

CFO pre-purchase checklist

The goal of the owner inspection is to identify any obvious issues that would preclude purchase, and illuminate details that should be considered soon after purchase. These details also help identify the need for an adjustment in the purchase price.

Common things such as compression check, inspection of spark plugs, prop blade inspection, AD searches etc. etc. etc. are not covered. Only those items with unique significant to the Cardinal are on this list.

Many of the items are fairly small. Almost none of them are deal-killers. Many of the entries have further information available, covering repair options, alternatives and tricks for dealing with the issue. You'll need to be a member to get to most of the detailed information.

If you are using this checklist for a purchase you should be a member of CFO and review the detailed information behind this checklist on the web page. We make this available to non-members so you can study and understand the purchase process and the nature of the Cessna Cardinal. But full understanding comes only with deeper research.

If the cost of membership seems daunting, remember that you are about to spend several thousand dollars on an asset that may or may not be worth what you are spending. \$34.00 should not seem like a very large investment to be more certain that it is. Give it some thought... and remember that most members see that investment repaid within days of joining. We look forward to welcoming you into CFO as well as Cardinal Ownership with as much knowledge as we can help you gain.

In all cases the final determination of airworthiness or the degree of potential trouble in areas of concern should be left to a licensed mechanic. Regardless of any suggestions or information that might be exchanged herein, Federal Aviation Regulations, the aircraft operating manual and various transmittals from the FAA and aircraft and component manufacturers remain the ultimate authority.

If in your inspection or subsequent ownership you come across something we missed, please drop a note please drop a note to [the Webmaster, Keith Peterson](#) and let us know. Thanks!

There are two other pages worth reviewing: The first is [a sample Pre-buy 'preflight' inspection](#), as might be done by a non-mechanic. See the kinds of things that can be observed and the conclusions that can be drawn.

Secondly, an example of a complete [Pre-purchase Inspection](#) done by a Cardinal familiar A&P / AI. Get an idea of what kind of information you should get from when you hire a mechanic to inspect your prospective purchase.

Both of these pages contain specific and personal information, so in keeping with our privacy policy, you need to be a member to review these pages.

But realistically, if you are serious about buying a Cardinal you should really invest the \$34 to

become a member.. there is at least 4 times more information available inside the member's areas.

All that being said, let's take a look at the checklist. It is designed for a walk-around inspection starting at the left wing:

#	Inspection Area	Desired condition	Comments
#	Left Wing		
1	Wing skin overlap near tips	smooth fit, no wrinkles	Certain later model Cardinals used wing skins that were not drilled perfectly. The story is that these skins were set aside for years then used whenever they ran short of a skin. No adverse effect on flight, just cosmetic, but worth knowing if this one has the problem.
2	Spar cap rivet row	smooth, uniform thickness	Some members have had corrosion in the spar cap area, requiring a very expensive wing project on the order of \$20,000 or so. Look for smooth metal, no swelling or bumps. This is a deal-stopper.
3	Wing tip fuel vent	Secure with clamp holding free from aileron. More Info	The tube from the trailing edge of the wingtip vents the fuel tank in the opposite wing. It should have a hole 6 inches up or so and a phillips screw holding it to the wingtip. Otherwise it can engage the aileron and bind the controls. Easy to fix, it's a preflight item for Cardinal owners worth checking before you test fly.

4	Wing Leading edge	straight, no dents	Dents in the leading edge are hard to fix. Most have a couple, but a beat up one might mean it's been flown through hail or off gravel runways a lot. Cosmetic, may effect performance.
5	Pitot tube	secure, heating properly if heated.	There have been reports of repair being noted in the pitot tube mount area. Look for cracks, looseness. If there is a pitot heat switch it should get hot fast on the ground, too hot to hold within a few minutes. If not it may be a switch or connection (quite common) or a burned out heater.
6	Tie-down ring	Spring intact, no rust on ring. More Info	The tie-down loop springs are very hard to get to. The condition of the rings themselves are an indication of the condition inside the wing, although the steel rings will be worse than the aluminum wing parts. A rust ring is a good reason to pull a few more inspection plates to check it out.
7	Left upper wing fairing	Attach washers clean, solid, no black powder.	If there are black rings around the wing root fairing attach washers, check the thickness of the fairing skin below the washer. They can wear out, requiring a new fairing skin.
8	Inner wing surfaces	Clean and free from corrosion	Pull three or four panels and look up into the wing. It is common for there to be some dust. Look at a few you know the history of to see what's `normal'. A perfect wing will be like a mirror, you can see

