Nanchang CJ-6 Mishap and Incident Data Summary

The following is a compilation of mishaps and incidents that have occurred in the Nanchang CJ-6 aircraft in the U.S. The CJ-6 is a marvelous aircraft, but like other similar types has experienced some problems. In fact, several incidents are not at all related to the aircraft type, but may be chalked up to deficiencies in pilot judgment, training, or maintenance issues. It is hoped that a summary of the incidents will benefit all CJ pilots.

This list is compiled from various sources and individuals. As such, it may contain information based on hearsay or rumor. The purpose of this summary is not to determine a cause, or assign blame or guilt in any particular situation, but to present information so that CJ pilots may prevent reoccurrence of these mishaps. At the end of the mishap listings is a list of operational and mechanical service difficulties that have been reported which, although have not resulted in incidents, could contribute to future mishaps.

Thank you to those who submitted this information for the benefit of the CJ pilot group. Please send any additional information, comments, or corrections to Jeff Linebaugh, linedog@compuserv~e.com. (407) 522-2723 Thanks!

Collision With Ground, Low Level Aerobatics
Damage/Injuries: Aircraft Destroyed, two fatalities
Findings: After executing a low pass, the aircraft pulled up and began a right aileron roll. An accelerated stall developed during the roll and the aircraft impacted in a nose low attitude.

Collision With Ground, Low Level Maneuvering
Damage/Injuries: Aircraft destroyed, two fatalities
Findings: A pilot-rated witness stated that he saw the airplane maneuvering at about 300 feet, when he heard the engine sound stop. He heard the airplane impact trees and then the ground. The airplane and engine were examined and no pre-impact failure or malfunction was noted.

Engine Failure, Collision With Ground During Forced Landing
Damage/Injuries: Aircraft Destroyed, two fatalities
Findings: The engine lost power due to a failure of the pressure carburetor diaphragm which led to restricted fuel flow through the carburetor and eventual fuel starvation. During an attempted forced landing the aircraft stalled and impacted the ground in a wings-level nose low attitude. Factors in the accident were unsuitable terrain and tall trees that contributed to the pilot's inadvertent stall during the attempted forced landing.

Engine Failure, Forced Landing
Damage/Injuries: Substantial damage with injuries.
Findings: The aircraft suffered a catastrophic engine failure. While attempting to clear trees during the forced landing, the aircraft stalled and impacted the ground nose low. The pilot was not wearing the installed shoulder harness. The #9 cylinder was found separated from the engine and the auxiliary rod piston pin hole was elongated.

Engine Failure, Collision with Trees During Forced Landing: (Yak 18T, with M-14P engine)
Damage/Injuries: Substantial damage, two fatal, one serious.
Findings: The aircraft suffered a catastrophic engine failure shortly after takeoff. The aircraft impacted trees during the attempted forced landing. Examination of the engine revealed 3 broken connecting rods and a shattered #5 piston. Probable Cause: Inadequate preflight-failing to avoid a hydraulic lock, which resulted in a bent connecting rod, subsequent failure of the #5 piston, and loss of engine power. Also causal was the flight crew's failure to maintain adequate control of the aircraft and/or clearance from trees, while maneuvering for an emergency landing.
Comments: The M-14P, the stock Chinese engine, and in fact all radial engines tend to have oil seep into the bottom cylinders while sitting on the ground. It is essential to ensure there is no oil or fluid trapped in the bottom cylinders prior to start. If a hydraulic lock is indicated or suspected, drain fluids from the cylinders by removing the intake manifold drains and/or the bottom spark plugs. Failure to do so could be catastrophic, as can be seen above.

Inadvertent Engine Start On Ground
Injuries: Serious Injuries.
Findings: An experienced pilot attempted to pull the prop through with the magnetos inadvertently left on. The engine started with very little movement of the prop. The prop struck the pilot causing injuries.
Comments: There have been at least two other very similar incidents without injuries. Always double check that the magnetos are off before touching the prop for any reason. Always treat the prop as if the mags are on. Note for transitioning pilots: the "both" position on the mag switch is full *counterclockwise*. This is opposite of most general aviation aircraft. Use caution when checking the mag switch position.

Runway Excursion on Landing
Damage: Substantial
Findings: The aircraft landed long on a short wet grass runway after the pilot perceived an engine problem. The aircraft was unable to stop on the runway. The FAA noted flat spots and melted treads on both new main tires. No other mechanical malfunctions were found.

Gear Collapse on Landing
Damage: Substantial
Findings: After takeoff with minimum air pressure, the gear did not fully retract. The pilot unsuccessfully re-attempted gear retraction. The pilot then returned for landing with the gear indicating down but low air pressure. It was reported the Emergency Air System was not used. One main gear collapsed on landing. The aircraft departed the runway and went into a ditch.

