NAVAL AIRCRAFT FACTORY

60–3–6 Navy Amdt. 98 Part 507 Federal Register February 3, 1960. Applies to All N3N–3 Aircraft Including Those Certificated in the Restricted Category.

Compliance required within the next 10 hours' time in service.

A fatal accident resulted when a control stick separated from the lower fitting. To preclude recurrence of this condition, the following shall be accomplished:

(a) Replace the two rivets which attach the control stick to the bottom fitting with AN steel bolts, undrilled type, of the equivalent diameter of the rivets, AN 960 washers and AN 364 or AN 365 nuts. The bolt grip shall equal the diameter of the control stick plus the washer thickness. The bolt installation shall not interfere with the full range of control stick movement.

This applies to the control sticks in both cockpits.

NAVION

(Formerly North American and Ryan)

47-11-1 Navion (Was Mandatory Note 1 of AD-782-3.) Applies Only to Serial Numbers NAV-4-2 to NAV-4-550, Inclusive.

To be accomplished immediately.

Remove present rudder-nose gear steering bellcrank, P/N 145-34175 and replace with new part of the same number furnished by North American. The replacement part is to be identified by a yellow dot and the stamp (SPL).

(North American Service Bulletin No. 21, dated January 23, 1947, covers this same subject.)

47-11-2 Navion (Was Mandatory Note 2 of AD-782-3.) Applies to All Models Equipped With Hartzell HC12x20-1 Propeller Hubs and 8628 Blades.

To be accomplished not later than May 1, 1947.

Vibration tests of the Hartzell HC12x20-1 propeller with these airplanes indicate that the propeller diameter should be reduced from 86 inches to 84 inches. This is accomplished by cutting 1 inch from the tip of each 8628 blade, and making the shortened blade 18428R. This blade rework must be performed either by the Hartzell factory or by a certified propeller repair agency.

.(Par. B of North American Field Service Bulletin No. 20 dated January 28, 1947, covers this rework.)

Upon compliance with this AD, the presently required placard against engine operation between 1,950 and 2,150 r.p.m. and over 2,250 r.p.m. may be removed.

47-21-4 Navion (Was Mandatory Note 3 of AD-782-3.) Applies to Serial Numbers NAV-4-2 Through 21, 24 Through 29, 32, 35, 36, 40, 42 Through 47, 57, 192, 199, 251.

To be accomplished not later than August 1, 1947.

The original fuel filler scupper will collect spilled gasoline since no drain line is provided. In addition, the thickness of material is insufficient to prevent damaging by the filler hose nozzle. To eliminate these conditions, a redesigned scupper with drain line is to be installed per NAA Drawing 145-89010.

(NAA Field Service Bulletin No. 2 covers this same subject.)

47-21-5 Navion (Was Mandatory Note 4 of AD-782-3.) Applies to Serial Numbers NAV-4-11 Through 21 and 44 Through 47.

To be accomplished not later than August 1, 1947.

Replace the original propeller control with one that incorporates a positive friction lock in accordance with NAA Kit Drawing 145-89011.

(NAA Field Service Bulletin No. 5 covers this change.)

47-21-6 Navion (Was Mandatory Note 5 of AD-782-3.) Applies to Serial Numbers NAV-4-11 Through 22, 24, 26 Through 29, 32, 33, 41, 42, 44 Through 47, 62, 63, 192, 199.

To be accomplished not later than at first engine overhaul.

On certain Continental E-185 engines it is necessary to increase the compressive force on the valve springs to prevent rough engine operation at or near rated r.p.m. This may be accomplished by installing Continental No. 520023 spacers under all valve spring inner retainers. All engines having Serial Numbers 1395 and above have been modified by Continental Engines having this rework are identified by a yellow mark underneath the engine data plate.

(NAA Field Service Bulletin No. 11 and Continental Motors Bulletin No. E-112 cover this rework.)

47-21-7 Navion (Was Mandatory Note of AD-782-3.) Applies to Serial Numbers NAV-4-10 Through 20, 22 Through 26, 28, 29, 31 Through 49, 51, 52, 55 Through 58, 60, 63, 73, 76, 79, 82 Through 84, 88 Through 95, 99 Through 104, 106, 108, 110, 112 Through 116, 120 Through 122, 124, 125, 130, 133, 141, 151, 153, 158, 163, 171.

To be accomplished prior to August 1, 1947.

Some airplanes were delivered with a cork or rubber filler strip cemented to the upper surface of the 145-42201-71 carburetor air intake scoop where the scoop fits over the flange of the air mixing chamber. This strip may become dislodged and drawn into the air induction system. To prevent this, replace the filler strip with a 3⅛-inch x ⅝-inch dural strip of 0.093-inch thickness, flush-riveted to the scoop.

(NAA Field Service Bulletin No. 15 covers this subject.)

47-21-8 Navion (Was Mandatory Note 7 of AD-782-3.) Applies to Serial Numbers NAV-4-2 Through 411.

To be accomplished not later than August 1, 1947.

Short circuits have been reported caused between the generator lower terminal and the fitting on the hydraulic pump inlet hose. To prevent such short circuits, install a self-threading insulator No. 145-54053 (or equivalent) on the generator lower terminal stud.

(NAA Field Service Bulletin No. 18 covers this change.)

47-21-9 Navion (Was Mandatory Note 8 of AD-782-3.) Applies to All Serials Up to and Including Number NAV-4-947.

Compliance required prior to September 1, 1947.

Due to malfunctioning of the hydraulic system which has resulted in the failure of components of that system, including actuating cylinders, the following modifications must be accomplished:

(*a*) If an engine-driven hydraulic pump is installed in the airplane, rework the hydraulic power system to install the manually controlled relief valve, North American P/N 145-58027, and replace the existing placard "Hyd. System Pull Off" with new placard "Hyd. Power On".

