Piper Aircraft, Inc.
2926 Piper Drive
Vero Beach, FL, U.S.A. 32960

SERVICE NO. 1286A LETTER

Date: January 21, 2021 (S)

MAINTENANCE ALERT

Service Letter (SL) 1286A supersedes SL 1286 in its entirety.

For M600 only: on aircraft that were previously made compliant with SL 1286, compliance with SL 1286A is required at the next regularly scheduled maintenance event, not to exceed the next 50 hours time in service.

For all other models: on aircraft that were previously made compliant with SL 1286, no further action is necessary until the next 100 hour/annual inspection.

SUBJECT: **NOSE LANDING GEAR STEERING COMPONENTS INSPECTION AND ADJUSTMENT**

REASON FOR REVISION: SL 1286A clarifies the procedures required for PA-46-600TP M600 aircraft.

MODELS AFFECTED:	SERIAL NUMBERS AFFECTED:
PA-46-310P Malibu	All
PA-46-350P Mirage/M350	All
PA-46R-350T Matrix	All
PA-46-500TP Meridian/M500	All
PA-46-600TP M600	All

COMPLIANCE TIME: Compliance is to coincide with the next regularly scheduled maintenance event, but not to exceed the next 50 hours time in service (TIS). After that, compliance is to occur every 100 hours, in accordance with the applicable maintenance manual.

APPROVAL: The engineering aspects of this service document have been shown to comply with the applicable Federal Aviation Regulations and are FAA approved.

ATA/JASC: 3200

(OVER)

PURPOSE:

Several aircraft components, and their rigging, are important for proper ground steering and directional control. These components require regular, proper inspection and adjustment, and, on condition, replacement, to maintain proper ground steering and directional control.

This service letter provides a review of the best practices for maintaining ground steering system components on the affected aircraft: rudder cable tension, nose landing gear alignment, nose gear rake angle, and nose gear steering arm clearance.

NOTE: In addition to the nose landing gear procedures included in this service letter, proper tire pressure maintenance and main landing gear alignment are important to overall steering and directional control. For tire pressure maintenance, refer to Piper Service Letter 1285, "Proper Tire Pressure Maintenance." For main landing gear alignment, refer to Section 32-10-00 of the applicable Piper Airplane Maintenance Manual.

INSTRUCTIONS:

NOTE: This service letter is intended to bring attention to specific procedures that appear in the Piper Airplane Maintenance Manuals (AMM) for the affected aircraft.

NOTE: Any procedures in this service letter that include changes to procedures currently available in the applicable AMMs will be incorporated into a future revision of the applicable AMMs.

NOTE: In addition to the maintenance specified in this service letter for the nose landing gear, there are scheduled and unscheduled inspections in Sections 5-20-00 and 5-50-00 of the AMMs, respectively. The troubleshooting chart found in Section 32-20-00 can assist in targeting the cause and remedy of issues with the nose landing gear, including steering and directional control. Also, Section 12-20-00 specifies the type and frequency of lubrication for the landing gear, steering bellcrank and rod ends.

NOTE: Adhere to proper towing and taxiing practices provided in the applicable Pilot's Operating Handbook (POH) and Piper AMM. Refer to "Ground Handling" in Section 8 of the applicable POH, and Sections 9-00-00 and 9-10-00 of the applicable Piper AMM.

For reliable steering and directional control, chapters 32-20-00 and 27-20-00 include procedures that will help ensure that nose landing gear steering components operate nominally. These procedures verify the nose gear alignment, nose gear rake angle, clearance between the steering arm and steering horn rollers, and rudder cable tension (the rigging and adjustment of the rudder controls).

1. Nose Landing Gear Alignment

NOTE: In addition to maintaining the nose landing gear alignment, maintaining the main landing gear alignment affects proper ground directional control. Refer to Section 32-10-00 of the applicable AMM for the main landing gear alignment procedure.

- **For all affected models except PA-46-600TP M600,** check and set the alignment of the nose gear per "Alignment," in Section 32-20-00 of the applicable AMM.
  1) In place of the following steps in Section 32-20-00 of the applicable AMM:
     - Step (3) under "Alignment," of Piper PA-46-350P/PA-46R-350T AMM P/N 761-876 and Piper PA-46-500TP AMM P/N 767-072
     - Step (c) under "Nose Gear Assembly Alignment," in Piper PA-46-310P/350P AMM P/N 761-783

     Complete Item 3, Clearance between Nose Landing Gear Steering Arm and Steering Horn Rollers, below.
  2) Upon the completion of Item 3, below, continue the remaining alignment steps in the applicable AMM.

