RIG IT RIGHT!

Proper Landing Gear Rigging Procedures

for

Cessna 300 and 400 Series Twins

with

Electro-mechanical Landing Gear

Compiled by:

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Follow all of the steps in the order that they appear. For all specifications, the latest, up to date, service manual for the model in question must be used.

Key to Symbols

 = Visually Inspect

 = Disconnect

 = Reconnect

 = Physically Check

 = Adjust

 = OK to Proceed

 = Not OK to Proceed

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Thank you for your interest in the proper landing gear rigging procedures for the Cessna 300 and 400 Series twins. The following procedure is recommended for all models equipped with electro-mechanical landing gear.

The National Transportation Safety Board has nearly 800 accidents on file involving the landing gear on only the 310 through 310R models alone. In almost half of these accidents, the aircraft was landed without the landing gear down and locked. If the landing gear accidents and incidents were eliminated, the Cessna 310 would be the safest airplane in the sky. We have found that all Cessna twins with electro-mechanical landing gear should have the gear completely inspected and re-rigged every 200 hours or annually, whichever comes first.

The following pages, along with the DVD, should be used as a guide and must be used **only** with the **latest up-to-date Service Manual** for the aircraft model involved. Rig It Right is not intended to replace the Service Manual and should be used only as an additional guide to rigging procedures.

Getting Started

The following is a list of items necessary for proper gear rigging:

1. Basic hand tools including a flashlight.

2. A spring scale that reads from 0 to 150 pounds.

3. Cessna part number 080001-1, a tool for rigging main gear door tensions.

4. The current Service Manual for the particular airplane involved.

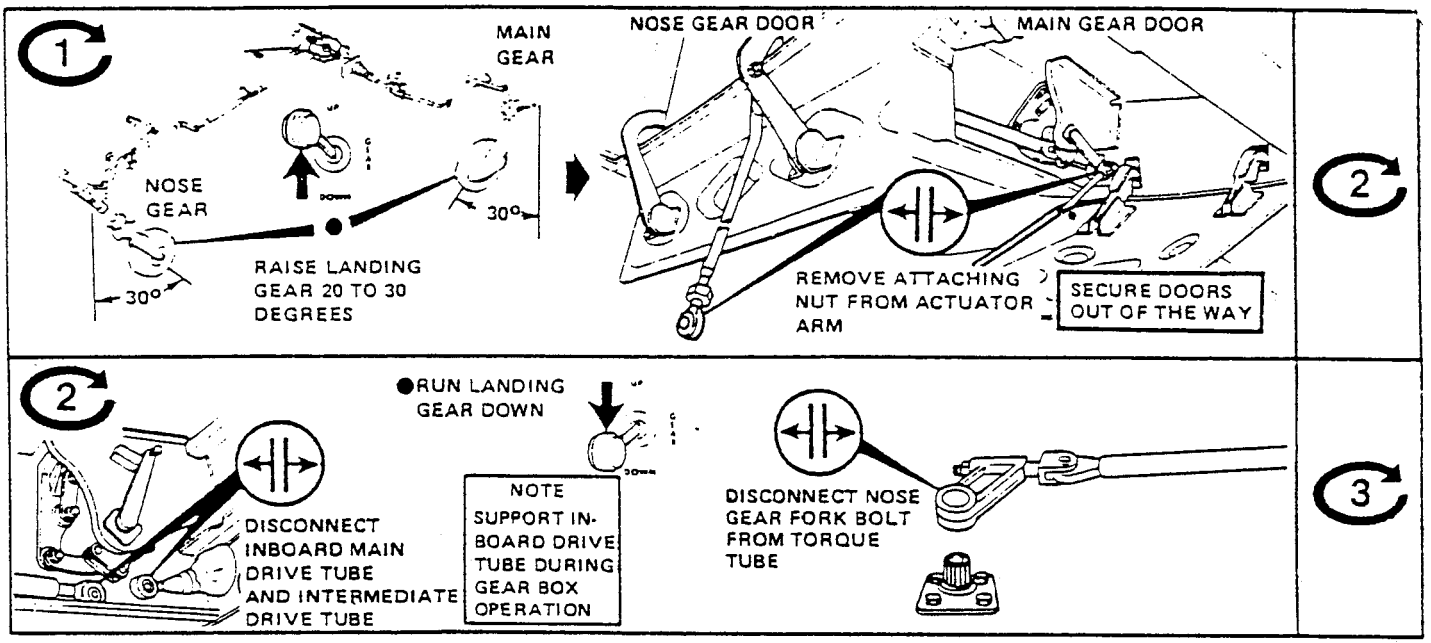
5. An auxiliary power unit is advisable to eliminate excessive power drain on the aircraft batteries.

6. The aircraft must be placed on jacks using the Service Manual as a guide.

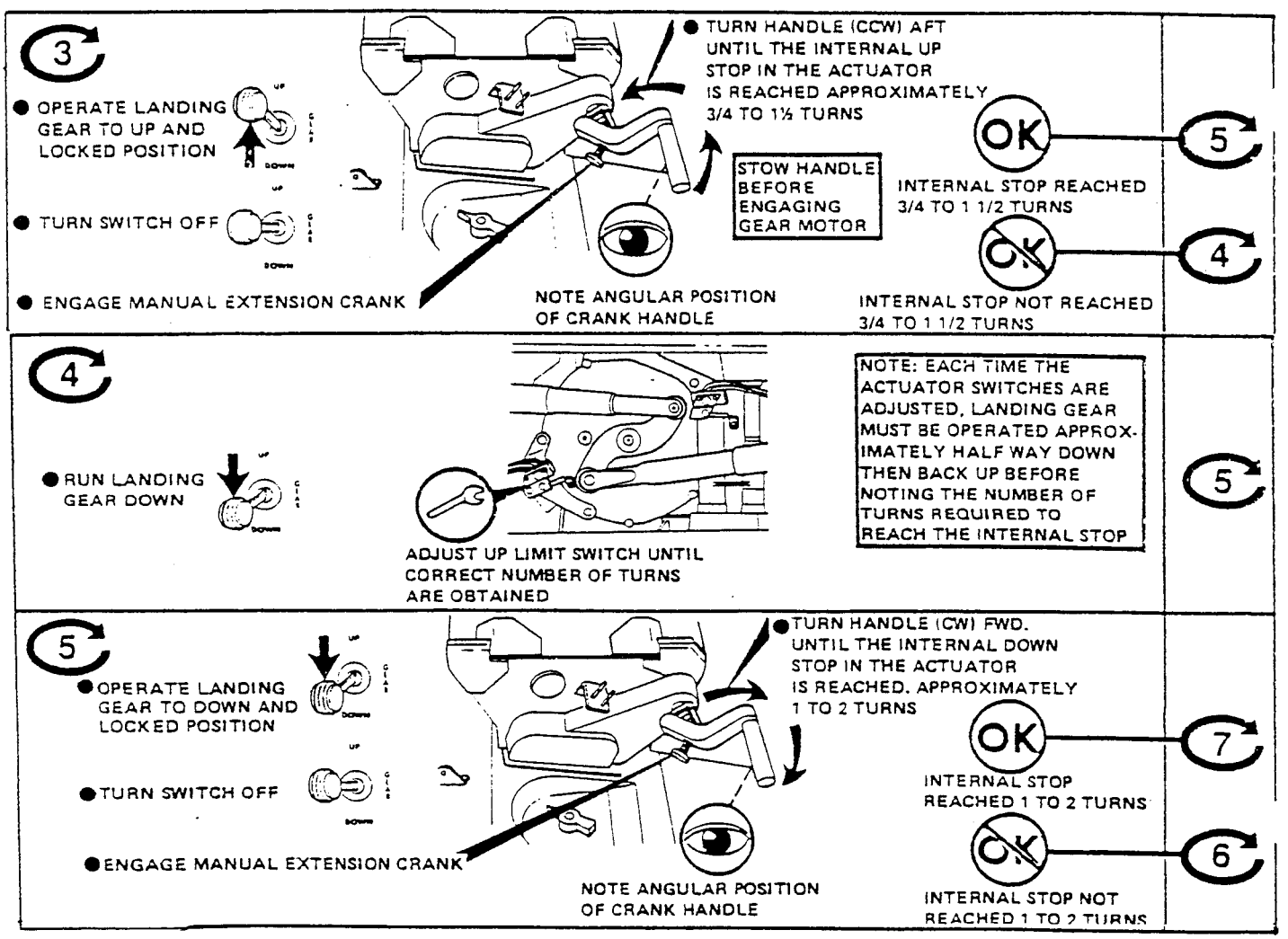
Remember, the proper up-to-date Service Manual must be used for the correct specifications. All steps must be followed in the order printed and no steps should be left out. We have found the following procedure will work well on all models with electro-mechanical landing gear.

