

# **KITFOX AIRCRAFT**

## **KITFOX SUPER SPORT LANDING GEAR INSTALLATION**

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## Section A. Main Landing Gear Assembly

The Super Sport aircraft can have either a conventional or tricycle landing gear configuration. The configuration can be changed at any time during assembly or even after the aircraft has been completed and flown.

These instructions describe the installation of the landing gear as though this were the final assembly, however the gear will have to be removed to cover and paint the aircraft. Therefore, all illustrations showing finalization of hardware (such as torqued nuts, cotter pins, safety wire, etc.) are there for your future reference.

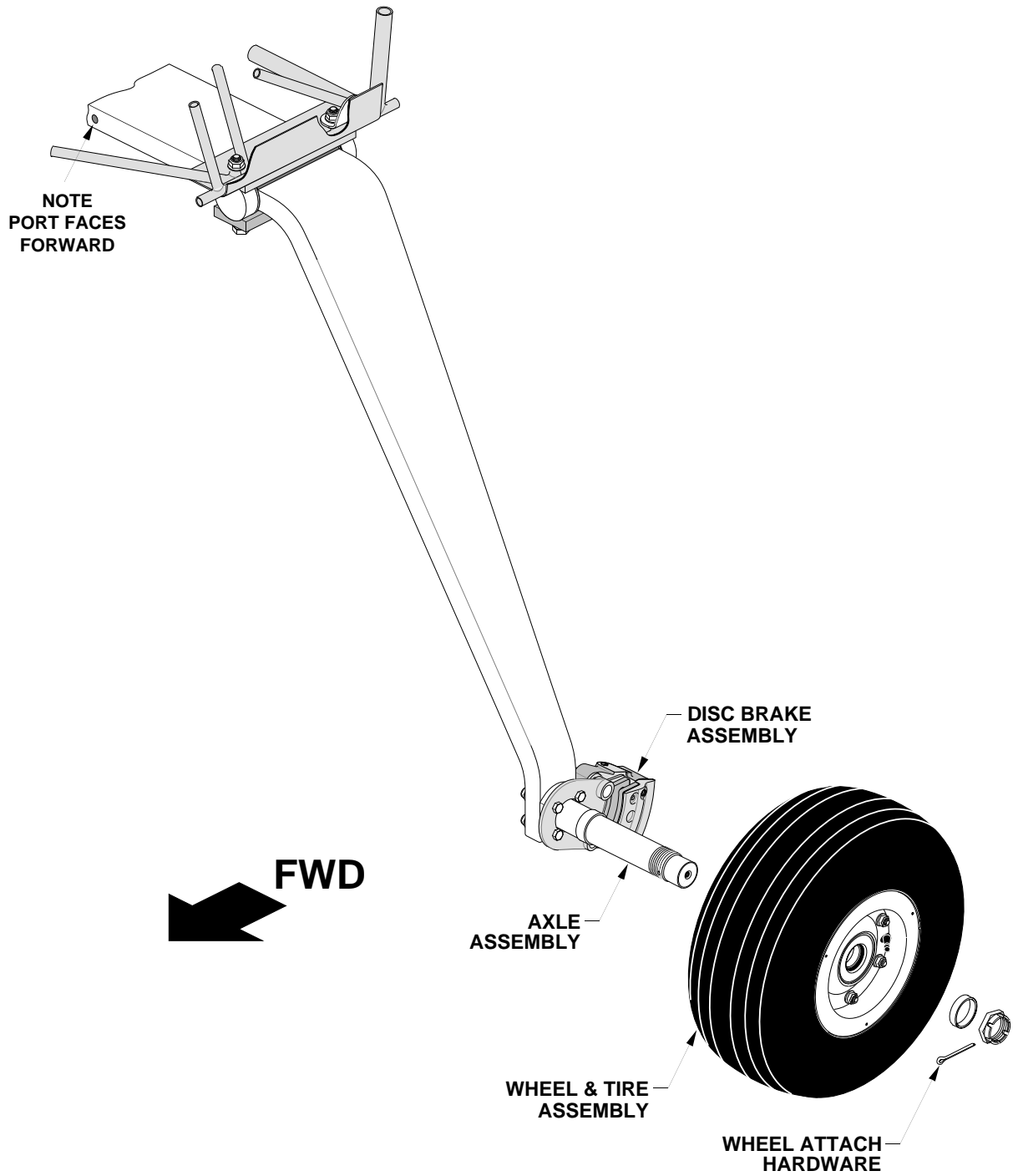
The Super Sport main landing gear consists of a single-piece aluminum gear bow that is mounted to the fuselage between two points that allow the gear to pivot as loads are applied.

Axles bolt to the gear legs to mount the wheels and disc brake assemblies.

This gear design has proven to be extremely rugged, has low aerodynamic drag, and is virtually maintenance free.

This section is illustrated with the landing gear in its normal, upright position. You may find it advantageous to invert the fuselage while installing the gear - this helps keep the hardware in place while you get the nuts threaded on the bolts. If you choose to invert the fuselage, invert the illustrations as well to reduce confusion while you are working.

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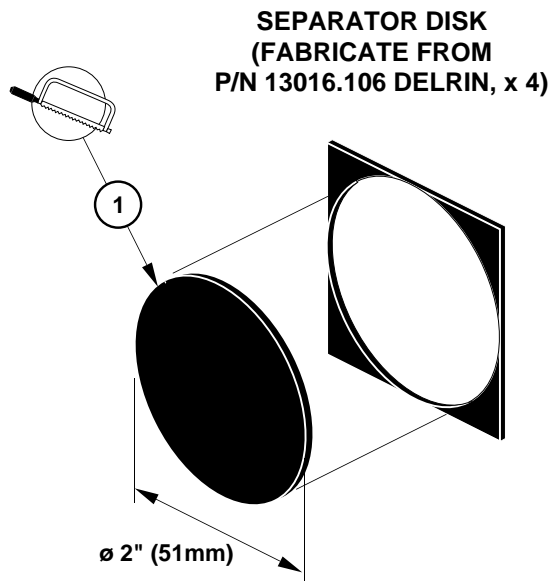
**Figure A-1**  
Main Gear Assembly Overview

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1. Cut four Delrin® separator disks from the supplied material. A bandsaw works well for the initial cut. Clean up the edges with sandpaper or a file. Make sure that the disks do not exceed the 2" outside dimension.

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**Figure A-2**  
Separator Disk Fabrication

2. Ream the four fuselage gear attach bushings to .3750". Drill out the  $\frac{5}{16}$ " holes in P/N: 13016.102 lower pivot blocks to  $\frac{3}{8}$ "
3. Press the four roll pins into the gear leg at the locations shown. Use an arbor press if one is available. If not, the pins can be carefully driven in with a small hammer. If you use a hammer to drive the pins in, hold them with a pair of pliers initially to keep your fingers out of the way.
4. Attach the gear leg to the fuselage with the hardware called out in Figure A-3. Note that the gear is not symmetrical - the tapered face must be installed toward the rear. Figure A-3 shows the tricycle (aft mounting) configuration. The conventional landing gear configuration is similar, although longer bolts are used.

