	ar
101814-2	31,33	ar	ar	ar	ar	ar	ar	ar	ar
101814-3	31,33	ar	ar	ar	ar	ar	ar	ar	ar
101814-4	31,33	ar	ar	ar	ar	ar	ar	ar	ar
101840	53	1	1	1	1	1	1	1	1
101841-1	43	1				1			
101841-2	43		1	1	1		1	1	1
101857-1	31	3							
101857-2	31		3						
101858-3	27	1	1						
101880-2	37								1
101880-3	39	1	1						
101880-6	41			1	1			1	

SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY								PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY							
		C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26			C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
101880-7	41					1	1			104266-2	43								1
101885	53	1	1	1	1	1	1	1	1	104269-3	27			1	1	1	1	1	1
101886	59	1	1	1	1	1	1	1	1	104335-1	33,35			3	3			3	
102157	59	1	1	1	1	1	1	1	1	104336-1	33,35			3	3			3	
102211	37,39,41	1	1	1	1	1	1	1	1	104344-2	33			3				3	
102212	37,39,41	1	1	1	1	1	1	1	1	*104344-5	33			3				3	
102213	37,39	1	1						1	*104344-6	33			6				6	
102349	43								1	*104344-7	33			3				3	
102351	51		1	1	1		1	1	1	104344-8	33			3				3	
102504-1	49	3	3	3		3	3		3	104349	27					ar	ar	ar	ar
*102572	51	1	1	1	1	1	1	1	1	104426	51	1	1	1	1	1	1	1	1
*102576	51	1	1	1	1	1	1	1	1	104525-2	35			3				3	
102600-12	43				1			1		104660	45	1	1			1	1		
102600-16	43			1					1	104662	45			1	1			1	1
102604	51	2	2	2	2	2	2	2	2	104684-2	35				3				
102826	31	3								*104684-4	35				3				
102888	45	1	1			1	1			*104684-5	35				3				
102890-1	45,59					1				*104684-6	35				6				
102890-2	45,59						1			104684-8	35				3				
102889	57,59			1	1	1	1	1	1	104685-2	35				3				
102891	57,59			1	1	1	1	1	1	*104695	53	1	1	1	1	1	1	1	1
104044-7	43	1								104758-1	41			3	3			3	
104044-8	45		1							104758-3	41					3	3		
104057	27				1			1		104835	41			3	3	3	3	3	
104095	33			3				3		104836	41			1	1	1	1	1	
*104095-1	33			3				3		104871	41			1	1	1	1	1	
*104095-2	33			3				3		104887	41			1	1			1	
104185-3	33,35			3	3			3		104888	41			1	1			1	
104233-1	35				3					104889	41			1	1			1	
104233-3	35			3				3		104890	41			1	1			1	

SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY							
		C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
104923	31			3	3		3	3	3
104927-1	31					3			
104927-2	31			3	3		3	3	3
104928-1	31					3			
104928-2	31			3	3		3	3	3
104932						3			
106632	43	1	1	1	1	1	1	1	
106648	53	1	1	1	1	1	1	1	1
106664-1	27					3			
106664-2	27						3		3
*106664-3	27					1			
*106664-4	27					1			
*106664-5	27						1		1
*106664-6	27						1		1
106794-1	43	1				1			
106794-2	43		1	1	1		1	1	
106837	53	1	1	1	1	1	1	1	1
106892	41					1	1		
106963	27								1
106980	57,59			6	6	6	6	6	6
108060	27								3
108128	55	5	5	5	5	5	5	5	5
108133	55,57,59	1	1	1	1	1	1	1	1
108328-7	45					1			
108328-8	45						1		
108355	31,33	3	3	3	3	3	3	3	3
108665-1	59			1	1			1	1
108665-2	59	1	1			1	1		
108711	57,59			6	6	6	6	6	6
*108713-1	59					1	1		
108715-1	59					1			
108715-2	59						1		
108733	57,59			1	1	1	1	1	1
108796	31,33	3	3	3	3	3	3	3	3
108797	31,33	3	3	3	3	3	3	3	3
108818	57,59			1	1	1	1	1	1
108915-1	57,59	1				1			
108915-2	57,59		1				1		
*108925	55	1	1	1	1	1	1	1	1
*108971	57			1	1			1	1
*109084	51	1	1	1	1	1	1	1	1
109092	61	3	3	3	3	3	3	3	3
109093	61	3	3	3	3	3	3	3	3
*109185	51	1	1	1	1	1	1	1	1
*109192	51	1	1	1	1	1	1	1	1
109809	51	4	4	4	4	4	4	4	4
109870	51	1	1	1	1	1	1	1	1
109871	51	1	1	1	1	1	1	1	1
109872	51		1	1	1		1	1	1
109873	51	1				1			
109874	51		1	1	1		1	1	1
109874-40.5									
-165.5	53								1
109874-44									
-203.5	53			1	1			1	
109874-55.5									
-161	53						1		
109874-55.5									
-162	53		1						
109876	51	1				1			

SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
109876-55.5									
-163.5	53					1			
109876-55.5									
-164.5	53	1							
109901-1	33,35			18	18			18	
109938-2	57			1	1			1	1
*109943-2	57			1	1			1	1
109952-2	57			1	1			1	1
110106	57			1	1			1	1
110870	57			6	6			6	6
110871	57			6	6			6	6
110986	61	3	3	3	3	3	3	3	3
111262	55	4	4	4	4	4	4	4	4
111488-1	53	2	2	2	2	2	2	2	2
111488-2	55	1	1	1	1	1	1	1	1
111488-5	61	1	1	1	1	1	1	1	1
111590-2	39,41	4	4	4	4	4	4	4	4
111668	31	2	2	2	2	2	2	2	2
*111958-1	51	1	1	1	1	1	1	1	1
112287	31			1	1	1	1	1	1
112323	31	1	1	1	1	1	1	1	1
112324	31	1	1	1	1	1	1	1	1
112374	49	9	9	9	9	9	9	9	9
112845	53	1	1	1	1	1	1	1	1
512-1c1.5									
-9	33			3					
512-1c1.5									
-15	33							3	
55737	31	3	3	3	3	3	3	3	3
55870	51	1	1	1	1	1	1	1	1
55927	31,33	3	3	3	3	3	3	3	3
55930	27	1	1	1	1	1	1	1	1
55931-2	27	2	2	2	2	2	2	2	2
55932	27	2	2	2	2	2	2	2	2
55936	43,51	1	1	1	1	1	1	1	1
55948	43	1	1	1	1	1	1	1	1
614-cc1.5-6	31		3						
615-cc1.5-6	31	3							
614-1c1.5-6	33						3		
614-1c1.5-24	33				3				
615-1c1.5-6	33					3			
652-1c1.5-6	33								3
88119	45	1	1	1	1	1	1	1	1
88126	27	6	6	6	6	6	6	6	6
88136-1	51	4	4	4	4	4	4	4	4
88137	55,57,59	4	4	4	4	4	4	4	4
88140-24	39,41	1	1	1	1	1	1	1	1
88140-25	39,41	1	1	1	1	1	1	1	1
88140-26	39,41	1	1	1	1	1	1	1	1
88140-27	39,41	1	1	1	1	1	1	1	1
*88141-2	51	1	1	1	1	1	1	1	1
88143	51	4	4	4	4	4	4	4	4
88164	53	2	2	2	2	2	2	2	2
88169	55	1	1	1	1	1	1	1	1
88255-1	37,39,41	1	1	1	1	1	1	1	1
88255-2	37,39,41	1	1	1	1	1	1	1	1
88255-3	37,39,41	1	1	1	1	1	1	1	1
88256-1	37,39,41	1	1	1	1	1	1	1	1
88256-2	37,39,41	1	1	1	1	1	1	1	1
88256-3	37,39,41	1	1	1	1	1	1	1	1