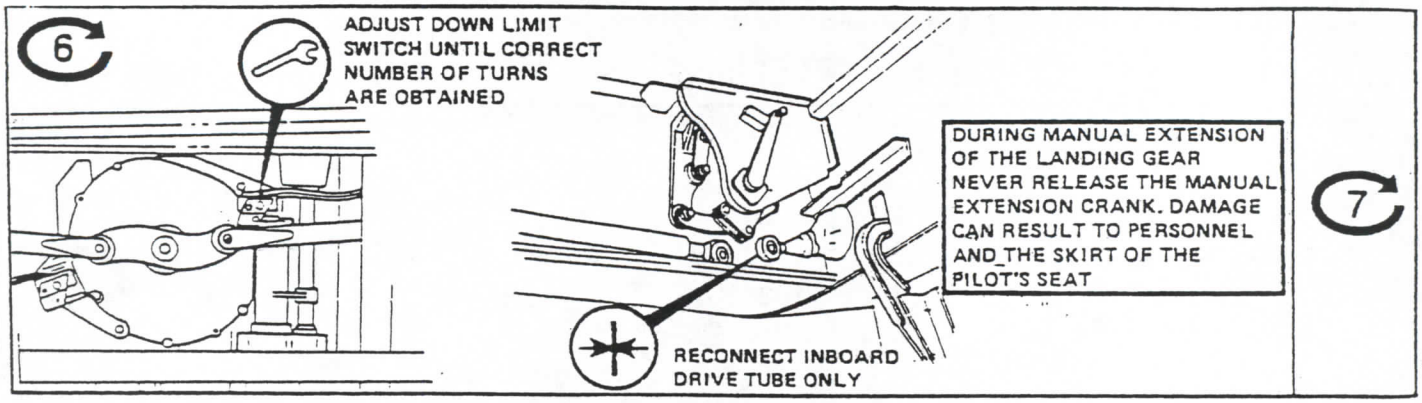
DISCONNECTING: Landing Gear Doors

STEP | PROCEDURE | RESULT

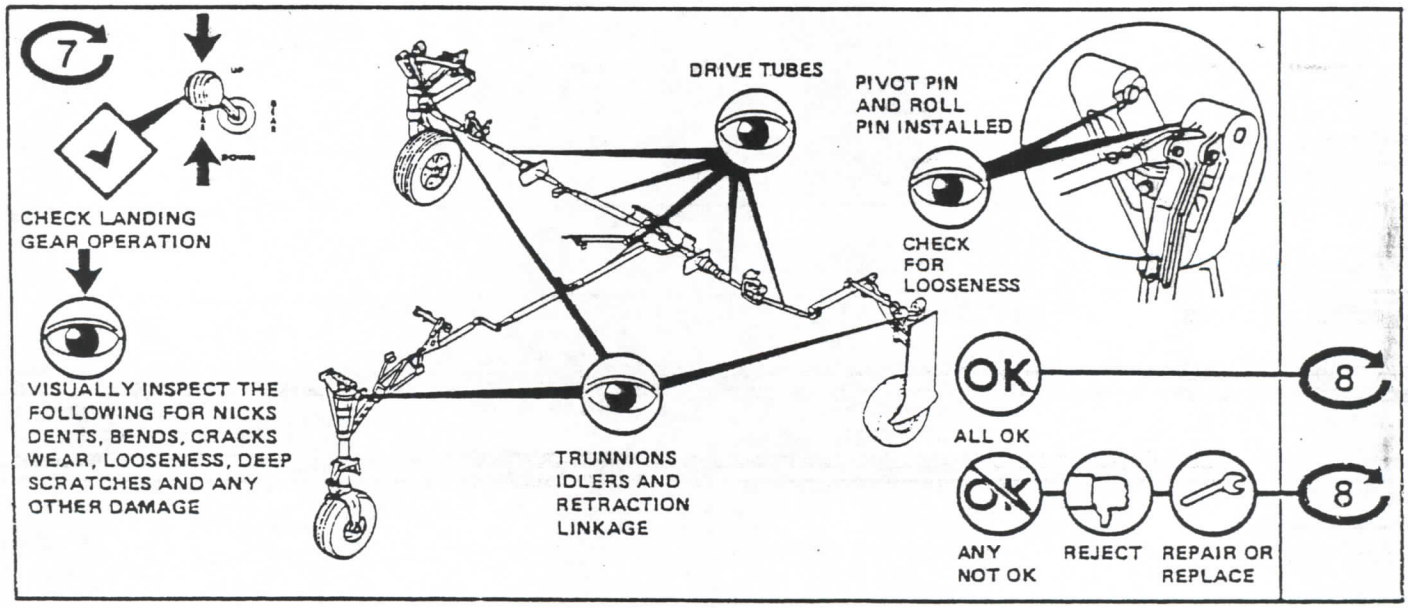


CHECKING: Up and Down Limit Switches



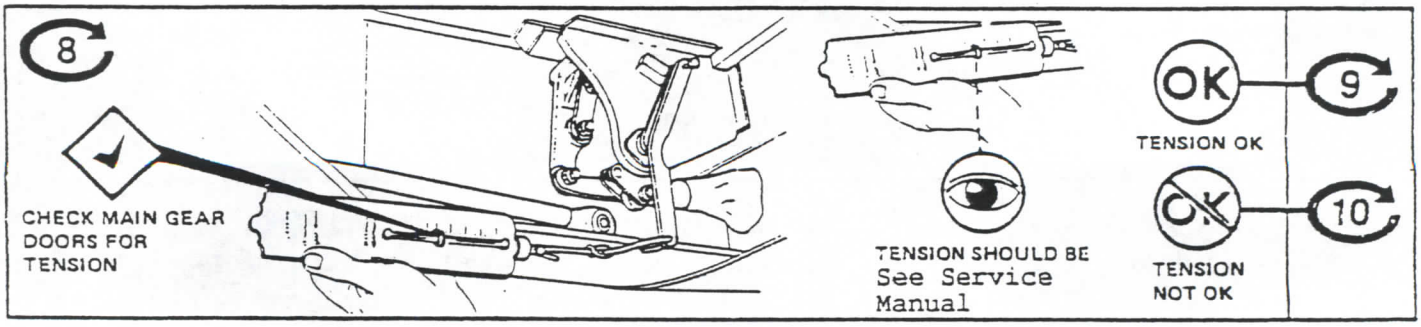


CHECKING: Drive Tubes, Trunnions, Retracting Linkage, and Wheel Well area

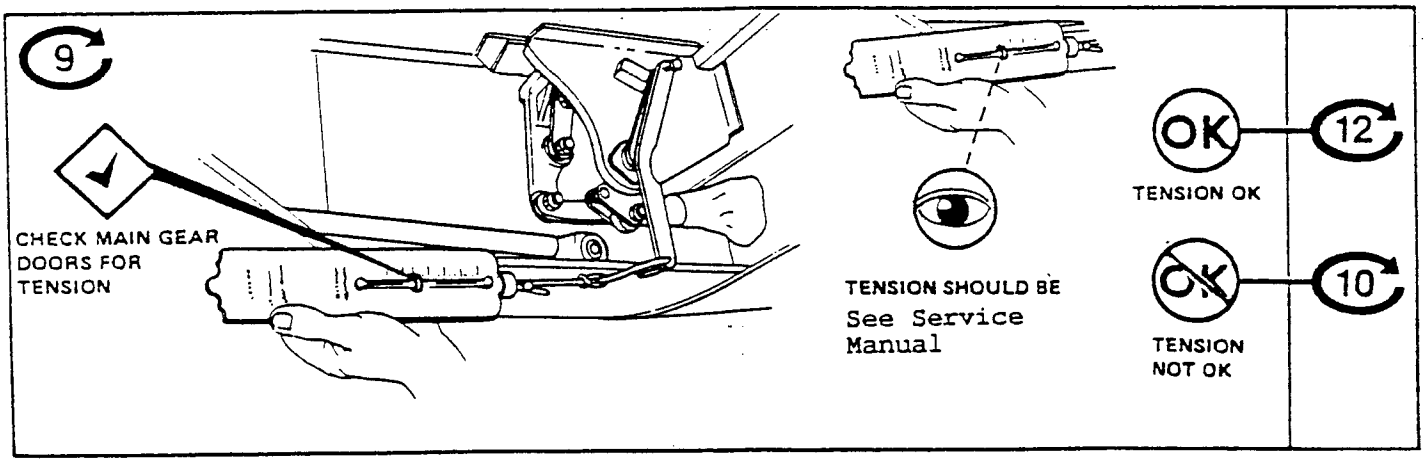


CHECKING: Main Gear Door Actuator Arm Tension Gear Down

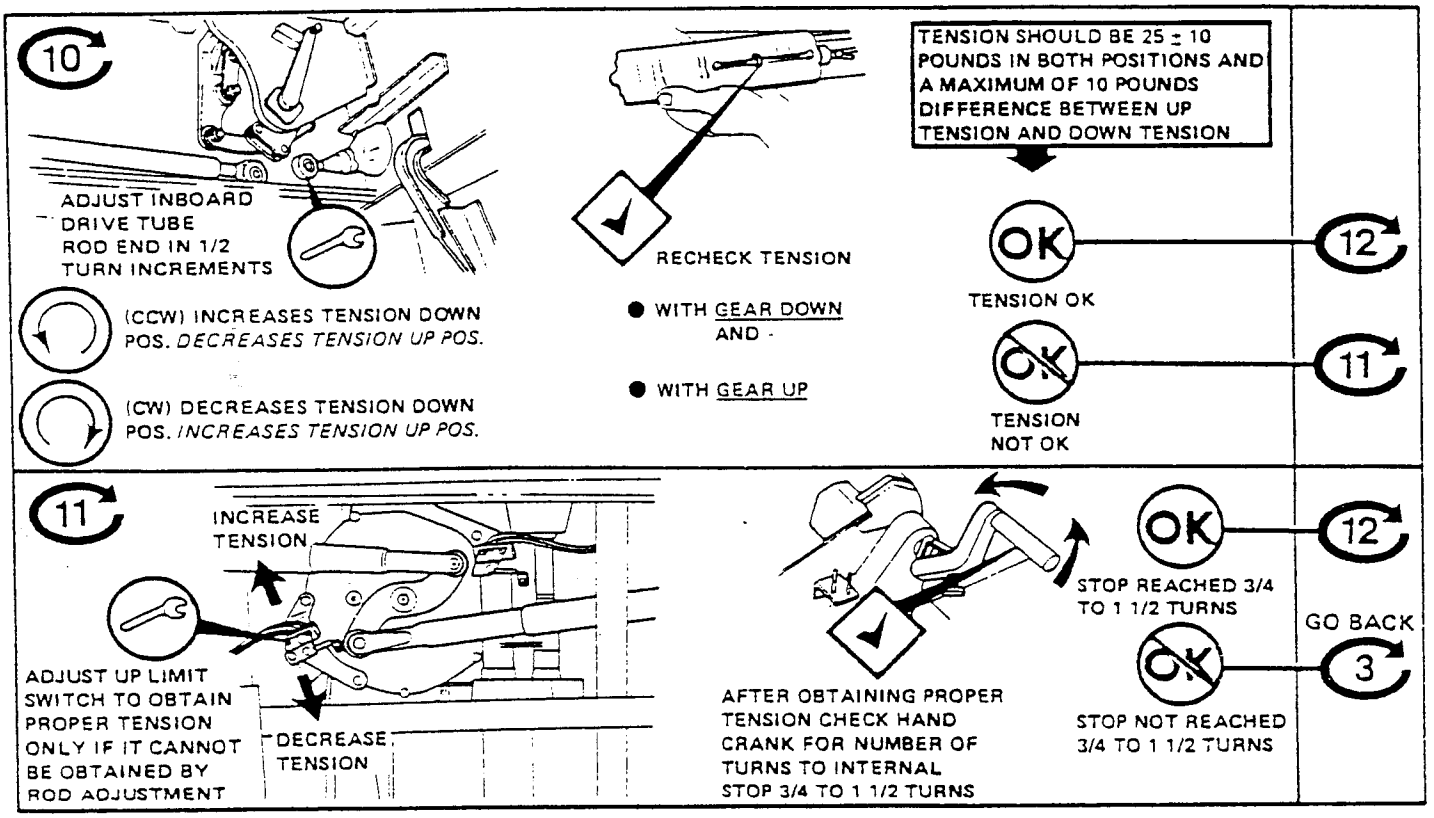
STEP	PROCEDURE	RESULT



CHECKING: Main Door Actuator Arm Tension Gear Up



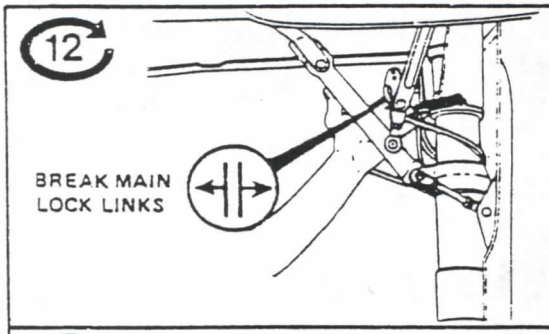
ADJUSTING: Main Door Arm Actuator Tension Gear Up and Gear Down



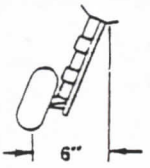