### NOTE

To help you achieve the proper fit of the gear leg between the rocker and separator disks, the mounting hole through the rocker disks has been drilled .010" off center. If the gear leg seems too tight or too loose between the disks, rotate one or both of the disks on each side 180° until the leg is held with as little play as possible without binding.

### NOTE

There are threaded holes in the Delrin® gear rocker blocks. They will not affect the installation - they are from the tooling process. Deburr the threaded holes as required to remove any remaining material on the surface from the threading process.

### OPTIONAL WHEEL PANTS

If you are installing wheel pants, refer to the instructions that came with the wheel pant kit before installing the axles.

5. Bolt the axles and brake torque plates to the gear legs using the hardware shown. The plates should be oriented at about the 4 o'clock position, viewed from the axle end. Torque the nuts to 50 to 70 inch-pounds.

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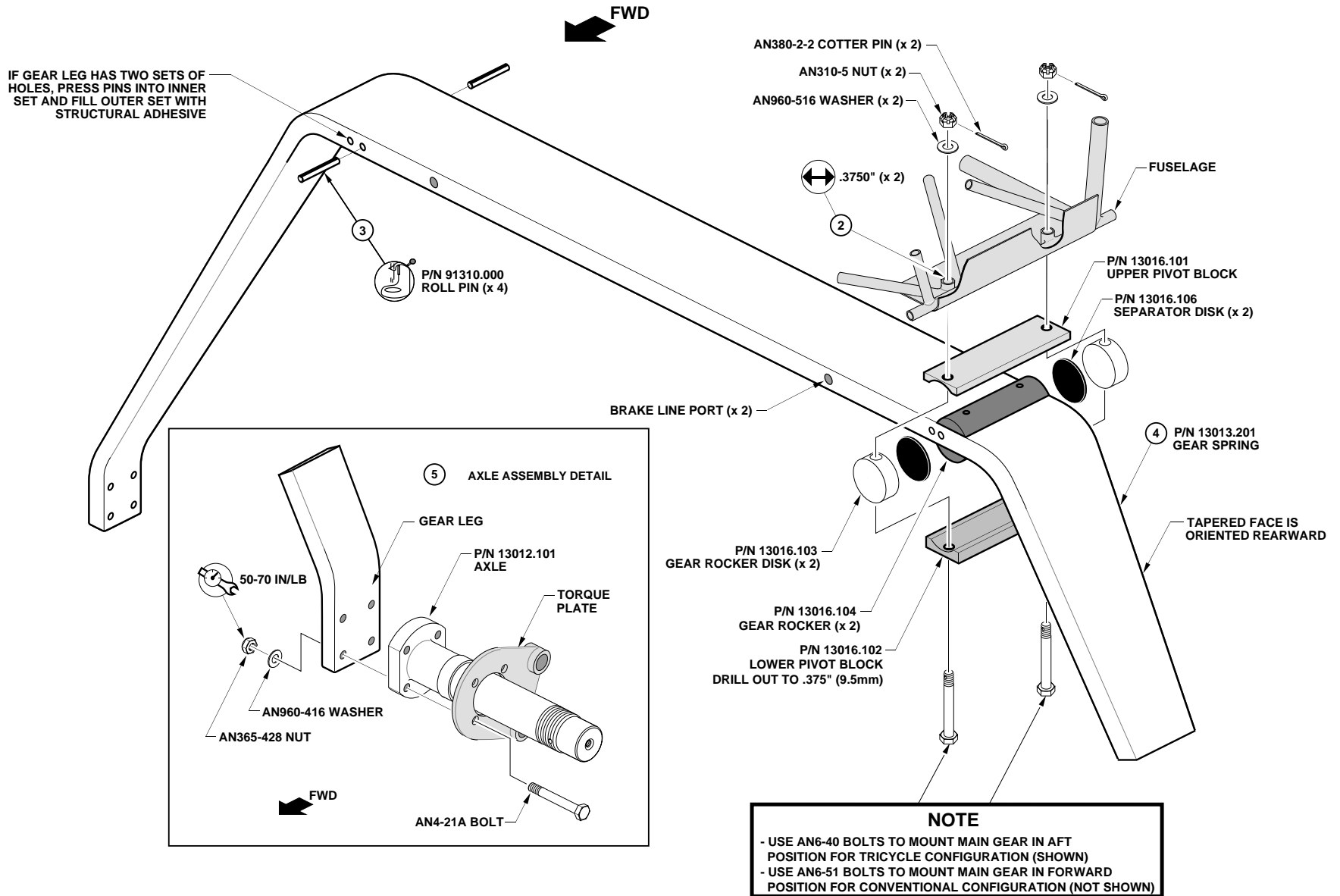


Figure A-3  
Main Landing Gear and Axle Installation

**Section B. Wheel and Brake Assembly**

1. Working on a clean workbench, remove the wheel bearing retaining spring ring, the cover washers, the felt wiper, and the bearing from the wheel halves. Work on one wheel half and bearing at a time to prevent mixing the parts. Pack the bearing with wheel bearing grease by putting a golf ball sized lump of grease in the palm of one hand and pressing the edge of the bearing into the grease. Rotate the bearing a little and repeat the packing motion. You should see the grease oozing up between the rollers. Turn the bearing over and pack the grease in from the other side, all the way around. When the bearing is fully packed with grease, put it and the rest of the bearing hardware back into the wheel half and reinstall the retaining ring, making sure that it is fully seated in its groove. Repeat for the bearing in the other wheel half and repeat the whole process on the other wheel.
  
2. Remove the nuts and bolts holding the wheel halves together and separate the wheel. Insert a tire tube into a tire, dusting the tube with tire talc to eliminate friction between the two. If the tire has a red dot painted on the sidewall, align the valve stem with the dot. Press the valve stem through the hole in the wheel half, and then press the wheel half fully into the tire. It is helpful to put a very small amount of air in the tube, just enough to help it hold its shape. Press the opposite wheel half into the tire from the other side, visually aligning the mounting holes. Pass a bolt through the wheel halves and brake disc, press the halves together, and start a nut on the bolt threads. Install the other bolts in a similar manner and torque them to 90 inch-pounds.