- **For PA-46-600TP M600 aircraft only,** check and align the rudder pedals and the nose gear:
  1) Loosen the rudder cable turnbuckles to allow for rudder pedal movement.
  2) Adjust the pushrods:
     a) Unclamp and slide the pushrod bellows assembly to expose the Pushrods, P/N 83660-002. See the applicable AMM, Section 27-20-00, Figure 1, Sheet 3.
     b) Disconnect push rods from Bellcrank Assembly, P/N 83639-002, as necessary, to adjust both pushrods connected to the left and right rudder pedals. Adjust the pushrods until the adjustable ends are bottomed out (that is, adjusted for minimum pushrod lengths).
     c) Hold the bellcrank perpendicular to BL 0.00 at FS 93.00. Reconnnect the pushrods to the bellcrank assembly.
     d) Verify the alignment of the rudder pedals. If the left and right pedals are misaligned, realign by adjusting only one of the pushrods: Turn the rod end a half turn at a time, to extend it until the left and right rudder pedals are aligned with each other in the cockpit.

     NOTE: This adjustment may result in rudder pedal positions that deviate from the standard neutral position (FS 105.70).
  3) With the rudder set at 0 degrees, set the tension for the rudder cables, per Section 27-20-00 of Piper PA-46-600TP M600 AMM, P/N 767-617.
  4) Check and set the alignment of the nose gear per “Alignment,” “Adjustment,” and “Clearance,” in Section 32-20-00 of Piper PA-46-600TP AMM P/N 767-617.

As part of the alignment procedure, with the exception of PA-46-310P Malibu aircraft, it is necessary to check the rake angle and, if required, to adjust it (Item 2, below).

2. Rake Angle Adjustment

NOTE: Rake angle adjustment is not applicable to PA-46-310P aircraft.

As mentioned under Item 1, it is necessary to inspect and/or adjust the nose gear rake angle as part of the nose gear alignment procedure. In addition, inspection and/or adjustment of the rake angle is necessary whenever the pilot experiences poor steering, or upon the replacement or service to the nose gear trunnion, the nose gear actuator, or the engine mount.

Check and adjust the rake angle, for the applicable models (all except PA-46-310P), per “Adjustment,” in Section 32-20-00 of the applicable AMM.

Adjusting the rake angle affects the clearance between the steering arm and steering horn rollers, which requires that this clearance is checked, as provided under Item 3, below.