CHECKING: Main Landing Gear Free Fall

STEP | PROCEDURE | RESULT

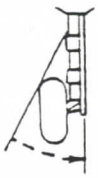
12



BREAK MAIN LOCK LINKS



RAISE GEAR APPROX. 6 INCHES BY HAND



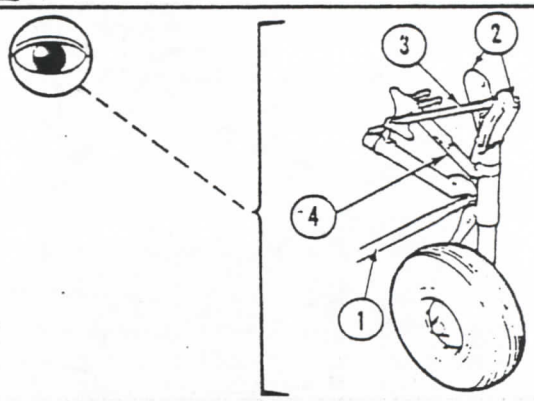
RELEASE GEAR

OK → GEAR LOCKS → **15**

O.K → GEAR DOES NOT LOCK → **13**

13 VISUALLY CHECK THE FOLLOWING:

1. DRIVE TUBES FOR BENDS, BREAKS BINDING AND DAMAGE.
2. TRUNNION PINS FOR SEIZING BINDING, ALIGNMENT AND LUBRICATION.
3. LOCK LINK BRACE FOR ALIGNMENT, OVERCENTER TRAVEL, BENDING AND BREAKS
4. SIDE BRACE FOR PROPER OVERCENTER ENGAGEMENT, BOLTS FOR PROPER TORQUE (REFER TO TORQUE CHART, CHAPTER I)
5. BOLTS IN WHEEL WELL AREA FOR BINDING AND INTERFERENCE