(North American Field Service Bulletin No. 26 covers this same subject.)

(*b*) Install the swivel head type nose gear actuating cylinder, North American P/N 145-58014.

(North American Field Service Bulletin No. 19 covers this same subject.)

(*c*) Visually inspect all flap and landing gear actuating cylinders for evidence of cracks or other damage. Any cylinders found to be damaged should be replaced.

47-21-10 Navion (Was Mandatory Note 9 of AD-782-3.) Applies to Serial Numbers NAV-4-2 Through NAV-4-1010 Which Incorporate Hartzell HC-12X20-1 Propellers.

To be accomplished not later than September 1, 1947.

The propeller control piston guide pins, Hartzell P/N A-11, require additional safetying in order to prevent loosening and subsequent loss of engine oil. This is accomplished by the installation of a 3/32-inch steel dowel through the guide pin.

(NAA Field Service Bulletin No. 30 covers this rework.)

47-31-1 Navion (Was Mandatory Note 10 of AD-782-3.) Applies to All Serials Up to and Including Number NAV-4-947.

To be accomplished not later than October 1, 1947.

To reduce the possibility of nose gear hydraulic actuating cylinder line failures due to inflexibility, the cylinders must be removed and reinstalled with the lines therefrom leading aft. Each of the present lines must be replaced with a longer line incorporating a "U" bend.

(North American Field Service Bulletin No. 28 covers this same subject.)

47-31-2 Navion (Was Mandatory Note 11 of AD-782-3.) Applies to Serial Numbers NAV-4-2 Through NAV-4-850.

To be accomplished not later than November 1, 1947.

Remove carburetor vapor return line hose P/N 75696 and install fire-resistant hose P/N 76701. This change is necessary to present premature failure of the vapor return line in the event of an engine compartment fire.

(NAA Field Service Bulletin No. 23 dated April 11, 1947, covers this rework.)

47-31-3 Navion (Was Mandatory Note 12 of AD-782-3.) Applies to Serial Numbers NAV-4-2 Through NAV-4-1010 Which Incorporate Koehler Model 2250 Fuel Strainers.

To be accomplished not later than November 1, 1947.

To preclude the possibility of loss of fuel pressure due to air leakage into the fuel sys-

tem through the CCA-1550-⅛ drain cock on the Koehler Model 2250 fuel strainer, remove this draincock and install Whittaker Model 7600—⅛ drain cock.

(NAA Field Service Bulletin No. 32 dated May 1, 1947, covers this rework.)

48-6-3 Navion Applies to All Models Equipped With Hartzell Propeller Blade Models 8428, 8428C, 8428R Having Serial Numbers Below 61000.

Compliance required by April 15, 1948.

Examine all Model 8428, 8428C, and 8428R blades having Serial Numbers below 6100 in bright daylight or strong artificial light on the front face in the area approximately 4 inches outboard of the blade clamp. Any fillers used in the blade will be discernible to the naked eye. If fillers are found in this area, the paint should be carefully removed and the fillers removed from the blade. Defects that can be eliminated by removing material to form a shallow saucer not over ⅛ inch at its deepest point, ⅜ inch in width overall, and 1 inch in length overall, should be repaired. Following removal of the defects, the area from which paint has been removed should be repainted and the propeller rebalanced before being returned to service. Blades having defects that cannot be repaired by the above method or by methods described in the applicable portions of CAM 18, should be returned to the propeller manufacturer. The exact location and the extent of rework necessary to remove any defect should be recorded in the log book. Areas having maximum material removed may not have additional material removed for subsequent injuries.

48-8-3 Navion Applies to Serial Numbers NAV-4-2 Through NAV-4-1110.

To be accomplished as soon as possible but not later than April 1, 1948.

To insure full opening of the fuel shutoff valve when the control knob is pushed to the full "ON" position, conduct the following inspection:

Determine that the fuel fuel shutoff valve flexible control is adequately supported along its length from the instrument panel to the shutoff valve to prevent buckling of the flexible control when it is moved to the "ON" position while valve motion is restrained by the fingers to simulate moderate valve friction. One additional support clip must be added adjacent to the present support clip at the valve end of the flexible control to prevent rotation of the present clip and resultant misalinement of the flexible control if the clip attaching screw should become loose. Other additional support clips along the flexible control may be necessary. Also determine that the control is properly rigged with respect to valve detents and that excess wire has been cut from the valve end of the control wire to prevent snagging of the end of the wire in the upholstery.

48-29-1 Navion Applies to All Airplanes Employing Carter Engine Driven Fuel Pumps Not Presently Equipped With Vent Drain Lines.

To be accomplished as soon as possible but not later than October 15, 1948.

Several instances of rupture of the main diaphragm of Carter fuel pumps have occurred. This is considered a fire hazard, since fuel can then squirt from the pump breather hole onto the engine. To correct this condition the pump breather should be provided with an overboard drain to carry fuel clear of the airplane if the diaphragm ruptures. Before installing the drain line, the fiber screen and snap ring must be removed from the pump breather opening. The drain line should vent into a low pressure area so that any fuel leaving this drain will not be in the proximity of any engine or cabin heater exhaust and will not contact the airplane or enter any air intake line, in ground or flight operation.

(Ryan Navion Service Letter No. 47 covers this same subject.)

49-5-3 Navion Applies to Airplanes Eqiupped With Continental Model E185-3 Engines Having Serial Numbers 4289-D to 5110-D Inclusive, and Engines Which Have Been Equipped at Overhaul With Tri-Metal Front Main Bearing Inserts and Bronze Thrust Washers in Accordance With Continental Bulletin No. M48-7.

To be accomplished as soon as possible but not later than the first major engine overhaul.

Because of unsatisfactory service experience with Continental E185-3 engines equipped with No. 530497 Tri-Metal front main bearing inserts, and with Nos. 530494, 530495, 530544

thrust washers and 530545 dowel pins, these parts must be replaced with the original silver main thrust bearing inserts, Continental No. 40644.

