

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WAR TRAINING SERVICE
Washington

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W. R. MEDICAL FLEC

N3N-3

SERVICE BULLETINS AND ENGINEERING CHANGES

N3N-3 airplanes have recently been made available for CAA War Training Service flight training. These airplanes were originally built in the Navy Aircraft Factory at Philadelphia, Pennsylvania and have never before been used in the commercial field. Consequently, no manufacturer's service bulletins or information on engineering changes have ever been made public.

To Assure safe and efficient operation of these airplanes while being used at CAA War Training Service training centers, it is necessary that pertinent information be made available to all Maintenance Supervisors and Flight Contractors concerned.

The Maintenance Section of the Aircraft and Flight Equipment Division, by reviewing Navy Service Bulletins, Engineering Change Orders, and by personal contact with Navy personnel who' have had long experience with this type of aircraft, **has** obtained the necessary information to compile the present service bulletins and engineering changes. These will be supplemented from time to time when deemed advisable by the Washington Office. Future bulletins will be based on, and be the direct result of, reports submitted by Maintenance Supervisors and General Inspection personnel in the field.

The necessity of promptly submitting complete reports cannot be overemphasized.

Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 1

Subject: DRAINAGE OF PILOT'S SEAT

It has been reported that rainwater collects in the bottom of the pilot's seat, thereby causing wetting of the parachute pack. This situation may be remedied by drilling a 1/8 inch diameter drain hole in the bottom seat plate, located as closely as possible to the intersection of the seat bottom and back on the seat centerline. It is suggested that such work be accomplished where necessary.

Stanford J. Stelle, Chief
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CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 2

Subject: BRAKE FLUID RESERVOIR SUPPORT, BRACKET

Cracking of the strap, N3N-3, part 67708-23, in the brake fluid reservoir mounting bracket, N3N-3, part 7708-9, near the flange which fastens to the fuselage structure has been reported. It is believed the cracking was due to vibration fatigue.

If evidence of similar cracking is found during the routine checking of the subject airplanes, the present .040 gauge strap shall be replaced by a similar strap, manufactured from .064 gauge 24ST aluminum alloy material.

Stanford J. Stelle, Chief
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CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO, 3

Subject: STRENGTHENING OF WOBBLE PUMP HANDLE

This reported trouble is due to bending of the wobble pump handles on early models of N3N-3 airplanes, later models include a gusset to strengthen the handle.

In cases where bending or obvious weakness is found the stiffening gusset should be incorporated locally as shown on attached drawing.

Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

Attachment: (Drawing will be forwarded at
a later date)

I. B. Serial

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CIVIL AERONAUTICS ADMINISTRATION
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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 4

Subject: INSTALLATION OF OIL THERMOMETER

Failure of capillary tubes at the connection to the instrument case of the oil thermometers installed in the Model N3N-3 airplanes has been reported. It is believed that this trouble was due to a combination of sharp bending and tension at this point. This trouble has been reported as occurring in early Model N3N-3 airplanes only.

Oil thermometer installations in all Model N3N-3 airplanes should be inspected and measures taken to relieve tension or sharp bends if they exist in the capillary, particularly at the indicator and bulb ends of the instrument.

A Stanford J, Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 5

Subject: MODIFICATION OF TAIL WHEEL LOCK

The tail wheel assembly, part No. 67709-2, should be inspected for excess wear of the tail wheel locking-pin holes in the caster cap, part No. 67709-32, and in the locking pin housing tube, part No. 68155-3.

When the tail wheel locking pin holes in the caster cap and the locking pin housing tube of the subject model airplanes become worn in excess of .010", repairs to the tail wheel locking assembly shall be made as follows:

The locking pin hole in the tail wheel caster cap, part No. 67709-32; shall be reamed and bushed as shown and described on attached drawing of this bulletin.

The existing locking pin housing tube, part No. 68155-3 (or 67709-5), shall be removed and the holes bored and reamed to permit the use of a new housing tube of 1/8 inch larger diameter. Press fit a bushing into the new housing tube and electric weld the tubing in place as indicated on above mentioned drawing. In order to avoid distortion by heat treatment, the assembly shall not be normalized:

A Cain, U'L 1. JtZ '1'

Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

Attachment: Drawing, "Tail Wheel - Lock Modification"

STANDARD BUSHING
(NAF) 2/2146 -g-191

ELECTRIG WELD

G45TER CAP
NAF67709-32 (R)

REAM. SOL
LINE UP W/ TN BUSH
NG 110CJIN 67709 32

H-0
hw

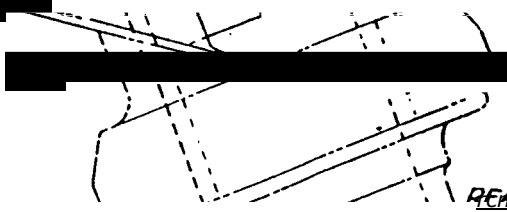
SHIN61
CAP

.TAP 10 32 NC-2

j, b) MOD / FICATIC W

CHAMFER

/ RITCHI



PRESENT 4 S1 EM6LY
OF LOCK

REAM FOR BUSHING: 2-HOUSING-LOCK

FOR BUSHING . 625 . 000 REPLACING NAF 67709 32

FINISH-11NC CHROMATE. PAINT r0 SUIT

DEPARTMEN
CIVIL AIRCRAFT
WAR TRAIN
Fa3h
Model N
TAIL SHEET
LJDI FIG

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CIVIL AERONAUTICS ADMINISTRATION,
WAR TRAINING SERVICE
Washington

December 3, 1943

N3N-3 SERVICE BULLETIN NO. 6

Subject MODIFICATION OF PORTABLE FIRE EXTINGUISHER BRACKETS

Cracking at the bend relief of the lower bracket supporting the portable fire extinguisher in the subject-model-airplanes has been reported.

It is requested that all operations check this bracket, and where not already accomplished, increase the bend reliefs from 1/8" to 5/16" to prevent occurrence of the above cracking.

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Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 7

Subject: INSPECTION OF ELEVATOR CONTROL TUBE AT
FUSELAGE FRAME NO. 16

It has been reported that the elevator control tube, Part No. 68148-4, installed on the Model N3N-3 airplanes, has been found chafed where it passes through the lightening hole of the fuselage frame No. 16 plate, Part No. 67744 11, and between the fuselage tee diagonals, Part No. 67731-35 and -36.