			yourself. Very few are like this. Most will show a pattern much like galvanizing.
		dust, no powder when rubbed	Rub your knuckles on the upper wing surface. A near-perfect plane will not put any white dust on your knuckles while doing this. Look for pits or any signs of white powder.
		No swelling or powder in corners or joints.	Look at the wing skins (inside) near the spar strip. Both top and bottom (with a mirror). There may be a slight discoloration in the surface, but there should not be any powder visible or any signs of dimensional change.
		Overall state of corrosion	Corrosion is very much a matter of degree. All airplanes have some `corrosion' which is simply the alumiclad forming it's self-made barrier to further corrosion. Serious corrosion is anything that continues past this initial pattern of discoloration. Consult your mechanic if you have any concerns about what you find. In particular check for Spar carrythrough corrosion .
#	Cowling Area		
9	Upper front corners of cowl	No dimples or holes from baffling fastener wear	The `forehead' of the cowl on some Cardinals gets a hole worn through it from the rear, caused by a rivet

			that holds the upper and lower internal baffle seals together. Check for the presence of this rivet (it can be done without the rivet) and check for a hole or thin spot in the cowl. May require new cowl or cowl repair.
10	Seam between bowl and top	All rivets tight, clean, no black powder	The nose cowl (fiberglass) is attached to the rest of the cowl (Aluminum) with a row of rivets. These rivets can loosen and wear. Very loose rivets can cause the cowl to open up in flight, causing drag and risking worse. Look for black circles (caused by wearing aluminum) or looseness.
		No oil in gap (prop seal) More info	Any oil in this seam is a sign of a leaking crankshaft seal, or prop seal. They are fairly easy to replace, although the prop has to come off, but can be hard to make the seal hold.
11	Prop spinner alignment	Aligns with cowl (Engine mounts) More info	Look for the spinner to be centered on the cowl. This could be a sign of worn or sagging engine mounts or bad Lord mounts on the cowl. If they are out of alignment look at the backplate of the spinner (mounted behind the prop) to see if the cowl screws have worn a groove in the backplate. This is a fairly expensive but easily replaced part. Engine mounts and cowl mounts are fairly inexpensive (about \$200 for all 4 engine mounts, \$10 for each cowl mount) and easy to replace. If they are not sagging you have to wonder why the cowl does not fit the

			airplane..??
12	Prop spinner	No cracks or patches at edges. More info... and more	Spinner MAY NOT be repaired. Cessna says no patches or cracks are allowed in the spinner. Many have a patch at the corners by the prop, but you'll want anew spinner. Not cheap.
13	Prop spinner side-play	No side play: play suggests missing or incorrect inner spinner bulkhead. More info	Part of keeping the spinner healthy is a proper sizing of the internal front bulkhead. If you can wriggle the spinner on the prop this bulkhead is not installed or not spaced properly and your spinner is at risk.
14	Propeller	No oil on shanks. Up to 1/4 inch play at tip in any direction is acceptable.	Cardinal props are still ok when they have 1/4 inch play at the tips. The proper inspection procedure is to pull the prop blade outward, as centrifugal force would, then see if there is still a wriggle. If so you will want to have a prop expert take a look at it. If there is oil on the prop blade it may have a seal problem. Look for oil drops on the front edge of the cowl, the windshield or the front edge of the vertical rudder to see if the prop is shedding any grease or oil.
#	Engine area		
15	Length of inner cowl bolts	Short, 1/4 inch. More info	If not, check for scoring near prop on spinner backing plate. The inner cowl bolts should be very short, on the order of 1/4inch. Otherwise they can score the spinner