Continental Service Bulletin M48–30 covers this same subject.

(Ryan Navion Field Service Bulletin No. 5 outlines the interim precautions to be taken on airplanes equipped with the unsatisfactory thrust washers until silver main thrust bearings are installed in accordance with this note.)

49–9–2 **Navion** Applies to Airplanes Equipped With Adel Electric Booster Pumps. The Following Adel Pumps Do Not Require Modification in Accordance With This Directive: (1) Pumps With Serial Numbers Above 2451, (2) Pumps Having a Red Painted Band on the Pump Housing, (3) Pumps Having the Letters "G" or "S" Suffixed to the Pump Serial Number.

To be accomplished as soon as possible but not later than April 1, 1949.

Several instances of air leakage into the fuel system have been reported on Navions equipped with Adel electric booster pumps. It has been determined that air can enter the fuel system through the 0.062-inch diameter hole in the plate at the rear of the Adel pump inlet chamber. This hole was originally provided to prevent overboard drainage of fuel through a faulty pump shaft seal while the pump was running.

All of the pumps affected require blocking of the hole at the rear of the pump inlet chamber. This is accomplished in the field by means of an Adel manufactured wire plug which is inserted into the hole through the pump inlet port. Pumps with Serial Numbers below 1600 which do not have the letter "R" suffixed to the serial number also require replacement of the pumpshaft running seal spring.

Adel Accessories Service Bulletin No. 147–49 describes these changes. The required plug and spring and copies of the Adel Bulletin and Ryan's covering Service Letter No. 57, may be obtained from the Ryan Aeronautical Co., San Diego, California.

49–11–1 **Navion** Applies to Airplanes Equipped With Carter Fuel Pumps, Continental P/N 530509 (Carter M687–S and M688–S) or Continental P/N 50375.

To be accomplished as soon as possible but not later than April 15, 1949.

Due to Carter fuel pump lower diaphragm failures, caused by diaphragm deterioration due to excessive pump temperatures when pumps are run dry, the two Carter pumps should be connected in series to insure that fuel will be continuously flowing both pumps and that the pumps will not overheat.

It is therefore required that all parallel Carter pump fuel systems be converted to the series pump arrangement, or, as an alternative, that either an approved Ryan fuel system incorporating an Adel electric booster pump or an equivalent approved fuel system be installed.

Ryan Navion Field Service Bulletin No. 7 also covers this subject and describes means for connecting the fuel pumps in series. In addition, the daily inspections for looseness of the pump lower bowl, which are specified in section II of Ryan's Bulletin No. 7, should be continued.

This supersedes AD 48–40–1.

49–12–2 **Navion** Applies to All Airplanes Equipped With Romec Engine-Driven Fuel Pumps.

To be accomplished as soon as possible, but not later than May 1, 1949.

On some of the Romec fuel pumps, a 1/16-inch hole has been drilled through the 1/8-inch pipe plug which closes the vent opening at the top of the pump. This is a fire hazard since, in the event of pump seal failure, fuel could squirt from this hole into the generator which is directly above the fuel pump, and into the engine compartment. It is therefore required that all drilled vent plugs be replaced by undrilled plugs.

The Ryan factory has accomplished this change in production, starting with airplane Serial Number 1823. Undrilled vent plugs are being painted with zinc chromate primer at the Ryan factory.

49–28–1 **Navion** Applies to All Airplanes Equipped With Product Techniques, Inc., Propeller Spinners.

To be accomplished as specified below:

In order to preclude the possibility of continued use of any unsatisfactory spinners which may be in existence, the following steps must be taken:

1. Spinners not previously installed on an aircraft must be inspected before installation for the thickness of the bulkhead. This may be accomplished by measuring the thickness of the bulkhead at the perimeter; measurements should be taken about ½ inch from the edge for best accuracy. The manufacturing process used in fabricating the bulkheads reduces the gage of the material about 0.012 inch at the perimeter. Bulkheads measuring less than 0.045 inch at this point must be replaced with heavier gage steel bulkheads.

2. Spinners which have partially completed the inspections perviously required by AD 49–1–1 may continue in service until the next 10-hour inspection at which time the bulkhead should be gaged as specified above and replace if under 0.045-inch thickness.

3. Spinners having satisfactorily passed the five inspection periods required by AD 49–1–1 must be inspected for bulkhead thickness, as specified above, within the next 50 hours of flight, and replaced if under 0.045-inch thickness.

It has been determined that bulkheads of 0.058-inch and 0.064-inch cadmium plated steel are satisfactory and do not require the periodic inspections previously specified in AD 49–1–1. However, bulkheads made of thinner gage steel, or of aluminum, are unsatisfactory.

This supersedes AD 49–1–1.

50–5–2 *See* Shakespeare Equipment.

50–10–2 Navion Applies to all Airplanes, Serial Numbers NAV–4–2 Through NAV–4–1790.

To be accomplished as indicated below.

The above aircraft employ flexible hose, Ryan Drawing 145–42202, between the exhaust shroud and the carburetor heat valve. This hose has shown a tendency to deteriorate with age and may collapse, resulting in a considerable loss of engine power.

An inspection of these hoses should be made not later than March 20, 1950, and after each 25 hours of aircraft operation until replacement is made with the hose mentioned below. All hoses found to be in poor condition should be replaced immediately by wire reinforced hose. Arrowhead Rubber Co. hose type 8AX (Ryan Drawing No. 145–42202–3) or equivalent is satisfactory.

The installation of the above wire reinforced air intake hose in replacement of the original hose should be accomplished in all aircraft by September 1, 1950.

(Ryan Service Letter No. 67 dated February 7, 1950, also covers this subject.)

50–24–1 Navion
Superseded by AD 62–3–3.