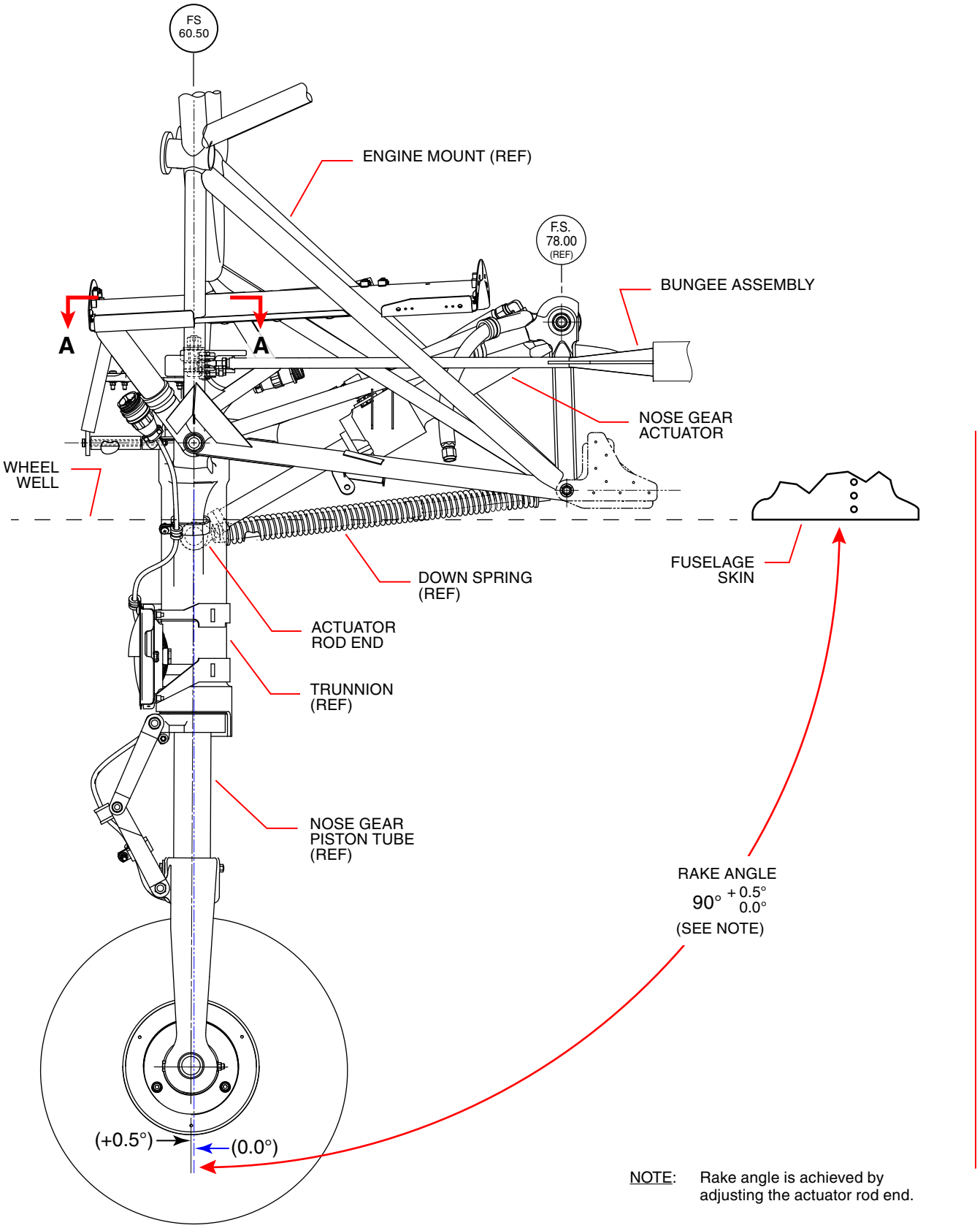
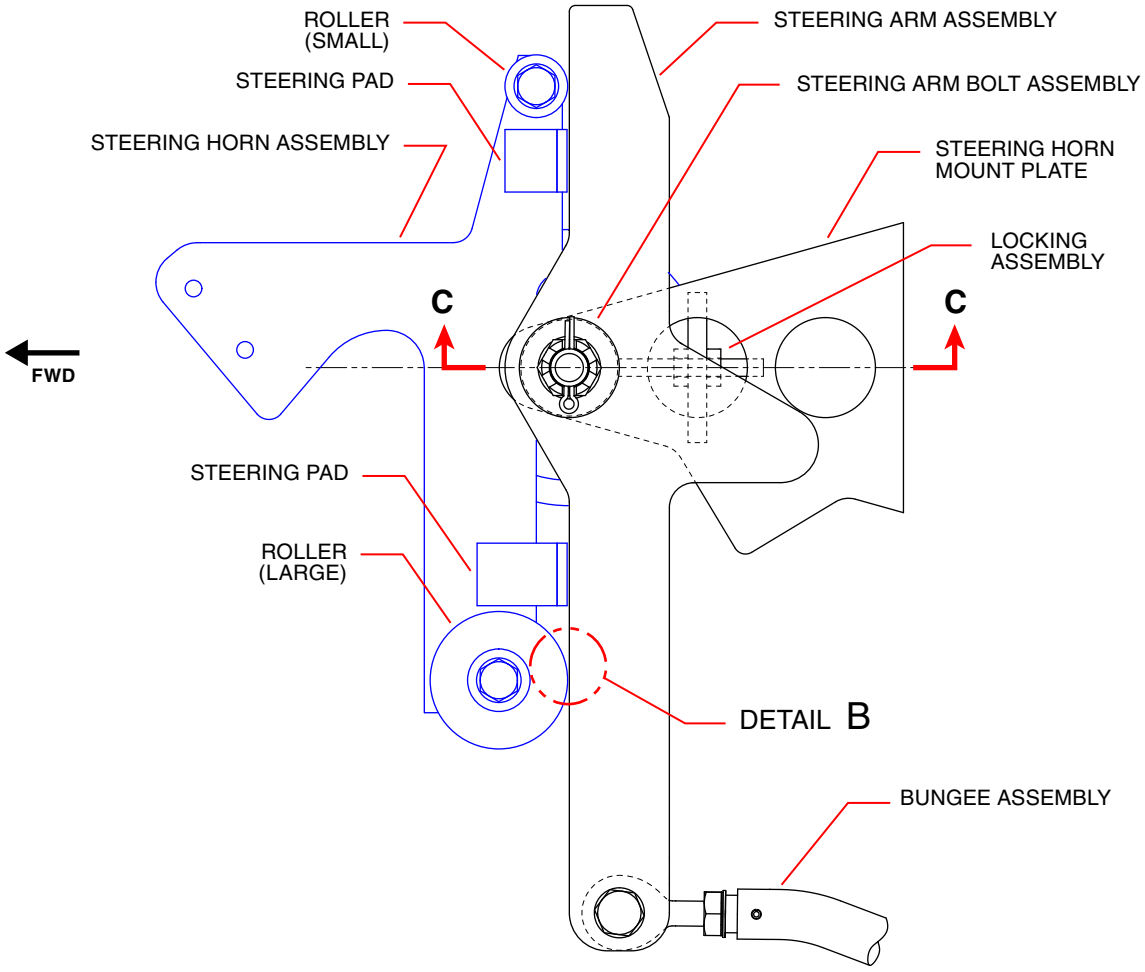
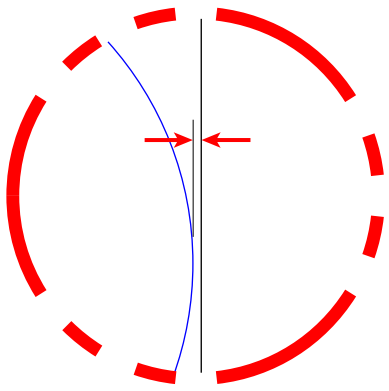


