

Comanche Abnormal Gear Operation  
Part 1: The Checklist  
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NTSB accident briefs on Comanche landing gear problems over a four-year period indicate two cases where the gear transmission was separated from the aircraft, four cases of disconnected cables and/or rod ends, two incidents of gear train blockage, and one torque tube arm failure. Although these occurrences are unusual, there is no basis for assuming that they will not happen again. The abnormal gear operation checklist which follows therefore covers both simple and unusual causes for gear malfunction. Although the checklist includes owner's manual recommendations by Piper, it is not approved by either Piper or the FAA (nor is any such approval likely). Inasmuch as the FAR's specify the pilot to be in command, the responsibility for its use is yours. Items which you may consider unusual are therefore preceded by the

word "consider". We cannot command your aircraft. We are merely presenting argument as to what we believe is the best course of action. If objections or improvements exist, we would like to know. It can be revised.

The checklist assumes that your transmission has been painted with red alignment stripes as outlined in the gear article in the October Flyer. Read each item completely before taking action. If the specified conditions of an item do not apply, proceed to the next item. Items should be completed in specified order. If the item states "proceed to manual extension", go direct. Do not continue with remaining items of the present section. Double failures are not considered. Reasoning and argument on the checklist will follow in the next issue of the Flyer.

### COMANCHE ABNORMAL LANDING GEAR OPERATION

#### **If Green Gear Light not on:**

1. **Do not recycle gear.** Move gear switch to OFF and then DOWN at least twice. If green light obtained (or at anytime hereafter) proceed with normal landing.
2. If green light not obtained, depart traffic area to 3000 ft AGL, set power & monitor fuel. **Fly the airplane.**
3. Remove transmission cover. Inspect transmission for security and blockage. Inspect for broken gear-train components. Check gear alignment stripes.
4. If transmission unsecured or jammed, gear switch OFF. Clear blockage if appropriate. Proceed to manual extension.
5. If gear train components broken and one gear inop, proceed to appropriate partial-gear landing checklist. If both nose gear and right main inop (left torque arm), proceed to Gear-up landing.
6. If gear stripes matched but not aligned full-travel, proceed to next section on "Gear stripes not full travel."
7. If all stripes aligned full travel and components not broken, recycle gear at least twice in an effort to obtain green light.
8. If unable green light and stripes still aligned full travel, reset all breakers and test gear-warning circuits:

- A. Cycle light dimmer to detent several times.
  - B. Cycle gear indicator light CB several times.
  - C. Test gear warning horn at retarded throttle to determine if nose gear is down.
  - D. Trade amber and green light bulbs as bulb test.
9. If unable green light, have tower visually inspect gear.
10. If any gear up or partially up, anticipate collapse of malfunctioning gear.
11. If gear stripes full travel and all gears appear down, consider landing on centerline without attempting manual extension. Avoid crosswinds. Be alert for possible gear collapse.

### **If Gear Stripes Not Full Travel:**

1. Reduce to 1.3Vsfl with full flap. Power for level flight,
2. Check Master switch NO and generator charging. Reset breakers if necessary. Reduce electrical load.
3. Check landing gear motor and solenoid circuit breakers.
4. If either or both breakers popped, move gear selector to OFF, reset breakers and attempt gear down electrically while pushing on emergency extension handle to assist motor.
5. If unable stripes full travel, consider placing gear selector down not to exceed 8 seconds. If available have copilot push extension handle forward at the same time. Repeat procedure if required after five minute cooling.
6. If stripes now full travel but no green light, backtrack to item 8 of the first checklist and complete remainder.
7. If unable stripes full travel, proceed with manual extension.

### **Manual Gear Extension (Last Resort)**

1. Maintain 1.3Vsfl. Landing gear switch off.
2. Remove transmission cover & pull motor release arm up and forward through full travel.
3. Extend (insert on some models) emergency handle and push forward full travel.
4. If unable extend, lift gear by pulling rearward on handle. Then push forward as hard and rapidly as possible. Repeat procedure.
5. If unable extend, push handle forward using all available force. Use foot and leg pressure. Bend handle if necessary.
6. If gears extend but no green light, conduct gear warning circuitry check in item 8 of first section.
7. If unable green light after circuitry check, request tower visual inspection.
8. If all gears appear down and both rod-end stripes are full travel, proceed with landing. Avoid crosswinds. Hold extension handle firmly forward with foot to prevent possible collapse on landing roll. (Disregard this item if safety lock installed.)

9. If unable extend all gears, see Gear-up or Partial-gear landing procedures below.

### **Gear Up Landing:**

1. Declare emergency. Fly to airport with emergency equipment and long runway into the wind. Consider excess fuel burn off. Declare souls on board. Request emergency equipment. Consider zero flap landing at higher approach speed if runway permits. Plan idle power touchdown. Brief passengers on bracing positions and rapid exit.
2. If two gears inop, retract operative gear if possible. Have tower confirm gear positions.
3. Just before flare... **Fuel Selector and Master Switch OFF.**
4. At touch down... **Ignition OFF.**

### **If Nose Gear Not Down:**

1. Accomplish Item 1. under "Gear up Landing" except omit zero flap landing.
2. Extend main gears electrically to full travel on gear stripes if possible. (If manual extension previously conducted or necessary and safety lock not installed, plan to hold extension handle firmly forward with foot on roll-out.)
3. Have tower inspect gears to confirm positions.
4. Just before flare ... Fuel selector and Master Switch OFF.
5. At touch down ... Ignition OFF.
6. Hold nose off as long as possible.

### **If One Main Gear Not Down:**

1. Accomplish Item 1. under "Gear -up Landing".
2. Plan landing off centerline of concrete with extended gear near edge of runway.
3. Extend functional gears electrically to full travel on gear stripes if possible. (If manual extension previously conducted or necessary, and safety lock not installed, plan to hold extension handle firmly forward with foot during roll-out.)
4. Have tower inspect gears to confirm positions.
5. Just before flare ... Fuel selector and Master Switch OFF.
6. At touch down . . . Ignition OFF.
7. Use full aileron to hold wing up as long as possible.
8. Use maximum rudder & brake to hold aircraft on runway.

**Have passengers exit aircraft as rapidly as possible after landing.**