50–32–1 *See* Continental Engines.

51–7–1 Navion Applies to All Models Having Serial Numbers 1789 Through 2019; 2021 Through 2026; 2028 Through 2142; 2144 Through 2169; 2171 Through 2177; and 2180.

To be accomplished as indicated below.

It has been found that on some of these airplanes throttle housing slippage has occurred at the point where the cable housing is swaged to the ferrule at the instrument panel end. This slippage can result in erratic throttle operation. An inspection of these controls for evidence of housing slippage must be made not later than March 5, 1951. Any control showing evidence of slippage shall be replaced immediately.

It has been found that housing slippage may be caused by the inner shaft in the control head striking the end of the housing when the throttle is moved to the full open position. To prevent such occurrence, a special stop nut must be installed on the throttle shaft in place of the existing jam nut. This special nut, which will prevent the inner shaft from striking the end of the housing, is being furnished by the Ryan Co. and must be installed by July 15, 1951.

(Ryan Field Service Bulletin No. 9, dated September 1, 1950, covers this same subject.)

51–24–1 *See* Avco Engines.

52–8–2 Navion Applies to All Model B Aircraft and Cancels AD 51–19–3 Upon Compliance.

Compliance required not later than June 15, 1952.

Due to reports of engine malfunction caused by collapse of flexible ducts in the air induction system, it is necessary to replace the section P/N 146–42207 ducting between the carburetor air filter assembly and the carburetor air mix box with wire reinforced ducting, or its equivalent.

(Ryan Field Service Bulletin No. 16, dated February 12, 1952, covers this same subject.)

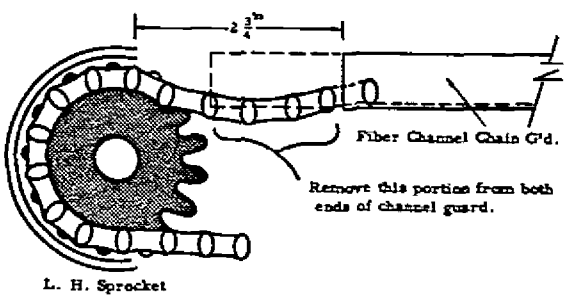
This supersedes AD 51–19–3.

52–24–1 Navion Applies to All Models, Serial Numbers NAV–4–2 and Above.

Compliance required as soon as possible but not later than November 1, 1952.

In order to eliminate the possibility of the aileron control chain jamming, each end of the fiber channel chain guard should be reworked as shown in Figure 1. The chain and guard are on the control column.

(Ryan Navion Field Service Bulletin No. 18 dated September 3, 1952, covers this same subject.)



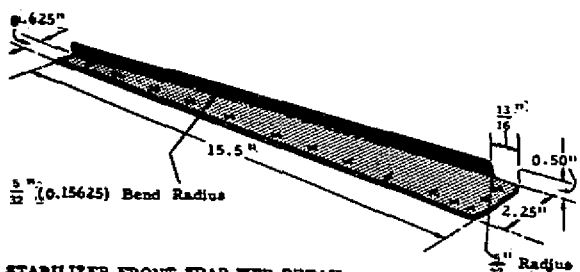
AILERON CONTROL CHAIN-CHANNEL GUARD REWORK

FIGURE 1

52–26–1 Navion Applies to All Models, Serial Numbers NAV–4–2 and Subsequent.

Compliance required as indicated.

Inspect as soon as practical, but not later than February 1, 1953, and at 100-hour intervals thereafter the area in the vicinity of the stabilizer fuselage attachment for cracks. Particular attention should be given to the stabilizer spar web (gusset) immediately outboard of the root rib and the fuselage attaching fitting. If cracks are found in the fuselage fitting, P/N 143–31004–13, the entire part should be replaced. Cracks in the root rib may be repaired in accordance with CAM No. 18. Cracks in the spar web (gusset) require the replacement of the gusset with a new part made in accordance with Figure 2.



STABILIZER FRONT SPAR WEB DETAIL
Fabricate From 0.032, 24st Alclad

FIGURE 2

Periodic inspections of stabilizer spar web only may be discontinued after installation of new gussets.

(Ryan Navion Field Service Bulletin No. 17 dated September 28, 1952, covers this same subject.)

53–3–1 Navion Applies to All Model B Aircraft Equipped With Hartzell HC–12 X20–8C/9333C–0 Propellers.

Compliance required not later than March 15, 1953.

Vibration tests conducted subsequent to the initial tests of the Hartzell HC–12 X20–8C/9333C–0 propeller installed on the Lycoming GO–435 engine revealed vibration characteristics of a hazardous nature. Therefore, to prevent possible blade cracks and/or failures, the existing r.p.m. restriction placard should be revised as follows:

"Avoid continuous ground operation between 1675 and 2150 engine r.p.m."

53–8–1 Navion Applies to All Models Except Those Incorporating Palo Alto Airport Co. or Symon Engineering Co. Horizontal Stabilizer Modifications.

Compliance required by June 15, 1953, or next 100-hour inspection, whichever is first.

Inspect both 145–21404–1 and –2 front fittings on the horizontal stabilizer for proper rivet edge distance. If the entire outboard edge of the steel fitting extends past the outboard edge of the butt rib, no further action is required. On the other hand, if the edge of the fitting disappears behind the rib, it will be necessary to ascertain that at least 1/16 inch of material (steel fitting) extends beyond the edge of all rivet holes. Whenever the edge distance is found to be less than 1/16 inch, a new fitting should be installed with proper edge distance.

(A method of conducting the above inspection is described in Ryan Field Service Bulletin No. 19, dated February 16, 1953, which covers this same subject.)

54–18–1 Navion Applies to All Models.

Compliance required as indicated.