It is directed. that an inspection be made at the first convenient opportunity on all Model N3N-3 airplanes for similar chafing of the elevator control tube. If this condition is found, the lightening hole of the frame plate, Part No. 67744-11 shall be bumped up at the top of the hole so that, with full-up elevator, a minimum of 1/8 inch clearance.-is. maintained between the plate and the elevator control tube. he fuselage diagonals, Part No. 67731-35 and 36, shall be filed or cut to a similar clearance when the elevator control tube is nearest these members. If the cut in either diagonal member is greater than 1/8 inch, it shall be reinforced for a distance of 3 inches on each side of the centerline of the cut with an aluminum alloy extruded angle, approximately 3/32" x 11/16" x 7/8" modified to nest in the fuselage "T" section diagonal. If extruded angle stock is not available, the reinforcing part may be made from equivalent bent-up sheet stock. The reinforcement shall be installed on the outboard side of the presser diagonals, with eight (8) 1/8" diameter rivets per reinforcement and equally spaced.

Stanford J. Stelle, Chief
Aircraft and Flight Equipment
CAA War Training

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 8

Subject: INSPECTION AND REPAIR OF ENGINE MOUNT ASSEMBLY

Several Model N3N-3 airplane engine mount rings have failed at the upper front welded joint.

It is directed that an inspection be made at the first convenient opportunity of all Model N3N-3 airplane engine mount rings for cracks or incipient failures. This inspection can be accomplished by the magnaflux method if equipment is available or by careful visual inspection if it is not.

If cracks are found in a section of the mounting ring, the section where the crack is located shall be cut out and replaced by a new piece of 4130 steel tubing of the same gage. This new section shall be attached to the original mounting ring by means of splices, a typical example of which is shown as -2 on the attached drawing.

In removing the old ring, extreme care shall be exercised so that the support tubes and gussets will not be damaged. Old weld material along points to be rewelded shall be ground off, taking care that the original thickness of material is not reduced. It is desirable that the remainder of the old weld material be preheated by the torch before welding.

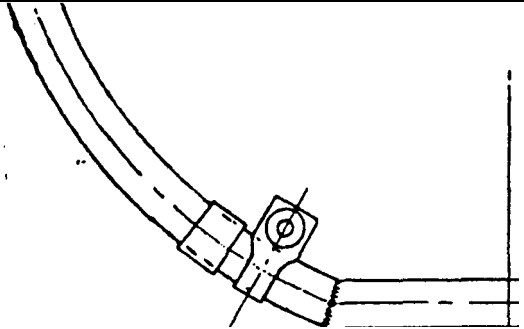
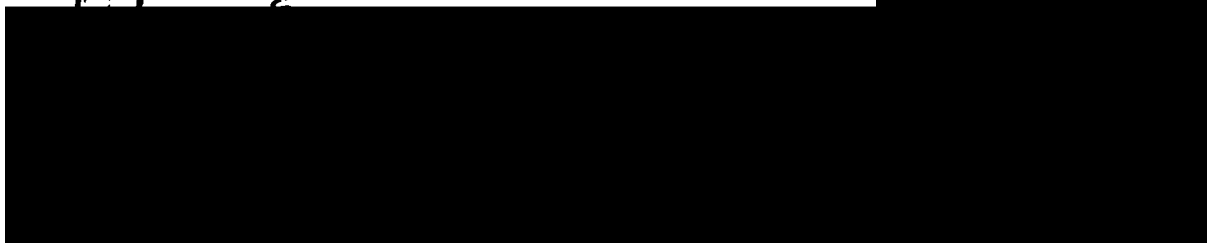
At the joints where wrapper gussets are used to fasten support tubes to the ring, slightly longer and wider wrapper plates shall be used so that the major portion of the new weld will be on virgin metal.

No heat-treatment is considered necessary subsequent to any of the above welding operations, inasmuch as none was given to the original mount. Usual finishing procedure shall be employed after all work is completed.

It is also directed that the .049" steel engine mount ring be replaced with .058", 4130 steel ring after three welding repairs such as described above have been made, or when it is considered desirable.

Stanford J. Stelle, Chief
Aircraft and flight Equipment Division
CAA War Training Service

Attachment: Drawing, "Engine Mount Ring (Method of Repair)"



- I I NSTALLAT ION - 1 C TYP I CAL

WELD

WELD



JOINT

.065 .11 O. D. - 4" LONG
4130 STEEL TUBE

-2 FI SH - MOUTH SPLICE



DP. PARMENT OF COERCE
CIVIL AERONAUTICS AWNSTTATION
lift R MINING SERVICE
Washington

Model N3N-3

ENGINE MOUNT RING
(Method of Repair)

DEPARTMENT OF COMMERCE
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Washington

December 3, 1943

N3N-3 SERVICE BULLETIN NO. 9

Subject: INSPECTION AND REPLACEMENT OF LANDING GEAR - TIE ROD
UPPER BOLT

It has been reported that failure, wear, or incipient shear has occurred in the landing gear tie rod upper attaching bolt, 1,N6-33, which is installed through the landing gear tie rod fitting, Part No. 310741-7, and the landing gear attaching fitting, Part No. 67736-9LH, -10 R.H. (Refer to Page 42 of the Model N3N-3 "Erection and Maintenance Instruction Manual".)

It is directed that an inspection be made at the next and each successive 100 hour inspection check for indication of the above described unsatisfactory conditions. All bolts showing signs of failure, as indicated by incipient cracks, excessive wear, or other surface defects shall be replaced.

However, all the subject bolts, regardless of their condition, shall be replaced after every 400 hours of operation.

It is permissible to replace the 3/8" bolts with 7/16" bolts when deemed advisable. Tie rod bolts should be kept very snug at all times..

Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

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WAR TRAINING SERVICE

I. B. Serial No. 71

December 3, 1943

N3N-3 SERVICE BULLETIN NO: 10

Subject: INSPECTION OF LANDING GEAR - SHOCK STRUT SPRING

It has been reported that the landing gear shock strut springs, Part No: 214431-1, of the Model N3N-3 airplanes have been found broken at the ends and that this condition caused scoring of the plunger, Part No. 21.4430-1, and the inner walls of the oleo strut. The subject springs, when tested, retained a permanent **set** up to 1/32" while holding test loads between 1300 and 1500 Pounds.

It is directed that an inspection for similar unsatisfactory condition's be made at the next major overhaul. All springs found to be necessary shall be modified and tested before installing as follows:

- (a) The spring ends shall be rounded off.
- (b) The spring shall have a free length of 9-13/16" +1/8" - 1/16" and a maximum solid height equal to 6-15/16" + 0" - 1/4"
- (c) The springs shall be tested to a load at compressed length equal to 1700 pound -1- 100 pounds at a rate
- (d) The springs may retain a permanent setup to 1/16".