			backplate (see #10)
16	Second bolt back on sides	Should be #10 Sheet metal screw	The last threaded in bold as you move from the front of the cowl back should be a #10 sheet metal screw. If not, the nut plate may be missing or damaged. Inexpensive parts, but it is a very visible sign of whether the mechanic really knew what parts to put on a Cardinal.
17	Length of fasteners	Should be #120. More Info	The quarter-turn fasteners on the cowl should be #120's. If not the lord mounts may be worn, the cowl worn too thin or just the wrong parts used. If too long, check to see if the skin is worn down below the head.
18	Condition of cowling	Holes normal size, No wear at upper front corner. more info	Worn or loose fasteners can 'hog out' the cowl mount holes, very difficult to repair. Alternative fasteners can save the day. See note #8
19	Condition of baffling	Oriented forward, good condition, no gaps.	The flexible baffling should be oriented forward and be lively and unbroken. Cardinals suffer in cooling from poor baffling material, and the top center section often flops over backwards. Beware of wires holding the material but wearing a hole in the cowl.
20	Case joint	Clean, no epoxy or surface seal More info	Standard case split oil leak concern. Epoxy is one clue that it's had the problem.

21	Front through bolts	Clean, no oil seepage. More info	IO-360s have a tendency to weep oil from the front through bolts if they've ever been apart. It's a small problem but hard to fix without splitting the engine.
22	Cylinder baffles	Springs in place (all 4) with uniform degree of stretch in springs.	Each cylinder should have a baffle wrapped around it's side and bottom, with a spring holding it on. These springs are each a different length and often are missing or replaced with safety wire. Look for worn holes, missing parts or broken baffles. If all the springs are there, they should all have the same degree of compression. Otherwise they are in the wrong locations. Look for 4 springs total, two for each pair of cylinders.
23	Spark plug area	Clean, no oil or discoloration (signs of cracking or leakage.)	A common cylinder head crack is across the spark plug holes, continuing around the head between the fins. It can be hard to see, so start by looking for any signs of oil or combustion gas leakage. Any leakage means a crack is almost certain.
24	Cylinder bases	Uniform steel color, no bluing of steel or evidence of excessive heat.	A hot running cylinder will often show in blistering of the paint or the color of the steel. This is a sign of a deeper engine problem, past or present, and would be worthy of additional research.
25	Prop governor line	Magnet shows steel fittings, steel elbow. More Info	Both fittings should be steel (check with a magnet). The nuts on both ends of the tube should also be steel. This is an AD that is worth

			\$200 to \$300
	Prop Governer Line	Proper fit (not a shortened line) More Info	The line leading from the prop governer, at the rear of the engine accessory case, to the fitting at the front of the engine case, should be in good shape and correctly installed.
34	Governer Tube clamps	Clamp in place above injector/carb More Info	A clip should hold the tube just above the injector or carb. It should be tight and have fresh rubber that holds the line firmly.
Prop Governer Line	Solid line, not flexible hose More Info	Be wary of anyone using a flexible hose in place of this tube.It's legal, but will need to be replaced at overhaul and is the only high-pressure oil line in the engine area.	
26	Rocker cover drain tubes	Rubber portion lively, tight. More Info	The tubes that lead from the bottom of each head to the case just below the cylinders are a common source of leakage. The rubber hoses at the inner connection should be lively, new looking and without any cracks. No oil should be hanging from the clamps or hoses. They are inexpensive, a few dollars each, but a challenge to install and a good sign of overall maintenance.
27	Mufflers	All brackets in place. More Info	Check to be sure that all the support brackets are in position and no cracks are visible on the mounting points.