Figure 1 – Sheet 1 of 3
Nose Wheel Adjustment – Typical



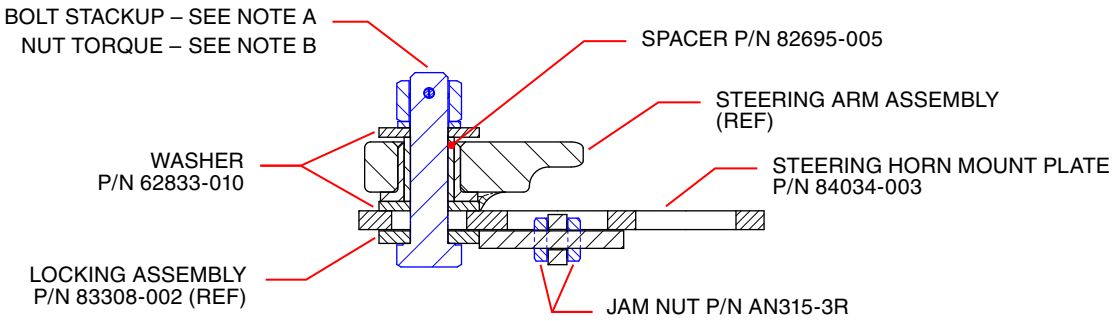
VIEW A–A
NOSE LANDING GEAR
STEERING HORN AND STEERING ARM ASSEMBLIES
LOOKING DOWN



NOTE: The clearance between the steering arm and both of the rollers must be 0.010 – 0.030 inch.

DETAIL B
CLEARANCE BETWEEN STEERING ARM AND ROLLERS

Figure 1 – Sheet 2 of 3
Nose Wheel Steering Assemblies – Typical



NOTE A: The bolt stackup, by models:

For PA-46-600TP (shown):	For PA-46-310P, PA-46-350P, PA-46R-350T, and PA-46-500TP:
BOLT AN6-15 WASHER NAS1149F0663P NUT MS17825-6 COTTER PIN MS24665-283	BOLT AN6-14A NUT MS21042-6

NOTE B: For PA-46-600TP only, torque the Nut MS17825-6 to 100 in-lb, then back off to the nearest radial slit.