OK → ALL OK → **15**

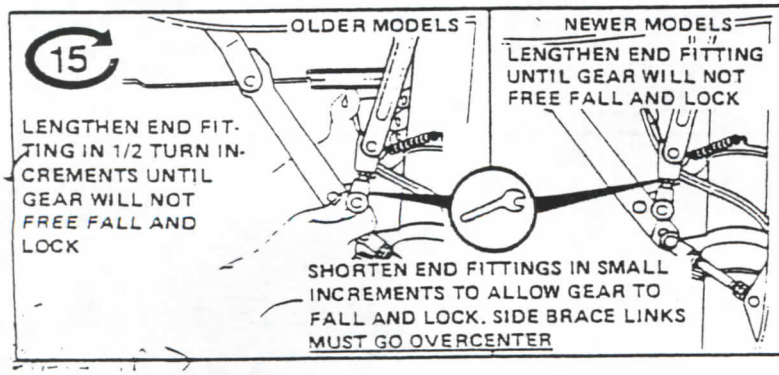
O.K → ANY NOT OK → **14**

14 → REJECT QUESTIONABLE PARTS

REPAIR OR REPLACE AS NECESSARY → **15**

ADJUSTING: Main Landing Gear Free Fall

15



LENGTHEN END FITTING IN 1/2 TURN INCREMENTS UNTIL GEAR WILL NOT FREE FALL AND LOCK

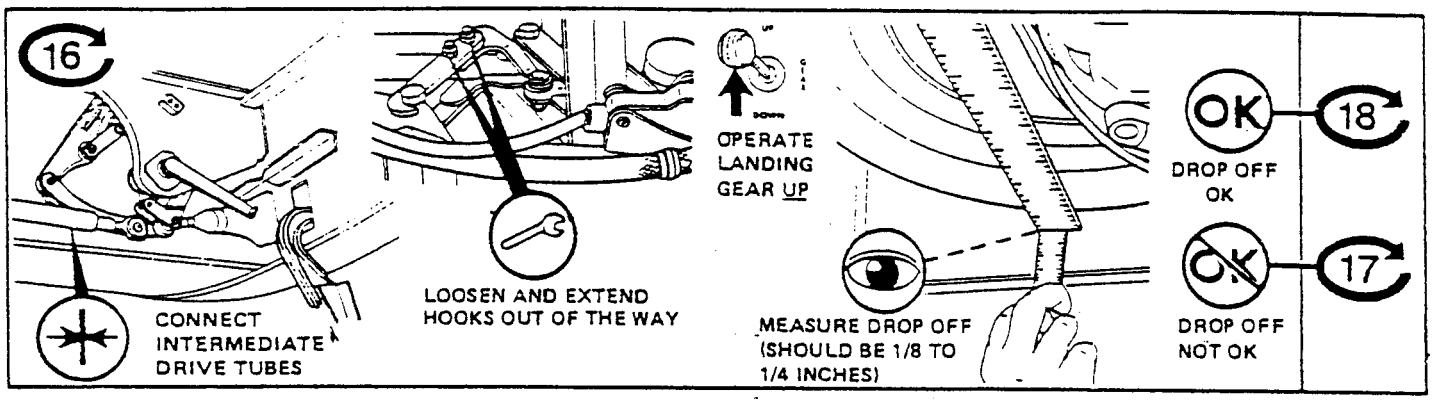
SHORTEN END FITTINGS IN SMALL INCREMENTS TO ALLOW GEAR TO FALL AND LOCK. SIDE BRACE LINKS MUST GO OVERCENTER

CHECK GEAR DOWN INDICATOR LIGHT

OK → LIGHTS WHEN GEAR LOCKS → **16**

O.K → LIGHTS BEFORE GEAR LOCKS → ADJUST LIGHT (SEE STEP 34) → **16**

CHECKING: Landing Gear Drop Off * SEE NOTES

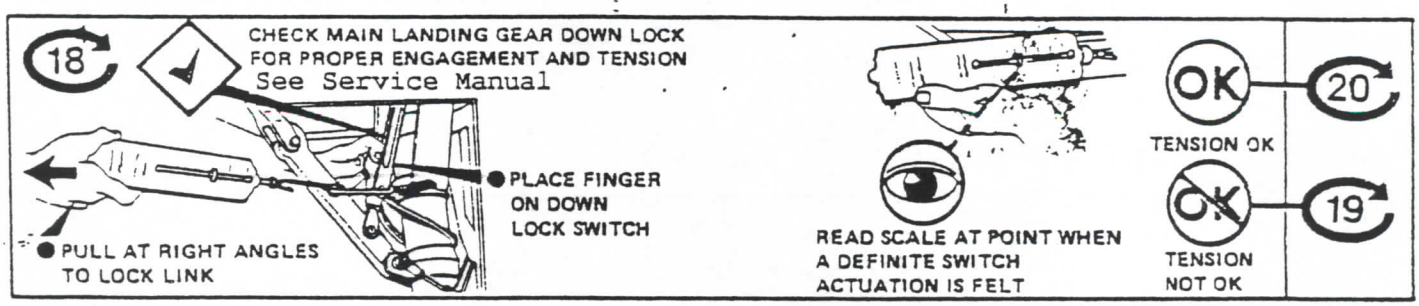


STEP	PROCEDURE	RESULT
17	ADJUST INTERMEDIATE DRIVE TUBE LENGTHEN TO DECREASE DROP OFF SHORTEN TO INCREASE DROP OFF RECONNECT INTERMEDIATE DRIVE TUBE AND RECHECK DROP OFF	18

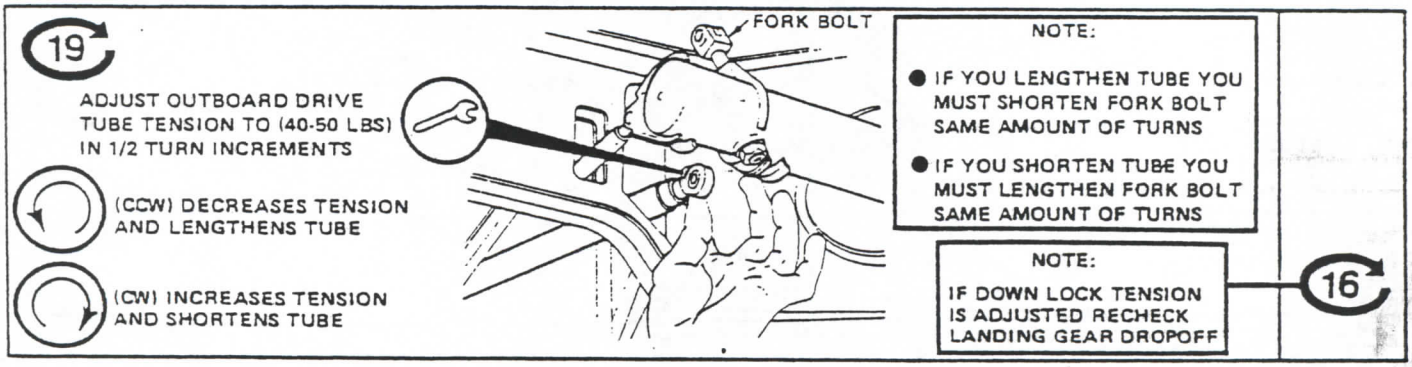
Notes

* WHILE CHECKING PROPER DROP OFF AS SHOWN IN STEP 17, PUT A SMALL WAD (MARBLE SIZE) OF MODELING CLAY, PLAY DOUGH OR WINSHIELD STRIP CAULK ON THE HUB CAP OF THE WHEEL. THIS WILL INDICATE HOW HIGH THE GEAR TRAVELS IN THE WELL. THE LANDING GEAR HUB WHEN UP AND LOCKED SHOULD NOT TOUCH THE AIRFRAME, 1/8 TO 1/4 INCH CLEARANCE IS DESIRABLE.