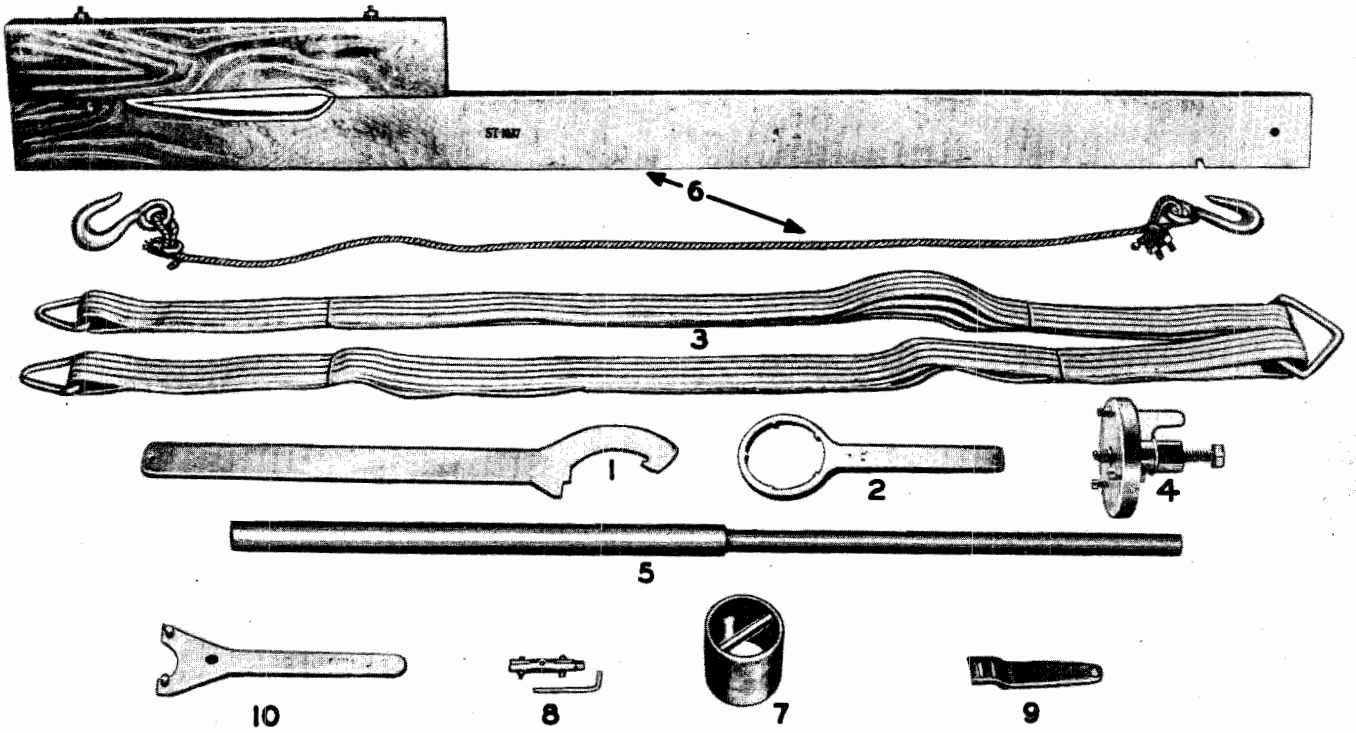
SECTION III—NUMERICAL PARTS LIST

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
88256-4	37,39,41	1	1	1	1	1	1	1	1
*88256-5	37,39,41	1	1	1	1	1	1	1	1
*88256-6	37,39,41	1	1	1	1	1	1	1	1
*88256-7	37	1	1	1	1	1	1	1	1
*88256-8	37,39,41	1	1	1	1	1	1	1	1
88257	37,39,41	1	1	1	1	1	1	1	1
88258	37,39,41	1	1	1	1	1	1	1	1
*88259	37,39,41	4	4	4	4	4	4	4	4
88260	37,39,41	6	6	6	6	6	6	6	6
88261	37,39,41	1	1	1	1	1	1	1	1
88263-4	39,41	6	6	6	6	6	6	6	6
88606-5	39,41	1	1	1	1	1	1	1	1
88606-6	39,41	1	1	1	1	1	1	1	1
88606-7	39,41	1	1	1	1	1	1	1	1
88606-8	39,41	1	1	1	1	1	1	1	1
88629	55	6	6	6	6	6	6	6	6
88654	55	6	6	6	6	6	6	6	6
*88656	55	1	1	1	1	1	1	1	1
88659	55	2	2						
88664	55	6	6						
88666	37,39	1	1						1
88692	55	1	1						
88706	55,57,59,61	4	4	4	4	4	4	4	4
88707	55,57,59,61	4	4	4	4	4	4	4	4
89107	39,41	ar	ar	ar	ar	ar	ar	ar	ar
89107-1	39,41	ar	ar	ar	ar	ar	ar	ar	ar
89144	31,33	3	3	3	3	3	3	3	3
89146	27	1	1	1	1	1	1	1	1
89295	53	1	1	1	1	1	1	1	1
89298	51	1	1	1	1	1	1	1	1

PART NUMBER	GROUP LIST PAGE NUMBERS	TOTAL QUANTITY C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
89358	51	4	4	4	4	4	4	4	4
89375	51	1	1	1	1	1	1	1	1
89487-2	31	1	1	1	1	1	1	1	1
89487-4	31	1	1	1	1	1	1	1	1
89859	27	1	1	1	1	1	1	1	1
89887	45			1	1			1	1
89897	27	1	1	1	1	1	1	1	1