		No cracks or discolorations. More Info	Look for old repair welds. Look up inside the exhaust pipe to be sure the flame tube is installed and intact. You may need to look at a known good one first to see what it should look like.
28	Throttle, Mixture cables	Outer housing unbroken.	The cables for throttle and mixture run in an adverse environment. Check to be sure they are routed smoothly, tied up well and are not cracking or otherwise distressed. Take a look at the attach points to see if they are properly cotter-pinned.
29	Prop governer cable	Clamped securely	A cable runs from the right firewall up to the prop governer. The attachment between that cable and the supporting arm from the prop governer is a common problem area. See that it is well supported but not too tightly held.
		Pivot assembly intact	The cable must be held firmly, but allowed to rotate as the governer moves. You may have to see one to see how it should be installed. Incorrect installation may result in slippage of the prop control or breakage of the control cable.
	Governer Spacer Plate	Assure plate is installed on -D engines. Critical to flight safety! More Info	The -D engines, which have a single 'dual' magneto rather than two seperate magnetoes, must have a spacer plate under the governer. Do not fly without this plate.
30	Oil cooler lines	Date coded within last 5 years.	The hoses that run from engine to oil cooler have a tendency to leak

			<p>under the braid after a dozen years or so. Check their date codes (on the strap around the hose) to see how much time you have left. If there is no date strap, the hoses were probably made in the field. You'll have to check the log books to see their age.</p>
		Clearly marked with part number.	<p>You should also be aware of an old Aeroquip recall that pulled back a lot of hoses in the early 1990's. Have your mechanic check AD's for aeroquip if you find suspect hoses.</p>
31	Oil Filter	Note type: screen, spin-on or cartridge More Info	<p>Some Cardinals use a screen, some have a cartridge style filter and some use a spin-on. A spin-on is best for most people (easy to change but a bit more expensive.)</p>
		Properly safety wired	<p>Check to see that it is safety-wired, and wired the correct direction. It's another clue to overall maintenance.</p>
#	RG engine area		
32	Injector lines	Well supported, no wriggle in clamps. More Info	<p>The lines that lead from the fuel distribution spider should all be well supported and free of any motion when wiggled. This is an AD that your mechanic will know about. Also look for any fuel stains that would indicate cracks or leaks in the lines, fittings or spider diaphragm.</p>

33	Throttle switch	wires Intact More Info	From the right side of the RG engine, with the upper cowl (or better with the lower cowl) off, you can see the switch that runs the gear warning system. Check to see that hat wires are properly attached.
		switch properly engaged. More Info	You can test the throttle switch to be sure it's properly engaged with the throttle cam by holding in the green button until the horn sounds (half way in) then moving the throttle in and out to notice where the switch engages. It should be about 3/4 inches in from idle.
#	Right side of fuselage		
34	Sight down fuselage	Straight, smooth paint, no blemishes	Look at the paint or in a reflection down the fuselage for clues of any past damage or repair.
35	Right door hinge area	no wrinkles or doublers on door or fuselage. More Info	Check for any extra rivets. The large doors without stops can cause the door to blow open on ramp tail-wind situations, and in some cases the lower door hinge is damaged. The repair can be easily seen in most cases. This is a critical spot on a Cardinal, just open both doors, step back 30 feet and ask yourself what holds the front of the airplane on to see why.
36	Door hinge up/down play	Less than 1/4 inch of play while nearly closed.	Hold the door almost closed and check the vertical wriggle in the

		More Info	door. It should be less than 1/4 inch, in fact in the perfect world there would be none. Door hinges are fairly difficult to repair.
37	Door locking handle	Springs to proper unlocked position without sticking More Info	Flip the handle back and forth and see if it returns to the center position. It should easily return to center. In most cases this is just a lubrication problem.
38	Door hold-open spring	Door stays fully open, slight click at full open. More Info	A small spring clip in the bottom hinge area should click into place when the door is fully open and hold the door in place. It is not expensive, as long as the track the associated bar runs in is not damaged. Problems in this area suggest deeper research.
#	Right Wing	Desired condition	Comments
39	Wing skin overlap near tips	smooth fit, no wrinkles	The rumor is that some wing skins were not made just right and were set aside at the factory. When the fresh part supply was delayed or a little short the marginal parts were made to fit. As a result you may see wrinkles between skins.
40	Spar cap rivet row	smooth, uniform thickness	If there are any bubbles you should be concerned about corrosion in the spar cap area.
41	Wing tip fuel vent	secure with clamp holding free from aileron. More Info	The vent can move over and lock the aileron if it comes loose. To check for blockage, blow into the vent then feel how much air blows

