

SHIMMY DAMPENER - MAINTENANCE PRACTICES

1. General

- A. This section gives procedures for the shimmy dampener removal/installation and disassembly/assembly.
- B. A longitudinal nose gear fairing extends aft to cover the shimmy dampener, upper part of the shock strut and the drag link spring. For more information about the nose gear fairing, nose gear shock strut and drag link, refer to Nose Gear Fairing - Maintenance Practices, Nose Gear Shock Strut - Maintenance Practices and Nose Landing Gear - Maintenance Practices.
- C. The nose wheel is steerable through an arc of 15 degrees each side of center by use of the rudder pedals. By applying brakes, the angle may be increased up to 56 degrees either side of center.

2. Shimmy Dampener Removal/Installation

- A. Remove the Lord Shimmy Dampener (Airplanes 20800247 and On and 208B0502 and On and Airplanes 20800001 thru 20800246 and 208B0001 thru 208B0501 incorporating CAB96-3) (Refer to Figure 201).
 - (1) Remove the nose gear fairings as necessary to get access to the shimmy dampener. Refer to Nose Gear Fairing - Maintenance Practices.
 - (2) Open the upper and lower cowling doors and cowl panels as necessary to get access to the shimmy dampener. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices
 - (3) Remove the cotter pin from the castellated nut.
 - (4) Remove the castellated nut and washer from the bolt.
 - (5) Remove the bolt and washer from the steering ring assembly.

NOTE: Keep the shim washers that are found between the trunnion and the shimmy dampener attach lug. Make a record of the washer installation order, because the shim washer thickness can be different.
 - (6) Remove the cotter pin from the trunnion.
 - (7) Remove the eyebolt from the trunnion.

NOTE: The head of the eyebolt is flat to let you get a good hold on to it for removal.
 - (8) Remove the shimmy dampener from the airplane.
- B. Install the Lord Shimmy Dampener (Airplanes 20800247 and On and 208B0502 and On and Airplanes 20800001 thru 20800246 and 208B0001 thru 208B0501 incorporating CAB96-3) (Refer to Figure 201).

CAUTION: Do not exceed the 50 degree turn radius when you turn the nose gear.

 - (1) Turn the nose gear to the right tow limit to let the steering ring assembly bolt clear the engine truss.
 - (2) Put the shimmy dampener in position so the mounting holes align in the steering ring assembly and the trunnion.

CAUTION: Do not put the cotter pin in position at this time.
 - (3) Install the removed shim washers as they were installed before, between the shimmy dampener and the steering ring assembly.
 - (4) Lubricate the bolt with MIL-G-21164C, then put the bolt for the shimmy dampener in position in the steering ring assembly attach point.
 - (5) Make sure the shimmy dampener has a maximum vertical movement of 0.035 inches (0.889 mm).
 - (6) Make sure the shimmy dampener is free to turn in the steering ring assembly.
 - (7) Put the shimmy dampener piston rod end into the trunnion attach point.

CAUTION: Do not install the cotter pin at this time.

CAUTION: Do not exceed the 50 degree turn radius when you turn the nose gear.
 - (8) Lubricate the eyebolt with MIL-G-21164C, then put the eyebolt for the shimmy dampener in position in the trunnion.
 - (9) Make sure the piston rod is free of any load or interference.
 - (10) Turn the nose gear left and right to the tow limits to make sure there is no interference or load after the initial movement of the nose gear.
 - (11) If there is any interference or load found after the initial movement of the nose gear, then install a different set of washers.

(12) Install the nut for the steering ring assembly, then torque the nut to approximately 50 to 70 inch-pounds.

(a) Align the cotter pin hole as necessary to install the cotter pin.

(13) Install the cotter pins.

(14) Install the cowl doors and cowl panels as necessary. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.

(15) Install the nose gear fairings as necessary. Refer to Nose Gear Fairing - Maintenance Practices.

C. Remove the Shimmy Dampener (Airplanes 20800001 thru 20800246, and 208B00001 thru 208B0501, Not Incorporating CAB96-3) (Refer to Figure 202).

(1) Remove the nose gear fairings as necessary to get access to the shimmy dampener. Refer to Nose Gear Fairing - Maintenance Practices.

(2) Open the upper and lower cowl doors and cowl panels as necessary to get access to the shimmy dampener. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices

(3) Remove the cotter pin out of the trunnion.

(4) Remove the eyebolt from the trunnion.

NOTE: The head of the eyebolt is flat to let you get a good hold on to it for removal.

