

spongy, service brake in accordance with instructions under FILLING AND BLEEDING BRAKE HYDRAULIC SYSTEM, Chapter 6, Section II.

b. Engage control lock with forward control stick to lock wheel brakes.

c. Attempt to insert a suitable feeler gage between brake housing and inboard face of brake disc to check for maximum clearance. A clearance of 0.312 inch or greater requires replacement of anvil and piston brake linings.

4-318. CASTORING AXLE ASSEMBLY.

4-319. In the event of improper drift correction at touchdown, the castoring axle permits the main wheel on the downwind side of the airplane to momentarily swivel outboard to align with the drifting track of the airplane. However, the opposite (upwind) wheel is incapable of swiveling inboard, and it scrubs lightly until the drifting motion has ceased. The castoring axle is essentially a spring-loaded, fluid-filled, orifice-dampened cylinder.

4-320. REMOVAL (figure 4-27).

a. Remove main landing gear wheel assemblies in accordance with paragraph 4-300.

b. Remove bleeder screw (11, figure 4-26) and washer (10) from cylinder head (9) and drain hydraulic fluid into a receptacle.

c. Disconnect brake line (34, figure 4-27) at elbow (3, figure 4-21).

d. Remove bolts (19 and 33, figure 4-27), washers (20 and 32), tow lug (21), static ground assembly (31) (if installed), right main landing gear only from landing gear spring (2) and remove axle (15).

Note

Note the number and position of alignment shims (22). Tape them together so they may be reinstalled in exactly the same position.

e. Remove bolts and washers (28 and 23) and bushings (29) attaching axle (15) to brake assembly (30).

4-321. DISASSEMBLY (figure 4-27).

a. Remove screw (7) securing stop block (6) and pin (4).

b. Deflect axle and remove stop block.

c. Using soft punch, drive out pin (4) and pull axle assembly from adaptor (3).

d. Remove bleeder screw (18) and plunger (9).

e. Remove internal retainer ring (11), orifice plate (12), piston (16), and spring (14).

4-322. CLEANING. Clean all parts in solvent (item 4, table 1-6) and dry thoroughly. Make sure the small hole in the orifice plate and bleeder passage in the plunger are not restricted.

4-323. INSPECTION. Inspect parts for excessive wear, cracks, nicks, dents, scratches, scoring, and other obvious defects.

4-324. REPAIR OR REPLACEMENT. Repair other than dressing out minor external scratches, dents and nicks, is limited to replacement of defective parts.

4-325. ASSEMBLY (figure 4-27). Since too much or insufficient hydraulic fluid will reduce the efficiency of the castoring axle, it is important that the following procedure be used during assembly.

Note

Because of the very small hole in the orifice plate, it is essential that all internal parts be clean. Use only clean hydraulic fluid (item 3, table 1-6) to lubricate plunger, orifice plate, piston, spring, O-rings and inner bore of axle assembly.

a. Install new O-rings on piston (16) and plunger (9).

b. Position spring (14) on piston (16) and insert into axle, spring first.

c. Place orifice plate (12) against piston. Using a brass or aluminum rod, press the assembly into the axle, compressing spring (14) until retainer ring (11) can be installed. Be sure retainer ring seats properly in its groove.

d. With the open end of the axle up, fill to the top with (item 3, table 1-6) hydraulic fluid.

e. With bleeder screw removed, slowly slide plunger into axle until all air is expelled and fluid starts to flow from the bleeder hole.

4-313. REPAIR OR REPLACEMENT.

- a. Replace defective and excessively worn parts.
- b. Smooth blend minor nicks or burrs with sandpaper (item 36, table 1-6), 250 grit or finer.
- c. Replace cracked or warped cylinder head (9, figure 4-26) and piston (7).
- d. Replace defective seal (8).

Note

Always replace brake linings in sets.

- e. Replace excessively or unevenly worn anvil and piston brake linings (2 and 4) as follows:

Note

The piston brake lining (4) is thicker than the anvil brake lining (2).

- (1) Insert new piston brake lining (4) into brake lining recess in brake housing (5).

- (2) Using a suitable tool, depress piston brake lining (4) and insert new anvil brake lining (2) into brake lining recess in brake housing (5).

Note

Install anvil and piston brake linings in brake housing with the smooth side facing the brake disc.