For PA-46-310P, PA-46-350P, PA-46R-350T, and PA-46-500TP, torque the Nut MS21042-6 to 175-190 in-lb.

SECTION C–C
STEERING ARM BEARING BOLT STACK-UP AND JAM NUTS

Figure 1 – Sheet 3 of 3
Nose Wheel Steering Assemblies – Typical

3. Clearance between Nose Landing Gear Steering Arm and Steering Horn Rollers

NOTE: The following procedure has been incorporated into the current revision (Nov. 30, 2020) of Piper M600 AMM P/N 767-617.

NOTE: This procedure replaces the following steps in the currently available revisions of the applicable AMMs:

- Step (3) under “Alignment,” in Section 32-20-00, of these applicable AMMs:
  - Piper PA-46-350P/PA-46R-350T AMM P/N 761-876
  - Piper PA-46-500TP Meridian/M500 AMM P/N 767-072
- Step (c) under “Nose Gear Assembly Alignment,” in Section 32-20-00, in Piper PA-46-310P/350P AMM P/N 761-783.

Checking and adjusting the clearance between the nose landing gear steering arm and steering horn rollers is part of the alignment procedure found in applicable AMMs (see Item 1, above). In place of Step (3) under “Alignment,” or Step (c) under “Nose Gear Assembly Alignment,” in Section 32-20-00 of the applicable AMMs (refer to the note, immediately above), complete the following procedure.

Adjust the steering arm to achieve the desirable clearance between it and the steering horn rollers. First, adjust it with the assembly in neutral position, then with the left pedal pressed and, finally, with the right pedal pressed. The instructions for adjusting this clearance, in the applicable AMMs, will be replaced with the following procedure.

1) With the landing gear in the down and locked position, weight proportionally on the nose gear and the nose wheel facing forward, adjust the steering arm.
   a) Loosen the steering arm bolt assembly and adjust the jam nuts fore and aft (refer to View C–C).
   b) Place 0.020 of an inch (in.) thick feeler gauges (two are required) between the steering horn rollers and the steering arm. Adjust the steering arm to achieve contact between the steering horn roller, the feeler gauge, and steering arm, for both left and right hand sides simultaneously.

c) When properly adjusted, the acceptable clearance between both rollers and the steering arm is between 0.010 and 0.030 in., as shown in Detail B.

NOTE: This clearance requirement applies to both rollers at the same time. The clearance measurement is to be taken while the nose wheel is locked in alignment with the longitudinal axis, and the steering arm is parallel to the steering horn pads (as shown in Figure 1, View A–A).

d) Torque the steering arm assembly nut per torque note in Figure 1, View C–C, and tighten the locking assembly jam nuts.

NOTE: In Steps 2) and 3), below: the small roller will make contact with the steering arm when the left rudder pedal is depressed; the larger roller will make contact with the steering arm when right rudder pedal is depressed.

2) Clearance with the left rudder pedal pressed:

a) With the nose wheel off the ground and free to turn, and the left rudder pedal pressed firmly against the right forward stop, determine whether there is 0.010 in. minimum clearance between the steering arm and the larger roller on the steering horn assembly, as shown in Figure 2.

b) If the clearance is less than the minimum 0.010 in., then complete Steps c) and d), below. Increase the nose landing gear centered clearance per the steering arm adjustment procedure, Step 1), above. A 0.010 in. minimum clearance must be maintained for the larger roller on the steering horn assembly at full left rudder pedal deflection.

c) With weight on wheels, lock the rudder pedals together, in alignment with each other and on fuselage station 105.70 (with the exception of the deviation for the M600 model, due to pushrod adjustment required in Item 1, above). See Figure 4.

d) To align the nose wheel straight forward (weight remaining on wheels), stand in front of the nose gear and align the center rib of the tire with the chalk line. Alternatively, lay a straightedge along the side of the tire and parallel the straightedge with the chalk line.

NOTE: The chalk line referred to was created while accomplishing Item 1, Nose Landing Gear Alignment.

e) If Steps c) and d) were necessary, unlock the rudder pedals, then repeat Step a), above, to confirm that minimum clearance is achieved.