Replacement springs not conforming to the above requirements shall not be installed.

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December 3, 1943

N311-3 SERVICE BULLETIN NO. 11

Subject: INSPECTION OF FUSELAGE FRAME NO. 2 - LOWER ANGLE

It has been reported that the fuselage frame No. 2, lower cross member angle, 67737-4, has been found buckled due to excessive compression loads caused by hard landings on various Model N3N-3 airplanes.

It is directed that an inspection be made at the first convenient opportunity for the condition reported above for any indications of incipient column failure.

Stanford J. Stelle, Chief
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CAA War Training Service

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I. B. Serial No. 71

December 3, 1943

N3N-3 SERVICE BULLETIN NO. 12

Subject: SECURING OF PORTABLE FIRE

It has been reported that a portable fire extinguisher in a Model N3N-3 airplane became detached from its bracket during take-off and jammed behind the right rudder pedal. While attempting to dislodge the extinguisher, the pilot lost control and the airplane crashed. Investigation disclosed that the toggle action was not sufficiently positive as a retainer to prevent the strap from opening under the inertia forces developed when the airplane hit a hard bump on the ground.

Later portable fire extinguisher brackets for the subject model airplanes incorporate a spring **device** which automatically compensates for wear or compression of the gasket material, and which provides a positive toggle action. Another feature incorporated in the later bracket is an adjustment which provides for variations in the diameter of the cylinder neck and is locked bar means of a set screw. It has been determined that the bracket assembly was not of this later type, and it is considered that the trouble would not have occurred if the improvements had been incorporated.

It is directed that all Model N3N-3 airplanes be inspected to determine whether the portable fire extinguisher bracket is of this later design. In the event that such inspection discloses the bracket to be of an earlier type, a practical means of securing the extinguisher is as follows: a #55 hole should be drilled in the end of the toggle strap and the strap should be lashed to the bracket by means of a single strand of soft annealed copper wire. The use of a fabric sleeve on the wire to prevent chafing is recommended. For operation, the wire will break away when reasonable finger pressure is exerted on the toggle strap.

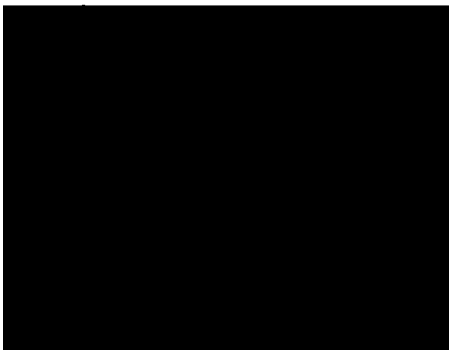
Drawings of both the early and later types of portable fire extinguisher brackets are attached for information and to assist in identification.

Attention is invited to the later type bracket wherein a set screw is provided for the purpose of locking the adjustment for the diameter of the cylinder neck. Care should be taken that the adjustment is tightened sufficiently to provide adequate tension on the spring device, and that the set screw is tightly drawn up to prevent movement of the adjustment.

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Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

Attachment: Drawing, "Fire Extinguisher (Portable) Securing".

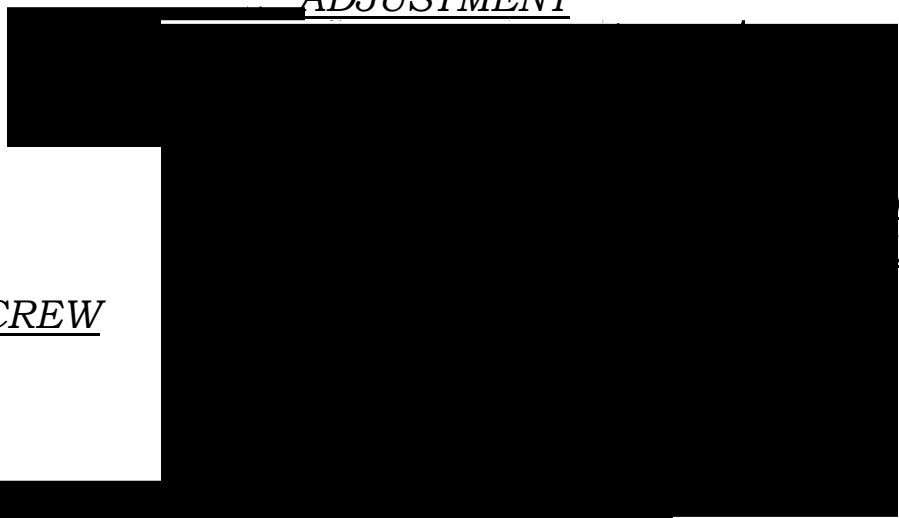


- CYLINDER NECK
CROSS SECTION



EARLY TYPE

ADJUSTMENT



CYLINDER NECK
CROSS SECTION

SET SCREW



FIG. 2.
LATER TYPE

COMMERCE
REGISTRATION
WAR TRAINING SERVICE
Washington

Model N3N-3
EXTINGUISHER (Portable)-SECURING



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I. B. Serial No. 71

December 3, 1943

N3N-3 SERVICE BULLETIN NO. 13

Subject: INSTRUCTIONS REGARDING **THE** USE OF ENGINES AND PROPELLERS

It is directed that the propeller Pitch on the subject airplanes equipped with R-760-2, -4, and -8 engines be set to 13.5 degrees at the 42" station for 9' diameter propellers and to 14.6 degrees for 8'6" diameter propellers.

Tests conducted at the Naval Aircraft Factory with an N3N-3 airplane indicate that the most satisfactory engine operating conditions are obtained with the above pitch settings when the speed of the engine **is** kept within the range between 1680 and 1800 RPM. It is therefore recommended that cruising be normally accomplished at an engine speed within this range.

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Stanford J. Stelle, Chief
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I. B. Serial No. 71

December 3, 1943


N3N-3 SERVICE BULLETTIN NO.14

Subject: CARBURETOR HEAT

N3N-3 airplanes as received from the Navy for use on CAA War Training Service programs. have presented a problem because of the fact that solo flying. should be done from the rear seat and carburetor heat controls axe accessible only in the front cockpit.

A method. suggested to correct this condition is to utilize the spark control which now is installed and not being used. This spark control is not part of the throttle and mixture control quadrant, but IS a separate push-pull rod extending from in front of the fire wall to the rear cockpit with knobs in each cockpit. To utilize this control for carburetor heat control it is only necessary to make up a bell crank and supporting bracket to be mounted on the fire wall attaching one lever to the control rod and the other lever to the original control wire after cutting it to the proper length (see attached sketch).

