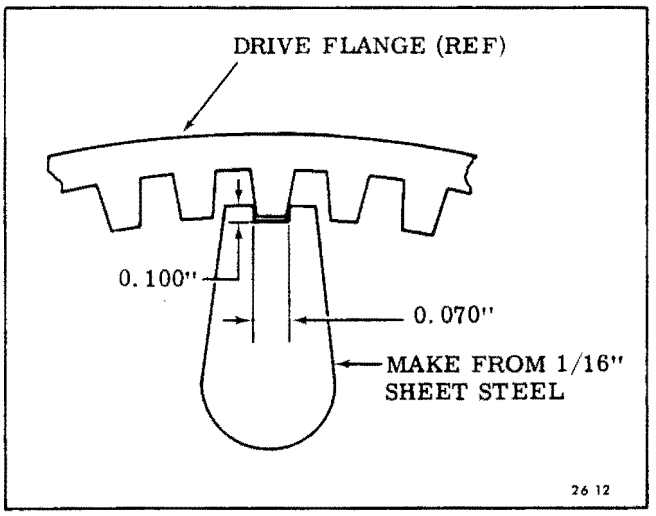

Figure 6-3. Disc Drive Teeth Dimension Gauge

a. If bearing cups have been removed install them as follows:

1. Heat wheel half in boiling water or an oven for 30 minutes not to exceed 149°C (300°F) and chill cups with dry ice.
2. Remove wheel half from heat and immediately install chilled cup and seal.

b. Inflate inner tube until just rounded out and install in tire with yellow stripe on base of inner tube aligned with red dot on tire.

c. Install tire and tube on outboard wheel half and position valve stem in valve stem hole.

d. Place inboard wheel half in tire and align bolt holes.

e. Place countersunk washers on bolts with countersink facing bolt head, and install bolt through inboard and outboard wheel halves and secure with plain washers and self-locking nuts.

f. Torque self-locking nuts evenly to 83 inch-pounds.

g. Inflate tire just enough to seat the beads then completely deflate.

h. Install valve core and inflate tire.

i. Pack bearing cones with clean Mil-G-5345 bearing grease and lubricate lips of bearing seals.

j. Install bearing seal and cone on axle then install wheel and tire, outboard bearing cone, and outer bearing seal.

CAUTION

The wheel must be positioned so that the three wide slots between the teeth of the rotating discs are in alignment with the three clips. The three disc clips must be pried upward and retained in that position with wooden wedges until wheel is installed.

k. Install axle washer and nut. Tighten axle nut until bearings bind slightly, then back axle nut off to nearest castellation and install cotter pin.

NOTE

Rotate the wheel while adjusting the axle nut to assure proper seating, and check that there is no side motion in wheel.

l. Inflate tire to 28 pounds and install valve cap.

NOSE LANDING GEAR

The nose landing gear strut outer body is welded to and becomes a part of the engine mount assembly. The nose landing gear cylinder and piston fits upward through the strut outer body. An upper and lower strut bearing fits between the strut outer body and the strut cylinder, permitting the strut cylinder to rotate within the outer body. A shimmy damper collar or bracket assembly is secured to the upper end of the strut by a through bolt, and a shim separates the collar from the upper strut bearing. An air port or an air valve in the top of the cylinder is utilized for servicing the cylinder with hydraulic fluid and supplying air pressure to the strut. The lower strut bearing fits over the strut cylinder to ride against a machined collar on the cylinder. The cylinder is pulled up against this bearing to mate with the lower outer body sleeve, and the entire assembly is held in place by the upper shimmy damper collar and through bolt. On the Model 100 Darter serial number 051 thru 250 the upper strut cylinder contains a coil spring, which is held in place by the lower cylinder nut, to aid in absorbing the minor shock forces incurred during taxi (see Figure 6-4). On Model 100 Darter serial number 251 and subs and on all Model 100-180 Larks the compression of air and metering of oil through a hole in the top of the piston controls the flow of the oil from the cylinder assembly through the piston, allowing the piston to move through the oil with a resistance to the shock loads (see Figure 6-4). The strut cylinder is joined to the landing gear fork boss by the upper and lower scissors links. Bolts and accompanying hardware secure the towing arm and nose wheel fork to the fork boss. The nose wheel fairing is attached to the nose wheel fork with bolts, and the nose wheel is attached to the nose wheel fork with an axle, axle rod, spacers, end caps, and cotter pins.

