GFC 700 AUTOPILOT - INSPECTION/CHECK

1. General

A. This section has the inspections and checks necessary to keep the GFC 700 autopilot in a serviceable condition.

TASK 22-12-00-640

2. Autopilot Servos Lubrication

A. General

(1) This task gives the procedures to do a lubrication of the Garmin Roll, Pitch, Yaw, and Pitch Trim Servo output gears.

NOTE: This task is only applicable for the Model 208 airplanes with the Garmin 1000 and the GFC 700 autopilot system with the GSM 85 servo gearbox (mount) installed.

B. Special Tools

(1) Aeroshell 33MS Grease (preferred), or Aeroshell 17 Grease.

C. Access

(1) Remove the copilot's seat to get access to the roll servo. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

(2) Remove access panel 232DR to get access to the roll servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(3) Remove the rear compartment partition or unzip the canvas wall to get access to the yaw and pitch servo. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(4) Remove access panels 226A and 226D from the pedestal to get access to the pitch trim servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

D. Do a lubrication of the Autopilot Servos.

(1) Remove the roll, pitch, yaw, and pitch trim servos (Refer to GFC 700 Autopilot - Maintenance Practices).

CAUTION: Do not use solvents to clean the output gears.

(2) Use a lint-free cloth to remove the excess grease build-up from the output gears for the different servos.

(3) Apply Aeroshell 33MS (preferred), or Aeroshell 17 grease to the output gear.

(4) Install the roll, pitch, yaw, and pitch trim servos (Refer to GFC 700 Autopilot - Maintenance Practices).

(5) Operate all of the control surfaces through their full range of travel.

(6) Make a maintenance log entry that shows that the GSA 8X servo output gears have been lubricated with Aeroshell 33MS or Aeroshell 17 grease.

E. Restore Access

(1) Install the rear compartment partition or zip the canvas wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(2) Install access panels 226A and 226D to the pedestal. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(3) Install access panel 232DR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(4) Install the copilot's seat. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

END OF TASK

TASK 22-12-00-710

3. Garmin Autopilot (GFC 700) Slip Clutch Override Operational Check

A. General

(1) This task gives the procedures to do the slip clutch override operational check of the Garmin GFC 700 Autopilot with GSM 86 servo gearbox (mount) installed.

B. Special Tools

(1) External Electrical Power Unit

C. Access

(1) Remove the copilot's seat to get access to the roll servo. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

(2) Remove access panel 232DR to get access to the roll servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(3) Remove the rear compartment partition or unzip the canvas wall to get access to the yaw and pitch servo. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(4) Remove access panels 226A and 226D from the pedestal to get access to the pitch trim servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

D. Do an operational check of the slip clutch override of the GFC700 autopilot system with GSM 86 servo gearbox (mount) installed.

(1) Apply external electrical power to the airplane.

(2) Set the external power switch to BUS.

(3) Set the battery switch to ON.

(4) Set the avionics switches 1 and 2 to ON.

(5) Make sure that the A/P SERVOS circuit breaker and A/P CONT circuit breaker on the avionics circuit breaker panel are engaged.

(6) On the PFD, navigate to the second of the GFC pages.

(7) For each of the autopilot servos (pitch, roll, yaw and trim) and only one servo at a time, do the steps that follow:

(a) Engage the autopilot servo with the ENG CLCH soft key.

(b) Select zero servo speed with the DRV SRVO soft key.

NOTE: For each autopilot servo you must engage the servo clutch and select zero speed for the servo to prevent false readings.

(c) Make sure that the DIS CLCH and STP SRVO are shown on the PFD.

(d) Move the applicable control axis (pitch, roll, yaw or trim) through its travel. The control should move with some resistance.

NOTE: Sufficient movement in both directions is needed to make sure that the slip clutch is being overridden. Full travel is not necessary.

(e) Make sure that the autopilot servo motor does not turn by viewing the SPEED display in the SERVO DATA area of the PFD as you override the slip clutch.

NOTE: The motor of the autopilot servo actuator should remain stationary as the clutch slips.

(f) Disengage the autopilot servo by selecting the DIS CLCH and STP SRVO soft keys.

(g) Move the applicable control axis (pitch, roll, yaw or trim) through its travel. The control should move without the resistance from the autopilot slip clutch.

(h) Do these steps again for the other servos.

(8) Exit the GFC pages on the PFD.

(9) Set the avionics switches 1 and 2 to OFF.