Forced Landing, Fuel Starvation, Fuel System Modifications
Damage: Substantial
Findings: Fuel pressure dropped to zero and the engine quit. The fuel tanks contained fuel and the fuel vent system was clear. The aircraft had a modified fuel system with an extra fuel tank and a selector valve. The pilot reported the selector valve was difficult to operate and determine proper position.

Forced Landing, Fuel Exhaustion
Damage: Substantial
Findings: Experienced pilot new to the aircraft ran out of fuel while flying his new purchase home. The pilot executed a forced landing to a field with the gear up.

Forced Landing, Fuel Exhaustion, Uneven Fuel Feeding
Damage: None
Findings: A pilot experienced uneven fuel feed out of the wing tanks. Eventual fuel exhaustion led to a forced landing on a beach.

Gear Up Landing
Damage: Minor structural damage
Findings: A pilot landed with the gear up and flap extended. The flap and gear were initially extended however the landing gear was raised on final approach.

Gear Up Landing
Damage: Minor structural damage
Findings: An experienced pilot landed with the gear up. The pilot was distracted by the inadvertent opening of the rear canopy and also an aircraft conflict while attempting to land.

Inadvertent Gear Retraction on Ground
Damage: Minor structural damage
Findings: An experienced pilot raised the gear handle while taxiing back from landing. The pilot was distracted by landing aircraft and other duties.

Ground Collision, No Air in Brake System
Damage: Minor
Findings: Aircraft lost braking while taxiing and struck a fence. The Main air valve was in the off-closed position during start and initial taxi.
**Comments:** There have been several similar reports. It is quite possible to start the aircraft with the main air valve closed with just the residual air in the system. A loss of air pressure while taxiing or after airborne could be catastrophic. The main air valve must be double checked open before aircraft movement.

**Runaway Aircraft During Hand Propping**  
**Damage/Injuries:** None.  
**Findings:** An experienced pilot hand started the engine because of no air pressure in the system. The aircraft was not chocked nor tied down. The aircraft started moving with no brakes but was diverted from striking nearby aircraft by a bystander who grabbed the wing tip, turning the aircraft toward an open field.

**Brake Failure on the Ground**  
**Damage:** None  
**Findings:** During a before takeoff engine run-up, the brake handle cable end failed in the belly causing the aircraft to jolt forward. The magnetos were quickly turned off and the aircraft came to a stop, averting a ground collision.

**Partial Power Loss, Fuel Line Blockage**  
**Damage/Injuries:** None  
**Findings:** Engine lost power while performing aerobatics during flight test regiment. Engine restarted but only sustained partial power. Found Partial blockages were found in the wing tank fuel lines resulting in center (header) tank starvation. Blockage was difficult to detect in a 90 degree elbow on newly replaced fuel lines. The problem was not detected on earlier, short test flights.

**Partial Power Loss**  
**Damage/Injuries:** None  
**Findings:** Engine lost power after the mixture was leaned. The mixture control was unresponsive. The engine surged drastically until the throttle was moved full forward where it produced some power and surged less. The engine stopped when the throttle was retarded for landing. The mixture control was found separated from the carburetor which resulted in an excessively rich mixture. Suspect an improperly installed or failed cotter pin in mixture control connector.  
**Comments:** There have been at least two other reports of similar damaged or missing cotter pins on control connectors.

**Nanchang CJ-6 Operational and Maintenance Service Difficulties**

The CJ-6 is a wonderful aircraft, but like other similar aircraft has experienced some problems. The following difficulties have been reported that could have caused substantial damage to the aircraft. It is hoped that making the CJ community aware of these difficulties can reduce the chances of recurrence. This is a partial list and is not all inclusive. Recommendations should not be a substitute for proper training and maintenance. Thank you to those who submitted this information for the benefit of the CJ pilot group. Please send any additional information, comments, or corrections to Jeff Linebaugh, linedog@compuserve.com. (407) 522-2723  Thanks!

**Horizontal Stabilizer Cracks:** Horizontal stabilizer cracks have been reported in the center spar section. This was an acknowledged problem in China and could be from control overloading or just time in service. A horizontal stabilizer failure could be catastrophic. This section should be closely inspected and strengthened. Modification kits have been created to strengthen and correct this weakness.

**Engine Hydraulic Lock:** Radial engines are prone to hydraulic lock and the CJ is no exception. It is absolutely necessary to pull the prop through (always verify the magnetos are off first) numerous blades to check for a hydraulic lock just before start. Again, it is essential to ensure there is no oil or trapped fluid in the bottom cylinders prior to start. If a hydraulic lock is indicated or suspected, drain fluids from the cylinders by removing the intake manifold drains and/or the bottom spark plugs. “Clean Kits” are available from various sources that might reduce chances of a problem, but failure to clear a hydraulic lock could result in bent or failed connecting rods and probable catastrophic engine failure.
Exhaust System Failures: There have been at least two cases of exhaust system leaks and failures with the standard Chinese exhaust system. One failure at the bottom left exhaust "y" resulted in hot exhaust gases melting a large portion of the carburetor heat muff in flight. This area is directly in front of the firewall fuel filter and shutoff valve and could have caused more serious problems.