**CAUTION**

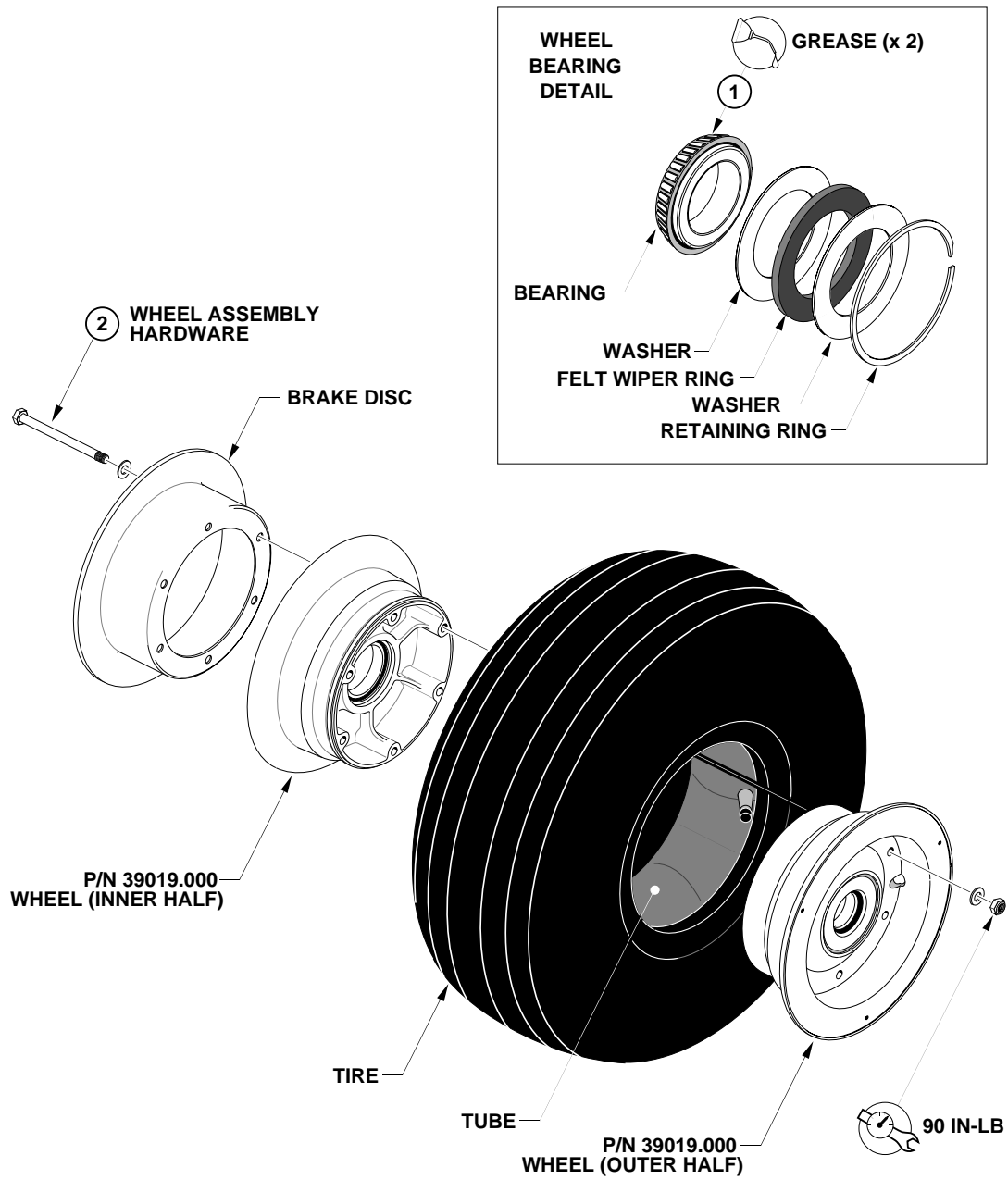
**Be careful not to pinch the tube between the halves of the wheel as they come together. Listen and feel for crisp, metal-to-metal contact of the wheel halves before tightening the bolts. If you have difficulty ensuring that the tube is not caught between the wheel halves, a ring of thin cardboard can be taped in place around the wheel half split line to help guard the tube.**

**WARNING**

**Never inflate the tire unless all the wheel bolts are installed and properly torqued. Always deflate the tire before loosening any wheel bolt. The wheel halves will be very forcefully ejected by the tire pressure if these precautions are overlooked.**

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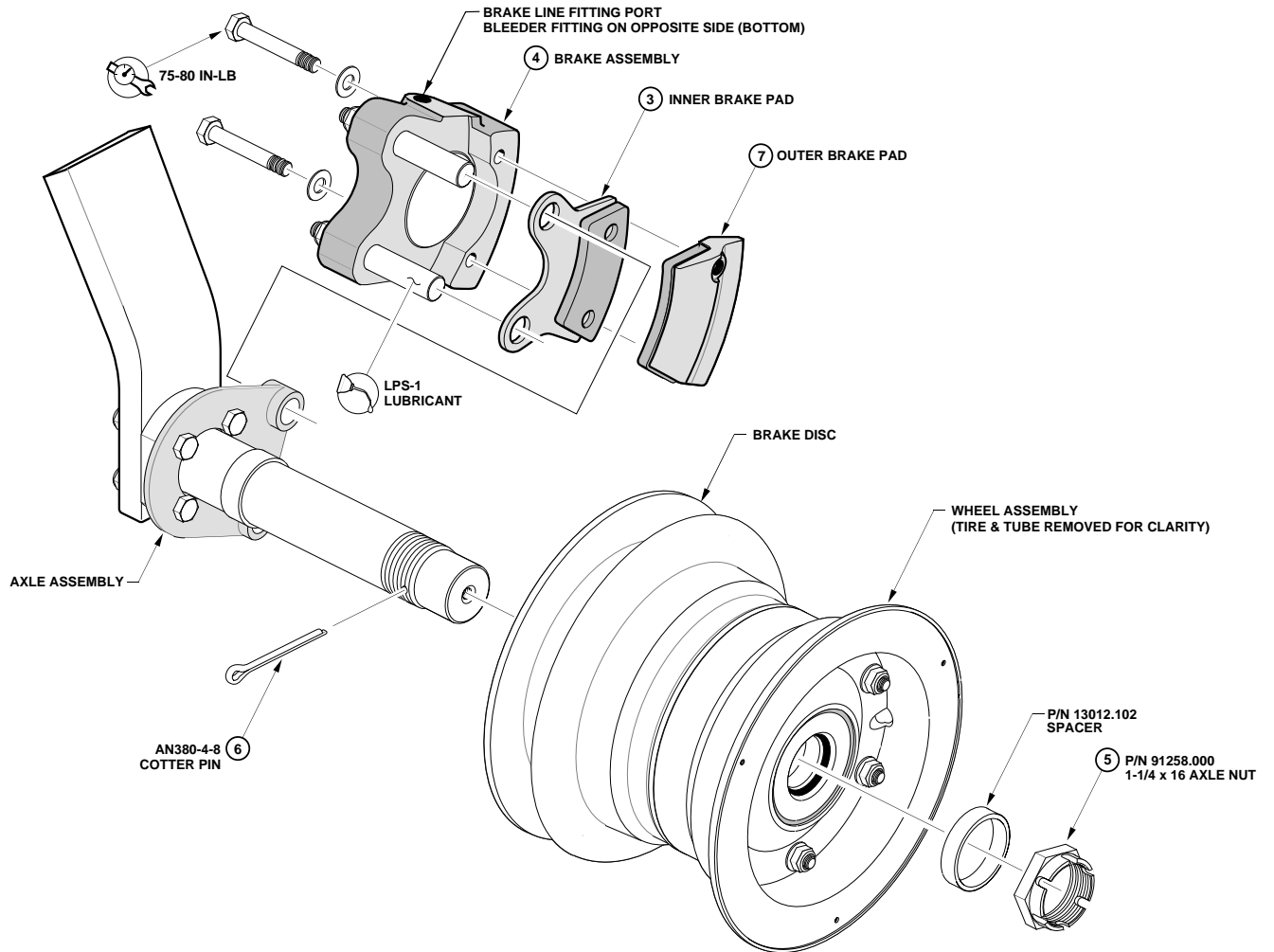