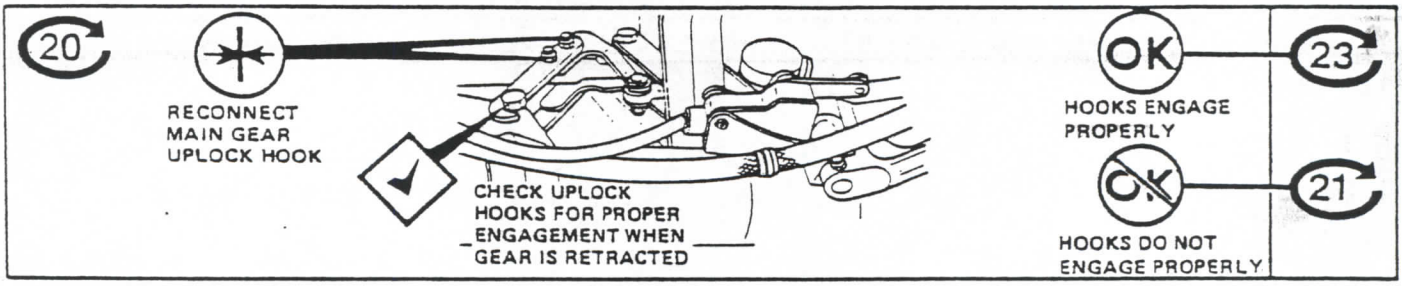
CHECKING: Down Lock Tension



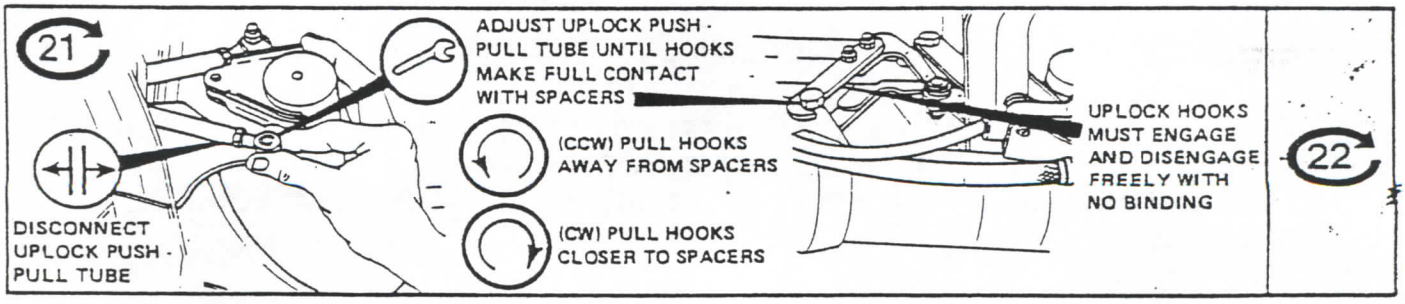
ADJUSTING: Down Lock Tension



CHECKING: Uplock Hooks For Engagement

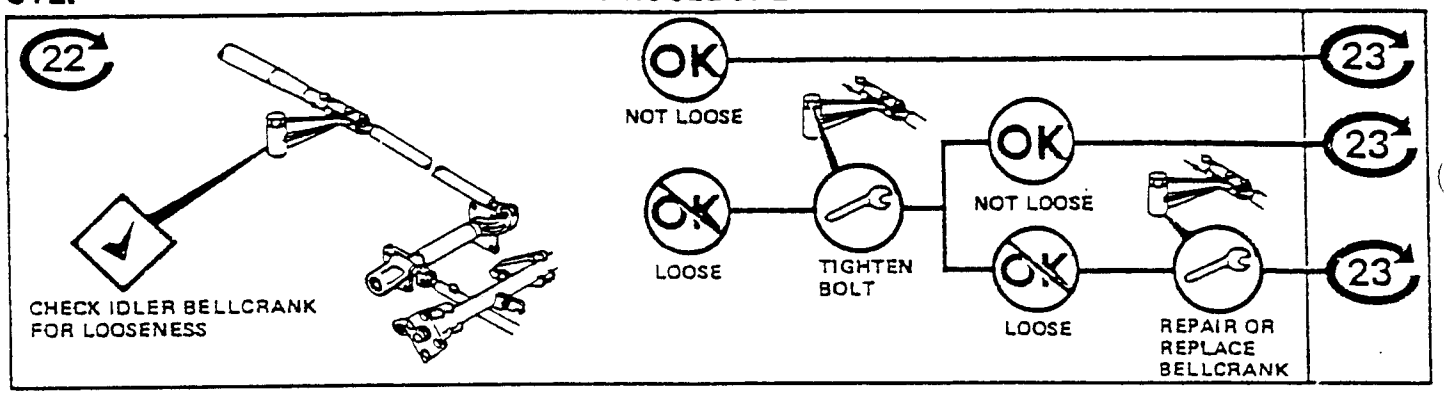


ADJUSTING: Uplock Hooks For Engagement

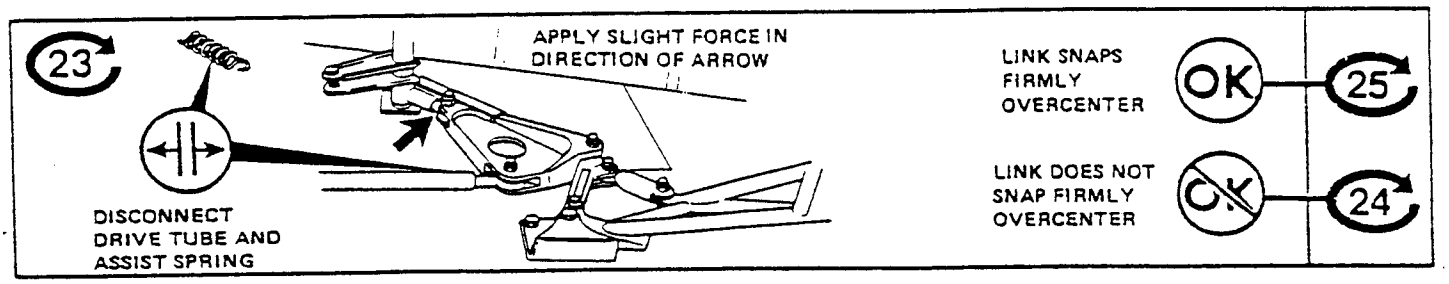


CHECKING: NOSE GEAR IDLER BELLCRANK FOR LOOSENESS

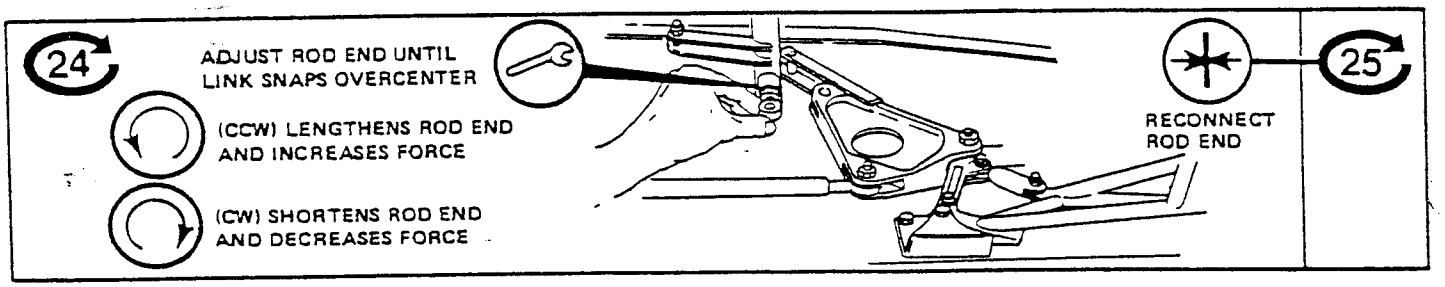
STEP | PROCEDURE | RESULT



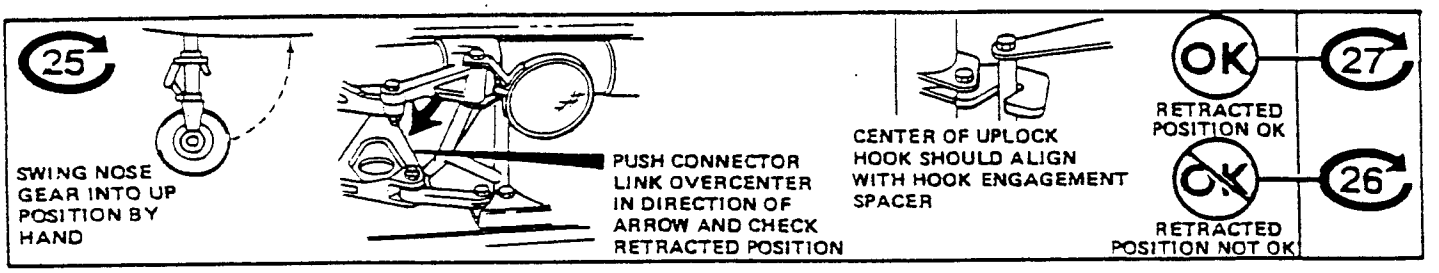
CHECKING: Nose Gear Connector Link For Overcenter Travel