- f. Replace defective or excessively worn axle (19, figure 4-21).

4-314. REASSEMBLY.

- a. Lubricate seal (8, figure 4-26) and new piston seal (6) with hydraulic fluid (item 3, table 1-6).
- b. Carefully insert piston seal (6) into piston seal groove of piston (7).
- c. Insert piston (7) inside brake housing (5).
- d. Position seal (8) and cylinder head (9) on brake housing (5) and install lockwashers (13) and screws (12).
- e. Install washer (10) and bleeder screw (11) in cylinder head (9).

- f. Install preformed packing (14), nut (15), and elbow (16) in brake housing (5). Tighten nut (15).

- g. Insert anvil and piston brake linings (2 and 4) into brake lining recesses in brake housing (5).

- h. Install brake disc (3).

4-315. INSTALLATION.

Note

Ensure that shims (2) are installed in exactly the same position as removed to prevent wheel misalignment.

- a. Position shims (2, figure 4-21), axle (19), brake assembly (15), disc cover plate (20), and towing lug (23) on landing gear spring (25). Install bolts (24), washers (5), and nuts (6). Do not tighten nuts (6).

Caution

To prevent the static ground wire (if installed) from lodging between the brake housing and brake disc, check the ground cable bracket for correct angle, approximately 20 degrees inboard, and static ground wire for correct length. (Approximately one-half inch in addition to length required to touch ground.)

- b. Position static ground assembly (21) (if installed) (right main landing gear) on landing gear spring (25) and install bolts (13), washers (14), and nuts (22). Tighten bolts (13) to a torque of 250 to 290 inch-pounds.

- c. Tighten bolts (24) to a torque of 160 to 180 inch-pounds.

- d. Connect brake line (1) at elbow (3).

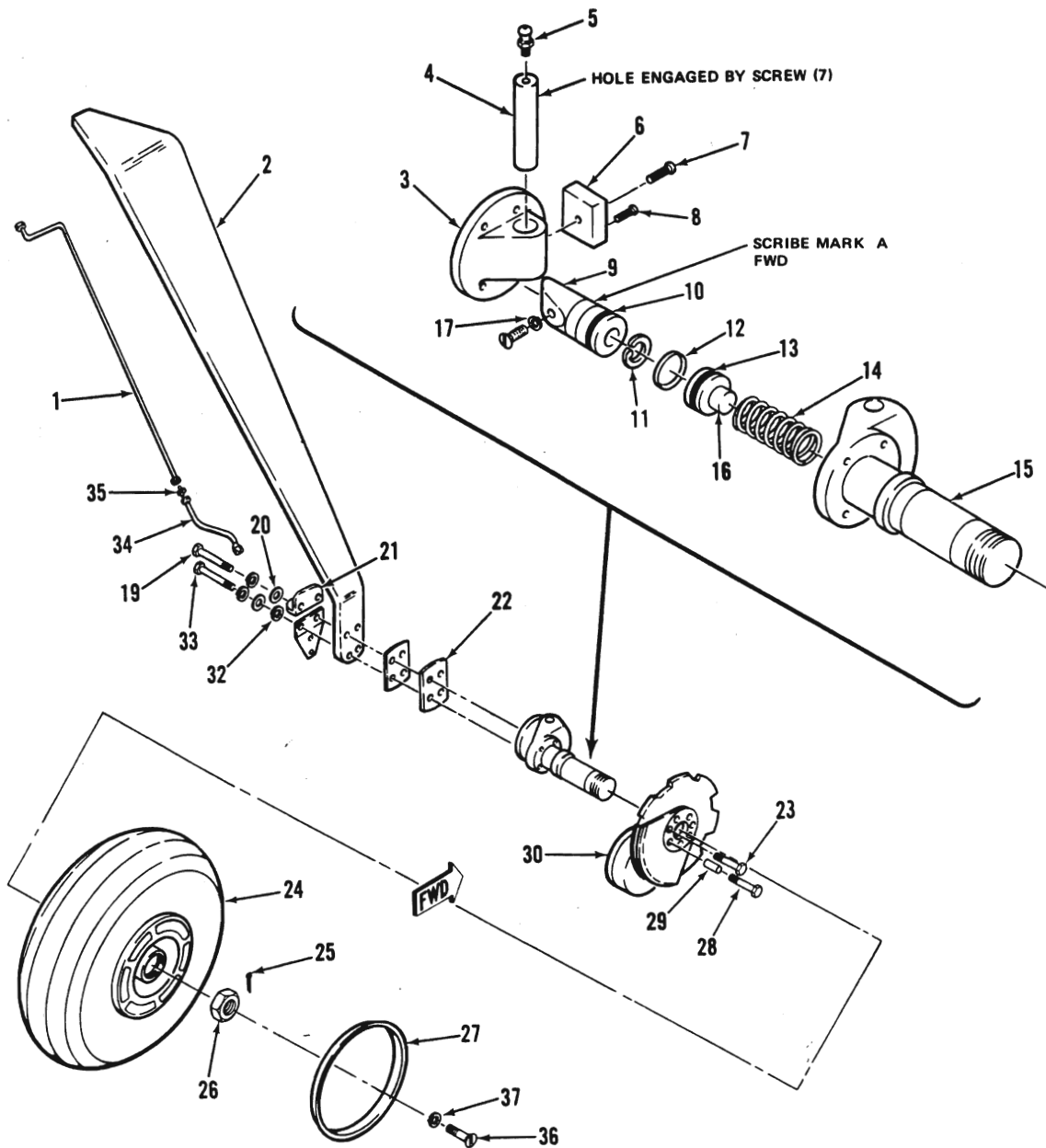
- e. Install main wheel assembly in accordance with paragraph 4-306.

