



**T-CRAFT  
AERO CLUB**

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# AUGUST NEWSLETTER

Volume 12, Issue 8

## Safety Article

### Smoke and Fire 2015

This is an update to the safety article on the same topic in 2010, in which we had similar conditions with an abundance of fires starting as a result of waves of thunderstorms, this year August 13<sup>th</sup> and 14<sup>th</sup>. At the time of this writing there are numerous TFR's north of us and we have had several in the local area. As you know the smoke will flow with the winds and can cause visibilities and ceilings at MVFR and IFR levels. Not only winds, but temperature and humidity can also affect the smoke densities and it is very hard to predict and/or model. One can easily become engulfed in smoke unexpectedly on a VFR flight.

Two questions come to mind regarding these situations.

- 1) How can we obtain better information on smoke for our flight planning?
- 2) What can we do if caught in IFR or near IFR conditions?

Since 2010 I've come across some new modeling tools that may help in our flight planning and some additional advice if you find yourself caught in IFR conditions.

To help answer the 1<sup>st</sup> question I contacted Flight Services to see if there are any tools they have to help forecast smoke. There are some IR satellites that can detect hot spots, or fires, but the resulting smoke is very difficult to detect, especially the smoke layers if there are clouds above the smoke. PIREPS are the best source, if any are provided near your time of flight. It's always a good idea to give a PIREP to help our fellow pilots.

*Continued on Next Page*

**Membership Status**  
**77**  
MEMBERS

Sponsor a  
New Member  
& Recieve  
1 Hour  
Flight Credit  
(C152)

## WELCOME NEW MEMBER!

Bill Chapman  
Class I

**NEWSLETTER CONTRIBUTIONS:**  
Please send your photos & flying stories to [brent@papaross.com](mailto:brent@papaross.com) for inclusion on future issues.

## SCHEDULED EVENTS

### AUGUST/SEPTEMBER

S	M	T	W	T	F	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

#### ✦ **T-Craft Board Meeting**

September 8, 2015 @ 7pm  
Location: T-Craft Hanger

#### ✦ **General Membership Meeting**

September 29, 2015 @ 7pm  
Location: T-Craft Hanger

# Remember to submit your Pictures and Articles to Secretary Bert Osborn. Member's stories are always a great addition to the newsletter.



“For once you have tasted flight, you will walk the earth with your eyes turned skywards, for there you have seen and there you will long to return”

Leonardo da Vinci

## Remember

September 29<sup>th</sup> – 19:00 General Membership Meetings resume. General Business and Presentation by Preston Rufe – Airport Design / Instrument approach/departure considerations.

## Policy Change

The board has approved a policy change that will allow pilots (except students) to fly into Garden Valley without a full level 1 BC checkout. This exemption would allow a member to make solo flights into Garden Valley airstrip (U88) as an exemption to the T-Craft Backcountry policy. The reasoning for this policy is that Garden Valley is close, has a well maintained grass strip, has a

good safety record, and is a good strip to practice and get prepared further for backcountry training. This exception will require a checkout by a BC approved instructor. A check-out sheet is available on the club web site in the “Index” tab section, Backcountry-GV Checkout. Briefly the checkout will require two separate flights and a minimum of 10 landings and signoff by the instructor.

## Jim Hudson Safety Article - *Continued*

The briefer I spoke to, whom himself is a CFI, has been monitoring the Idaho fire situation and said it is very difficult to detect any smoke during the current period, especially with cloud cover. He said at times they can, but it is still difficult to detect the layers. [http://tfr.faa.gov/tfr\\_map\\_ims/html/index.html](http://tfr.faa.gov/tfr_map_ims/html/index.html) - FAA TFR map.

Keep in mind is that new TFR's may pop up suddenly. The graphical depictions on various web pages, including the FAA's, and apps such as Foreflight may not be up to date. The only source for the most current TFR's are from Flight Service. Also, not all have TFR's, but they should be shown on the sites below.

[http://activefiremaps.fs.fed.us/lq\\_fire2.php](http://activefiremaps.fs.fed.us/lq_fire2.php) This map shows large fires.

[http://www.idahoforests.org/fire\\_links.htm](http://www.idahoforests.org/fire_links.htm) This link is Idaho specific in which you can find out more information on large fires.

What can you do to research the fires and smoke? The following web sites may help.

<http://www.airfire.org/data/bluesky-daily/> This link shows major fires in the NW and smoke projection 72 hour forecasts. I run the CONUS 12-km MAP, and/or the PNW 4-km MAP.

National WX Service - Boise Office: <http://www.wrh.noaa.gov/boi/>

Under the Forecast, Forecast Discussion tab you will find additional information regarding weather patterns and the possibility of Aviation smoke/visibility issues. There is also the Aviation Weather tab to explore.

Jim Hudson's Safety Article  
continued below

# SQUAWKS AND Rates

Always check current squawks on Master Schedule & Hanger Wall

## N1227G

\$50 / Hour



27G is still under-going repairs. Hopefully she will be flying in the near future.

## N67375

\$55 / Hour



375 had some door issues. She is still flying.