NOSE LANDING GEAR WHEELS

The nose landing gear wheel is equipped with a 600 x 6, four-ply tube tire, which is normally inflated to 28 pounds. The wheel halves are divided and held together with bolts and secured with washers and self-locking nuts. The nose wheel is secured to the nose gear fork assembly with an axle rod, axle, spacers, axle end caps, and cotter pins. The wheel is supported with two tapered roller bearings, seated in hardened cups in the wheel hub, protected by special rubber grease seals to prevent loss of lubricant and to keep foreign material from the bearings.

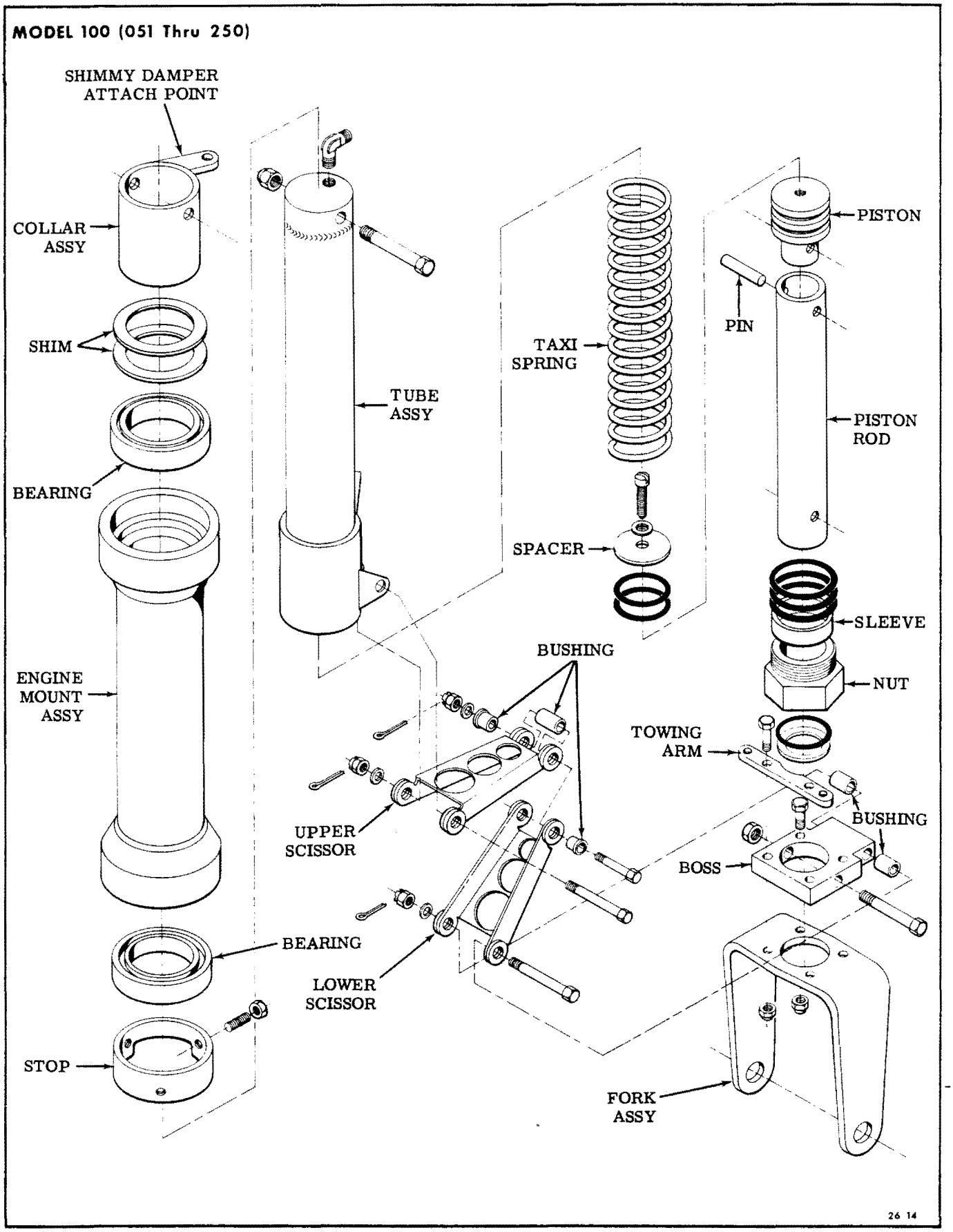

Figure 6-4. Nose Landing Gear (Sheet 1 of 2)