			back when pressure is released.
		Vent hole open More Info	About 6 inches up there will be a small hole drilled to provide a backup vent in case of blockage of the tip. Check to be sure it is open.
42	Wing Leading edge	straight, no dents	Largely cosmetic, but worth a look down the wing.
43	Tie-down rings	Spring intact, no rust on ring More Info	The springs in the wing tie-downs can be difficult to replace. Rusty rings can be a sign of internal corrosion.
44	Right upper wing fairing	Attach washers clean, solid, no black powder.	The washers on the overhead gap fairing can become loose and wear down the fairing. If there is a lot of black aluminum dust around those washers be sure they have not worn through the skin.
#	Stabilator and Rudder		
45	Stabilator	No play up/down or front/back at end More Info	Hold the stabilator tip in both hands and check for movement both up/down and fore/aft. There should be none. 1/4 inch is common, more than 1/2 inch is something to worry about. Repair ranges from tightening the through-bolts to tightening the bearing clamps in the stab to replacement of the bearings. It's a Cardinal specific job, but not terribly expensive.

		Free movement	Move the stab through it's full range of motion. You should have some idea what a normal degree of drag is on the cables and pivots. Some Cardinals have been seen with very high elevator forces required, which keeps them from maintaining trim speed.
		Quiet through full travel	The stab should not make any noise (listen for the crunch of a bird's nest in the tailcone.)
		Clear, solid end limits	Be sure the end-limits are solid. Some Cardinals have been known to bend their end-limit posts if parked in high winds without gust locks.
		1/8 or more clearance from fuselage	Take a look at the clearance between the stab and the fuselage. It should be tight but not rubbing. Adjustments in the tailcone or stab bearing mounts can resolve this.
46	Stabilator counterweight	Steel brackets installed.(Visible from side) More Info	The counterweight (and cable attach) arm is held to the stab carrythrough spar with 4 L brackets. There have been reports of these brackets cracking. A kit is available to replace the aluminum brackets with steel ones. These brackets can be seen from the side of the stab if you know what you're looking for. You should probably plan on doing this if it has not been done, so include the cost in your ownership cost analysis if you find aluminum brackets.

47	Stabilator Trim	Tight hinges	Check for end play or cracks in the hinge points.
		Tight rod ends on actuator	Check the degree of movement between stabilator and trim tab. A little wriggle is ok but more than 1/4 inch or so is cause for concern.
		Clean, painted, rust free actuator rod	The stab trim system is unique to the Cardinal but not too tricky. Just check for free movement of the rod ends, the actuating rod should move easily in your hand around the rod ends. This steel rod tends to rust, another good clue if this Cardinal was taken care of well or just adequately.
48	Leading edge strips	Intact, attached, free of corrosion	There is some risk of corrosion near or under the optional abrasion boot leading edges on the stabilizer. Look for filiform type corrosion or bubbles under the strip. The normal `abrasion boot' is a thick rubber layer. If your prospective bird has a layer closer to electrical tape or duct tape, it's homemade. There are other approved variations out there.. check if it's questionable.
49	Skin surfaces	Smooth, no dimples or signs of repair	Look across the stabilator surfaces as you did the fuselage, looking for signs or repair or replacement.
		Rivets are all solid: no center-pull rivets	Look at the rivets, any with a center pin are a sign of a replaced skin.