- f. Bleed brakes in accordance with instructions under FILLING AND BLEEDING BRAKE HYDRAULIC SYSTEM, Chapter 6, Section II.

4-316. ADJUSTMENT. The brake system on the O-1 series aircraft is self adjusting.

4-317. OPERATIONAL CHECK.

- a. Apply brake pedal and check brake for proper action. Brake pedal should be firm. If brake pedal is



- 1. BRAKE LINE
- 2. STRUT
- 3. ADAPTOR PLATE
- 4. PIN
- 5. GREASE FITTING
- 6. STOP BLOCK
- 7. SCREW
- 8. SCREW
- 9. PLUNGER
- 10. O-RING
- 11. RETAINER RING
- 12. ORIFICE PLATE

- 13. O-RING
- 14. COMPRESSION SPRING
- 15. AXLE
- 16. PISTON
- 17. WASHER, SCREW, AND SEAL
- 18. BLEEDER SCREW
- 19. BOLT, UPPER
- 20. WASHER
- 21. TOW LUG
- 22. SHIMS
- 23. BOLT AND WASHER, UPPER

- 24. WHEEL AND TIRE
- 25. COTTER PIN
- 26. AXLE NUT
- 27. DUST SHIELD
- 28. BOLT AND WASHER, LOWER
- 29. BUSHING
- 30. BRAKE ASSEMBLY
- 31. GROUND WIRE BRACKET
- 32. WASHER
- 33. BOLT, LOWER
- 34. BRAKE HOSE
- 35. UNION
- 36. SCREW
- 37. LOCKWASHER

AVN 000675

Figure 4-27. Castoring landing gear

Note

Scribe mark "A" is used during assembly to indicate the maximum allowable quantity of hydraulic fluid.

f. Loosely install bleeder screw (18), washer and seal, and continue forcing plunger into axle until scribe mark "A" is flush with the axle surface. Tighten bleeder screw when this position is reached.

g. Lubricate pin (4) with grease (item 32, table 1-6) and assembly adaptor (3) to axle with pin (4). Be sure to align the hole for the screw (7) properly.

h. Deflect axle, forcing plunger (9) into axle, until stop block (6) can be installed. The beveled edge of the stop block must be inboard for clearance. Tighten screws (7 and 8) and safety to each other.

i. Attach axle assembly to brake with bolts and washers (23 and 28) using bushings (29) in two bottom holes. Lockwire bolts in pairs.

4-326. INSTALLATION (figure 4-27).

