

CESSNA AIRCRAFT COMPANY
MODEL 414
 SERVICE MANUAL

LANDING GEAR.

WARNING: Anytime a landing gear retraction or extension system component has been removed, replaced or the tension on the downlocks adjusted, the entire landing gear system must be re-rigged.

The landing gear is a fully retractable tricycle landing gear consisting of a main gear located aft of each engine nacelle, and a nose gear located in the nose section of the fuselage. Each landing gear is mechanically connected to a single gearbox driven by an electric motor. In the event of landing gear electrical system failure, the landing gear can be extended by operating the manual extension hand crank, located at the right side of the pilot's seat. Limit switches control the UP and DOWN limits and prevents overtravel by opening the electrical circuits to the motor when the correct amount of travel has been attained. There is a position indicator switch located on each gear to indicate when the landing gear is down and locked. A safety switch prevents accidental retraction on the ground by opening the landing gear electrical circuit while the weight of the airplane is on the landing gear.

Trouble Shooting the Landing Gear System.

TROUBLE	PROBABLE CAUSE	CORRECTION
LANDING GEAR FAILS TO RETRACT - GEAR MOTOR OPERATES	Manual extension crank improperly stowed.	Stow crank properly.
	Failed landing gear actuator.	Replace actuator.
	Failed reduction unit.	Replace reduction unit.
	Pin sheared on gear motor shaft.	Replace pin.
	Broken bolts or retracting linkage, or disconnected retracting linkage.	Replace broken parts. Connect linkage if disconnected.
LANDING GEAR FAILS TO RETRACT - GEAR MOTOR DOES NOT OPERATE	Circuit breaker out.	Reset circuit breaker.
	Failed circuit breaker.	Replace circuit breaker.
	Insufficient electrical power.	Recharge batteries. Check voltage regulators.
	Failed UP limit switch.	Replace switch. Adjust in accordance with rigging procedures.
	Failed landing gear safety switch.	Replace switch.
	Incorrectly adjusted landing gear safety switch.	Adjust safety switch.
	Failed landing gear relay.	Replace relay.
	Failed landing gear switch.	Replace switch.
	Failed landing gear motor.	Replace motor.
	Failed UP electrical circuit.	Repair circuit.
LANDING GEAR FAILS TO RETRACT COMPLETELY	Landing gear incorrectly rigged for retracted position.	Rig in accordance with rigging procedures.
	Circuit breaker out, due to overload caused by incorrect landing gear rigging.	Reset circuit breaker and rig in accordance with rigging procedures.
	Circuit breaker out, due to overload caused by failed retracting linkage.	Reset circuit breaker, replace failed linkage, and rig in accordance with rigging procedures.
	UP limit switch incorrectly adjusted.	Adjust in accordance with rigging procedures.

Troubleshooting the Landing Gear System (Continued)

TROUBLE	PROBABLE CAUSE	CORRECTION
ONE LANDING GEAR FAILS TO RETRACT	Retracting linkage to affected gear broken or disconnected.	Replace broken parts. Connect linkage if disconnected. Rig in accordance with rigging procedure.
	Affected landing gear incorrectly rigged for retracted position.	Rig in accordance with rigging procedure.
	Defective retracting linkage to affected landing gear.	Replace defective linkage and rig in accordance with rigging procedure.
LANDING GEAR FAILS TO EXTEND - GEAR MOTOR OPERATES	Manual extension crank improperly stowed.	Stow crank properly.
	Defective landing gear actuator.	Replace actuator.
	Defective reduction unit.	Replace reduction unit.
	Pin sheared on gear motor shaft.	Replace pin.
	Broken bolts or retracting linkage, or disconnected retracting linkage.	Replace broken parts. Connect linkage if disconnected.
LANDING GEAR FAILS TO EXTEND - GEAR MOTOR DOES NOT OPERATE	Circuit breaker out.	Reset circuit breaker.
	Defective circuit breaker.	Replace circuit breaker.
	Insufficient electrical power.	Recharge batteries. Check voltage regulators.
	Defective DOWN limit switch.	Replace switch. Adjust in accordance with rigging procedure.
	Defective landing gear switch.	Replace switch.
	Defective landing gear motor.	Replace motor.
	Defective DOWN electrical circuit.	Repair circuit.
LANDING GEAR FAILS TO EXTEND COMPLETELY	DOWN limit switch incorrectly adjusted.	Adjust in accordance with rigging procedure.
	Landing gear incorrectly rigged for the DOWN position.	Rig in accordance with rigging procedure.
	Circuit breaker out, due to overload caused by incorrect rigging.	Reset circuit breaker and rig in accordance with rigging procedure.
	Circuit breaker out, due to overload caused by defective retracting linkage.	Reset circuit breaker, replace defective linkage, and rig in accordance with rigging procedure.
ONE LANDING GEAR FAILS TO EXTEND	Retracting linkage to affected gear broken or disconnected.	Replace broken parts. Connect linkage if disconnected. Rig in accordance with rigging procedure.
ONE LANDING GEAR FAILS TO EXTEND COMPLETELY	Affected landing gear incorrectly rigged for the DOWN position.	Rig in accordance with rigging procedure.
	Defective retracting linkage to affected gear.	Replace defective linkage and rig in accordance with rigging procedure.

Troubleshooting the Landing Gear System (Continued)

TROUBLE	PROBABLE CAUSE	CORRECTION
MANUAL EXTENSION SYSTEM FAILS TO EXTEND LANDING GEAR	Manual extension crank not fully engaged. Incorrect adjustment of manual extension linkage. Defective manual extension linkage. Defective landing gear retracting linkage or actuator. Landing gear improperly rigged.	Engage crank fully. Adjust linkage in accordance with rigging procedure. Replace defective linkage. Replace defective linkage or actuator. Rig landing gear in accordance with rigging procedure.
GEAR UP (AMBER) LIGHT FAILS TO LIGHT (414-0001 TO 414-0251)	Circuit breaker out. Defective circuit breaker. Lamp burned out. Lamp loose. Defective electrical circuit. Landing gear not fully retracted. Defective or incorrectly adjusted UP limit switch.	Reset circuit breaker. Replace circuit breaker. Replace lamp. Repair or replace receptacle. Repair circuit. Retract fully. Replace and/or adjust switch in accordance with rigging procedure.
GEAR UP (AMBER) LIGHT REMAINS ON WHEN GEAR IS DOWN (414-0001 TO 414-0251)	Defective UP limit switch.	Replace switch and adjust in accordance with rigging procedure.
LEFT GEAR DOWN (GREEN) RIGHT GEAR DOWN (GREEN) NOSE GEAR DOWN (GREEN) LIGHTS FAIL TO LIGHT	Circuit shorted to another system. Circuit breaker out. Defective circuit breaker or electrical circuit. Lamps burned out. Lamps loose. Landing gear not fully extended. One or more DOWN indicator switches defective or incorrectly adjusted.	Locate and repair. Reset circuit breaker. Replace circuit breaker. Replace defective electrical circuit. Replace lamps. Repair or replace receptacle. Extend fully. Replace defective switches and/or adjust in accordance with rigging procedure.
LEFT GEAR DOWN (GREEN) RIGHT GEAR DOWN (GREEN) NOSE GEAR DOWN (GREEN) LIGHT REMAINS ON WHEN GEAR IS UP	Circuit shorted to another system. Defective switch.	Locate and repair. Locate and repair or replace.