(10) Set the battery switch to OFF.

(11) Set the external power switch to OFF.

(12) Remove the external electrical power to the airplane.

E. Restore Access

(1) Install access panels 226A and 226D to the pedestal. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(2) Install the rear compartment partition or zip the canvas wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(3) Install access panel 232DR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(4) Install the copilot's seat. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

END OF TASK

TASK 22-12-00-720

4. Garmin Autopilot (GFC 700) Functional Check

A. General

(1) This task gives the procedures to do a Functional Check of the Garmin Autopilot (GFC 700).

B. Special Tools

(1) External Electrical Power Unit

(2) Cable Tensionmeter

C. Access

(1) Remove the copilot's seat to get access to the roll servo. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

(2) Remove access panel 232DR to get access to the roll servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(3) Remove the rear compartment partition or unzip the canvas wall to get access to the yaw and pitch servo. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(4) Remove access panels 226A and 226D from the pedestal to get access to the pitch trim servo. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(5) Examine the servos, connectors, support structures, and control cables for corrosion, chaffing, cracks, or other damage.

(6) Have a helper manually move the ailerons, (for roll servo), elevators (for pitch servo), elevator trim wheel (for pitch trim servo), and rudder pedals (for yaw servo) from stop to stop and examine the servo, capstan, and control surface operation.

(a) Make sure there are no binds in the control cables and that the capstan pulleys turn freely.

(7) Examine the servo control cables to make sure there is no fraying, corrosion, or other damage.

(a) If the condition of the cable is unknown, replace it with a new one.

(8) Examine the tension of each servo control cable. Refer to GFC 700 Autopilot - Maintenance Practices.

(9) Examine the GFC 700 autopilot system wiring and make sure there is no chaffing, wear, or other damage.

D. Do a GSM Servo Slip Clutch Check.

(1) Apply external electrical power to the airplane.

(2) Set the external power switch to BUS.

(3) Set the battery switch to ON.

(4) Set the avionics switches 1 and 2 to ON.

(5) Make sure that the A/P SERVOS circuit breaker and A/P CONT circuit breaker on the lower left circuit breaker panel are engaged.

(6) Push the AP key on the GMC 710 AFCS controller to engage the autopilot.

NOTE: The GFC 700 uses electronic torque limiting as well as mechanical slip clutches to limit the maximum servo effort. When the system is on the ground, the electronic torque limiting is removed, to allow manual checks of the slip-clutch settings.

(7) Apply force to the control yoke to find if the autopilot clutches can be overpowered in pitch and roll.

(a) If the autopilot clutches cannot be overpowered, examine the servo clutch torque settings. Refer to G1000 Caravan Line Maintenance Manual.

NOTE: There is an overpowered condition if the control surfaces can be moved by applying force to the control wheel or the rudder pedals against the resistance of the engaged autopilot.

(8) Apply force to the rudder pedals to find if the autopilot clutches can be overpowered in yaw.

(a) If the autopilot clutches cannot be overpowered, examine the servo clutch torque settings. Refer to G1000 Caravan Line Maintenance Manual.

(9) Use the Pitch MET (Manual Electric Trim) switch to initiate an autopilot disconnect.

(a) While the trim is running, grasp the aircraft pitch trim wheel and make sure that the trim clutch can be overpowered by preventing the trim wheel from moving.

1 If it cannot be overpowered, examine the servo clutch torque setting. Refer to G1000 Caravan Line

Maintenance Manual.

(b) Make sure that the trim wheel moves smoothly in both directions through the full trim range during the Pitch MET (Manual Electric Trim) operation.

1 If the trim wheel does not move in 2 seconds, this can show that the pitch trim clutch is slipping.

(c) Make sure that the clutch setting and cable tensions are correct.

1 If the clutch setting and cable tensions are in tolerance, examine the aircraft pitch trim system for too much friction.

(10) Set the avionics switches 1 and 2 to OFF.

(11) Set the battery switch to OFF.

(12) Set the external power switch to OFF.

(13) Remove external electrical power to the airplane.

E. Restore Access

(1) Install access panels 226A and 226D to the pedestal. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(2) Install the rear compartment partition or zip the canvas wall. Refer to Chapter 25, Rear Compartment Wall - Maintenance Practices.

(3) Install access panel 232DR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(4) Install the copilot's seat. Refer to Chapter 25, Flight Compartment - Maintenance Practices.

END OF TASK