3) Clearance with the right rudder pedal pressed:

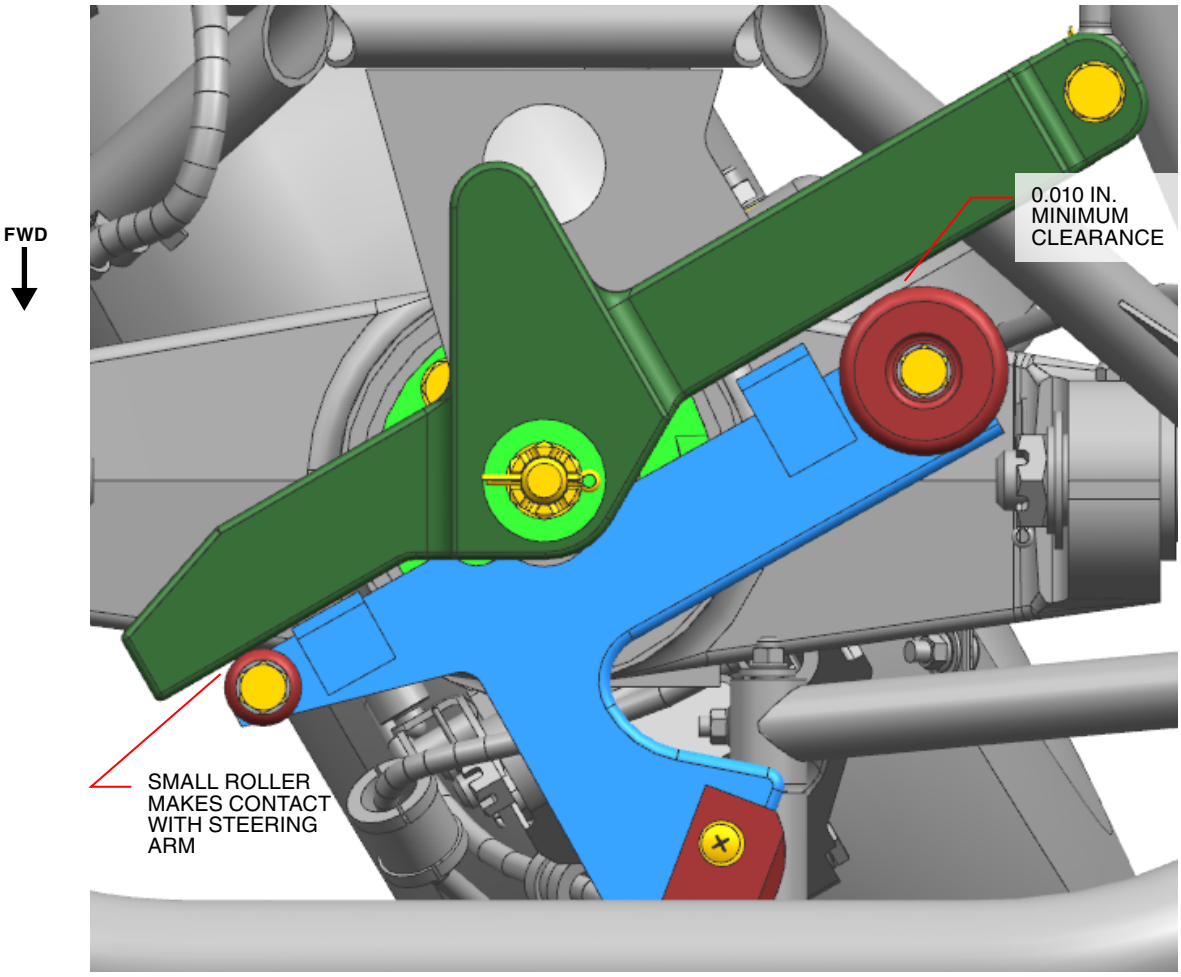
a) With the nose wheel off the ground and free to turn, and the right rudder pedal pressed firmly against the right forward stop, determine whether there is 0.010 in. minimum clearance between the steering arm and the small roller on the steering horn assembly, as shown in Figure 3.

b) If the clearance is less than the minimum 0.010 in., then complete Steps c) and d) under Step 2), above. Increase the nose landing gear centered clearance per the steering arm adjustment procedure, Step 1), above. A 0.010 in. minimum clearance must be maintained for the small roller on the steering horn assembly at full right rudder pedal deflection.

c) If Steps c) and d) under Step 2) were necessary, unlock the rudder pedals, then repeat Step a), above, to confirm that minimum clearance is achieved.