**Figure B-1**  
Wheel and Tire Assembly

3. Slip the inner brake pads onto the caliper pins if they were removed for any reason. Lubricate the brake caliper pins with a dry film lubricant such as LPS-1.
4. Slide the brake caliper onto the brake torque plate from the inboard side. The caliper should have its bleeder fitting oriented downward.
5. Slide the wheel and tire assembly onto the axle, followed by the axle spacer and the axle nut. Tighten the axle nut firmly and rotate the tire by hand to squeeze out the extra grease from the bearing rollers and races. Loosen the nut one-half turn, then re-tighten it slowly until all play has been removed from the bearings. This play can be felt by grasping the tire at the top and pushing it in and out. When the nut is adjusted, advance or retreat it just far enough to align the closest cotter pin hole. Double check the bearing play and readjust as required. A very small amount of play is preferable to having the bearing being too tightly preloaded.
6. Install a cotter pin to secure the axle nut.
7. Set the outer brake pad in place, trapping the brake disc between the two pads. Secure it with the bolts that were supplied with the wheel and brake kit. Torque the nuts to 75 to 80 inch-pounds for final assembly.

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**Figure B-2**  
Wheel and Brake Installation

## Section C. Tailwheel Installation

The tailwheel assembly consists of an aluminum tail spring, a steerable, full-swiveling tailwheel, and steering chains and springs that are connected to the rudder to allow maneuverability of the aircraft during ground operations.

1. Round the corners of the tailspring clamp plate with a file.
2. Ream the mounting holes in the clamp plate to .1875"
3. Ream the fuselage bushing to .3125" for the tailspring mounting bolt.
4. Ream the two holes in the fuselage mounted tailspring clamp plate to .1875".
5. Install the tailwheel springs using the hardware shown. Torque the tailspring clamp plate bolts to 20 to 25 inch-pounds and the forward tail spring attach bolt to 100-140 inch-pounds.
6. Bolt the tailwheel assembly to the tailwheel spring using the bolt, nut, and washer shown. Torque the tailwheel mounting bolt to 270 to 300 inch-pounds.

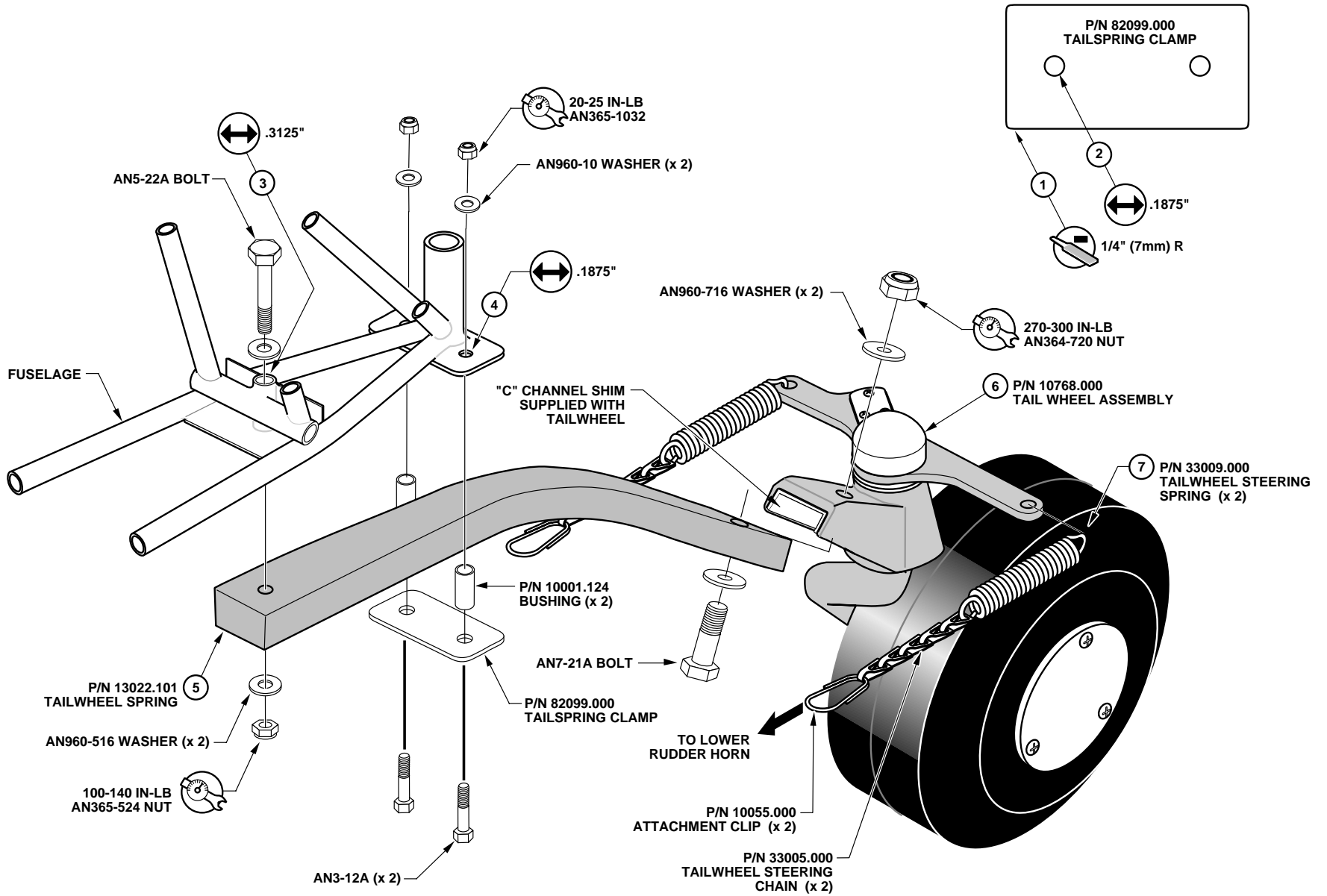
### NOTE

The steering springs and chains will be installed when the aircraft is complete and is at its empty weight (refer to the Final Assembly chapter for the weight and balance definitions and procedures) prior to initial taxi testing.

7. Install a tailwheel steering chain to each lower control horn on the rudder using a P/N: 10055.000 wire clip. Attach a steering spring between each steering arm on the tailwheel and the corresponding chains with a minimum of slack. Leave two or three extra links on the chain to allow for further adjustments until you are satisfied with the ground handling characteristics of the aircraft.