Note

AN960-516, -516L, -616 and -616L washers are to be added between the countersunk washer and strut as required (maximum three per bolt) to make bolts installed in step a and b below, flush with outboard surface of adaptor.

a. Place brake assembly (30, figure 4-27) on axle (15) and install bushings (29), bolts and washers (28 and 23). Tighten bolts to a torque of 250 to 290 inch-pounds.

b. Place shims (22) removed in paragraph 4-320 between strut and axle.

c. Place axle (15) onto landing gear spring (2); install static ground assembly (31) (if installed), right main landing gear only, towing lug (21), washers (20 and 32) and bolts (19 and 33). Torque bolt (19) to a torque of 160 to 180, bolt (33) to 250 to 290 inch-pounds.

d. Connect brake line (34, figure 4-27) at elbow assembly (3, figure 4-21).

e. Install washer (10, figure 4-26) and bleeder screw (11) in cylinder head (9) and fill with hydraulic fluid (item 3, table 1-6).

f. Prior to installing wheel assemblies, perform functional check in accordance with paragraph 4-327 on castoring axle.

g. After functional check indicates proper operation, install main landing gear wheel assemblies in accordance with paragraph 4-300.

h. Bleed brakes in accordance with instructions under FILLING AND BLEEDING BRAKE HYDRAULIC SYSTEM, Chapter 6, Section II.

4-327. FUNCTIONAL CHECK (figure 4-28).

a. Deflect axle just off the stop block and measure torque to hold this position. Torque shall be at least 160 inch-pounds.

b. Check travel for full 30 degrees movement.

c. Cycle axle rapidly through full range of travel and check for hydraulic leaks. Defective O-rings or a scored inner bore of the axle are the usual cause of leakage.

d. Deflect axle to full castor and then let it snap back. The plunger should remain in contact with the adaptor. Failure to maintain contact indicates a weak or broken spring, or insufficient hydraulic fluid.

4-328. FLUID QUANTITY ON AIRCRAFT IN SERVICE. If torque required in the procedure described in paragraph 4-327 is 120 inch-pounds or less, hydraulic fluid must be added as described in paragraph 4-325 and a functional check be performed per paragraph 4-327.

4-329. MAIN LANDING GEAR SPRING ASSEMBLIES.

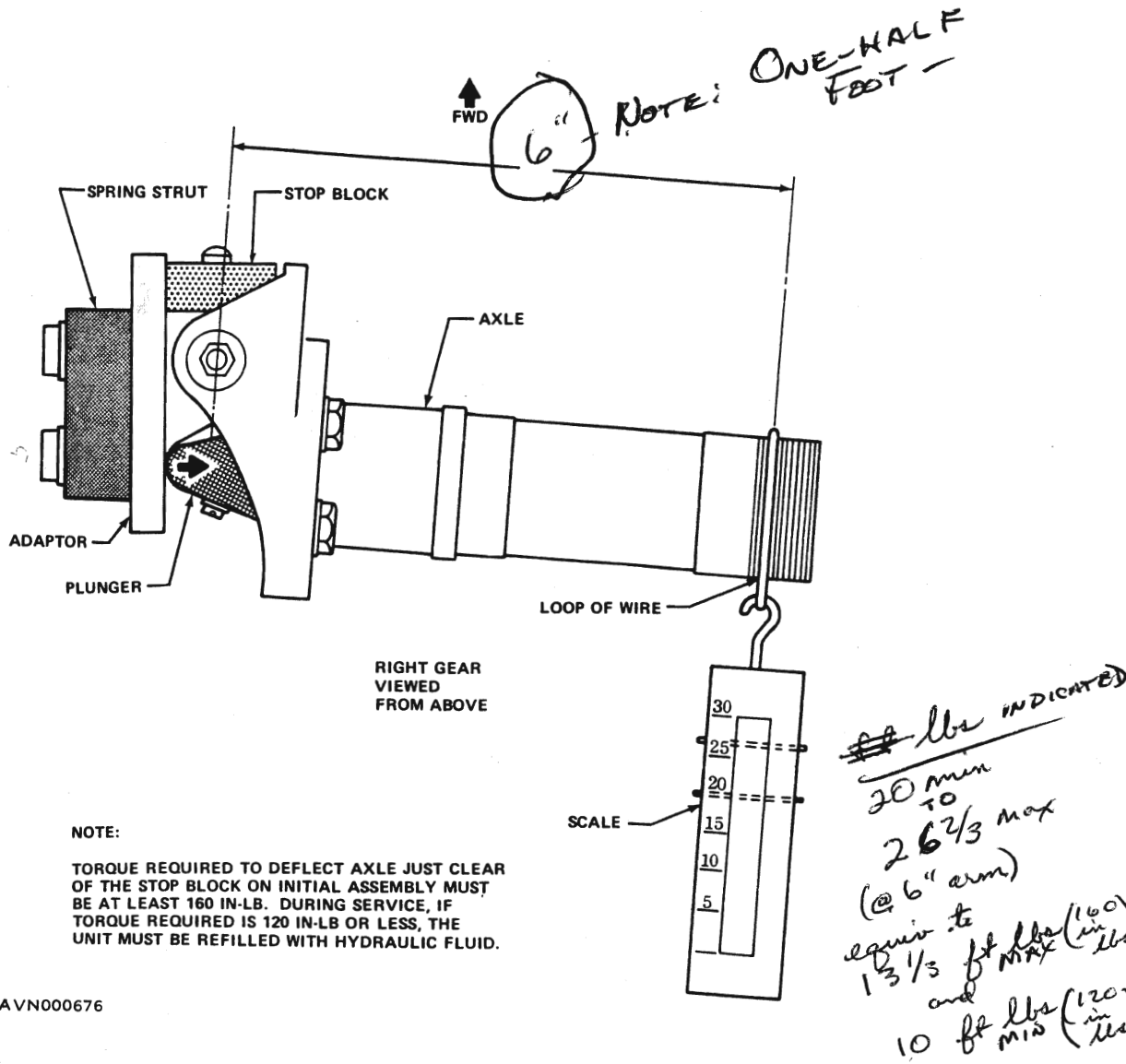
4-330. The main landing gear spring assembly is formed of heat-treated, chrome-vanadium, spring steel. The landing gear spring supports the main wheel assembly and has an hydraulic line attached to the trailing edge.