The knobs which are now marked with an S will have to be reworked and proper placards installed in each cockpit.



Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

Attachment : Drawing on Subject

6-32 FIBER NUT

0::1

DETAIL

1/4" SAE HEAD FACED
TO 1/16"

1-A

h

1/4" SAE BOLT

BRAZE

NOW INS
ON AIRPLANE

JEMk

R V^L Vii

BRAZE

16 GAUGE STOCK

FRONT

REA

COCKPIT

RIC WALL

SQUARX PLATE

(This plate required because
fire wall is not sufficiently,
rigid.)

D>Pt:RTAMT OF Qa80.AaC\$
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Model N3N-3

CONYactSIUN OF SP.UtiC COI~7hOL TO
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December 3, 1943


N3N-3. SERVICE BULLETIN NO. 15

Subject: INSPECTION OF INTER - AILERON STRUT ADJUSTING SCREW

Some cases of breakage of the inter-aileron strut adjustment screw have been reported. This breakage occurs in the threaded portion in the vicinity of the locking nut.

It is requested that at each 100 hr. inspection the locking-nut be run down and the threads carefully inspected.

Line crew men and helpers should be warned against pushing on the strut in moving the airplane in or out of the hangar; and when the airplane is tied out, ailerons are to be locked to prevent flopping in the wind.


Stanford J. Stelle, Chef
Aircraft and Flight Equipment Division
CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETINS NO. 16

Subject: OIL TO BE USED IN SHOCK STRUTS AND BRAKES

To clear uncertainties regarding the proper oils to be used in oleo struts and brakes, the following is submitted..

Oleo shock absorbers are of the spring oil type normally using 10 lbs. of air pressure, however, air pressure may be disregarded as long experience by the Navy has shown that the air-pressure is not necessary and need not be used. The seals are made of synthetic rubber packings and only mineral oils should be used. The following are considered satisfactory: Sitnava No. 9, Mobile SSJ Univus. No. .40, Sperry Servo and Refrigerator Oil.. It is not advisable to mix. two or more oils. To flush or clean mineral oil systems use kerosene or naphtha

Brake systems have. natural rubber seals and mineral oils should not be used. The following fluids are considered satisfactory; Lockheed 4-5-z1. AC-3586 or alcohol and castor oil mixed as follows : 50% alcohol and 50,%' castor oil for summer operation and 70;8 alcohol and 30% castor oil for winter operation. Brake fluids of different compositions should not be mixed. To flush systems, or clean parts, use one part toluene or benzene and one part dope thinner.

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Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

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December 3, 1943

N3N-3 SERVICE BULLETIN NO. 17

Subject: SUGGESTIONS FOR WINTER

In very cold temperatures, the engine will require warmth before starting and under no circumstances should the starter be engaged without first pulling the propeller through by hand three or four revolutions. This will prime the cylinders and assure that the engine is free to turn when the starter is engaged. Care should be taken in turning the engine if it has not been run for some time, since the lower cylinders may be loaded with oil or the lower rocker boxes *may* have ice in them due to condensation and freezing, thereby resulting in serious damage to the engine.

If the starter is engaged without first freeing the engine, it may result in a twisted or broken starter shaft, necessitating extensive repairs. As an additional precaution, starter clutches should be adjusted to 350 foot lbs. instead of the customary 450 foot lbs. For winter operation, the starter may be lubricated; with refrigerator oil.

Measures should be taken to insure engines running at recommended temperatures. This may be accomplished by lagging the oil tank and oil lines. Felt covers may be provided for the tanks and it is recommended that asbestos tape coated with waterglass be used on the lines.

Baffling of the nose section of the engine will raise the carburetor air temperature 80 to 100 centigrade. A drawing showing specifications for this accessory is attached. Too large a baffle on the nose may result in a burned out exhaust collector ring, so the dimensions shown should be closely adhered to.

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Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

Attachment: Drawing, "Front Baffle for Winter Operation"

SPOT WELD, TACK OR RIVET
AT 8 POINTS

$2\frac{3}{4}''$

120°

ASSEMBLY
SCALE: HALF SIZE

.040 SHEET METAL
(1025)

DETAIL of LUG

MATERIAL: .081 FLAT STOCK (1025)
SCALE: FULL SIZE

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FEDERAL AERONAUTICS ADMINISTRATION
WAR TRAINING SERVICE
Washington

Model N3N-3

*Front Baffle for
Winter Operation*

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CIVIL AERONAUTICS ADMINISTRATION
WAR TRAINING SERVICE
Washington

I. B. Serial No. 71

December 3, 1943

N3N-3 SERVICE BULLETIN NO.18

The following are pertinent points to check when conducting 25 and
100-hour

25 HOUR INSPECTION

Fuselage

1. Remove and clean all removable cowling.
2. Inspect all metal and fabric covering.
3. Inspect structure for cracks, bends, loose rivets, etc.,
4. Inspect fire extinguisher equipment—and CO2 charge.
5. Inspect control column assembly for freedom of movement,
lost motion and security.
6. Inspect rudder, pedal assembly and cables.
7. Inspect safety belt and fastenings;
8. Inspect tail wheel oleo strut assembly and locking device.
9. Inspect elevator tab for freedom of movement, looseness
and synchronization with indicator.
10. Clean all interior structure spaces.
11. Inspect windshields for cracks, and
cleanliness.

Wings

1. Inspect covering for damage, buckled ribs and damaged
end bows.
2. Inspect inter-plane struts and wires for bends, cracks,
3. Inspect wood wire stiffeners for cracks and loose
4. screws, .
- Inspect aileron hinges, horns, tabs and push-pull rods

Tail

1. Inspect covering for damage, buckled ribs and deformed
edges.
2. Inspect struts for bends cracks and security.
3. Inspect stabilizer and fin attachment fittings for

Landing Gear

- 1: Check landing, gear struts. for oil and air.
- 2: Check all fittings and bushings on shock strut for
wear.
3. Check wheel rims for cracks and inspect tires.

Lubrication

1. Grease wobble pump linkage and starter cranking shaft.
2. Clean and oil adjustable seat slides.
3. Grease and oil rudder Pedal assembly.