Inspection of a number of Navions has revealed an undesirable condition in which there is relative motion between the wing and fuselage at the wing-to-fuselage attachment necessitating installation of additional shear carrying attachment angles between the fuselage and wing. This condition is most prevalent in, but not limited to, older Navions and can be readily detected when the wing root fillets have been removed and a sharp fore and aft shaking force is applied to the wing tip. If loose, the applied force can be made to develop a motion of the wing mass which is opposite to the motion of the fuselage mass, and the looseness will be definitely seen and felt.

It is therefore necessary that all Navions be inspected for this condition as soon as practicable but not later than October 15, 1954. In case the wings and fuselage seem to move as a unit mass and feel "solid" to the person applying the force, the corrective action outlined below may be delayed until the next annual inspection of the airplane. If a loose condition is evident, immediate corrective action as indicated in items 1 and 2 is necessary.

1. Determine whether there is any looseness due to elongated holes at the six bolt locations (two outboard and two inboard forward wing attachment bolts and two aft wing attachment bolts). If no elongated holes are found, the corrective action in item 2 should be accomplished. If elongated holes are evident proceed as follows (including item 2):

(*a*) Ream each of the four forward wing attachment bolt holes (AN 5 inboard and AN 6 outboard) to receive the next larger size bolts. Remove and replace *only* one bolt at a time and torque to 140 inch-pounds. (If the next larger size bolts had already been installed previously for other reasons, the rework in accordance with this directive should be brought to the attention of the local FAA Agent for detail consideration.

(*b*) Remove the two AN 5–65A aft attachment bolts, tube spacers, washers and units and install two 4½-inch long 0.064 24ST alclad doubler strips to each end of the bottom inside flange of fram 142.57. Rivet each strip to the frame with four 5/32-diameter rivets and drill and ream to 0.3125-diameter to match the existing 5/16-diameter bolt hole in each frame. The two tube spacers must be shortened to fit within the channel and the two AN 5–65A bolts should be installed and torqued to 140 inch-pounds.

2. Install the following wing-to-fuselage chordwise shear attachment.

(*a*) An 0.064 24S–T4 alclad angle should be fabricated to conform to the wing contour and attached to the lower longeron, inboard flange (both sides of airplanes). This angle should extend from the wing front spar reference plane to approximately 1 inch aft of the wing center spar reference plane (approximately 22½ inches long). Attachment to the upper longeron should be made with eight AN 3 bolts. Attachment to the wing skin should be with fifteen 5/32 rivets (may be blind). Caution should be used in drilling through the wing skin to avoid injuring the fuel tank.

(*b*) Flange of angle attaching to wing skin may be cut to conform to existing holes in wing skin for tubing which may pass through this area.

(Ryan Navion Field Service Bulletin No. 21 covers this same subject.)

55-1-1 Navion Applies to All Models.

Compliance required as indicated.

Some Navion aircraft have been found to have cracks in fuselage frame 143-31004-16 at Station 294.1 inboard from the top stringer cutout at W. L. 21.00.

It is therefore necessary that all Navions be inspected for this condition as soon as practicable but not later than March 15, 1955. Inspection may be made by removing the inspection plate on the left side of the fuselage beneath the horizontal stabilizer and looking forward to view the aft side of the points in question. If no crack is visible, no further immediate action is necessary, however, a thorough inspection of the frame at each 100-hour inspection will be required thereafter until the reinforcement indicated in item 2 or 3 as indicated below is completed.

If a crack is visible at either side of the frame, determine if it has extended beyond the nearest rivet inboard of the cutout (hereafter called the critical rivet). If it has not, the repair as indicated in item 1 may be used as an interim fix in lieu of the permanent repair indicated in item 2 or 3 which is mandatory in the case of a crack extending beyond the critical rivet.

1. Interim repair for cracks not extending beyond the critical rivet:

(*a*) When crack extends to the critical rivet, remove the rivet and relocate nearby or if crack has not reached the critical rivet, stopdrill end of crack.

(*b*) Install a modified diamond-shaped 0.125 24ST alclad gusset to right and left outer fuselage surfaces catching two existing rivets on each side of frame through W.L. 21 stringer, five existing rivets through the frame above the stringer cutout and three existing rivets through frame below the cutout. Add two AD4 rivets through the frame between the three existing rivets below the cutout. Additional AD4 rivets through the gusset and skin should be added as necessary.

(*c*) Check the cracked area at each 100-hour inspection to determine if crack has extended beyond the critical rivet. If so, it will be necessary to apply item 2 or 3.

2. Permanent Repair:

(*a*) Remove the cracked frame and strip off the angles and doublers and attach to new frame. Do not notch new frame to receive top stringers.

(*b*) Cut top stringers forward and aft of frame location.

(*c*) Install new frame in fuselage and attach skin. Where rivets do not properly fill holes use next size larger rivet.

(*d*) Secure top stringers forward of frame by adding a 0.040 24ST alclad angle 3 inches long to the forward portion of the stringer and attaching it to the frame flange with an existing AD4 rivet through the frame flange, skin and external gusset patch.

(*e*) Install gusset patch as indicated in item 1(*b*).

3. In lieu of item 2, an equivalent frame repair in accordance with CAM 18 will be accepted as an alternate for a new frame. This, however, may be difficult due to the presence of existing doublers and stiffeners on the forward face of the frame which is further complicated by the attachment of the W.L. 21 shear web to the aft side of the frame. Such alternate repairs must be submitted to a FAA Aircraft Engineering office for approval prior to installation.

(Ryan Field Service Bulletin No. 22 covers this same subject.)

55-6-1 Twin Navion Applies to All Dauby, Riley and TEMCO Twin Navion Conversions.

Compliance required not later than May 1, 1955.

In order to avoid the hazard of fuel and fumes entering the passenger compartment, it is necessary to install vented and drained fuel and fumeproof enclosures for all fuel tanks located in the fuselage. (Ref. CAR 3.442 (c).)

