6-41. **Landing Gear Retraction System.**

6-42. **Principal Of Operation.** The landing gear is a tricycle type, fully retractable through an electrically operated retraction mechanism The retraction mechanism consists of an electric motor and transmission assembly, torque tube assembly, push-pull cables for each main gear and a push-pull tube to the nose gear Limit switches are installed in the system to shut off the motor when the gear is fully extended or retracted These switches also operate gear indicator lights on the instrument panel.

The landing gear selector switch is placed in the up position activating the retraction motor which operates the transmission. The retraction transmission pushes the torque arms forward which pull the main landing gear cables and pushes the nose gear retraction tube forward, retracting the landing gear When the gear is fully retracted, the gear up limit switch stops the motor and the amber gear up indicator light on the instrument panel lights The landing gear selector switch is then placed in the down position, operating the motor and retraction transmission. The transmission pulls the torque arms back which pushes on the main gear cables and pulls on the nose gear tube extending the landing gear. When the gear is fully extended, the gear down switches stop the motor and the green gear down and locked indicator light on the instrument panel lights.

6-43. **Removal Of Gear Retraction Transmission Assembly.** (Refer to Figure 6-14.)

a. Remove the gear retraction transmission assembly by using the following procedure·

1 Place the airplane on jacks. (Refer to Jacking, Section II.)

2. Roll the carpet back off the front center access panel by removing carpet attaching screws

3 Remove front center access panel by removing attaching screws. On airplanes with Serial Nos 24-4783, 24-4804 and up, remove the retraction transmission access door located between the two front seats

4. Disconnect transmission motor electrical leads by sliding back the protective covering and uncoupling the quick disconnect terminals

5 Place the emergency retraction release handle (18) in the full up position

6. Disconnect the transmission retraction spring (23) located on the left side of the transmission housing on models PA-24-180 and PA-24-250, Serial Nos 24-3558 and up; and PA-24-260 and PA-24-400 On models PA-24-180 and PA-24-250, Serial Nos 24-1 to 24-3557 the retraction spring (22) is located on the right side of the transmission assembly connected to the brake solenoid brackets

7 Remove the cotter pin, washer and pin attaching the transmission housing to the mounting bracket

8 Remove the transmission assembly from the well.

6-44. **Cleaning, Inspection And Repair Of Gear Retraction Transmission.** (Refer to Figure 6-13)

a. Remove the six screws attaching the transmission cover (7) to transmission housing and remove the cover noting the position of the mounting lug.

b Wipe all old grease from the transmission housing and from the actuator screw (4) and screw nut (3)

c Check the gear release arm (1) and ascertain that it will snap lock in place and will require a load of 6 to 12 pounds applied at the end of the arm to release. Adjust by spreading or compressing the arm sides at the round head rivets to obtain proper fit (early PA-24-180 and PA-24-250 airplanes did not have a snap lock arm and requires a strap to hold the arm in place) Once the arm is released, ascertain that there is no binding through its travel.