The standard Chinese exhaust system is made of steel and is prone to rust, especially in humid climates. The system tends to corrode from the inside out and is not easily apparent. At a minimum, this system must be carefully inspected at close intervals. There are various alternatives available including ceramic coatings to the stock system or new stainless steel systems.

Brake Handle Failures: There have been reports of brake handle failures in at least two aircraft. The stock Chinese brake handles are cast aluminum and may crack at the base of the handle rendering it useless. This could result in a serious ground mishap due to the inability to stop. Back seat pilots should be briefed on the use of the brakes in such an emergency. Billet aluminum handles which are a direct replacement for the stock handles are available. However, one major operator reports they have not seen problems with brake handles on the aircraft they have imported and have not experienced this difficulty.

Aileron Control Loss: There was one report of an aileron connection failure due to a missing cotter pin. The aileron did not respond to control inputs during the before takeoff check. Recommend careful attention to control connections and fittings.

Uneven Wing Tank Feeding: This tendency has been with the aircraft since discovered on its initial test flight in China. As with any aircraft, fuel balance should be closely monitored. Rectify fuel imbalances using the procedure given in the aircraft flight training manual, namely raise the wing of the tank with the higher level and use crossed controls to attempt to start proper feeding.

Fuel Exhaustion: The aircraft was designed with a goal of shorter training missions. As such it does not have the copious quantity of fuel that several general aviation aircraft have. This fact must be taken into account with proper training and flight planning. As with any aircraft, know your typical fuel burn at different power settings, determine how much fuel is on board before flight and keep track of time airborne.

Wing Walk and Skin Cracks: Skin cracks have been reported under the wing walk panel. The wing area in front of the forward spar is not well supported; there is only a false rib to support our American weight. When the pilot gets in or out of the cockpit and steps on the wing, the skin will flex, especially if exiting off the front of the wing. Also there have been problems with excessive loads on the trailing edge step assembly. Recommend checking these areas, repair as necessary and consider strengthening the wing walk panel. As a side note, the wing walk can be extremely slippery when wet and/or oily. Consider coating with wing walk compound, truck bed liner coating or similar material.

Air System Lubrication: The life expectancy of the actuators in the air system is shortened by lack of proper lubrication. The gear and flap actuators should be lubricated on a regular basis using a proper lubricant (such as air compressor oil). Injecting a small amount of oil in the air lines adjacent to the actuators should greatly decrease wear, and keep seals in good condition.

Primer Operation: Should the primer be inadvertently left unlocked (or not correctly positioned perpendicular to the aircraft centerline), the engine will ingest raw fuel, will run rough and may not run on all cylinders. Include checking the primer properly locked in the after start check.

Fuel Line Chafing on Oil Cooler Door: There has been a report of a fuel line chafing on the oil cooler door. The fuel line was running from the right wing tank to the header tank and was rubbing on the oil cooler exit door.

Magneto Switch Position: There have been several instances of improperly positioned Mag Switches. This can result in serious injury to people on the ground. Two factors may contribute to the problem. First, the "both" position on the mag switch is full counter-clockwise opposite of most general aviation aircraft. Second is the engine shutdown sequence. Most general aviation aircraft require that the mags be positioned full counter-clockwise to off after the prop stops. At least twice, new CJ pilots with extensive general aviation time have
shut down the engine with the mags, waited for the prop to stop then out of habit moved the mag switch counterclockwise back to the both position. Always verify that the magneto switch is truly in the correct position.

**Aircraft Towing:** The nose gear has been known to collapse while the aircraft was being towed without air pressure to positively hold the nose gear "overcenter". Having the air system charged with positive air pressure on the down side of the gear actuators could prevent this. Alternately, a brace could be fitted to assure the gear remains locked overcenter. One operator reports that this problem may have been due to the gear being out of adjustment, and has not experienced this difficulty.

**One Final Comment:**
In reviewing the information above, individuals might disagree with the findings or the causes listed or take exception to what was written. (That is fine, and I am receptive to constructive comments and suggestions.) However, the one thing I hope we can all agree on is that **proper training is essential** for the safe operation of these (or any) aircraft.

We must all be proactive in requiring new pilots and **challenging each other** to get thorough initial and recurrent training. We must also help each other to get the information we need to safely maintain our aircraft.

There is nothing more tragic than an avoidable accident: as we all know, nearly all accidents are avoidable. Nobody is above mistake, but proper training and maintenance can greatly reduce risk and allow us to enjoy this great airplane for many years to come.

Please **Fly Safe!**