Fuel System

1. Drain and clean main fuel line strainer.
2. Drain carburetor bowl and quantity of fuel from fuel tank sump.
3. Inspect all fuel lines, primer pump and **connection for** sharp bends, cracks, leaks and security with pressure up.
4. Inspect fuel tank and selector valve for leaks and security.
5. Inspect hand fuel pump and linkage for leaks, security and proper pressure. (3-4 pounds.)
6. Inspect fuel quantity gages for proper functioning.
7. Inspect fuel and oil tank covers.

Propeller

1. Inspect blades for **p**its, cracks and nicks. Dress blades if necessary and track.
2. Inspect hubs for cracks, tightness and proper safetying.
3. Wipe down blades and cover with light film of oil.


Engine

1. Clean out rocker boxes, clean and oil felts, reset valve clearance and. grease. (R-760-2-4)
2. Check rocker box cover nuts.
3. Inspect push rod housings for oil tightness.
4. Inspect air scoops and collector ring for cracks and
5. Inspect carburetor for loose parts and leaky gaskets. Oil moving parts.
6. Remove and clean air maze and reinstall with light film of oil. See that drain pipe is open.
7. Drain condensation from bottom of oil tank.
8. Inspect oil tank and oil lines for leaks and security.
9. Turn oil cuno, drain and flush. (R-760)
Remove and clean. (R-680)
10. Drain oil sump and clean strainer.
11. Inspect engine mounts for cracks, distortion and loose bolts.
12. Inspect power plant control link rods and check operation.
Remove any lost motion. Oil.
13. Inspect all ignition harness, switch and wires. T.O. 28-40
14. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
15. Clean down engine with Jenny if necessary.

.100 HOUR INSPECTION
In addition to-the 25 hour

1. Install new or rebuilt spark plugs
2. Test engine mount bolts and cylinder hold-down nuts.
3. Remove, reinstall; and adjust push rods and rocker arms on manually greased rocker Arms.
4. Remove oil tank screen.
5. Remove propeller, inspect engine shaft cone and spacer for cracks and galling. _ .

6. Pull wheels and tires; check for cracks both inside and .but; inspect brakes; repack bearings with grease.
7. Pull upper bolts on tie rod lugs: (Refer to Service Bulletin #-9)
8. Drain oil, flush tank, and refill:

Stanford J. Stelle


Stanford J. Stelle, Chief
Aircraft and Flight Equipment
Division

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS
ADMINISTRATION
WAR TRAINING SERVICE

December 3, 1943

N3N-3 SERVICE BULLETIN NO. 19

Subject: TIES TO REPLACE REMOVABLE PANELS WHILE RECOVERING
OR DOPING FUSELAGE

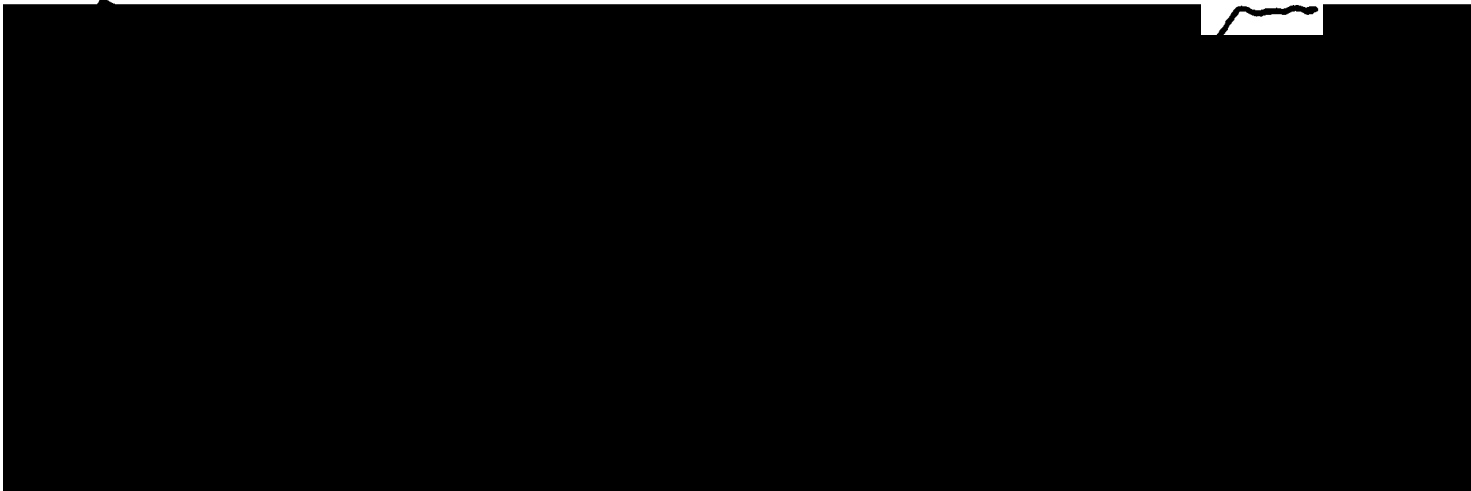
When it is necessary to remove the metal panels from the side of the fuselage for the purpose of recovering or doping the fabric, it is essential that ties be used to hold the proper spacing of the fasteners, otherwise the pull of the fabric will distort the attachments to such an extent that the panels cannot be replaced.

The attached sketch illustrates an adjustable tie made up of a turnbuckle and two hooks which has proved satisfactory.

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Stanford J. Stelle, Chief
Aircraft and Flight Equipment
Division
CAL War Training Service

Attachment: Drawing on Subject



TIES NEEDED AT THESE POINTS TO
HOLD ORIGINAL SPACING

DETAIL OF TIE



DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS DIVISION
WAR TRAINING SERVICE
Washington

Model N3N-3

Tzrs TO RbPiAcs nrovAai.E rAxr
WHILE UMF ,mPDTG FTJSELr

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION

I.,B. Serial No. 126
(To be attached by field
Personnel to I, .B,
Serial No 71

previous
;

WAR TRAINING SERVICE

forwarded)

N3N-3 SERVICE BULLETIN NO.

Subject: Cracking and Reinforcement of 30 x.5 Bendix Wheels (M-3)

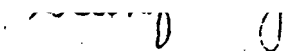
Information reaching this office indicates that the 30 x 5 Bendix wheels used on N3N-3 airplanes are subject to cracking; therefore, it is essential that after each 100 hours of operation, the tires be removed and rims be inspected very carefully for this condition. The cracks usually extend from the drop center portion of the rim in an outward direction; they are found at the valve stem hole and directly opposite at the splice plate.

It is desirable to reinforce any cracked wheels at once; however, on a basis of service experience, it appears satisfactory to temporarily operate a wheel of this type with not more than four cracks, none of which may have a developed length of more than 2 inches. A 1/16 inch hole must be drilled at each extremity of all cracks and 50 hour inspections are mandatory thereafter.