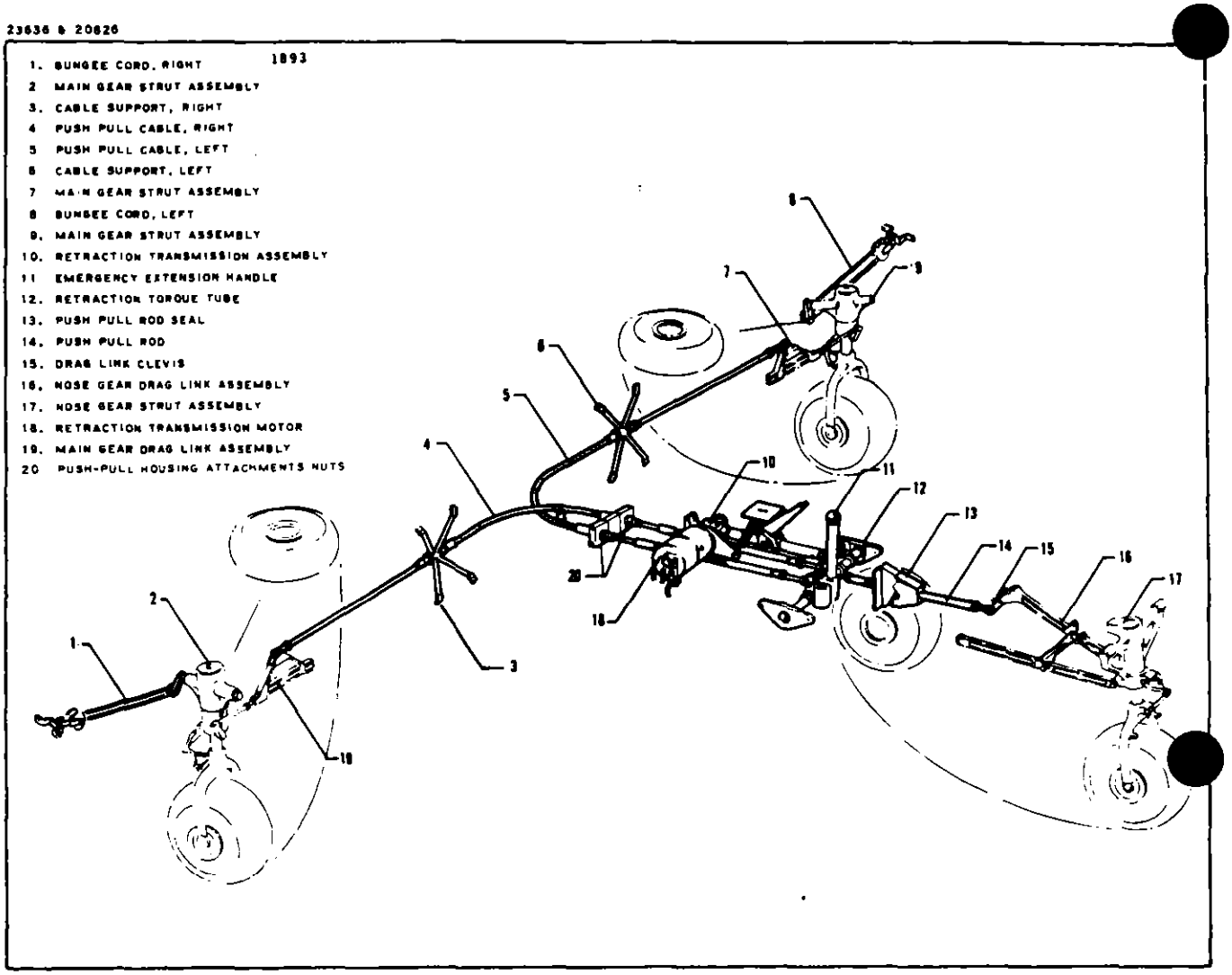

FIGURE 6-12. LANDING GEAR RETRACTION SYSTEM

d. Inspect the transmission screw and tube nut (2) for end and side play and ascertain that they are not distorted or bent.

e. Check that the screw bearing (9) is not loose on the transmission screw or within the transmission housing. A loose bearing can be determined by holding the transmission and moving the screw up and down. This check can also be made when the transmission is installed in the airplane, with the landing gear partially retracted, by applying a load to the emergency extension handle and noting play.

NOTE

On PA-24-180 and PA-24-250 airplanes, Serial Nos. 24-1 to 24-735 ascertain that bearing retainer Kit No. 754 219 consisting of plate, link, screws and nuts has been installed on the transmission.

f. Check for wear within the transmission by turning the transmission screw (4) by hand and noting end play in the transmission drive shaft (24). End play usually indicates a worn thrust bearing or a loose connection between the thrust bearing and drive shaft. If end play is in excess of 0.015 of an inch, the transmission should be replaced.

g. The coupling (10) between the transmission and motor may become worn to a point where the metal inserts in the coupling protrude from the rudder, thus causing chatter. This chatter may be eliminated by grinding the metal inserts until they are .010 to .015 below the surface of the rubber. This grinding operation may be repeated until the coupling reaches a minimum diameter of 1 inch and then should be replaced.

h. Adjust the motor brake (18) (early type) by adjusting the nut on the brake support rod (22) until the brake disc clears the highest point on the retraction transmission coupling. Hold the brake disc firmly against the brake solenoid while making this adjustment.

i. The only adjustment required for the later type motor is to align the brake solenoid unit with the transmission coupling which is accomplished by adjusting the nut on the brake support rod.

j. Fill the Dura transmission housing with MIL-G-23827 grease and the Dukes transmission housing with Dukes No. 4 lubricant manufactured by Dukes. Duke transmission is identified by label (Dukes Astronautics Co.) on transmission housing. Dura transmission is identified by Part No. 1010250 stamped on transmission housing.

NOTE

Refer to Lubrication Chart, Special Instructions for specific lubrication instructions of landing gear transmission assembly.

k. Position the transmission cover on the housing and secure with screws.

6-45. Installation Of Retraction Transmission Assembly. (Refer to Figure 6-14.)

a. Ascertain that the transmission is properly lubricated and position it in the transmission well.

b. Align the transmission mounting lug (27) with the hole in the mounting bracket (28) and secure with pin (12), washer and cotter pin.