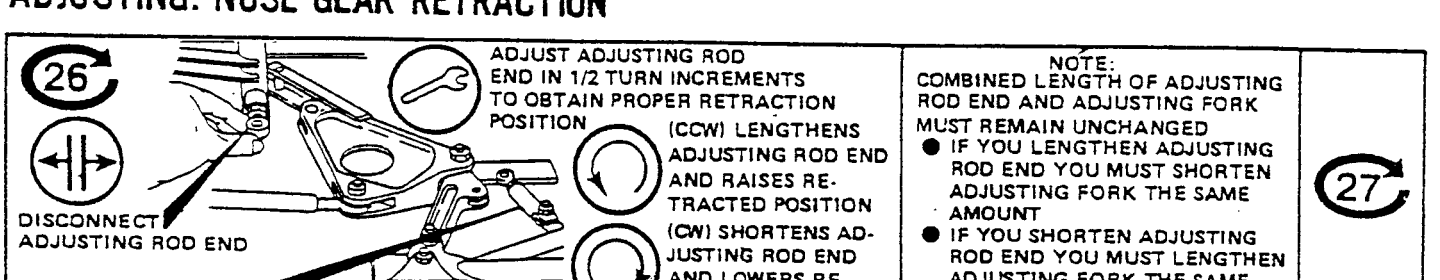
ADJUSTING: Nose Gear Connector Link For Overcenter Travel



CHECKING: NOSE GEAR RETRACTION



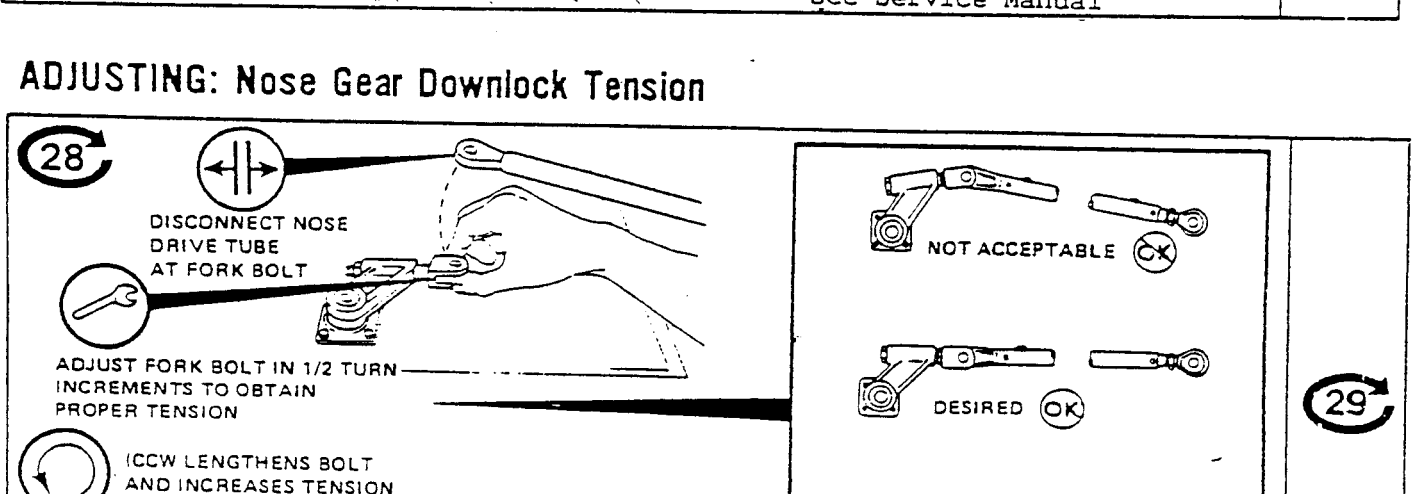
ADJUSTING: NOSE GEAR RETRACTION



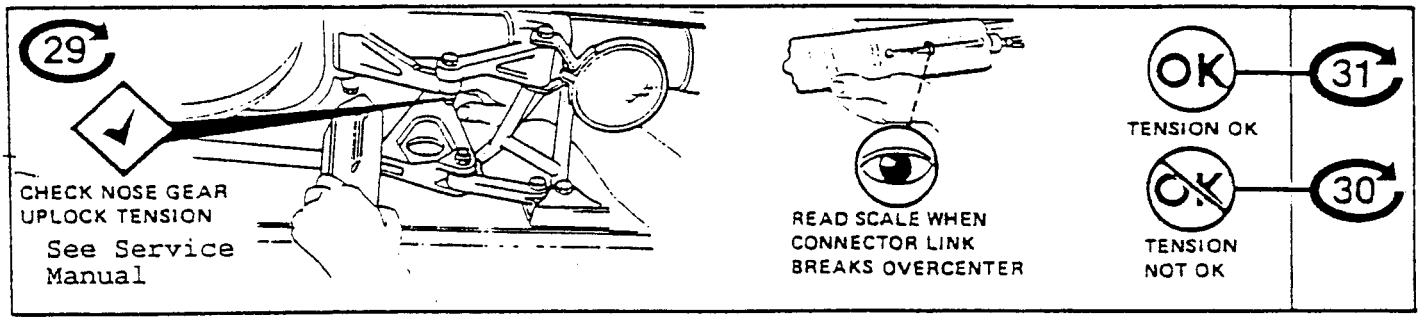
CHECKING: Nose Gear Down Lock Tension

STEP	PROCEDURE	RESULT
27	CHECK NOSE GEAR DOWN LOCK TENSION CONNECT NOSE DRIVE TUBE READ SCALE WHEN LOCK BREAKS OVERCENTER TENSION SHOULD BE See Service Manual	OK → 29 TENSION OK OK → 28 TENSION NOT OK