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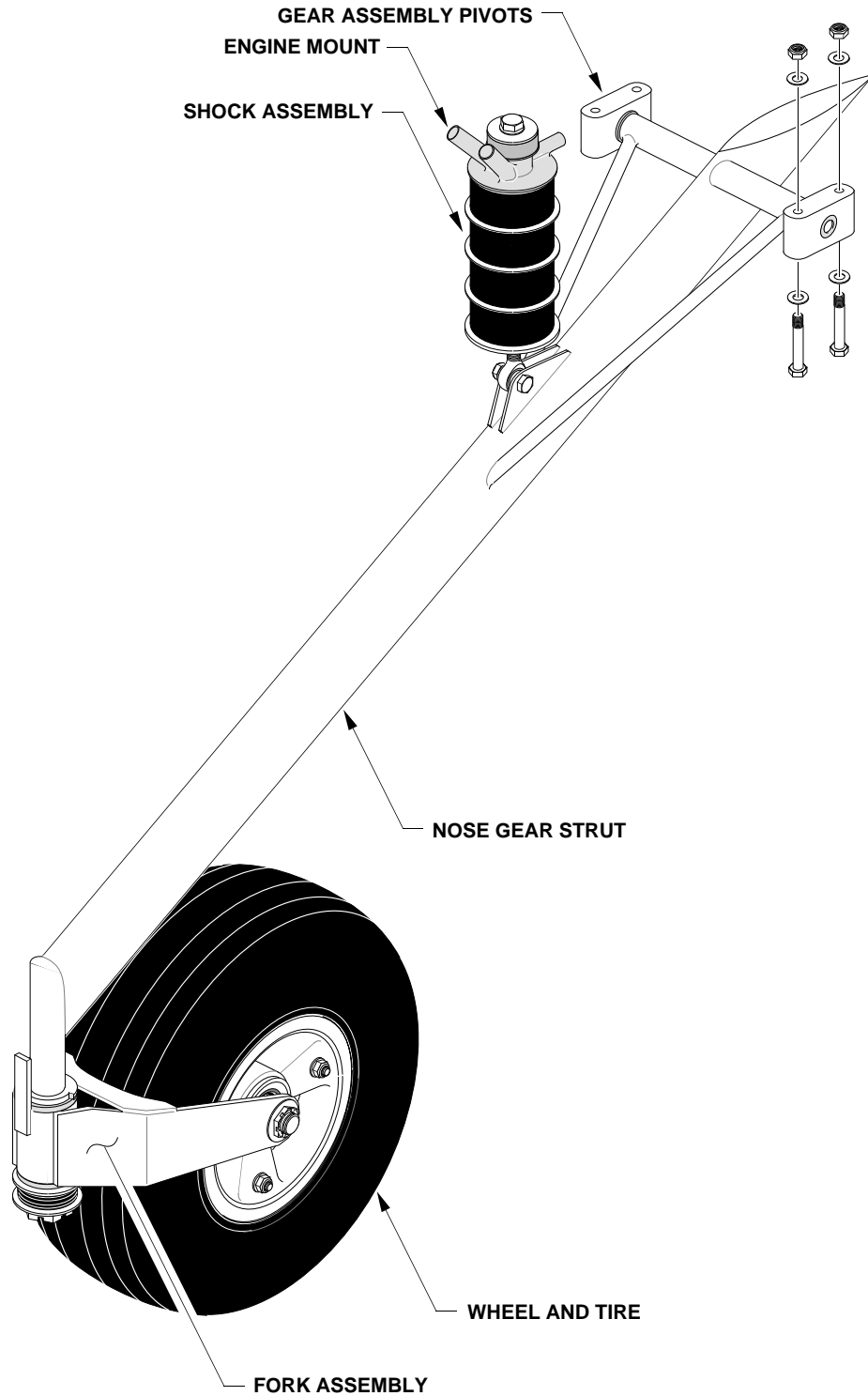
**Figure C-1**  
Tailwheel Installation

## Section D. Nose Gear Assembly

The nose gear assembly consists of a steel fork mounted to a streamlined steel tube strut. The strut is attached to the fuselage by pivot blocks, and an elastomeric shock assembly handles the shock absorption.

The wheel bearings are completely sealed, keeping the grease in and the dirt and moisture out.

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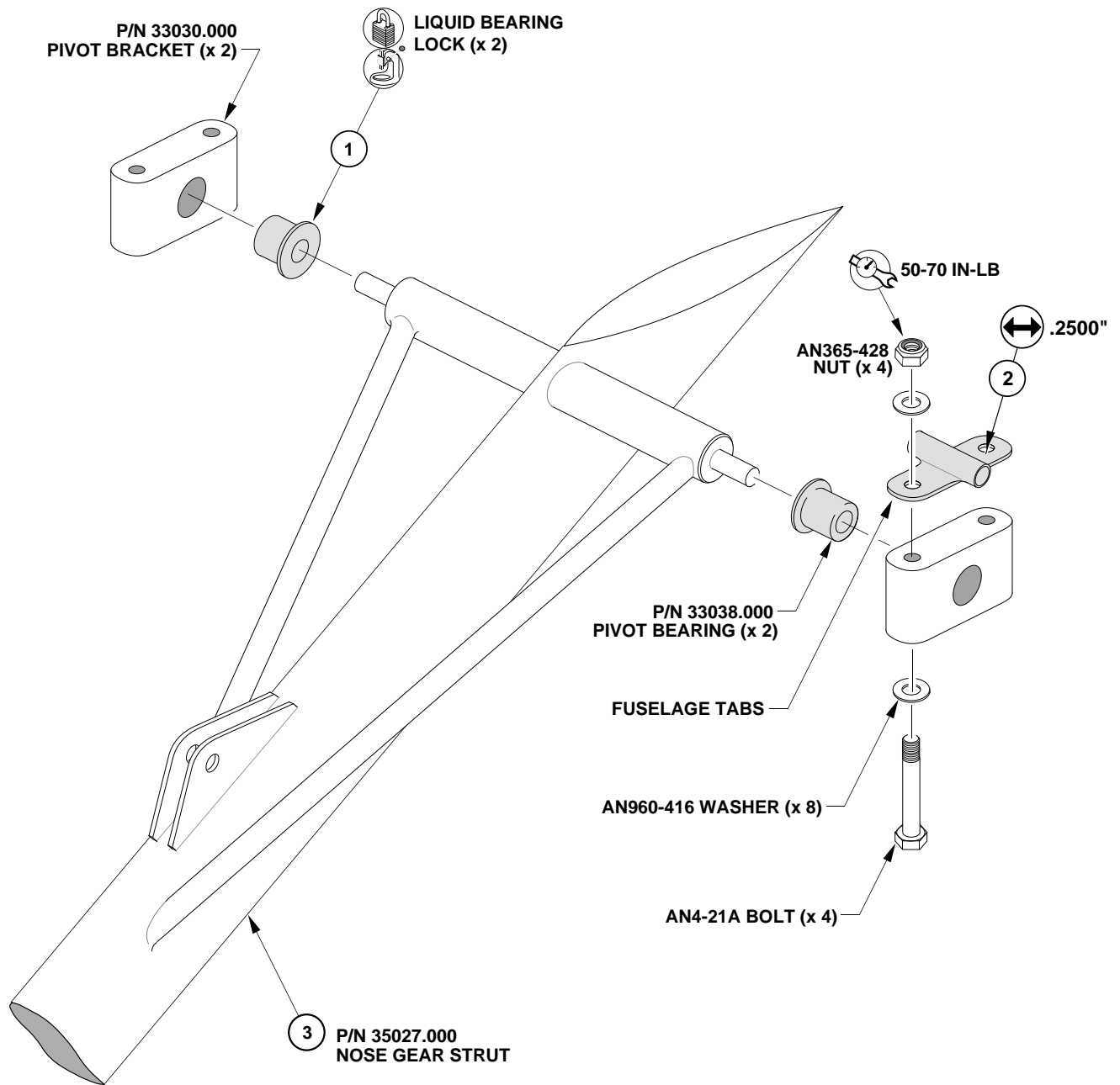
**Figure D-1**  
Nose Gear Assembly

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1. Press the pivot bearings into the pivot brackets. Use an arbor press if one is available. A smooth-jaw vice can be used to press the bearings in, but you must be careful to keep the parts in alignment to prevent binding and distortion of the bearings. Secure the bearings with a liquid bearing locking compound.
2. Ream the four pivot bracket mounting tabs on the fuselage to .1875".
3. Slip the pivot brackets onto the gear strut pins with the flanged side of the bearing toward the strut. Bolt the pivot blocks to the fuselage with the proper bolts, washers, and nuts as shown. Torque the nuts to 50 to 70 inch-pounds.