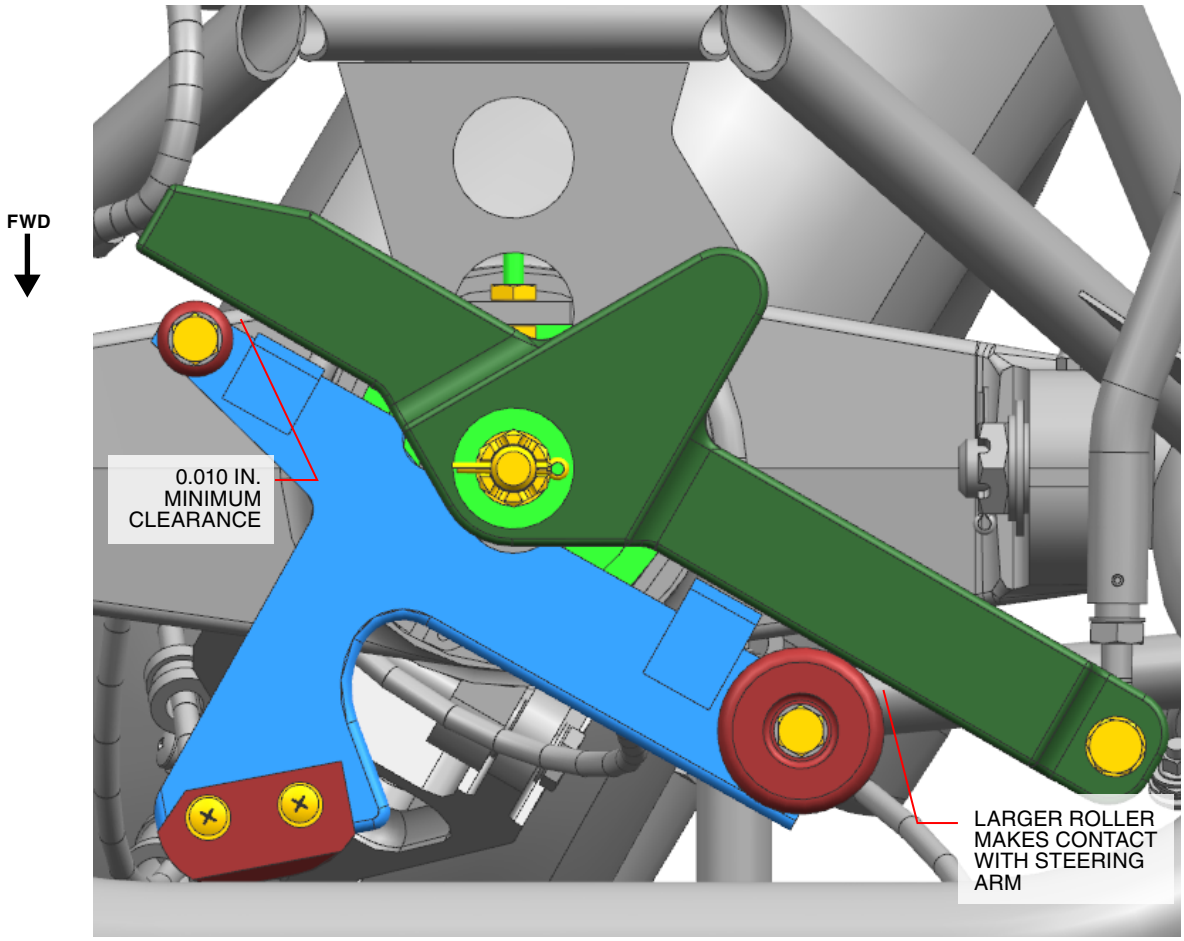
4. Rudder Cable Tension

Confirm that the tension of both rudder control cables is correct, per the appropriate steps in Section 27-20-00 of the applicable AMM.