TEMCO Aircraft Corp. Twin Navion conversion Service Bulletin No. 2 covers this same subject and kits approved by the FAA for accomplishing the necessary alteration are available from TEMCO.

56-3-3 Navion Applies to All Models.

Compliance required as indicated.

Cracks starting at the wing centerline attaching bolt hole in the wing rear spar junction

fittings (P/N 145-14070) at wing Station O have been found on a number of Navion aircraft.

To correct this, it will be necessary to inspect all Navions for this condition as soon as practicable but not later than May 1, 1956. Access to these fittings may be gained through the main wheel wells.

If no cracks are found, 3/16-inch thick 1010 steel (or equivalent) end plates, properly radiused for a snug fit, should be installed in each fitting prior to the next 50 hours of flight time.

If cracks are found, they should be stop-drilled with a No. 60 (0.040) drill and the end plates as described above should be installed prior to the next flight.

No further inspections will be necessary upon installation of these end plates.

(Ryan Navion Service Bulletin No. 23 dated December 5, 1955, covers this same subject.)

56-27-4 Navion Applies to B Type Aircraft Equipped With Reading Aviation Service Inc. or Hackenberg Sales and Service Downdraft Cooling Kit Installations.

Compliance required not later than July 1, 1957.

Engine cooling tests conducted subsequent to the installation of these kits reveal that cylinder head and oil temperature values can exceed established limits. To prevent serious damage to the engines in these aircraft due to overheating, one of the following alternate actions is necessary.

1. Remove Reading Aviation Service Inc. or Hackenberg Aviation Sales and Service downdraft cooling kit and return aircraft to the original Ryan cooling configuration, or

2. Modify the Reading or Hackenberg engine cooling kit in accordance with Reading Aviation Service Inc. Service Bulletin No. 1 dated July 26, 1956.

59-6-4 Navion Tusco Corporation (NAVION) Applies to All Models.

Several failures of hydraulic actuating cylinders have occurred causing the loss of the use of the flaps and the landing gear to collapse.

To prevent further difficulties of this nature, the following items must be accomplished by May 1, 1959, and at each periodic inspection thereafter.

(1) Inspect the flap and landing gear actuating cylinders for cracks. If any cracks appear, the cylinder must be replaced.

(2) Determine, by means of a hydraulic gage, that the hydraulic system pressure relief valve is adjusted to 1125+25, −0 p.s.i. Excessive pressures could cause damage to the components of the system.

(3) Hydraulic fluid restrictors are required in the nose gear lines, Serial Numbers 1271 and subsequent, main gear lines, Serial Numbers 1790 and subsequent, and flap lines, all serial numbers.

(4) Inspect the linkage adjustments of the landing gear bungee springs and the flap stops and determine that they have been properly adjusted in accordance with appropriate service manuals.

(Tusco Corporation Service Letter No. 79 dated December 23, 1958, covers this same subject.)

61-12-4 Navion, Twin Navion Amdt. 296 Part 507 Federal Register June 8, 1961. Applies to All Navion Serial Numbers NAV-4-2 and Above and All Twin Navion Aircraft, Camair Model 480, Dauby, Riley, and TEMCO Models D-16 and D-16A.

Compliance required within the next 50 hours' time in service from the effective date of this directive, unless already accomplished within the last 50 hours' time in service, and every 100 hours' time in service thereafter. The initial inspection of the Temco P/N TN 57009-1, shall be made within 50 hours' time in service after January 29, 1962.

Recent cases of failure indicate that previous inspection of the main landing gear retract link by the dye penetrant method has failed to disclose cracks which were present prior to complete failure of the part. Since this can result in collapse of the gear, the following shall be accomplished:

Inspect by magnetic particle or equivalent, the main landing gear retract link assembly Navion P/N 143-33165-10 or Temco P/N TN 57009-1, whichever is installed, for cracks in or near end fitting welds. Replace all defective parts with revised assembly P/N 143-

33165–20, or equivalent, having a longer lap-welded center section prior to further flight. This inspection is no longer required after the revised assembly is installed.

(Navion Field Service Bulletin No. 34 dated December 17, 1958, covers this subject.)

This supersedes AD 59–4–3 and AD 60–10–9.

This directive effective July 10, 1961.

Revised January 29, 1962.

62–3–3 Navion Amdt. 396 Part 507 Federal Register February 3, 1962. Applies to Navion, Navion A, B, D, E, F, and G Aircraft.

Compliance required within the next 25 hours' time in service after the effective date of this AD and at each periodic inspection thereafter.

The landing gear selector valve end fitting P/N 145–58145–3 (heat treated and non-heat treated) has a service history of failure during attempts to extend the gear. To preclude further difficulties:

Inspect the gear actuating system in accordance with Navion Service Letter No. 81, dated March 31, 1961. Any defective parts found as a result of this inspection must be replaced prior to further flight.

This supersedes AD 50–24–1.

This directive effective March 6, 1962.

62–14–4 Navion and Twin Navion Amdt. 450 Part 507 Federal Register June 14, 1962. Applies to All Navion Serial Numbers NAV–4–2 and Up and All Twin Navion Aircraft, Camair Model 480, Dauby, Riley and Temco Models D–16 and D–16A.

Compliance required within the next 50 hours' time in service after the effective date of this AD unless already accomplished within the last 50 hours' time in service and thereafter every 100 hours' time in service from the last inspection.

Inspect by magnetic particle method or FAA approved equivalent, the nose gear retract link assembly P/N 145–34106 or 145–34106–10, for cracks in or near end fitting welds. Replace all cracked parts prior to further flight with Navion P/N 145–34106–20, Camair P/N 1–6031, or FAA approved equivalent, incorporating a longer lap weld center section that completely covers the turned down part of the end fitting. The inspection required by this AD may be discontinued after Navion P/N 145–34106–20, Camair P/N 1–6031, or FAA approved equivalent is installed.

