

COMANCHE GEAR

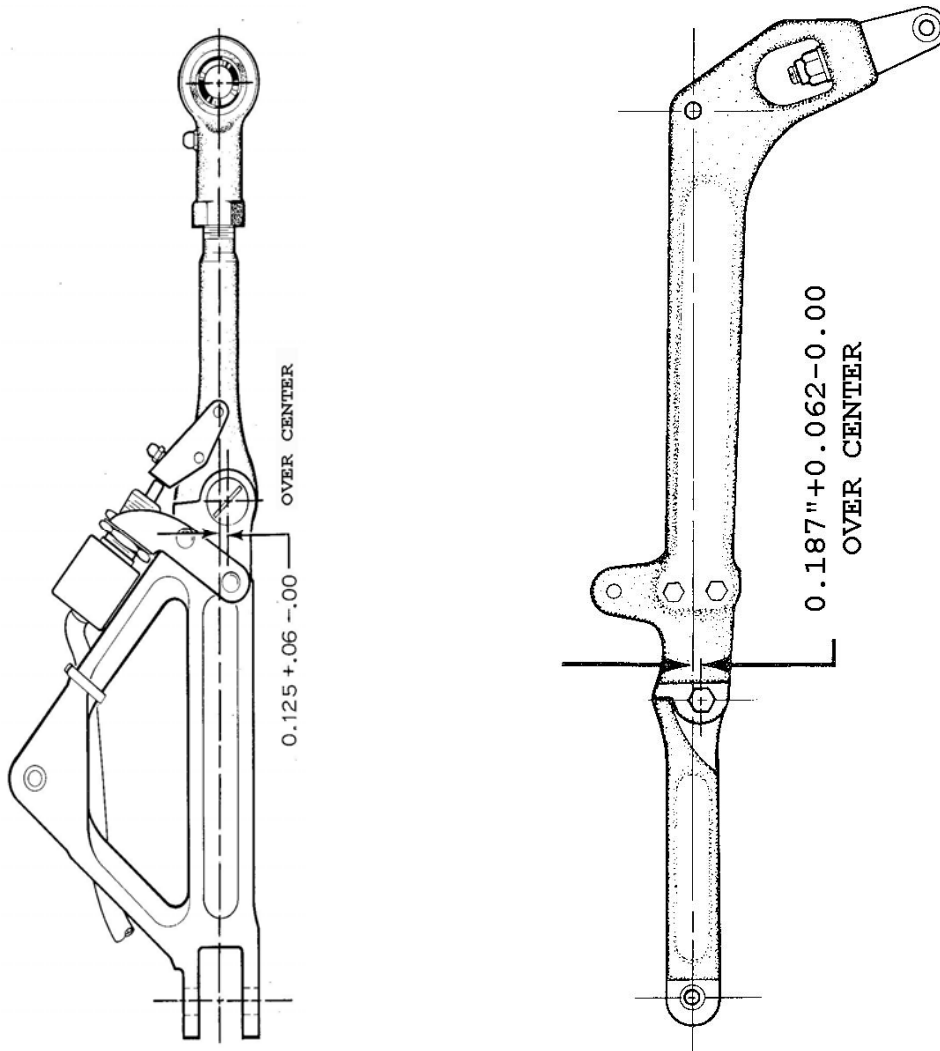


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ADJUSTMENT HINT FOR THE LIMIT SWITCHES

IT IS OF THE UTMOST IMPORTANCE TO GET THIS ADJUSTMENT RIGHT!! THE LIMIT SWITCHES' ADJUSTMENT PROCEDURE IS SOMEWHAT VAGUE IN THE COMANCHE SERVICE MANUALS; THE FOLLOWING WILL ASSIST AND OFFERS A SUGGESTION THAT MAY BE OF SOME HELP AND CLARIFICATION IN UNDERSTANDING THE SYSTEM. SEE MY FURTHER DESCRIPTION ON PAGE 3.

PROCEED AS FOLLOWS [AIRPLANE ON JACKS]. WITH THE GEAR PARTIALLY-RETRACTED AND THE DRAG LINK DISCONNECTED AT THE SIDE-BRACE STUD, IT IS POSSIBLE TO MIMIC THE KNEE ACTION BETWEEN THE UPPER AND LOWER DRAG LINK ASSEMBLIES. MAKE THIS ADJUSTMENT SO THE SWITCHING ACTION TAKES PLACE AT THE DIAGRAMMED VALUE SHOWN; I.E. FOR THE MAINS $0.125''+0.06''-0.00''$ AND FOR THE NOSE $0.187''+0.062''-0.00''$, BEFORE THE "DOWN AND LOCKED" POSITION. WORN BUSHINGS HERE WILL FRUSTRATE THIS ADJUSTMENT ESPECIALLY FOR THE MAINS ON THE RECTANGULAR SWITCH VERSIONS. TRIPLE-CHECK THIS IMPORTANT ADJUSTMENT FOR YOUR CONFIDENCE AND YOU WON'T HAVE TO GO BACK OR WONDER ABOUT IT AGAIN. ALSO PLEASE READ AND UNDERSTAND 6-53D [FROM SCSM] FOLLOWING. THIS IS AGAIN VAGUE WITHOUT AN ANSWER TO THE QUESTION, "HOW MUCH PRESSURE"? ALTHOUGH I HAVE A PROBLEM PERSONALLY WITH THIS 6-53D METHOD, I CANNOT DISAGREE PUBLICALLY WITH PIPER'S METHOD.