(5) Remove the cotter pin, nut, washers, and bolt that attach the shimmy dampener barrel to the steering bell crank.

(6) Remove the shimmy dampener from the airplane.

D. Install the Shimmy Dampener (Airplanes 20800001 thru 20800246, and 208B00001 thru 208B0501, Not Incorporating CAB96-3) (Refer to Figure 202).

CAUTION: Do not exceed the 50 degree turn radius when you turn the nose gear.

(1) Turn the nose gear to the right tow limit to let the steering ring assembly bolt clear the engine truss.

(2) Put the shimmy dampener in position so the mounting holes align in the steering ring assembly and the trunnion.

CAUTION: Do not put the cotter pin in position at this time.

(3) Install the removed shim washers as they were installed before, between the shimmy dampener and the steering ring assembly.

(4) Lubricate the bolt with MIL-G-21164C, then put the bolt for the shimmy dampener in position in the steering ring assembly attach point.

(5) Make sure the shimmy dampener has a maximum vertical movement of 0.035 inches (0.889 mm).

(6) Make sure the shimmy dampener is free to turn in the steering ring assembly.

(7) Put the shimmy dampener piston rod end into the trunnion attach point.

CAUTION: Do not install the cotter pin at this time.

CAUTION: Do not exceed the 50 degree turn radius when you turn the nose gear.

(8) Lubricate, then put the eyebolt for the shimmy dampener in position in the trunnion.

(9) Make sure the piston rod is free of any load or interference.

(10) Turn the nose gear left and right to the tow limits to make sure there is no interference or load after the initial movement of the nose gear.

(11) If there is any interference or load found after the initial movement of the nose gear, then incorporate the trunnion modification procedures as necessary from Service Bulletin CAB96-3.

(12) Install the nut for the steering ring assembly, then torque the nut to approximately 50 to 70 inch-pounds.

(a) Align the cotter pin hole as necessary to install the cotter pin.

(13) Install the cotter pins.

(14) Install the cowl doors and cowl panels as necessary. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.

(15) Install the nose gear fairings as necessary. Refer to Nose Gear Fairing - Maintenance Practices.

3. Shimmy Dampener Disassembly/Assembly (Airplanes 20800394 and On and 208B1140 and On)

A. The Lord Shimmy Dampener is sealed, and cannot be disassembled or assembled. Contact Cessna Propeller Aircraft

Product Support at (316) 517-5800 or Fax (316) 942-9006, for more instructions about replacement.

4. Shimmy Dampener Disassembly/Assembly (Airplanes 20800001 thru 20800393 and 208B0001 thru 208B1139)

- NOTE:** These procedures include a check of the shimmy dampener components for a leaking shimmy dampener.
- NOTE:** For procedures to make a piston insertion tool for the shimmy dampener servicing. Refer to Figure 203 for fabrication details.
- NOTE:** The temperature compensating piston must be put in a position on the piston rod at a distance of 3.32 inches from the end of the piston rod (with ambient temperature 70°F). Mark a piece of welding rod or equivalent material with the 3.32 inch dimension from one end to be used as a positioning gauge in the following procedure.

A. Leaking Shimmy Dampener.

- NOTE:** Leaking of the shimmy dampener at either end of the barrel, at the filler plugs, or at the end of the piston rod where the temperature compensating piston is installed, indicates a need for servicing of the shimmy dampener. Do a check of the position of the temperature compensating piston relative to the end of the piston rod to make sure there is a leaking condition. The piston is factory set at 3.32 inches, +0.05 or -0.05 inch, from the end of the piston rod at 70°F. As the temperature decreases below 70°F, the 3.32 inch dimension will increase to a maximum of 4.83 inches at 37°F. As the temperature increases above 70°F, the 3.32 inch dimension will decrease to a minimum of 2.74 inches at 98°F.

- (1) Use the Temperature versus Position Chart to service the shimmy dampener if the dimension from the end of the piston rod to the piston exceeds +0.15 inch from the normal line. Refer to Figure 202. If the shimmy dampener does not leak at the ends of the barrel or the piston, it may be possible to remove the filler plug and check the filler plug packing and service the dampener assembly without removal of the piston from the piston rod assembly.

B. Disassembly of the Shimmy Dampener on Airplanes 20800001 thru 20800393, 208B0001 thru 208B1139 (Refer to Figure 203).

- NOTE:** Keep the shimmy dampener clean, especially the exposed portions of the piston rod, to prevent collection of dust and grit which could damage packings in the barrel. Use a clean lint free cloth saturated with MIL-PRF-5606 hydraulic fluid or ASTM D 3699-78 kerosene to keep the machined surfaces wiped free of dirt or dust. All surfaces must be wiped free of unwanted hydraulic fluid.