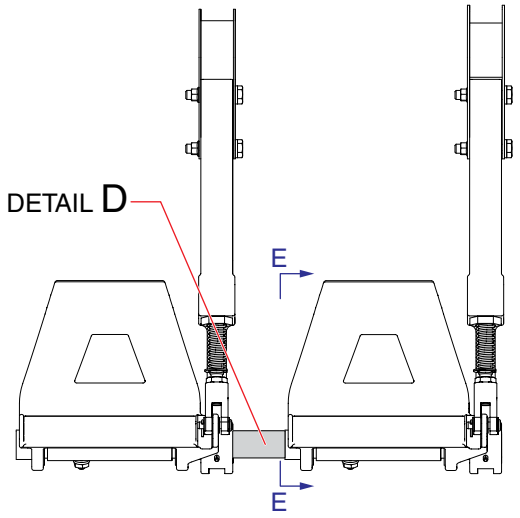
LOOKING DOWN
(M600 INSTALLATION SHOWN, OTHERS SIMILAR)

Figure 2
Position of Steering Horn and Arm Assemblies – Left Rudder Pedal Pressed

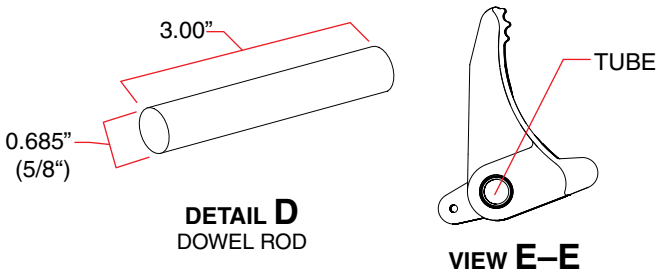


LOOKING DOWN
(M600 INSTALLATION SHOWN, OTHERS SIMILAR)

Figure 3
Position of Steering Horn and Arm Assemblies – Right Rudder Pedal Pressed



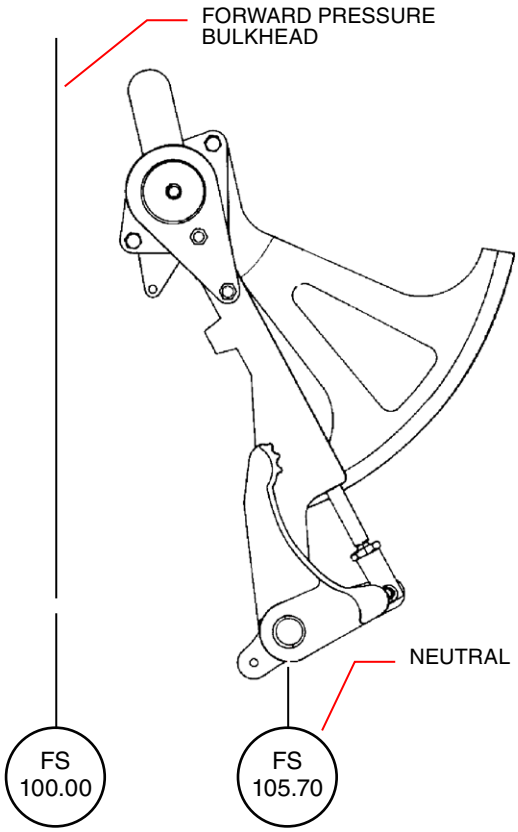
PILOT'S RUDDER PEDALS
LOOKING FWD



DETAIL D
DOWEL ROD

VIEW E–E

CLAMPING RUDDER PEDALS IN NEUTRAL POSITION



NOTE: On M600 models, the adjustment of pushrods may result in a rudder pedal neutral position that deviates from the FS 105.7 position.

RUDDER PEDALS IN NEUTRAL POSITION

NOTE: This figure illustrates the requirement to fix the rudder pedals in the neutral position while performing the applicable rigging step. Instead of using the depicted technique, it is permissible to fashion and utilize tools and/or devices that are suitable for accomplishing the same intent.

Figure 4
Rudder Pedals Set in Neutral Position

MATERIAL REQUIRED: N/A

AVAILABILITY OF PARTS: N/A

EFFECTIVITY DATE: This service letter is effective upon receipt.

SUMMARY: Please contact your Piper Approved Service Center to make arrangements for compliance with this service letter in accordance with the compliance time indicated.

NOTE: Please notify the factory of any address/ownership corrections. Changes should include aircraft model, serial number, and current owner's name and address.

Corrections and/or changes should be directed to:

PIPER AIRCRAFT, INC.
Attn: Customer Service
2926 Piper Drive
Vero Beach, FL 32960
or:
CustomerService@piper.com
Please include in subject line: "Aircraft ownership update"