In the event that subsequent inspections reveal more than four cracks or that cracks are extending beyond the drilled holes, the wheels must be removed from service at once, reinforced as follows:

- (a) Rim cracks shall not be in excess of 22" developed length
- (b) The wheels shall be in otherwise serviceable condition, insofar as discs, drums, and rim surfaces are concerned .
- (c) Drill a 1/16" diameter hole at each extremity of all cracks
- (d) Replace the present rim splice plate with plate of material and dimensions shown on attached drawings
- (e) Replace the present reinforcing plate at the valve stem hole with a new plate similar to plates shown on drawings
- (f) Plates installed must be of proper size and in proper relation to each other so wheel balance may be maintained

All wheels on which the above repair has been accomplished shall be inspected at each 50 hour check thereafter to assure that cracks have not progressed beyond the drilled holes.


Stanford J. Stella, Chief.
Aircraft and Flight Equipment
Division

Attachment: Drawing on Subject
S-2316



r--REINFORCEMENT

NATERIAL FOR REINFORCEMENT

OSi ALUMINUM ALLOY ~ SPfC.
47A3. - N EAT., TRJ~AT AFTER
FORMING: ~

EACH REINFORCEMENT 2.
MUST BE PROPERLY.
COUNTERBALANCED

NO LESS THAN 4 RIVETS
IN EACH REINFORCEMENT
PIECE, OUTSIDE OF CONTACT-

ORILL t/16 D
Ar ExrREMITTY

FOR RIVETS, OIL - RI-M-2862 REINFORCEMENT.
5/32" DIAMETER AND COUNTERSINK RIM 5/16" O.D. METER
. X-QO' ASSEMBLE WITH 5 3/8" O.D. ALUMINUM ALLOY
RIVETS AND .430 D5~.5, PEENING THE RIVETS INTO THE
RIM COUNTERSINK;

DRAWING NO.

Ex- 10036A

j8D382~~

SEE ALSO F.~C° 10037A

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aan.

1(od*1 N3N-3

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11NIB11;MEMO,30

GES

REINFORCEMENT
w'; • CUT FROM RIM

LENGTH AS REQUIRED

ALTERNATE REINFORCEMENT ~ PLATE . (TO THAT SHOWN
K -10036 A) MAY BE MANUFACTURED FROM A SECTION

THE RIM OF A DISCARDED WHEEL THIS PLATE
BE KE ANNEALED. AND WORKED TO FIT THE RIMMER,
WHEN SHAPING IS IN PROCESS. THE ASSEMBLY
BE MELD- TOGETHER . TEMPORARILY. -WITH SOLTS.

OW EX- 1003bA FOR DETAILS.

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
NO. 1

EX- 1003(A

U8 TR11M0 S88VIC8
Rashiaøton

Model N3N-3

MNY09CEMT ~
LANDING WHEEL, 30 X

January 4, 1944

N3N-3 SERVICE BULLETIN NO. 21


Subject: Method of Installing Double trap Safety Wire on Swaged-End Type
Turnbuckles

Safety Wire



Attachment of Safety fire to Swaged Turnbuckle:

When a swaged terminal is being safetied, one wire shall be passed through the hole provided for this purpose in the terminal, looped over the free end of the other wire and both ends shall then be wrapped around the shank as shown in the above sketch.

Stanford J. Stelle

Stanford J. Stelle, Chief
Aircraft and Flight Equipment Division
CAA War Training Service

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
CAA WAR TRAINING SERVICE
Kansas City, Missouri

February 11, 1944

To: All CAA WTS Flight Contractors Using Navy N3N-3
Airplanes

From: Superintendent, CAA War Training Service

Subject: N3N-3 Airplane Engines

Navy R-760 engines are now available for replacement in Navy N3N-3 type airplanes. These engines are in the Kansas City Warehouse and should be ordered on the Form ACA-1280 CAA-WTS Warehouse Order.

The certification on the bottom of the order should be changed in this manner: Delete the sentence reading, "The Government is authorized to deduct from any monies otherwise due the undersigned flight contractor under contracts between the Government and the undersigned flight contractor the price of such parts above set forth, upon shipment of such parts to the undersigned flight contractor," and the following inserted: "This (or these) engine (s) is to be receipted for on Form ACA-1265, Acceptance of Airplane, Engine or Components of Equipment by Licensee from the Government, for inclusion on the Revocable License."

The Form ACA-1280, CAA-TITS Warehouse Order, should be sent to the Regional Office, Attention Assistant Superintendent, and not to the Warehouse.

Any operator in need of replacement engines is urged to order at once.

L. B. Littrell

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
CAA WAR TRAINING SERVICE
Kansas City, Missouri

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a, ~ 1

December 24, 1943

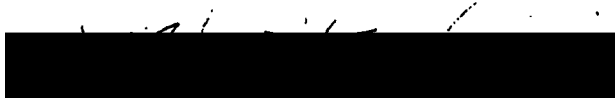
To: All CAA War Training Service Flight Contractors
All CAA 1-ITS Aircraft Maintenance Supervisors

From: Superintendent, CAA War Training Service

Subject: Operation and Service Recommendations for N3N-3
Airplanes

Attached is Operation and Service Instructions for Navy N3N
airplanes. These instructions were written in lieu' of
regular service manuals which are not available at this
time, but which will be sent to all flight contractors when
received.

Careful perusal of the Operation and Service Instructions
will help in the maintenance of these Navy Aircraft assigned
to your operation.


L. B. Littrell

Attachment

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
CAA WAR TRAINING SERVICE
Kansas City, Missouri

OPERATION AND SERVICE RECOMENDATIONS FOR N3N-3 AIRPLANES

At the time of transfer of the subject airplanes to CAA War Training Service by the Navy, there were no Operation and Service Manuals available for distribution to the contractors to which the airplanes were assigned. However, through discussion with Navy personnel experienced in the maintenance and operation of this type of equipment, the following recommendations and suggestions are set forth with the request that they be given close attention until such time as more complete information is available.

Oil Pressure: If a loss of oil pressure is noted, it is probably due to a galdded and pitted pressure relief valve seat caused by grit or sand in the oil-supply. Make certain that all servicing containers are kept covered in a protected place.

Cranking: Experience has proven that too rapid acceleration of the starter results in starter gear failure particularly in cold weather. Therefore, advise mechanics to refrain from using too much "beef" during the first few revolutions of the crank.