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**Figure D-2**  
Nose Gear Strut Installation

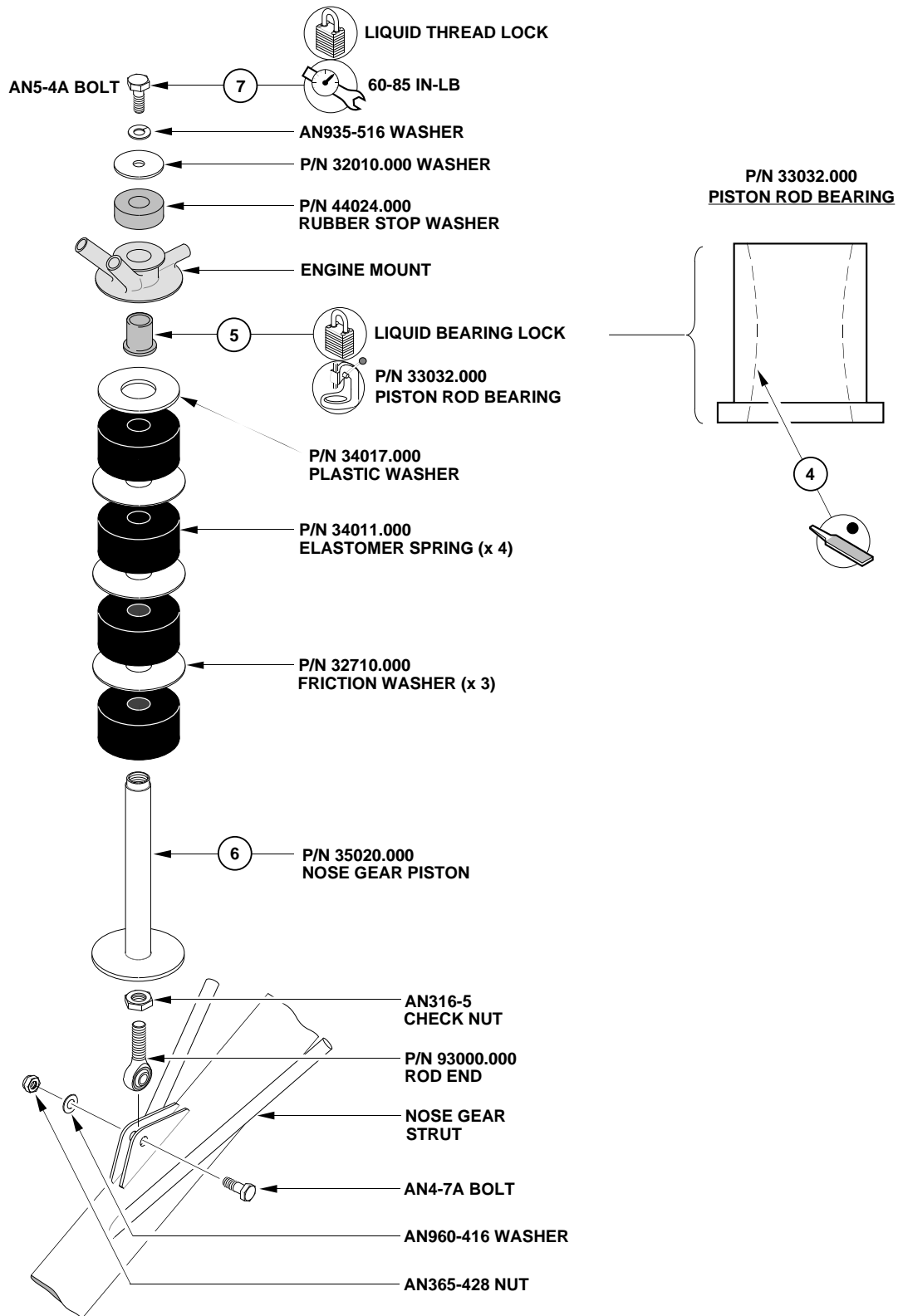
**NOTE**

The engine mount must be installed to complete the installation of the nose gear assembly.

4. To allow the nose gear piston to move freely in the piston rod bearing, file the inside of the bearing to the profile shown.
5. Press the piston rod bearing into the engine mount weldment as shown. A large C-clamp can be used, however you must keep the parts in alignment to prevent the bearing from binding in the mount.
6. Thread the check nut onto the rod end all the way and thread the rod end into the piston shaft as far as it will go. Attach the piston/rod end assembly to the nose gear strut using the hardware shown.
7. Install the elastomer springs and friction washers onto the nose gear piston in the order shown. The AN4-5A bolt, washers, and rubber stop washer are installed by lining up the piston in the piston rod bearing and compressing the elastomer springs by using the strut as a lever. Carefully thread in the AN4-5A bolt a minimum of one turn and then you can relax pressure on the strut. Use a liquid thread locker on the AN5-4A bolt to back up the lock washer for final assembly and torque the bolt to 60 to 85 inch-pounds. As with the main gear legs, the system is very robust and virtually maintenance free.

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**Figure D-3**  
Nose Gear Shock Mount Installation