PIPER COMANCHE SERVICE MANUAL

6-52. Adjustment Of Landing Gear Safety Switch.

- a. The landing gear safety switch located on the left main gear is adjusted so the switch is actuated in the last 0.75 of an inch of gear extension.
- b. The switch with the boot seal and adjusting rod (refer to Figure 6-9, Sketch B) is adjusted by placing the gear in full down position and the strut fully extended. Screw the actuator arm (41) down until the switch clicks on, then screw down an additional 0.187 of an inch and secure with jam nut (40).
- c. The round switch used on aircraft without the adjusting rod and arm is adjusted by compressing the strut until 5.5 inches is obtained between the top of the gear fork (34) and bottom of the gear housing (15), then adjust the switch down until it contacts the striker plate. Secure the switch and safety.
- d. Ascertain that either switch will actuate in the last 0.75 of an inch of oleo extension.

6-53. Adjustment Of The Gear Down Limit Switch.

- a. Before attempting any adjustment of the down limit switch, ascertain that the nose and main gear drag link assemblies are properly adjusted. Refer to paragraphs 6-15 and 6-34.
- b. Each main gear down limit switch attached to the side brace drag link assembly is adjusted by moving the switch toward or away from the striker plate. When the landing gear is down and locked, the limit switch should have broken contact.
- c. The nose gear down limit switch located at the left drag link is adjusted by moving it toward or away from the striker plate. When the gear is down and locked, the switch should have broken contact.
- d. Check operation of the down limit switches by the following procedure:
 1. Open landing gear retraction motor circuit breaker.
 2. Turn on the master switch.
 3. Disconnect the retraction transmission by pulling up on the release lever and manually retracting the landing gear using the emergency extension lever.
 4. At the point where the green light goes out, apply rearward pressure on the nose gear and inward pressure on the main gear. The gear should not unlock.

6-54. Adjustment Of Gear Retraction Transmission Assembly. (Refer to Figure 6-14.) Adjust the retraction transmission by using the following procedure:

- a. Release the retraction transmission by pulling up on the emergency release lever.
- b. Adjust the push-pull cables so the cable (1) from the right gear has three threads exposed forward of the castellated nut and the cable (2) from the left gear has one thread exposed forward of the castellated nut. (A spanner wrench may be fabricated to tighten the castellated nuts. See Figure 6-40.)

NOTE

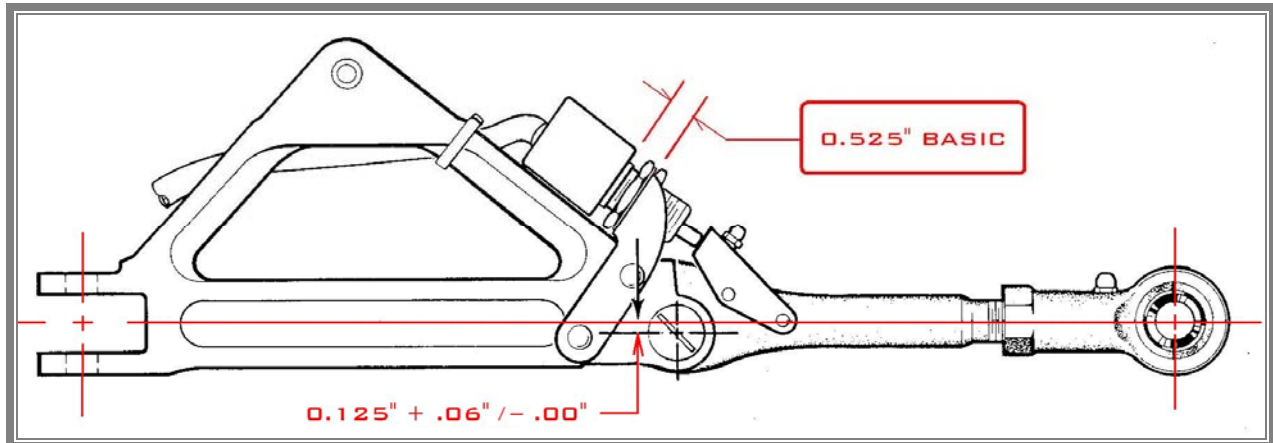
The main gear push-pull cables cross each other aft of the retraction transmission.