Engine Mounts: It is essential that thorough and frequent inspections of the engine mount be made. Cracks sometimes occur adjacent to the mounting lugs at the firewall and at the engine mounting lugs. Cracks also are sometimes found near the large gussetts on either side.

Aileron Push-Pull Strut: The threaded aileron adjustment screw in the lower end of the aileron push-pull strut has been known to crack, at the jam nut. Excessive tightening of the jam nut has probably contributed to this failure.

Wheels: Repeated hard landings with improperly inflated tires sometimes result in the wheels cracking across the rim. It is recommended that the tires be removed from the wheels at each 100 hour check to inspect for this condition. Forty-eight to fifty pounds of air in the tires will be beneficial in minimizing this type of failure.

Brakes: The brake clearance should be adjusted to .010 and if being operated at freezing temperature with considerable moisture the clearance should be slightly greater.

Tail Wheel: A frequent check of the tail wheel assembly is recommended with complete disassembly of the bearings and repacking when necessary. The type of field from which

Carburetor Accelerating Pump: The carburetor accelerating pump should be lubricated with fuel resistive grease every twenty-five hours, or difficulty will be experienced with worn piston parts.

Fuel Pump Drain: On some N3N-3 airplanes, the fuel drain from the fuel pump is vented outside of the cowling on the right side of the fuselage, If any installation of this description is found on any airplane, it should be immediately rerouted to the left side of the fuselage; as the original installation is a fire hazard. A zerk fitting is provided on the fuel pump drive housing; and fuel resistive grease should be used every twenty-five hours.

Condensation of Moisture in Rocker Boxes: When operating an engine in freezing temperature or below freezing temperature, it will be noted that a great deal of condensation will be present in the rocker boxes of the lower cylinder, especially when the engine is allowed to idle for extensive periods. In freezing weather, when the airplanes are tied out, the lower rocker boxes should be loosened to allow this excessive moisture to escape. If this is not done, upon starting the engine, the frozen deposits will secure the rocker arm, causing the pushrod to become damaged.

Fuselage Frame Failures: Upon inspecting the fuselage on regular inspections, particular attention should be paid to the #2 frame (first one aft fire wall) as all loads transmitted from the landing gear arc absorbed by this frame. Any bending of members will be noted by buckling of the flooring in the front cockpit.

Recovering of Fuselage: When it becomes necessary to recover the fuselage; spacer 'hooks should be installed on the inspection plate frame of the fuselage. If this is not accomplished, the shrinking action of the fabric being installed will have a tendency to distort this frame.

Rudder Cables: If rudder cables are rigged too tight, they have a tendency to wear rapidly, as they come in contact with the fuselage station.

Hydrostatic Fuel Gauges: If the instrument operates properly, one stroke of the air pump located on, the instrument panel should rotate the pointer past full position, then gradually settle down to one position, this position indicating the amount of fuel in the tank. The instrument will read correctly for approximately two minutes and then recede to zero. Before attempting any repairs on the instrument, or its system, the manufacturer's instructions should be consulted, as the instrument can be damaged beyond repair if not properly tested.

Pitot and Static Tubes: The pitot and static tubing on airplanes being tied down outside, should be covered, as moisture will enter those tubes and cause malfunctioning of the instruments. A drain is provided in each adjacent to the entrance of the fuselage.

Electric Tachometers: When encountering difficulty with electric tachometers, ascertain that all electric connections have good electric contact at the generator, which is installed in the engine compartment, and the instrument, as this is a frequent source of trouble. In some cases, the electric generator has a tendency to load up with oil. This condition does not harm the generator operation,, but does indicate that the oil seal at the engine tachometer takeoff is either installed, improperly or excessively worn.

Hydraulic Systems: The landing gear oleos have synthetic rubber seals and mineral base oils should be used in those units. The brake system should be filled with a castor or a vegetable base oil, as oil seals are natural rubber. For cleaning hydraulic systems using castor oil or vegetable oil base, use one part of toluene or benzine and one part dope or lacquer thinner. For cleaning systems using mineral base oils use kerosene or naptha.

Starting Procedure: It is suggested that the following stops be followed in starting the engines installed in N3N-3 airplanes:

1. Switch off, pull propeller through a few times.
2. Place fuel valve in "on" position.
3. Place carburetor heater control in "cold" position.
4. Place mixture control in full "rich" position.
5. Crack throttle. Operate wobble pump until fuel
6. pressure roaches normal, and prime approximately six strokes.
7. Energize and engage starter.
8. After engine starts advance throttle to desired warm-up speed.

Stopping Procedure: It is suggested that the following steps be taken in stopping the engines installed in 11311-3 airplanes:

1. With engine idling at about 800 R.P.M. bring the mixture control to full "lean" position.
2. After the engine has ceased firing move the ignition switch to "off" position.

If it is found that the above procedure does not satisfactorily stop the engine, it is recommended that the following steps be taken:

1. Throttle the engine to full idling position.
2. Mixture at full "rich"
3. Close fuel valve and open throttle slowly to .800 R. P. M.
4. When fuel pressure drops to zero, wait a few seconds and then turn ignition switch to the "off" position, at the same time moving the throttle slowly to the full "open" position. After the engine has stopped, turn the fuel valve to the, "on", and operate the wobble pump until pressure is obtained.

SUGGESTED INSPECTIONS OF

25 HOUR

FUSELAGE

1. Remove and clean all removable cowling. Inspect all metal and fabric covering. Inspect structure for cracks, bends, (particular attention to be paid to fuselage second frame) end loose rivets etc. Inspect fire extinguisher equipment and CO2 charge-weigh CO2 bottles every six months..
- 2.
- 3.
- 4.
- 5.. Inspect control column assembly for freedom of movement, lost motion and security.
6. Inspect rudder pedal assembly and cables.
7. Inspect safety belt and fastening. Ascertain if safety belt buckle has safety snap.
8. Inspect tail wheel oleo strut assembly and locking device.
9. Inspect elevator tab for freedom of movement, looseness and synchronization with indicator.
10. Clean all interior structure spaces.
11. Inspect windshields for cracks and cleanliness.

WING

- 1: Inspect covering for damage, buckled ribs and damaged end bows.
2. Inspect inter-plane struts and wires for bends, cracks end security of fitting.
3. Inspect wood wire stiffeners for cranks and loose screws.
4. Inspect aileron hinges, horns, tabs and push-pull rods for security.