4-331. CLEANING. Wash landing gear spring assembly with a mild soap (item 33, table 1-6) and water solution. Rinse thoroughly with clean, fresh water.

4-332. INSPECTION. Inspect main landing gear spring assemblies for cracks, dents, distortion, corrosion, and security of attachment.

4-333. TAIL LANDING GEAR ASSEMBLY.

4-334. The tail landing gear assembly (figure 4-29) consists of a tailwheel assembly, a fork assembly, and a



AVN000676

Figure 4-28. Axle torque measurement

leaf spring assembly. The tailwheel assembly is controlled through a rudder control system.

4-335. TROUBLESHOOTING. Troubleshooting consists of locating and correcting failure, leakage, or unsatisfactory operation of the tail landing gear assembly. The following procedures list the most common troubles, probable causes, and possible remedies.

4-336. TAILWHEEL ASSEMBLY.

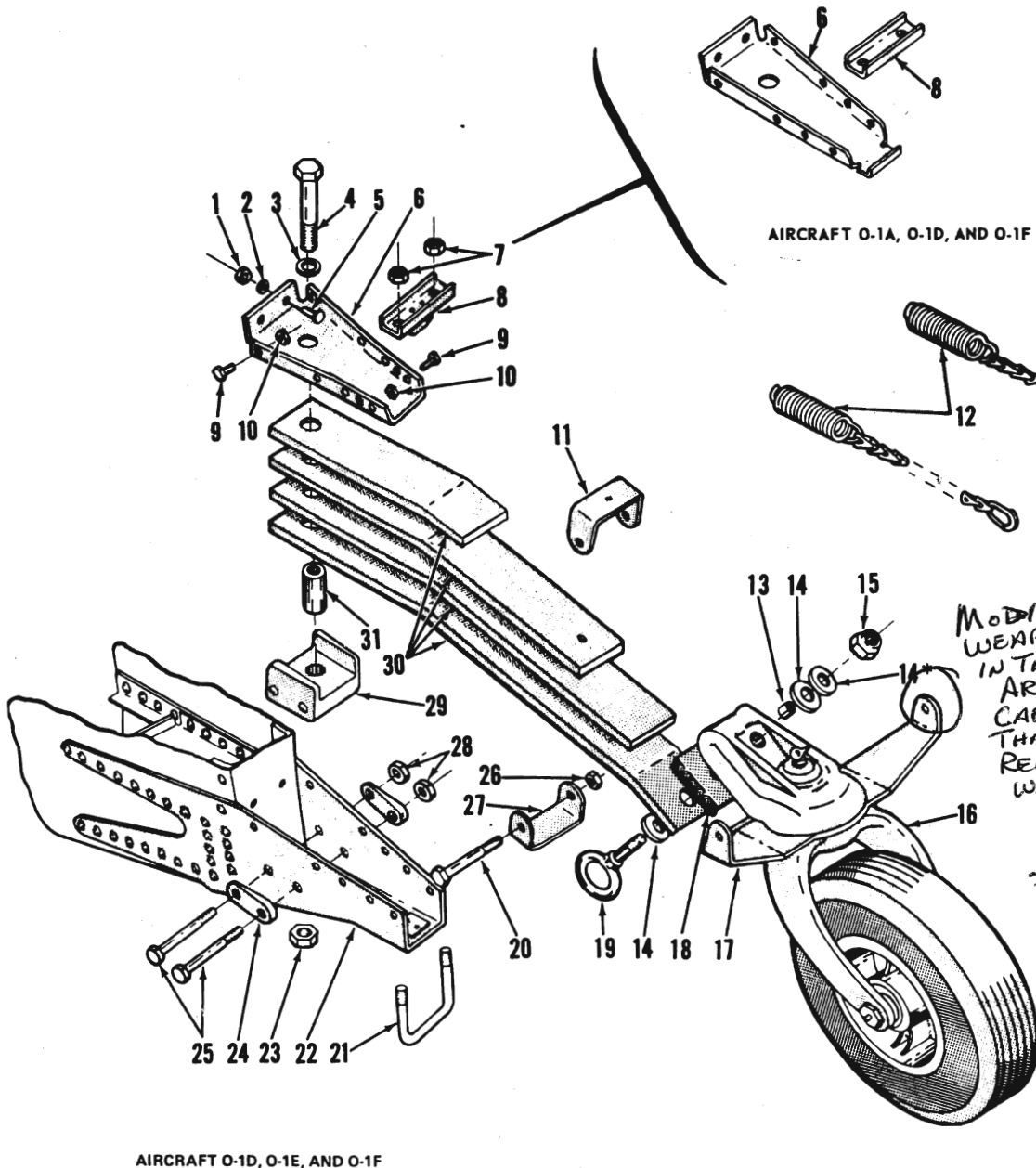
4-337. The tailwheel assembly consists of a two-piece, cast magnesium alloy wheel and an 8 X 3.00-4, 4-ply

rating tire and inner tube. The tailwheel assembly is equipped with tapered roller bearing cones and shrink-fit bearing cups.

4-338. REMOVAL.