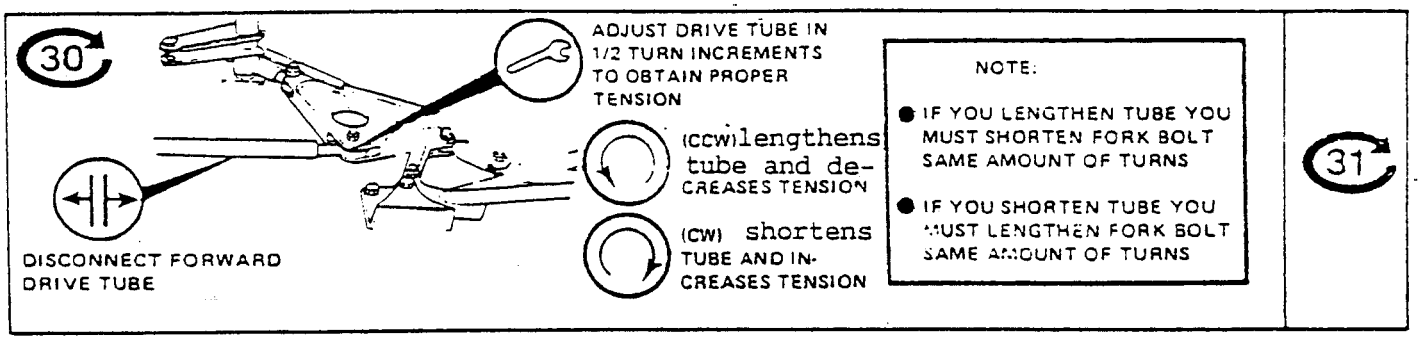
ADJUSTING: Nose Gear Downlock Tension



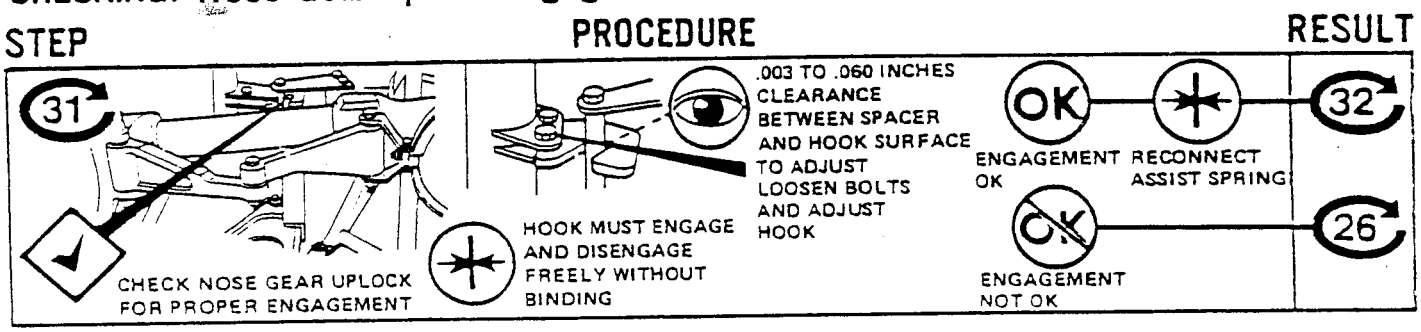
CHECKING: Nose Gear Uplock Tension



ADJUSTING: Nose Gear Uplock Tension



CHECKING: Nose Gear Uplock Engagement

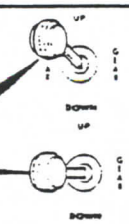


CHECKING: Gear Down Indicator Light Switches For Proper Adjustment

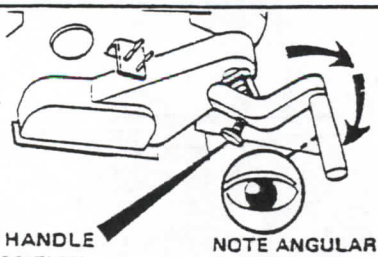
32

RETRACT LANDING GEAR APPROXIMATELY HALFWAY

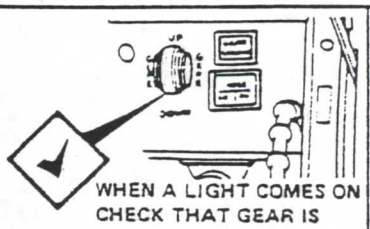
MOVE SWITCH TO CENTER POSITION



ENGAGE MANUAL EXTENSION HANDLE AND CRANK TOWARD DOWN POSITION UNTIL GREEN LIGHT COMES ON



NOTE ANGULAR POSITION OF MANUAL HANDLE

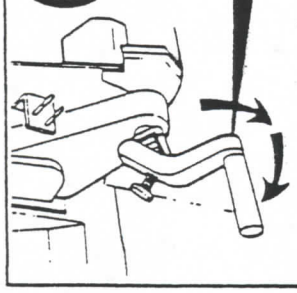


WHEN A LIGHT COMES ON CHECK THAT GEAR IS DOWN AND LOCKED WITH OVERCENTER LINKAGE OVERCENTER

33

33

RESUME CRANKING TOWARD DOWN POSITION



- NOTE NUMBER OF TURNS REQUIRED TO REACH THE INTERNAL STOP IN THE ACTUATOR

NOSE GEAR	NOT LESS THAN 8 OR MORE THAN 14
MAIN GEAR	NOT LESS THAN 4 OR MORE THAN 8

NOSE GEAR OK — OK — 36

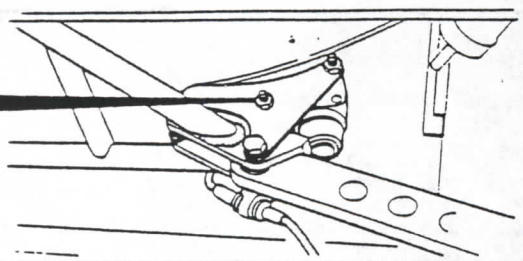
NOSE GEAR NOT OK — O.K — 34

MAIN GEAR OK — OK — 36

MAIN GEAR NOT OK — O.K — 35

ADJUSTING: Nose Gear Down Indicator Light Switch

34



ADJUST SWITCH ACTUATING BOLT

(CCW) ACTUATES SWITCH FARTHER FROM THE INTERNAL STOP INSIDE THE ACTUATOR

(CW) ACTUATES SWITCH CLOSER TO THE INTERNAL STOP INSIDE THE ACTUATOR

NOTE: AFTER ADJUSTMENT CHECK TO SEE THAT LIGHT COMES ON SAME TIME THAT GEAR LOCKS

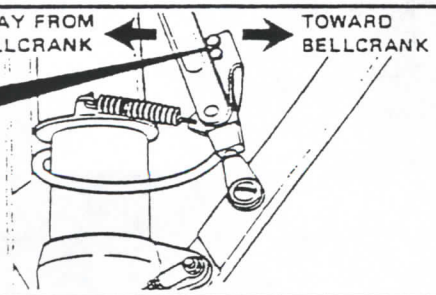
36

ADJUSTING: Main Landing Gear Indicator Light Switch

35

AWAY FROM BELLCRANK

TOWARD BELLCRANK



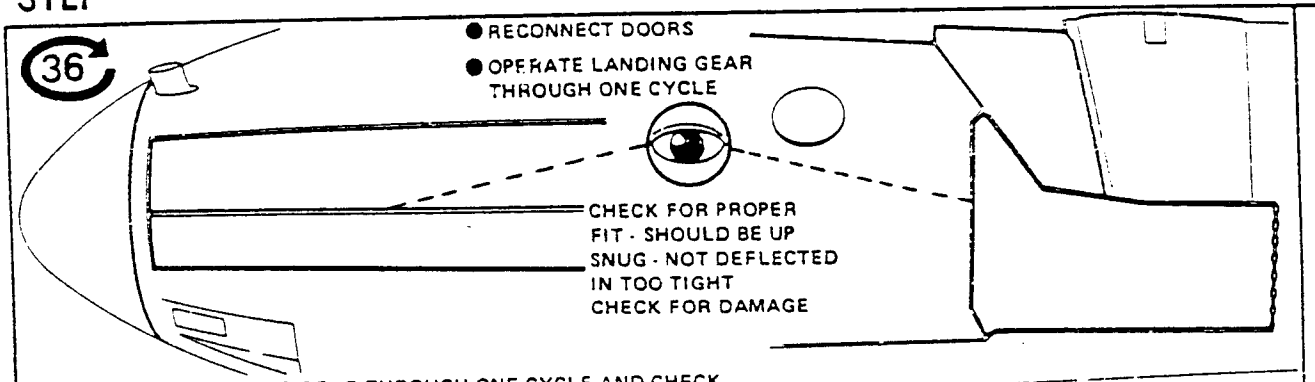
ADJUST SWITCH SCREWS REPOSITION SWITCH

- TOWARD BELLCRANK ACTUATES SWITCH FARTHER FROM INTERNAL STOP INSIDE THE ACTUATOR
- AWAY FROM BELLCRANK ACTUATES SWITCH CLOSER TO INTERNAL STOP INSIDE THE ACTUATOR

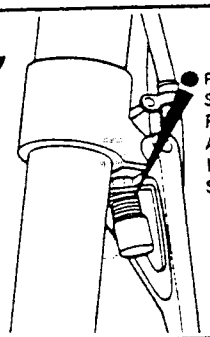
NOTE: AFTER ADJUSTMENT CHECK TO SEE THAT LIGHT COMES ON SAME TIME THAT GEAR LOCKS