ENGINE

- Clean out rocker boxes, clean and oil felts, reset valve clearance and grease, (R-760-2-4) on manually lubricated rocker boxes.
2. Chock rocker box cover nuts.
 3. Inspect push rod housings for oil tightness.
 3. Inspect air scoopes and collector ring for cracks and security. Inspect carburetor for loose parts, leaky gaskets, oil moving parts and grease accelerating pump with fuel resistive grease.
 5. Remove and clean air maze and reinstall with light film of oil. See that drain pipe is open. Drain condensation from bottom of oil tank.
 8. Inspect oil tank end oil lines for leaks and security. Turn oil cone, drain and flush. Remove and clean. Drain oil sump and clean strainer. Inspect engine mounts for cracks, distortion and loose bolts. Inspect power plant link rods such as carburetor control and crock operation. Remove any lost motion. Inspect all ignition harness, switch and wires.
 10. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
 11. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
 12. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
 13. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
 14. Inspect magnetos, carburetor, starter, oil and fuel pumps and tachometer drive for security of mounting.
 15. Clean down engine.

100 HOUR CHECK

1. In addition to 25 hour check install new or rebuilt spark plugs.
2. Test engine mount bolts and cylinder hold down nuts.
3. Remove, reinstall and adjust push rods and rocker arms on manually greased rocker arms.
4. Remove oil tank screen end engine oil scavenger screen. Note deposits and clean. Remove propeller, inspect engine shaft cone and spacer for cracks and galling.
6. Pull wheels and tires. Chock for cracks. Repack bearings with grease.
7. Pull upper bolts on tie rod lugs.
8. Drain oil, flush tank and refill.

EMPENAGE

1. Inspect covering for damage, buckled ribs and deformed edges.
2. Inspect struts for bends, cracks and security. Inspect stabilizer and fin attachment fittings for security.
4. Inspect rudder and elevator hinges, horns and tabs for cracks.

LANDING GEAR

1. Check landing gear struts for oil.
2. Chock all fittings and bushings on shock strut for wear.
3. Check wheel rims for cracks and- inspect tires.
4. Check tie rod tension and tie rod bolts.

LUBRICATION

1. Grease wobble pump linkage and starter cranking shaft.
2. Clean end oil adjustable seat slides and inspect for security.
3. Grease and oil rudder pedal assembly.
4. Grease landing gear fittings.

FUEL SYSTEM

1. Drain and clean main fuel line strainer.
2. Drain carburetor bowl and quantity of fuel from fuel tank sump.
3. Inspect all fuel lines, primer pump and connection for sharp bends, cracks, leaks & security with pressure up.
4. Inspect fuel tank, overflow lines, vent lines and selector valve for leaks and security,
5. Inspect hand fuel pump and linkage for leaks, security and proper pressure. (3 - 4 pounds.)
6. Inspect fuel quantity gages for proper functioning. Should hold correct reading for approximately one minute.
7. Inspect fuel and, oil tank covers.

1. Inspect blades for pits, cracks and nicks. Dress blades if necessary and track.
2. Inspect hubs for cracks, tightness and proper safetying.
3. Wipe down blades and cover with light film of oil.

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
CAA WAR TRAINING SERVICE
Kansas City, Missouri

February 26, 1944

TO: All. Aircraft Maintenance Supervisors

FRCM: Principal Aircraft Maintenance Supervisor

SUBJECT: Summary of Difficulties Experienced with
N3N Airplanes.

Received
2/27/44
CAF District 1
Denver, Colorado

Quoted below for your information and guidance is a summary of difficulties experienced with Navy N3N airplanes as reported on Chronic Mechanical Difficulties Report Forms ACA-816:

"ENGINE MOUNT: Several cases of cracking of engine mounts have been reported. These cracks appeared in the mounting rings gussets and support tubes.

"LANDING GEAR: Severe stresses caused by hard landings, rough fields cross-wind landings or ground loops have caused failure of the tie rods near the terminal fittings. Tie rods must be kept snug and attachment bolts must be checked for distortion every 100 hours.

Shock struts are reported to leak oil and air at the upper end when the soldered joints crack.

Shock struts have been found to be cracked under the top clamp which supports the hydraulic brake line.

Wheels (30 x 5 Bendix) cracking in the drop center portion of the rim at the valve hole and at splice plates. Refer to N3N-3 Bulletin No. 20 for information on repairing these wheels.

Tail wheel shock strut springs are reported to be breaking frequently.

"Interplane Struts: Cracks have been discovered in the lower end of the front interplane struts. The cracks run around the strut from a point where the diagonal member of the N-strut joins the front strut.

"Inter-Aileron Struts: Several cases have been reported of inter-aileron strut adjustment screws breaking in the threaded portion.

All Aircraft Maintenance Supervisors (2) February 26, 1944

"Aileron Stops: It has also been reported that in some cases aileron stops were not properly adjusted and as a result unusual stresses were imposed on the aileron control bearings causing excessive looseness.

"Tail Group: It has been reported that improperly adjusted elevator stops permitted the elevator spar to wear on the rudder fairing.

Elevator horn attachment bolts which pass through the horn and elevator spar flanges have been found loose with threads partially stripped.

Horizontal stabilizer attachment bolts have been found badly worn. These bolts should be removed and checked periodically.

"Gasoline Tanks: Cracks have appeared at the weld lines at both ends of tank. These welds hold baffles to ends of tank.

Vertical baffles have also been **reported broken**, breaks occurring near the **center**.

"Throttle Control: Numerous reports of throttles creeping are **attributed to lubricants being used on the friction surfaces** of the throttle quadrant.

"Magneto (American Bosch): Several cases have been reported where screws work out of distributor rotors damaging internal parts of magnetos beyond **repair**.

"Engine: Lower cylinders have been forced loose breaking crank cases around the cylinder base. This was caused by attempting to start engine with the starter while **an accumulation of oil was in the lower cylinders**. After engines have been standing for some time they should be turned over carefully by hand to **be sure that** oil has not accumulated in lower cylinders.

Loss of oil pressure due to dirt on **the oil pressure relief valve seat** has been reported. This **was due to improper or careless handling of lubricating oil when filling tank during daily service** permitting dirt to **enter lubricating system**.

The above difficulties are described to assist Aircraft Maintenance Supervisors in their inspections of Navy N3N-3 airplanes. Similar informative summaries of Chronic Mechanical Difficulties Reports will be supplied periodically. It is important that Forms ACA-816, Chronic Mechanical Difficulties Reports, covering all unsatisfactory

All Aircraft Maintenance Supervisors

(3)

February 26, 1944

conditions found be submitted promptly to the Regional office to facilitate the dissemination of such information to the Washington Office.