SECTION IV—STANDARD PARTS LIST

PART NUMBER	NOMENCLATURE	TOTAL QUANTITY								ATTACHING QUANTITY							
		C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26	C5315S-D3	C5315S-D4	C5315S-D18	C5315S-D20	C5315S-D21	C5315S-D22	C5315S-D24	C5315S-D26
AN25-18	Bolt - Clevis			3	3			3				3	3			3	
AN310-4	Nut - Castle	3	3	3	3	3	3	3	3								
AN310-5	Nut - Castle	9	9	12	12	12	12	12	12	9	9	12	12	12	12	12	12
AN310-7	Nut - Castle	1	1	1	1	1	1	1	1								
AN320-5	Nut - Shear			3	3			3				3	3			3	
AN320-6	Nut - Shear	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AN345B8	Nut - Hex	4	4	4	4	4	4	4	4								
AN380C2-1	Pin - Cotter	3	3	3	3	3	3	3	3								
AN380C2-2	Pin - Cotter	8	8	14	14	11	11	14	11	8	8	8	8	8	8	8	8
AN380C2-3	Pin - Cotter					1	1		1								
AN392-27	Pin - FH	1	1	1	1	1	1	1	1								
AN392-39	Pin - FH	1	1	1	1	1	1	1	1								
AN392-55	Pin - FH	1	1	1	1	1	1	1	1								
AN394-33	Pin - FH					1	1		1								
AN420-3-10	Rivet - CSK hd	1	1	1	1	1	1	1	1								
AN425D3-4	Rivet - CSK hd			30	36			30									
AN425D3-6	Rivet - CSK hd			33	36			33									
AN425D3-7	Rivet - CSK hd			60	60			60									
AN430-6-10	Rivet - RH	6	6	6	6			6									
AN445D4-6	Rivet - Brazier head	8	8	8	8	8	8	8	8								
AN5-7	Bolt - Air craft					3	3		3					3	3		3
AN502-8-4	Screw - Fil hd	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AN502-8-6	Screw - Fil hd	9	9	9	9	9	9	9	9	6	6	6	6	6	6	6	6
AN502-10-6	Screw - Fil hd								6								
AN510-8-7	Screw - FH				3			3									
AN510-10-6	Screw - FH	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AN520B5-4	Screw - RH	4	4	4	4	4	4	4	4								
AN520-8-5	Screw - RH	1	1	1	1	1	1	1	1								
AN520-10-5	Screw - RH	1	1	1	1	1	1	1	1								
AN535-0-2	Screw - Drive	3	3	3	3	3	3	3	3								
AN935-6	Washer - Lock	4	4	4	4	4	4	4	4								
AN935-8L	Washer - Lock	1	1	1	1	1	1	1	1								
AN935-10L	Washer - Lock	1	1	1	1	1	1	1	1								
AN960-3	Washer - Plain			6	6			6									
AN960B8	Washer - Plain	2	2	2	2	2	2	2	2								
AN960-8	Washer - Plain	9	9	9	9	9	9	9	9	3	3	3	3	3	3	3	3
AN960-416L	Washer - Plain	3	3	3	3	3	3	3	3								
AN960-416	Washer - Plain					1	1		1								
AN960-516	Washer - Plain	18	18	24	24	24	24	24	24	18	18	18	18	18	18	18	18
AN960-616	Washer - Plain	6	6	6	6	6	6	6	6								
AN960-716	Washer - Plain	1	1	1	1	1	1	1	1								
500A10-5	Screw - Fil hd	1	1	1	1	1	1	1	1								
525-10-10	Screw - Washer head			66	66			66									
673D4-3½	Rivet - CSK hd			111	54			111									
673D4-4	Rivet - CSK hd			36	36			36									



Service Tools (C5315S-D)

1	ST 1002	Wrench - Blade nut spanner
2	ST 1011	Wrench - Motor nut
3	ST 1012	Sling - Propeller hoisting
4	ST 1015	Puller - Diaphragm brake
5	ST 1034	Bar - Propeller shaft nut
6	ST 1037	Lever - Blade torque testing
7	ST 1038	Protector - Propeller shaft thread
8	ST 1046	Wrench - Hub contact and insulator
9	ST 1077	Wrench - Blade nut spread
10	ST 1073	Holder - Diaphragm brake disk

Revised April 5, 1944