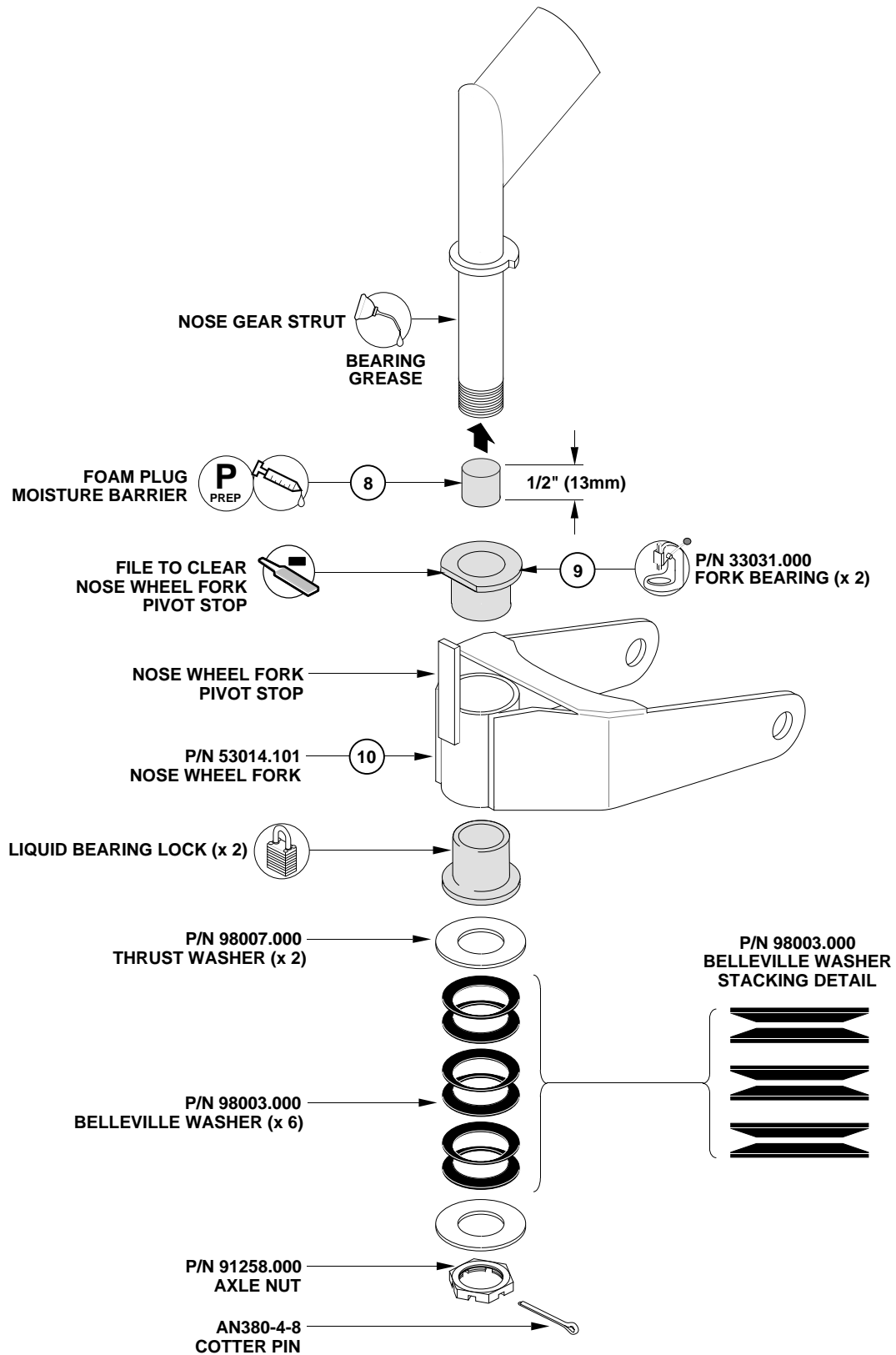
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8. Fabricate a foam plug from some scrap  $\frac{1}{2}$ " material and shape it to fit in the end of the nose gear strut. This plug will serve as a moisture barrier to protect the interior of the strut from corrosion. Bond the plug in place with structural adhesive and let cure. When positioning the plug, be sure to get it far enough into the pivot shaft to clear the cotter pin hole.
9. Press the nose wheel fork bearings in place using a liquid bearing lock to secure the installation. The upper fork bearing will need to have a flat section filed into the flange to clear the wheel pant attach tab.
10. Lubricate the lower end of the nose gear strut with wheel bearing grease. Assemble the stack of Belleville washers, being very careful to orient them as shown. Place a thrust washer above and below the stack. Install the fork assembly and washer stack on the gear strut and secure with the axle nut and cotter pin. Attach a fish scale to one of the ends of the axle. Tighten the nut until it requires a pull of 10 to 12 lbs on the fish scale to **keep** the fork moving. Note that the force required to **start** the fork moving will likely be higher than this. You may wish to only temporarily install the cotter pin in the strut at this time, as the nut may need slight adjustment later once taxi testing begins and all of the components have 'seated' in their proper positions.

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**Figure D-4**  
Nose Gear Fork Installation

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11. Remove the nuts and bolts holding the halves of the nose wheel together and separate them. Insert the inner tube into the tire, dusting the tube with tire talc to eliminate friction between the two. If the tire has a red dot painted on the sidewall, align the valve stem with the dot. Press the valve stem through the hole in the wheel half, then press the wheel half fully into the tire. If the valve stem comes equipped with a nut and washer, remove them and press the stem through the wheel hole. Once the stem is in place, reinstall the nut and washer and carefully tighten. It is helpful if you put a very small amount of air in the tube, just enough to help the tube hold its shape. Insert the bearing spacer into the wheel and press the opposite wheel half into the tire from the other side, visually aligning the mounting holes. Put a bolt through the wheel halves, press the halves together, and start a nut on the bolt threads. Install the other bolts in a similar manner and torque the nuts to 100 to 140 inch-pounds. Inflate the tire to 20-25 psi.

**CAUTION**

**Be careful not to pinch the tube between the halves of the wheel as they come together. Listen and feel for crisp metal-to-metal contact of the wheel halves before tightening the bolts. If you have difficulty ensuring that the tube is not caught between the wheel halves, a ring of thin cardboard can be taped in place around the wheel half split line to help guard the tube.**

**WARNING**

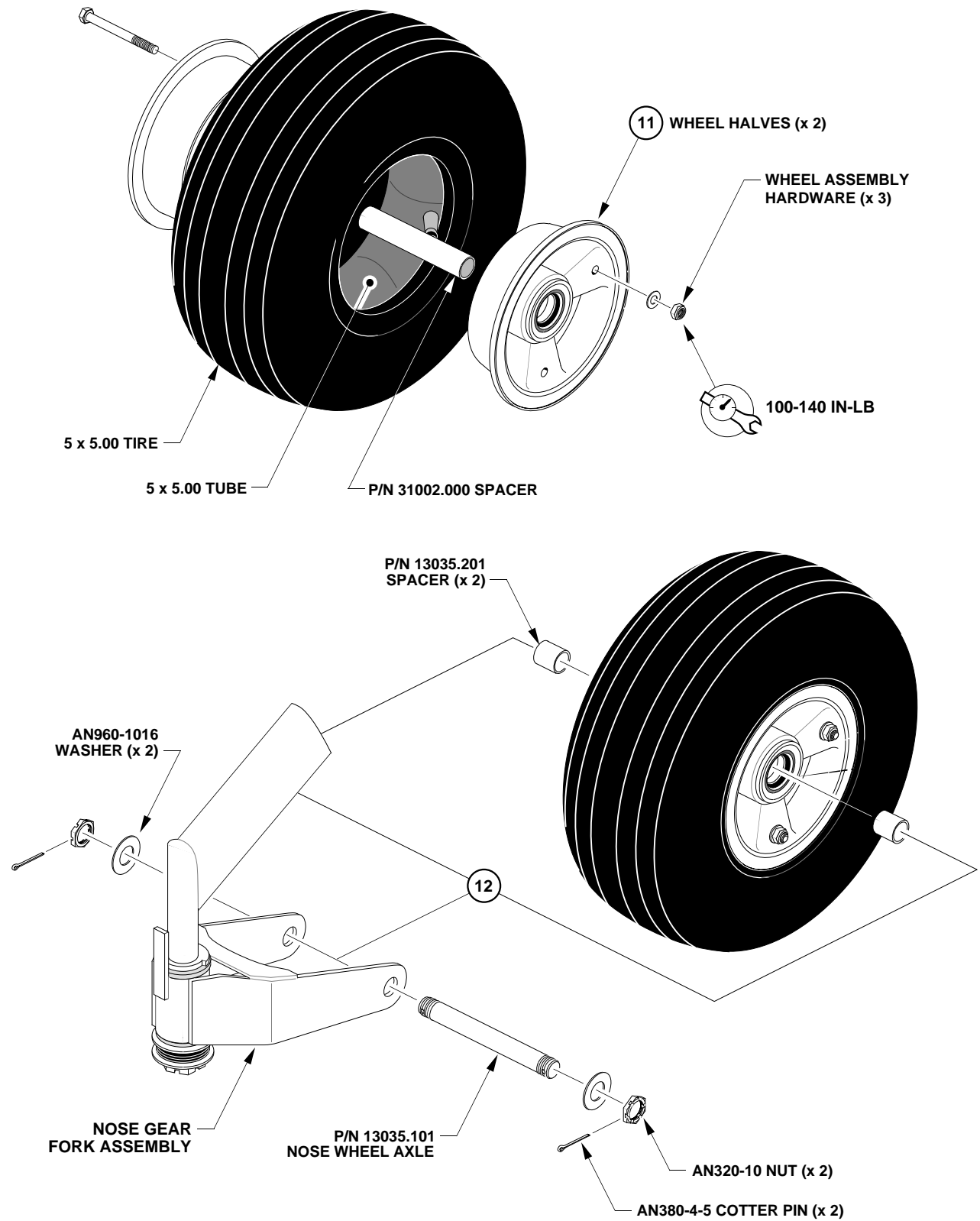
**Never inflate the tire unless all the wheel bolts are installed and properly torqued. Always deflate the tire before loosening any wheel bolt. The wheel halves will be forcefully ejected by the tire pressure if these precautions are overlooked.**