MODEL 100 (251 and Subs)
MODEL 100-180

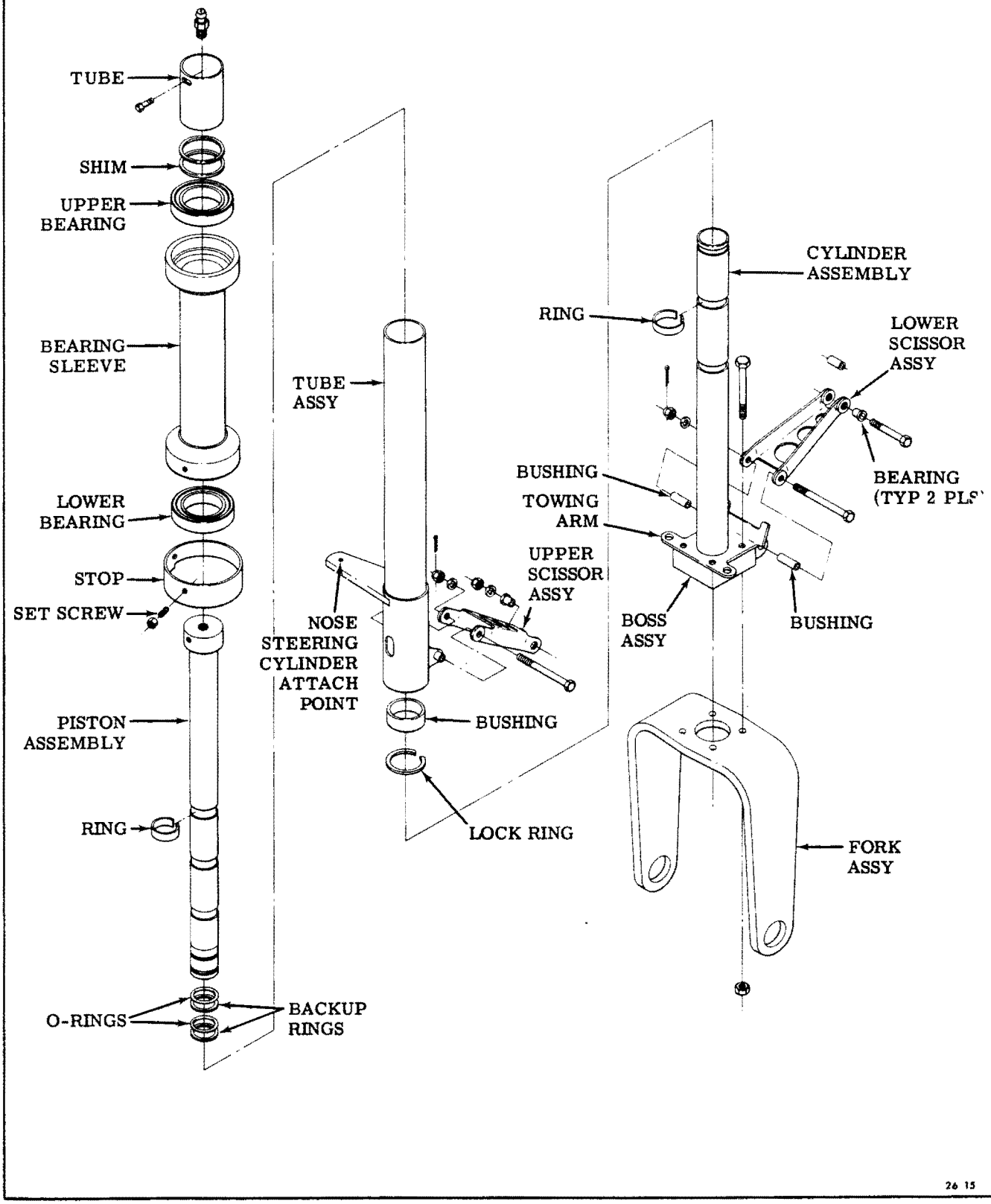

Figure 6-4. Nose Landing Gear (Sheet 2 of 2)