- (1) Remove the shimmy dampener from the airplane.
- (2) Remove the safety wire from the filler plugs.
- (3) Remove the filler plugs.

NOTE: There is packing found in front of the filler plugs.

- (4) Drain the hydraulic fluid from the barrel.
- (5) Do a check of the condition of the O-rings and replace the O-rings if necessary.
- (6) Remove the setscrew, spring and the temperature compensating piston from the piston rod.

NOTE: There is packing and a backup ring in front of the setscrew. Also, there is an O-ring in front of the temperature compensating piston.

NOTE: Low pressure shop air applied to the filler port may be required to force the temperature compensating piston out of the piston rod.

WARNING: Do not apply high air pressure to the filler port. Too much pressure will cause the temperature compensating piston to exit the piston rod at a high rate of speed. Make a way to stop the temperature compensating piston before complete egress from the piston rod occurs.

NOTE: A piston extraction tool can be fabricated to remove the piston. Refer to Figure 203.

- (7) Do a check of the condition of the O-ring and replace if necessary.
- (8) Do a check of the condition of the inside of the piston rod.
- (9) Remove the snap ring and the end gland.

NOTE: There is a backup ring and packing in front of the end gland.

- (10) Do a check of the backup ring and the packing to make sure they are serviceable.

- (11) Remove the piston from the piston rod assembly.
- (12) Do a check of the backup rings and the packing to make sure they are serviceable.
- (13) Do a check of the condition of the roll pin and surface condition of the piston and piston rod.
- (14) Do a check of the inside surface of the barrel.
- (15) Do a check of the backup rings and the packing to make sure they are serviceable.

C. Assembly of the Shimmy Dampener (Airplanes 20800001 thru 20800393, 208B0001 thru 208B1139) (Refer to Figure 203).

NOTE: Before you assemble the shimmy dampener, make sure there are no sharp edges on any parts that could cause damage to the backup rings or packings during assembly. Lubricate the backup rings, packings, and metal parts with MIL-PRF-5606 hydraulic fluid or VSP Alba White Amojell Petroleum (Vaseline) to make installation easy.

- (1) Install a backup ring and packing in the barrel if previously removed.

CAUTION: Make sure that the hole for the temperature compensating piston and the piston rod are correctly aligned.

- (2) Install a roll pin through the piston and the piston rod.
- (3) Install backup rings and packing on the piston.
- (4) Install the piston rod in the barrel.
- (5) Install the end gland in the end of the barrel.
- (6) Position the piston rod all the way to the gland end of the barrel.
- (7) Fill the chamber through the end port with MIL-PRF-5606 fluid.
- (8) Install the packing and the filler plug.
- (9) Fill the chamber through the end port with MIL-PRF-5606 fluid.
- (10) Install the packing and the filler plug.
- (11) Reposition the assembly so the piston rod is vertical with the end port down.
- (12) Remove the side filler plug, setscrew, and piston.
- (13) Push the piston rod down fully, to the opposite end of the barrel to force any remaining air through the orifice, then fill the rod assembly with fluid.

NOTE: Thumb pressure may be necessary to prevent fluid from coming out of the end of the rod assembly.

- (14) Fill the piston rod with MIL-PRF-5606 fluid, then install the temperature compensating piston and the setscrew.
- (15) Finish filling the barrel with fluid and install the side filler plug.
- (16) Cycle the piston rod five or six times at the full stroke of travel.
- (17) Reposition the assembly horizontal with the side filler up, then remove the side plug.
- (18) Fill with additional fluid as necessary to bring fluid up to the top of the filler opening.
- (19) Reinstall the filler plug so it is not fully tightened, to let fluid be bleed.
- (20) Remove the setscrew.
- (21) Push the temperature compensating piston in to the 3.32 inch dimension (+0.05 inch tolerance), then tighten the side filler plug.
- (22) Use the spring insertion tool and slide it over the piston rod, then insert the spring and setscrew.

NOTE: The setscrew is put into position in the end of the piston rod.

- (23) Operate the completed unit by hand at the full stroke of travel to check for air and correct operation.
- (24) If air is trapped in the shimmy dampener, then remove the temperature compensating piston and repeat the steps to remove air from the shimmy dampener.
- (25) If there is no air trapped in the shimmy dampener, then install the safety wires and reinstall the shimmy dampener on the airplane.