12. Install the two spacers into the wheel and install the wheel assembly onto the fork. Slide the nose wheel axle into the wheel until the same amount of axle shows on both sides of the fork. Install a washer and an axle nut evenly onto each end of the axle. Put a cotter pin through one of the axle nuts to hold it in place and adjust the wheel bearing preload by tightening the other nut until all bearing play is eliminated. Rotate the tire to ensure that it does not bind or drag, then install the final cotter pin. Again, do not completely bend over the legs of the cotter pins until final assembly.

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**Figure D-5**  
Wheel and Tire Installation

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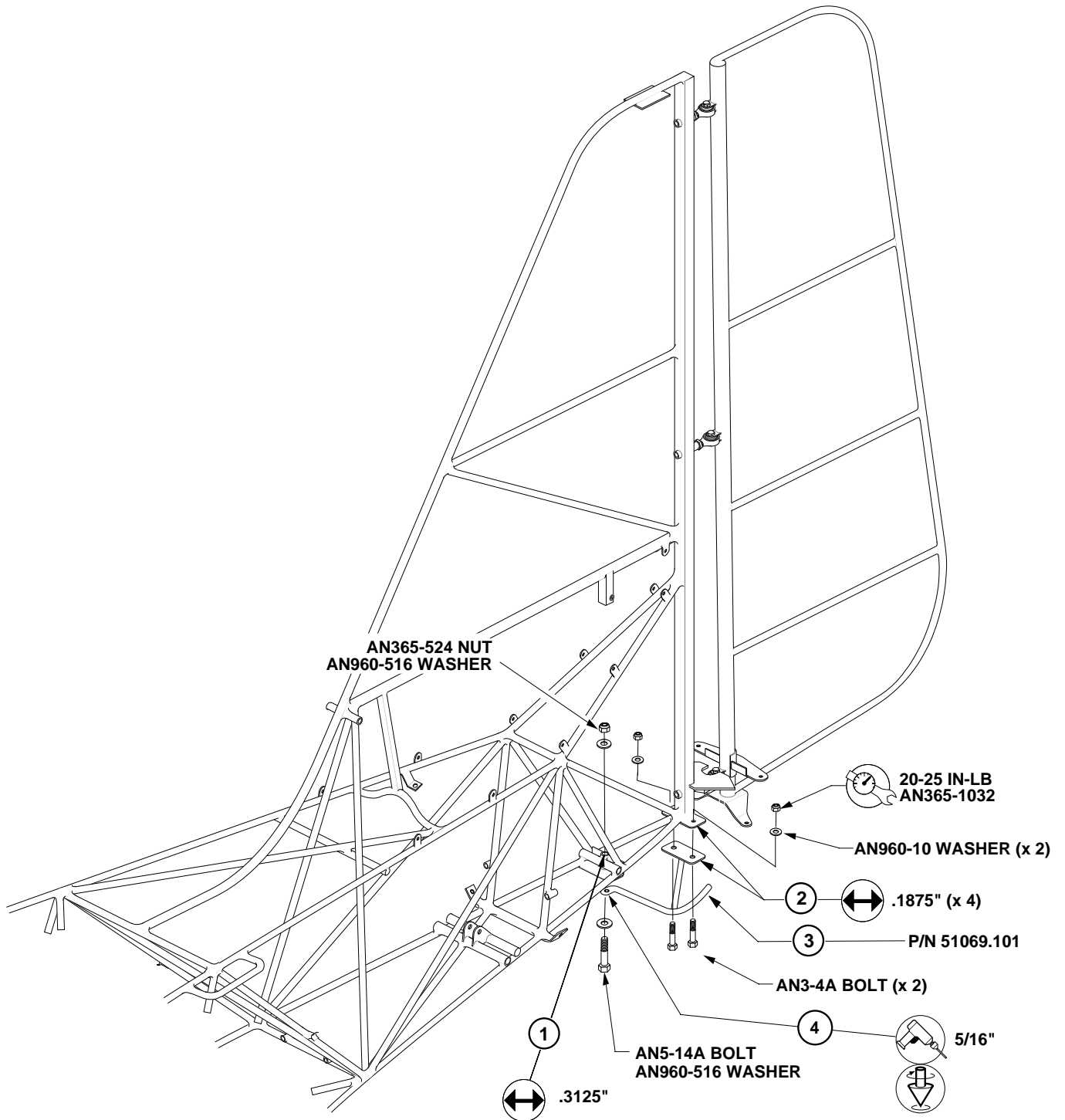
## Section E. Tail Skid Installation

A tail skid is mounted to the aft, lower empennage to prevent damage in the event of over-rotation during takeoff or landing. It also provides an excellent tie-down point for the tail of the aircraft.

1. Ream the forward attachment bushing in the fuselage to .3125".
2. Ream the mounting holes in the clamp plate and the tail skid plate to .1875".
3. Attach the tail skid to the fuselage at the aft attachment plate.
4. Align the tail skid so the forward attachment tab is centered over the forward attachment bushing. Match-drill the forward attachment tab on the tail skid with a  $\frac{5}{16}$ " bit. Remove the tail skid and deburr.
5. Install the tail skid using the hardware shown. The skid will need to be removed during the fuselage covering process.

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**Figure E-1**  
Tail Skid Installation

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