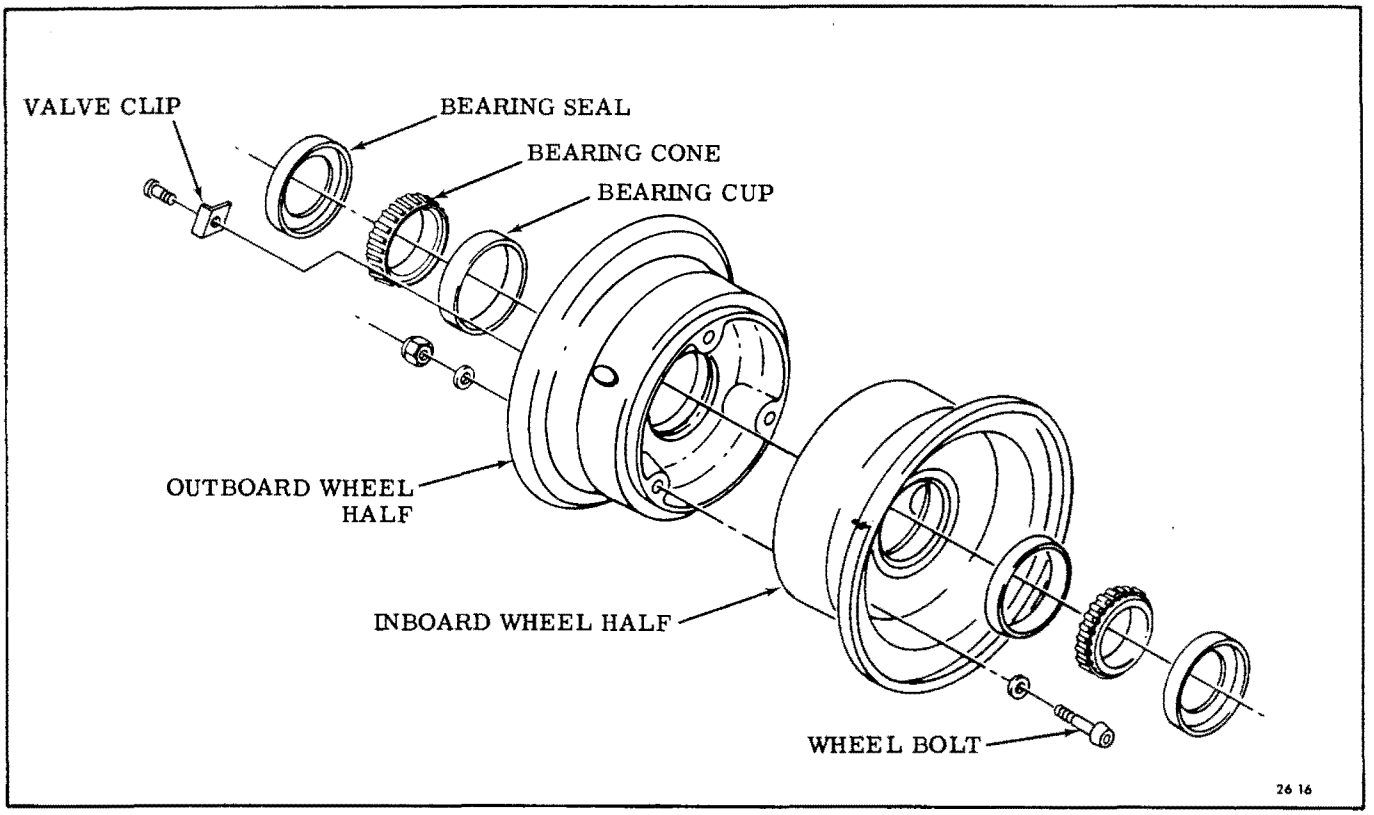

Figure 6-5. Nose Wheel Assembly (Aircraft 121 and Subs)