a. Jack fuselage in accordance with instructions under JACKING, Chapter 1, Section III.

b. Remove cotter pin (11, figure 4-30), axle (23), washers (13), and axle nut (12) securing tailwheel assembly to fork (25).



MODIFY TO PREVENT WEAR TO THE HOLES IN THE TAIL WHEEL ARMS. INSTALL CABLE SHACKLES THAT CAN BE EASILY REPLACED IF/WHEN WORN.

PARTS LIST:
(-for 2 Sides)

- (2) AN115-21 OR MS20115-4 CABLE SHACKLES
- (2) AN3-3 BOLTS
- (4) AN960-10CE (THIN) WASHERS
- (2) AN310-3 CROWN/CASTLE NUTS
- (2) COTTER PINS

MODIFY PROFILE OF 1 SIDE (ONLY) OF SHACKLES TO PERMIT SLIDING CHAIN ONTO SHACKLE
 Ex: BEFORE
 AFTER
 FLAT

- | | | |
|--------------|------------------------------|----------------------|
| 1. NUT | 12. STEERING SPRING ASSEMBLY | 22. MOUNTING BRACKET |
| 2. WASHER | 13. BUSHING | 23. NUT |
| 3. WASHER | 14. WASHER | 24. SPACER |
| 4. BOLT | 15. NUT | 25. BOLT |
| 5. BOLT | 16. WHEEL AND FORK ASSEMBLY | 26. NUT |
| 6. CHANNEL | 17. STEERING ARM | 27. STEERING GUARD |
| 7. NUT | 18. SPACER | 28. NUT |
| 8. STIFFENER | 19. EYEBOLT | 29. BLOCK |
| 9. BOLT | 20. BOLT | 30. LEAF SPRING |
| 10. NUT | 21. U-BOLT | 31. BUSHING |
| 11. SHACKLE | | |

AVN 000677

Figure 4-29. Tailwheel landing gear assembly