This directive effective July 16, 1962.

NOORDUYN

46–23–5 Noorduyn (Was Mandatory Note 1 of AD–2–578–1.) Applies to Army UC–64, –64A, and –64B Aircraft.

Required at next periodic inspection.

Inspect the trailing edge of the horizontal stabilizer to determine whether or not drain holes are present in the metal trailing edge cover. If the holes are not present, it will be necessary to remove enough fabric to permit inspection of the ribs. Defective or deteriorated wood must be replaced and drain holes, approximately 1/16-inch diameter, spaced to drain all pockets must be drilled.

46–23–6 Noorduyn (Was Mandatory Note 2 of AD–2–578–1.) Applies Only to Army UC–64, –64A, and –64B Airplanes Equipped With Fuel-Burning Cabin Heaters.

Required at next periodic inspection.

The surface combustion fuel burning heater must be made inoperative by disconnecting and plugging the fuel line as near the engine as practicable unless the following modifications are accomplished:

(*a*) A fire-resistant bulkhead must be installed between the heater and the belly fuel tank. A firewall having the fire-resistant qualities specified in CAR 3.624 will be acceptable.

(*b*) A fuel shutoff valve, controllable from the pilots' compartment must be installed in the fuel line between the engine and the heater.

(*c*) Shrouds must be installed on the heater exhaust and drain lines to isolate the lines from the airframe.

48–49–2 Noorduyn Applies to All Army UC–64, –64A, –64AS, and –64B Aircraft.

Compliance required as soon as possible but not later than February 1, 1949.

On airplanes equipped or about to be equipped with Edo Model 55–7170A floats, the float brace wire plates, P/N 16–31131, must be reinforced in accordance with Noorduyn Service Bulletin No. E5/44, dated August 22, 1944, (obtainable upon request from Canadian Car and Foundry Co., Ltd., Montreal 3, Canada), or Army Air Forces Technical Order No. 01–155CB–13, dated October 9, 1944. Other reinforcements shown to be equivalent to those covered in the Service Bulletin or the Technical Order will also be acceptable.

NORTH AMERICAN

(See Also Navion)

46–11–1 North American (Was Service Note 2 of AD–2–575–3.) Applies Only to Army BC–1A, AT–6, –6A, –6B, –6C; Serial Numbers Below 41–34249 and Navy SNJ–2, –3, –4; Serial Numbers Below 0–43692.

Inspection required at each periodic inspection unless doubler angles are installed.

Inspect the inboard end of the landing gear retracting strut attachment support channel, P/N 55–14102 or 66–14102–1, at the wing outer panel joint, for cracks. If cracks are found in any channel, it shall be reinforced as follows:

A. For cracks less than 2 inches long, install 0.062 inch–$^{29}/_{32}$ inch x 1 inch x $6\frac{3}{4}$ inches long, SAE No. 4130 steel, cadmium-plated (or 0.091 inch–24ST alclad) doubler angles in the upper corners of the inboard ends of each cracked channel. Drill a $\frac{1}{8}$-inch stop hole at the end of each crack. Attach the $^{29}/_{32}$-inch leg by picking up the existing rivet pattern through the wing skin and the channel upper flange. The rivets through the wing attach angle should be replaced with AN 3 bolts, or equivalent. Attach the 1-inch leg to the side of the channel using a row of seven AN 442–AD4 rivets or equivalent, at approximately $1\frac{1}{8}$-inch spacing.

B. For cracks over 2 inches long, install 0.062 inch–$^{29}/_{32}$ inch x $1\frac{3}{8}$ inches x $6\frac{3}{4}$ inches long SAE No. 4130 steel, cadmium-plated, doubler angles in the upper corners of the inboard ends of each channel containing a crack over 2 inches long. Drill a $\frac{1}{8}$-inch stop hole at the end of each crack. Attach $^{29}/_{32}$-inch leg as described in paragraph A. Attach $1\frac{3}{8}$-inch leg to the side of the channel using two rows of seven AN 442–AD4 rivets, or equivalent, at approximately $1\frac{3}{8}$-inch spacing.

C. For cases where no cracks are found, install the same doubler angles as required in paragraph A, except that they need not exceed 4 inches in length, or inspect at each periodic inspection.

In order to permit installation of rivets with the wing outer panel installed on the airplane, approved type blind $^{5}/_{32}$-inch rivets may be used in the 1-inch or the $1\frac{3}{8}$-inch leg of the doubler angle.

(Supplement No. 1 to North American Service Bulletin dated March 6, 1946, covers this subject also.)

46–17–1 North American (Was Mandatory Note 5 of AD–2–575–3.) Applies to Army BC–1A, AT–6, –6A, –6B, –6C; Navy SNJ–2, –3, –4 Aircraft.

To be accomplished prior to original certification or at first periodic inspection thereafter.

Inspect the universal joint pins in the flap control push-pull tubes, P/N 19–152642, connecting the outer and inner flap for broken pins. Replace all broken pins with new pins and install a close fitting rubber hose over each universal joint to hold in place any pins which may break in the future.

(North American Service Bulletin dated March 6, 1947, covers this subject also.)

46–46–2 North American (Was Mandatory Note 6 of AD–2–575–3.) Applies to Army BC–1A, AT–6, –6A, –6B, –6C; Navy SNJ–2, –3, –4 Aircraft.

To be accomplished prior to January 1, 1947.

Inspect all airplanes having Vest Two-Place Chum Seats installed prior to October 9, 1946, to determine that an elevator rear stop is installed on the horizontal stabilizer rear spar directly in front of the elevator horn and that the modification incorporates revised self-alining rudder balance brackets, rudder balance cable, rudder pedal adjustment bar and reinforcement plates on forward side of firewall at the balance pulley bracket attachment points in accordance with Vest Installation Instructions dated October 9, 1946.