NOSE WHEEL REMOVAL (Aircraft 121 and Subsequent). The procedure for removing the nose wheel is for aircraft with Goodyear wheels installed. To remove the nose wheel, proceed as follows:

a. Weight tail of aircraft until nose gear is fully extended and tire clears the ground.
b. Remove bolts attaching wheel fairing to nose gear fork assembly and raise wheel fairing.
c. Remove cotter pin and remove end cap from axle.
d. Remove axle rod, axle, and spacer from wheel and remove wheel from fork assembly.

CAUTION

When removing wheel be careful not to drop or damage bearing seals or bearing cone.

NOSE WHEEL DISASSEMBLY (Aircraft 121 and Subsequent). The following procedure is for disassembly of the Goodyear nose wheel. See Figure 6-5. To disassemble the nose wheel, proceed as follows:

a. Remove valve core and deflate tire.
b. Break tire beads away from wheel flanges with hands or by carefully stepping on tire while wheel lies flat.

CAUTION

Do not use tire tools. They may damage wheel flanges or tire beads.

c. Remove self-locking nuts and washers from wheel bolts.
d. Separate wheel halves and remove tire and tube.

— NOTE —

Bearing cups are shrink fitted into wheel halves and should not be removed unless replacement is necessary.

CLEANING, INSPECTION AND REPAIR

a. Clean all metal parts in PS-661 cleaning solvent and wipe dry with a clean lint-free cloth.
b. Wash bearings in clean solvent and dry with compressed air. However, do not allow compressed air to spin the bearing.

NOTE

Wash bearing cones last to keep solution clean. Place all parts in a clean place to avoid picking up foreign material.

c. Clean bearing seals in denatured alcohol and dry.
d. Inspect wheel halves for possible damage or cracks. If a casting is cracked or shows excessive corrosion, it should be replaced. Small nicks or gouges in the castings should be blended out and polished with fine (400 grit) sandpaper. Areas where protective coating has been removed or which show slight corrosion, should be thoroughly cleaned and repainted with two coats of zinc chromate primer and two coats of aluminum lacquer.
e. Inspect bearing cups for damage or wear. Do not remove bearing cups unless replacement is necessary.
f. Inspect bearing cones for possible damage or wear and then coat with bearing grease.
g. Inspect bearing seals for nicks, distortion, or damage that may affect their sealing qualities. Replace bearing seals if damaged.
h. Inspect wheel bolts for deformation or cracks at head junction and at first two threads adjacent to shank. Replace bolts if necessary.
i. Inspect self-locking nuts for locking condition. If nut can be turned past ends of bolt threads with fingers replace nut. Nuts should be replaced after being removed 10 times.

NOSE WHEEL REASSEMBLY AND INSTALLATION. Prior to reassembly of the nose wheel the bearing cones, the surface of the bearing cups, and the contacting edges of the bearing seals shall be lubricated with Mil-G-5345 bearing grease or equivalent. To reassemble the nose wheel, proceed as follows:

a. If bearing cups have been removed install them as follows:
   1. Heat wheel half in boiling water or an oven for 30 minutes not to exceed 149°C (300°F) and chill cups with dry ice.
   2. Remove wheel half from heat and immediately install chilled cup and seal.
b. Inflate inner tube until just rounded out and install in tire with yellow stripe on base of inner tube aligned with red balance dot on tire.
c. Install tire and inner tube on outboard wheel half and position valve stem in valve stem hole.
d. Place inboard wheel half in tire and align bolt holes.
e. Place countersunk washers on bolts with countersink facing bolt head, and install bolt through inboard and outboard wheel halves and secure with plain washers and self-locking nuts.
f. Torque self-locking nuts evenly to 83 inch-pounds.
g. Inflate tire just enough to seat the beads then completely deflate.
h. Install valve core and inflate tire.
i. Pack bearing cones with clean Mil-G-5345 bearing grease and lubricate lips of bearing seals.
j. Install bearing seal and cone on axle then install wheel and tire, other bearing cone, and seal.
k. Install axle washer and nut. Tighten axle nut until bearings bind slightly, then back axle nut off to nearest castellation and install cotter pin.