50	Rudder action	Free movement	No special rudder problems to look for, just standard pre-flight activities.
		Quiet through full travel	
		Clear, solid end limits	
#	Left fuselage		Comments are the same as the right fuselage side.
51	Sight down fuselage	Straight, smooth paint, no blemishes	
52	Left door hinge area	No wrinkles or doublers on door or fuselage.	
53	Door hinge up/down play		Less than 1/4 inch of play while nearly closed.
54	Door locking handle	Springs to proper unlocked position without sticking	
#	Belly	Desired condition	
55	Battery vent	Vent is in place	The battery vent should be intact and in place between the battery box and the outside air.
		Minimal corrosion	There is almost always some

		behind vent	corrosion in the paint behind the vent.
56	Exhaust on belly	`Normal' exhaust stains	
		No signs of oil More Info	Look for any sign of excessive oil (again there is a `normal' level that only experience can judge.)
		Not too clean.	Look for indications that the belly has recently been extensively cleaned. If it's too clean, look at it again after the test flight.
57	Nose gear hinges	Minimal end play More Info	Wear will show as end play of the hinge. Move it end to end. There should be little if any movement.
		Free of cracks More Info	Inspect the hinges for cracks. Hinges can be replaced with some effort.
58	Cowl flap hinges	Free of cracks	Inspect the hinges for cracks. Wear will show as end play of the hinge. Move it end to end. There should be little if any movement. These hinges can be replaced fairly easily.
59	Gear leg bumpers	Intact and symmetrical More Info	RG gear legs retract into a set of rubber bumpers that bolt inside the gear wells. These are fairly expensive. Check to be sure they are there, in reasonably good condition and are symmetrical. Pulled or distorted bumper pads

			may be a sign of a gear leg being bent or retracting oddly, perhaps a sign of a broken internal bulkhead.
60	Nose door link	Clean, solid, free of rust. More Info	Some Cardinal owners have reported problems with the turnbuckle that attaches the RG nose gear door to the nosegear strut. Some assemblies have shown rust or cracking, and in a few cases this link has broken and caused damage when the gear was lowered. Inspect for clean, solid parts in the linkage.
		Grommet in nose door. More Info	It should be the correct one, fit properly and not have too much play. Some may have been replaced with hard-plastic replacement.
61	Uplock arm bumper	Proper rubber strip installed More Info	Lie on your back and look up into the nose gear retraction area. There is an arm with a curved front that touches a rod end. It should have a small strip of rubber glued and screwed in place between it and the rod end. It is inexpensive and not critical, but is a sign of a properly cared for aircraft.
62	Uplock cam	Proper orientation More Info	Looking up into the nose gear retraction area, there is an L-shaped piece of metal that actuates the uplock roller through a short link. Occasionally this link will be flipped the wrong way and may cause problems with the nose gear. Check to be sure it is in the correct

			position. Look for marred paint on the back side (the top) of the uplock hook that sticks out behind the nose gear strut. If the paint has been marred it is likely that the uplock has not worked properly at some point in the past. This can be fixed by a nose gear rigging, a 2 or 3 hour project for a mechanic familiar with Cardinals.
#	Interior		
63	Inside of Tailcone	Clean, no corrosion	Perform same surface inspection as in wings (#8)
		Battery box vent intact	Verify that the battery box vent is intact internally.
		(RG) Pump tube well clear of rudder cable	Check the bottom of the hydraulic line from the RG gear pump which can be pushed down onto the rudder cables. Feel the bottom of the line to see if it's been cut by the cables.
64	Door handles	Smooth operation	
		Bolts or pins visible More Info	Many door handles have been broken over the years, and often they are repaired with a bolt or a pin. Handles are not that hard to get, but once a hole has been drilled in it the shaft may no longer be usable.
		Handle springs back to	Handles that are in need of