49–7–2 North American Applies to Army BC–1A, AT–6, –6A, –6B, –6C; Navy SNJ–2, –3, –4 Aircraft.

Compliance required not later than April 1, 1949.

Accidents have occurred in the above model aircraft from engine stoppage on takeoffs and landings when operating on the left tank standpipe outlet with the fuel in the tank down to the level of the standpipe.

Such engine stoppages have occurred because pilots not fully familiar with the fuel system have misinterpreted the left tank fuel gage as indicating total available fuel quantity with selector valve on the Left Hand Main (standpipe) position, unaware that the change to Reserve or Right Hand Main position must be made before the fuel level in the left tank drops to 20 gallons.

To preclude the possibility of pilot error with regard to the foregoing, the following placard shall be installed in each cockpit:

"CAUTION: Unless Left Tank is full, use Reserve or Right Tank for Takeoff and Landing."

50–9–1 North American Applies to All Army Model BC–1A, AT–6, –6A, –6B, –6C; Navy SNJ–2, –3 and –4 Aircraft.

To be accomplished prior to original certification.

Inspect the horizontal stabilizer rear spar connection for cracked fittings and the installation of shims as follows:

(1) Remove the fuselage to vertical stabilizer fairing assembly and the rear fairing assemblies at the horizontal stabilizer.

(2) Remove the ¼-inch bolts which attach the rear spar connection fitting to the spar assembly.

(3) Remove paint from connection fittings and inspect for cracks. Check with a machinist's square or other means to determine if fitting is preset. Replace any cracked or preset fitting and repaint all others. New fittings may be made of 24 ST or X4130 bar stock to the same dimensions as the old fittings.

(4) Inspect the fit between the spar and the sides of the base fitting with a feeler gage. Also inspect the fit between fitting P/N 77–21021 and the spar. If gaps exist, shims are necessary.

(5) Fabricate 24ST shims 3⅛ inches x 15/16 inch and of necessary thickness, and place on either side of spar flanges maintaining a parallel overall dimension to fit inside of fitting P/N 77–21021 within maximum clearance of 0.010.

(6) Drill holes through the shims to match those in the fitting. Remove all chips and reinstall the various parts.

(North American Service Bulletin dated March 6, 1946, covers this subject also.)

This supersedes AD 45–44–3.

50–38–1 North American Applies to All Model AT–6 Series Aircraft.

To be accomplished at the next annual inspection and at each succeeding annual inspection thereafter.

Several recent incidents have indicated that the inspections presently required are not sufficiently comprehensive to reveal all areas of the airplane which may have been adversely affected by intergranular corrosion, and that the required inspections should be repeated periodically. Accordingly, in order to minimize the possiblity of structural failure due to such corrosion, the following must be accomplished:

Inspect all accessible structural aluminum alloy components for evidence of intergranular corrosion, particularly in the following locations: At the upper and lower deck and the most forward and two aft bulkheads in the monocoque fuselage; frame around the baggage door; inboard end of horizontal stabilizer spars; fuel cell doors in the wing center section; wing attach angles; two inboard ribs on each outer wing; trailing edge ribs above flaps; and the outboard rib of the wings, especially at the trailing edge. Full use should be made of all access provisions to accomplish as thorough an inspection as possible.

In conducting these inspections, full reliance cannot be placed on visual examination alone. A screwdriver or other instrument should be used to explore for dull sounding areas and for material which may be penetrated easily by pressure applied to the screwdriver tip or similar sharp point. Areas adjacent to joints and sheared edges should be examined thoroughly.

Formed material in particular has been found to be subject to rapid intergranular corrosion, because of poor heat treatment of parts, which were formed in the annealed condition, and later heat treated.

All corroded parts must be replaced.

This supersedes AD 47–41–1.

58-22-2 North American Applies to All Model T-28A Aircraft Certificated in the Restricted Category.

Inspect the main landing gear trunnion shaft every 200 hours with a borescope or by an equivalent method for fatigue cracks emanating from the bolt holes. Replace all defective shafts.

(USAF T.O. 1T-28A-6 Page 39, Item 11, covers this same subject.)

59-12-7 *See* Wright Engines.

61-5-5 North American Amdt. 260 Part 507 Federal Register March 4, 1961. Applies to All T-28A Aircraft Certified In The Restricted Category.

Compliance required as indicated.

(a) The R-1300-1A engines which have been overhauled must have Change 53 of T.O. 2R-R1300-5 incorporated upon the accumulation of 860 hours since last overhaul. R-1300-1A engines which have never been overhauled must have Change 53 of T.O. 2R-R1300-5 incorporated upon the accumulation of 860 hours total time in service since new. The modified engines will be designated as R-1300-1B engines by stamping the letter "B" on the engine nameplate.

(b) The engine-driven fuel pump, AN-4100, and fuel booster pump must be overhauled every 1,200 hours' time in service.

(c) The engine-driven hydraulic pump, AS-6201-1, must be overhauled every 860 hours' time in service.

(d) (1) The A-422-E1 or -E2 propeller, regardless of serial number, must be disassembled, inspected, and reworked in accordance with T.O. 3H3-3-512 at 300 hours' time in service.

(2) The A-422-E1 or -E2 propeller must be removed from service after 2,100 hours' time in service.

(e) Conduct an inspection of all cylinders in accordance with paragraph 2 of T.O. 1T-28A-531 at the following intervals:

(1) Every 30 hours' time in service.

(2) During any intermediate engine inspection at which oil leaks, carbon smudges, etc., are detected.

(Cylinder assembly P/N 430622 Change T and later changes have shotpeened barrels and do not require the above cylinder barrel inspection. The cylinder assembly number is stamped on the flat of the cylinder identification pad.)

This supersedes AD 58-24-3.

This directive effective March 4, 1961.

NORTHERN

(*See Downer*)

NORTHWESTERN

46–36–1 *See* Continental Engines.