NOTE

Rotate the wheel while adjusting the axle nut to assure proper seating, and check that there is no side motion in wheel.

l. Inflate tire to 28 pounds and install valve cap.

The nose wheel and tire are balanced assemblies and the red dot on the tire must align with the valve stem. If nose wheel shimmy is encountered during takeoff or landing and the shimmy damper is properly serviced, the nose wheel and tire should be balanced with automotive balancing equipment.

SHIMMY DAMPER

The shimmy damper is installed on a bracket welded to a diagonal member of the engine mount. A clevis on the inboard end of the shimmy damper piston rod is attached to an arm on top of the nose landing gear strut. On aircraft serial number 026 through 088 the shimmy damper should be checked at each 100-hour inspection, or at any time shimmy is detected in the nose wheel. Remove the filler plug on top of the shimmy damper and fill with SAE 40 engine oil. Reinstall and safety wire the filler plug. On aircraft serial number 089 and subsequent, the shimmy damper is a sealed unit; therefore, if shimmy is detected in the nose wheel, remove and replace the shimmy damper.

BRAKES

The main landing gear wheels are equipped with hydraulic brakes. A hydraulic fluid reservoir is installed on the left forward side of the engine firewall. On the Model 100 Darter hydraulic fluid is supplied from the reservoir to a brake master cylinder, which is secured to the fuselage frame forward of the instrument panel. On the Model 100-180 Lark hydraulic fluid is supplied to two individual master cylinders, which are installed forward of the pilots rudder-brake pedals. The brake master cylinder on the Model 100 Darter is linked to the brake handle by a push-pull tube. The brake handle, which extends aft from below the instrument panel just to the right of aircraft centerline, is positioned by a brake handle pivot bracket supported to the aircraft frame by a mounting secured to the aircraft frame. When the brake handle is pulled aft the piston of the brake master cylinder moves forward, forcing brake fluid to each individual wheel brake cylinder. On Model 100 Darter serial number 051 through 120 the wheel brake cylinders expand and move the brake shoes out against the brake drum to provide the braking force. On Model 100 Darter serial number 121 and subsequent the wheel brake cylinders move a piston lining against a brake disc to provide the braking force (see Figure 6-7).