36

CHECKING: Nose and Main Landing Gear Doors For Proper Fit

STEP	PROCEDURE	RESULT
36	● RECONNECT DOORS ● OPERATE LANDING GEAR THROUGH ONE CYCLE  CHECK FOR PROPER FIT - SHOULD BE UP SNUG - NOT DEFLECTED IN TOO TIGHT CHECK FOR DAMAGE ● OPERATE LANDING GEAR THROUGH ONE CYCLE AND CHECK GEAR INDICATOR LIGHTS AND WARNING HORN ● CHECK FOR OPERATION WITH GEAR EXTENDED AND RETRACTED ● CHECK THAT WARNING HORN SOUNDS WITH FLAPS BELOW 15 DEGREES	37

CHECKING: Safety Switch Inspection

37	 ● REFER TO CESSNA SERVICE MANUAL FOR CHECKING AND ADJUSTMENT OF LANDING GEAR SAFETY SWITCH	AFTER COMPLETING THE INSPECTION MAKE SURE THE GEAR IS DOWN AND LOCKED, LUBRICATED AND POWER TURNED OFF. NOTE: IF ADJUSTMENTS WERE MADE, MAKE SURE ALL BOLTS HAVE BEEN TORQUED, COTTER PINS INSTALLED AND DOORS CONNECTED, BEFORE INSTALLING ACCESS PLATES, FLOORBOARDS, SEATS, CARPETS AND REMOVING AIRCRAFT FROM JACKS.	STOP

Cessna
SALES AND SERVICE

"TAKE YOUR CESSNA HOME FOR SERVICE AT THE SIGN OF THE CESSNA SHIELD"

multi-engine SERVICE LETTER

MARKETING DIVISION • CESSNA AIRCRAFT COMPANY
WICHITA, KANSAS 67201 • CABLE ADDRESS / CESSCO WICHITA

January 5, 1976

ME76-2

SUBJECT: WING RIB IMPROVEMENT -- MAIN LANDING GEAR SIDE BRACE

AIRCRAFT APPLICABILITY: All 300/400 Series Aircraft (except Skymaster) with the following serials ...

310 ... 35000 and on	402 ... 402-0001 thru 402B1003
320 ... 320-0001 thru 320F0045	411 ... 411-0001 thru 411A0300
340 ... 340-0001 thru 340A0002	414 ... 414-0001 thru 414-0802
401 ... 401-0001 thru 401B0221	421 ... 421-0001 thru 421B0970

REASON FOR LETTER:

Reinforcement plates and angles have recently been added to the wing ribs in the main landing gear wheel well area on the model 340 & 400 series production aircraft.

These improvements in strength and service life of the main landing gear mounting structure were specifically designed for aircraft engaged in heavy usage such as air taxi, rough field operation, etc.

ACTION REQUIRED:

It is recommended that the following items be checked as part of all landing gear inspections, especially on high time, heavy usage aircraft.

1. Inspect main gear upper side brace support for looseness and the support attach bolts for proper torque (reference applicable Service Manuals for torque values).

2. Inspect wheel well ribs for cracks in accordance with the attached instructions.

At any time cracks are found on in-service aircraft, the wing rib is to be repaired by installing Service Kit SK414-8E which incorporates the same structural improvements mentioned above.

PARTS INFORMATION:

Service Kit SK414-8E may be purchased through the Cessna Dealer Organization at a suggested list price of $89.40 (S) each.

REMARKS:

1. Service Kit SK414-8E is applicable to the Model 310 and all earlier 300/400 series aircraft and should be installed on an "as required" basis.

2. This Service Letter supersedes ME71-2 dated February 12, 1971.

3. Owners and operators of applicable aircraft should contact their Cessna Dealers for further details concerning this Service Letter.

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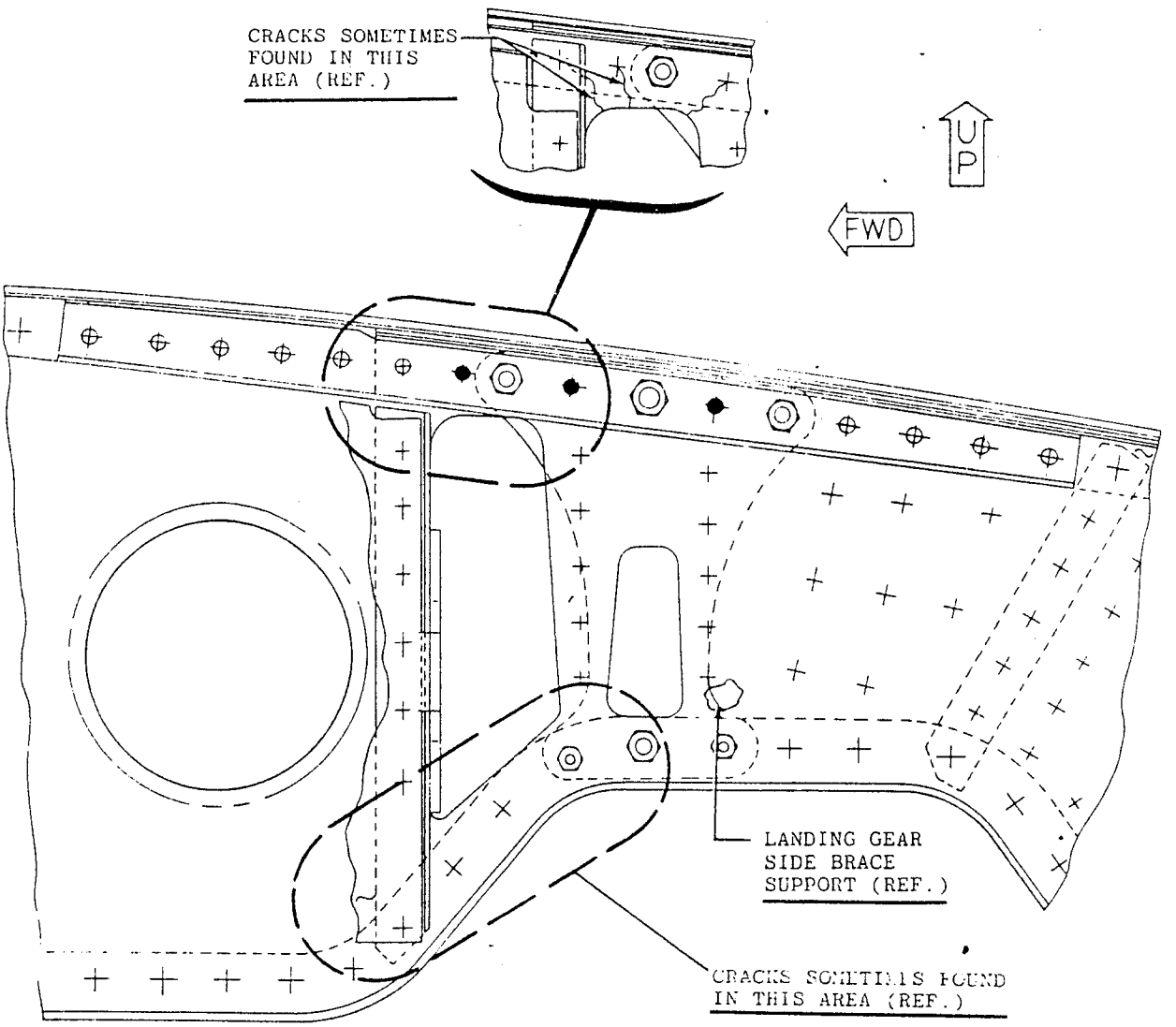
(Owner Notification System - No. 1)

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CESSNA AIRCRAFT COMPANY

WING RIB INSPECTION



VIEW LOOKING OUTBOARD AT RH MAIN GEAR WHEEL WELL INBOARD WING RIB (LH OPPOSITE)

INSPECTION:

1. Inspect wing ribs in LH and RH main landing gear wheel wells, at main landing gear side brace supports (forgings) upper and lower attach points for cracks and insure support attach bolts are tight, torqued in accordance with your aircraft service manual torque values.

2. Cracks are sometimes found in the existing doubler on inboard side of wing rib, at the top of the cut out in rib web for the aft push-pull tube (torque tube to landing gear bellcrank) and near the landing gear side brace support, upper and lower attach bolts.

3. If cracks are existing in the wing rib, repair rib by installing Service Kit SK414-8, Wing Rib Modification - Main Landing Gear Side Brace.