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DISCUSSION - LIMIT SWITCHES ADJUSTMENT



THE DIMENSIONAL METHOD OFFERED HERE CONCERNS THE ROUND VERSION MICRO SWITCHES ONLY – THE RECTANGULAR VERSION DESIGN DOES NOT LEND ITSELF TO SUCH A DISCRETE METHOD BECAUSE THE MOUNTING BRACKET AND STRIKER PLATE CAN BE BENT; HOWEVER THE THEORY IS THE SAME. KEEP IN MIND MANUFACTURING TOLERANCES WHEN CONSIDERING MY DIMENSIONS AND MEASUREMENTS; THERE COULD BE VARIATIONS BUT THEY WOULD BE ONLY SLIGHT. USE THESE SUGGESTIONS WITH THAT IN MIND.

AS A BASIC SETTING FOR INSTALLING THE MAIN GEAR LIMIT SWITCHES ADJUST THE NUT POSITION SO THERE IS **0.525"** BETWEEN THE BASE OF THE MICRO SWITCH AND ITS MOUNTING BRACKET. ON MY TEST SETUP THIS **0.525"** VALUE CORRESPONDED WITH THE CENTERLINE ALIGNMENT FOR THE MAINS; HOWEVER DON'T LET THIS SUGGESTION BE A SET-IT-AND-FORGET-IT. CHECK THIS IMPORTANT ADJUSTMENT AS PREVIOUSLY OUTLINED IN THIS MANUAL.

I HAVE MEASURED SWITCH ADJUSTMENTS IN THE FIELD AND OBSERVED THEM "ALL OVER THE MAP". ON ONE SPECIFIC AIRFRAME [A WELL-KNOWN GEAR INCIDENT] THE MAINS VARIED FROM 0.450" TO 0.510". TO DETERMINE WHETHER THESE FELL WITHIN THE SAFE LIMITS I MADE A SETUP USING COMPONENTS WITHIN THE SERVICE LIMITS AND MADE THE FOLLOWING DETERMINATION. NOTE – AN ENGINEER WOULD LIKE THIS TO BE DONE GEOMETRICALLY HOWEVER I DON'T FEEL MANY WILL APPROACH THIS ADJUSTMENT USING THAT PROCEDURE, IT'S JUST TOO NEBULOUS. THE INCORRECT 0.510" SETTING ALLOWED THE GEAR-DOWN LIGHT TO ILLUMINATE 0.102" BEFORE THE CENTERLINE ALIGNMENT POSITION. THAT COULD WELL MEAN TROUBLE; THE 0.450" SETTING WOULD BE EVEN WORSE. THE SWITCHING ACTION SHOULD **NOT** OCCUR BEFORE THE CENTERLINE ALIGNMENT POSITION. ANOTHER CONSIDERATION IS "COAST" OR MOMENTUM; HOW MUCH OCCURS? I SUSPECT IT IS NEARLY INSIGNIFICANT; BOB WEBER OF WEBCO AIRCRAFT FAME SAYS "YOU WOULD BE SURPRISED" [I ASSUME HE MEANS MORE]. **PREMATURE SETTINGS ARE A GEAR COLLAPSE JUST WAITING TO HAPPEN.**

UNDERSTAND THAT IN THE COMANCHE SYSTEM ALL THREE DOWN-LIMIT SWITCHES MUST HAVE SWITCHED TO OBTAIN A GEAR-DOWN LIGHT INDICATION. A TOO-LATE ADJUSTMENT [MOTOR RUNNING AFTER DOWN-LOCK] WILL TEND TO "PULL" THE BEARING OUT OF THE TRANSMISSION CASTING [A DURA PROBLEM] AND TORQUE-LOCK THE MOTOR, THUS OPENING THE 30 AMP CIRCUIT BREAKER. THIS RESULTANT LOOSE BEARING IS ONE CONDITION THAT PUTS THE DURA TRANSMISSION IN THE NON-SERVICEABLE CATEGORY. PIPER ADDRESSED THIS EARLY IN PRODUCTION; READ SL-315 WHICH CAN BE FOUND IN THIS FOLLOWING LINK.

[HTTP://WWW.COMANCHEGEAR.COM/LANDING%20GEAR%20TRANSMISSION/SL%20315.PDF](http://www.comanchegear.com/LANDING%20GEAR%20TRANSMISSION/SL%20315.PDF)