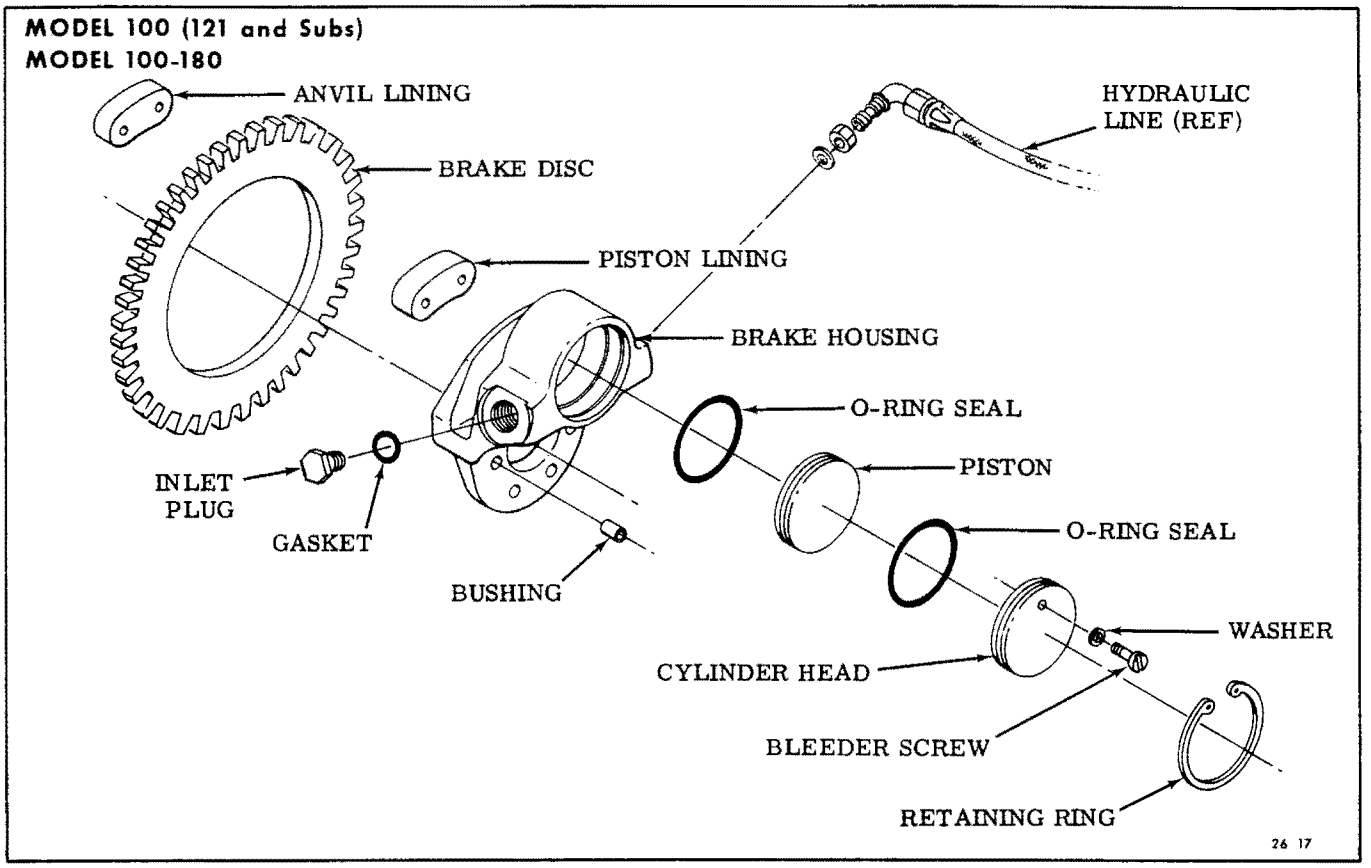

Figure 6-6. Brake Assembly (Aircraft 121 and Subs)

The brake master cylinder for the Model 100 Darter has provisions for locking the brake master cylinder in the brake pressure position to provide a parking brake. The parking brake control is attached to the master cylinder and controlled by a flexible cable and control knob, which is secured to the instrument panel immediately to the right of the mixture control. On the Model 100-180 Lark hydraulic fluid is directed to each wheel brake cylinder by the individual brake master cylinders installed just forward of the pilots rudder-brake pedal. When the rudder-brake pedals are pressed hydraulic fluid is forced through the respective brake master cylinders to each individual wheel cylinder. The wheel brake cylinders move a piston lining against a brake disc to provide a braking force. A parking brake control valve is installed on the aft side of the forward cabin bulkhead and is actuated by a parking brake control installed in the instrument panel. The parking brakes may be applied by actuating the rudder-brake pedals and pulling the parking brake control. On the Model 100 Darter a single hydraulic line extends under the cabin floor down the right side of the fuselage from the brake master cylinder to a tee fitting where a line is routed to each wheel brake cylinder. On the Model 100-180 Lark a line is routed under the cabin floor from each master cylinder to each individual wheel brake cylinder.

BRAKE ASSEMBLY

The wheel brake assembly consists primarily of a wheel brake housing, a rotating brake disc, an anvil lining, and a piston lining (see Figure 6-6). Braking action is produced by hydraulically clamping the rotating brake disc between the piston and anvil linings, which are retained in recesses provided in the brake housing and piston. To assure equal pressure from the entire surface of both brake linings, the rotating brake disc is geared to rotate with the wheel and to permit it to "float" sideways, allowing the brake disc to rotate free of the linings when the brakes are not applied. Inlet ports are provided on each side of the brake housing, so it can be installed on either wheel of the aircraft.

BRAKE LINING WEAR. Brake linings may be checked to determine the amount of wear and their serviceability without disassembly of the brake. To check the brake lining wear, proceed as follows:

a. Depress rudder-brake pedals and set parking brake.
b. Measure distance between rotating disc and flat surface of brake housing near center of disc face as shown in Figure 6-7.
c. Replace linings if space between rotating disc