		center with no drag More Info	lubrication will not return to their center position when released. You may notice a dent on the outside of the fuselage near the door striker from the locking pin being extended while shutting the door.
65	Seat mountings	no wear or cracks on seat rails	Reference the Cessna AD information for detailed instructions on seat rail inspection.
		minimal side or vertical play	Vertical or side-to-side play in the seats is an indication of wear or breakage in the seat mechanism. The rollers are the most frequent problem, although there are adjustments available to compensate for normal wear.
66	Spar Carrythrough corrosion	No pits or dust on spar carrythrough	This is one potential deal-killer. Corrosion between the vent cat tubing and the spar carrythrough structure can cause this expensive and difficult to replace part to become unairworthy. Click here for servicability limits on the spar and check out this page for information on the cause and avoidance of this problem.
#	Log Book		
67	Bendix Mag	Checked for pin wear in last 500 hours	Lycoming AD requires inspection of the dual Bendix mag in most Cardinals on 500 hour intervals. They should be looked at from time to time anyway, as the Bendix mag has a number of potential problems that warrant a look

68	Main Gear Actuator rod end (RG)	Replaced with newer type rod end More Info	The main gear actuator installed by Cessna had a stress point through a grease zerk on the rod end. This rod is under a cover in the center of the floor below the rear seats and is a bit of a chore to see in person. The log book should show an entry where the rod end was replaced with a stronger one with no zerk.
69	Oil pump	Replaced with new steel/steel pump More Info	A Lycoming AD requires the replacement of the oil pump gears with a pair of steel gears, one Carburized and one Nitrided. There is some debate on whether this is really required (as the AD refers to the old revision of the SB or FAA approved revision) but it's a potential problem of some expense. Check into it to see if it might affect the aircraft you are inspecting.
#	First Flight		
F1	Before Startup	Control operations normal	Before start, assure that all controls work 'normally', including flight controls, flaps, engine controls, fuel pump, etc. Read this story for an example .
		Aileron movement is quiet	Listen for noises when moving the yoke left to right. In some cases the aileron cable can drag on the wing root panel, usually resulting in a 'bong' or 'click' at one spot in the movement.
F2	Engine start	Normal indications, operation.	Remember that it's not always easy to start an injected Cardinal.. some reluctance on a hot start is normal.
		Starter engages quickly	The bendix should snap into the flywheel with authority. A starter that only spins or spins up slow is usually the result of an old battery,

			usually not the starter.
F3	Taxi	Brake calipers are quiet	Calipers will make some noise, but should not clatter. Clattering pucks is a sign of worn caliper pins or a worn caliper.
		Evenness of braking	Sense the pedal height of brake engagement and relative feel of the pedals. RGs can develop a leak in the swivel fitting that results in a soft pedal. More Info.
F4	Takeoff	Engine RPM correct, stable	Shortly after liftoff the governer should have the engine at redline and stable. Any surging or needle movement is reason for further research. Tach instability is rare, but governer surging is somewhat common. You will feel and hear it also.
		Control feel is correct	Shortly after takeoff, in climb, feel the operation of the controls for proper stiffness and interconnect feel at low speeds.
F5	Cruise	Normal performance	Cruise performance is perhaps the most significant indicator to watch. Know the book performance and expect the airplane to attain it. A number of issues can detract from cruise speed.
		Flys level	With the ball in the middle, evenly filled fuel tanks and trimmed for cruise the aircraft should not fall off on a wing. Not a serious problem but deserves some attention.
		Fuel take usage may be uneven.	Although most prepurchase flights will be too short to notice this, it is somewhat common for fuel tanks to feed unevenly. There are things to check to improve this, but it is not a concern for purchase.
F6	Landing Gear	Landing gear sounds solid, no clunks	Many Cardinals develop a sort of clunk on either uplock or downlock. That's usually a sign

			that the nose gear needs adjusting. Not a major issue, something to look at.
F7	Gear Warning horn adjustment	Should start at bottom of green arc.	It is most likely that the gear warning would be completely broken, but also annoying if it goes off at too high a power setting.. you'll never slow down enough to drop the gear. Fairly easy to adjust, can only be checked in the air.