## N4464R

\$75 / Hour



There is a sign on 64R that tells people not to fly her because of asymmetrical lift. In this case it is probably a good idea to do what the sign says 64R should be repaired within a week.

## N13686

\$77 / Hour



686 had a door issue. Also had an engine heating issue. Remains on the flight line and airworthy.

## N1891X

\$111 / Hour



This is one of the best back county aircraft in the fleet.

## N9989E

\$114 / Hour



There were some issues with the door. 89E is still flying.

## N7593S

\$114 / Hour



No problems have been reported with 93S.

Remember to set aside Wednesday October 7 and help wash the birds.

**Monthly Membership Dues \$70**



## FLOWN PILOTS FLOWN PLANES BILLED PLANES

### Top 3 Most Flown Pilots

1. <b>Lucas Wilhite</b>	10.2 hrs
2. <b>Bill McGlynn</b>	9.0 hrs
3. <b>Dale Reese</b>	8.6 hrs

### Top 3 Most Flown Planes

1. N13686	35.9 hrs
2. N7593S	35.0 hrs
3. N75375	26.8 hrs

### Top 3 Revenue Aircraft

1. N7593S	\$3990
2. N13686	\$2764
3. N9989E	\$2006

## AUGUST 2015

### COMPLETED BFR'S:

Mark Turner  
James Eyre

### ACCOMPLISHMENTS

IFR Rating: Mark Turner

### High Performance Check out

Kevin Harvey  
Solo Greg Graybadger (see below)

## WORRIED?

Aircraft late?  
Didn't call as planned?  
Did not arrive at their planned destination?

**Call Idaho State Communications  
208-846-7600 or 800-632-8000**

1. Ask for Aeronautics.
2. Tell Dispatcher: "I wish to report an overdue aircraft."
3. Leave your contact information.

Jim Hudson - Safety Article Continued:

<http://www.weather.gov/qa/sectors/pacnorthwest.php> Air Quality Guidance

This site is geared toward air quality interests but can be of use for aviation. It's a gridded forecast of ozone and smoke. The image defaults to Ozone, but if you move your mouse over the gray Surface Smoke or Vertical Smoke Integration 'boxes' the images will change. You can also look at a 36 hr forecast by advancing +12 hr. increments at the top of the grid. I don't have a key as to what value would represent lower visibilities, but it looks like the fire sites have values over 100 and I can imagine that somewhere between 20 and 50 you're starting to see reductions in visibilities.

Webcams can be useful, some popular ones for aviation are:

<http://lb.511.idaho.gov/idlb/cameras/routeselect.jsf?view=state&text=m&textOnly=false> Idaho department of highways - some can provide a view of the sky.

<http://www.mccallaviation.com/webcams.html> McCall Aviation - a nice collection of Backcountry Webcams on one page.

<https://idahoaviation.com/webcams.php> Idaho Aviation Association Webcams and Weather

Hopefully, this will help with the first question, where you might expect to find smoke.

Some things to keep in mind when there are known fires or TFR's:

- Look at the wind aloft forecasts at the altitude you will be using to see what direction the smoke may be going. Light winds may mean more dense smoke. However, remember winds aloft reports are forecasts and the real world may be different.
- Inversions, early morning or late evening may cause the smoke to settle to lower altitudes, and into the valleys.
- Search out webcam's along your route - see the links listed above.
- Calls FBO's along your route and get a real person's interpretation.

METAR/TAF's may report smoke and/or low visibility but are localized points for the specific airport. A reported ceiling with a known clear sky' is probably smoke. For example, flying near Challis a few weeks ago, it was reporting visibility of 4 SM, and a ceiling of 3300'. That was a little more than  $\frac{1}{2}$  mile ceiling, and that's about what it looked like in the air. Nampa was reporting

- visibility of 7 SM and clear above 12,000'. However, between 4,000 and 8,000' MSL visibility was about 3 mile.

Safety Article continued below:

Jim Hudson's Safety Article, Continued:

The second question, VFR into IMC .

Be relatively current in your abilities to fly under the hood. If you're rusty, go up with another pilot and do some practice under the hood. If you think the hood is bad, real conditions are much more stressful. If you do encounter IFR conditions, remember to:

- Pray
- Do a 180 or descend if you can and get back to known good conditions.
- Know your position and altitude relative to terrain. A moving map app such as Foreflight or GPS with terrain warning is a valuable tool. You can see where you are relative to higher terrain.
- The 5 C's
  - 1) Calm - Try to remain calm and keep the wings level. Aviate
  - 2) Climb - If able - you will get better range for communications, clearance over obstacles, and possibly clear of the weather. Navigate
  - 3) Communicate / Confess. Contact Flight Service or ATC for help. They may vector you to clear conditions. You also need to let them know you are in IMC conditions. Do not hesitate to declare an emergency. Use 121.5 for communications , 7700 on your transponder.
  - 4) Comply - Do what FS or ATC tells you
  - 5) Conserve - reduce power and conserve fuel.

AOPA Flight Safety has a few on-line courses which may help avoid these situations. Visit [http://www.aopa.org/asf/online\\_courses/](http://www.aopa.org/asf/online_courses/)

You may want to check out the accident case study titled "VFR into IMC" or the mini-course Weatherwise "Ceilings and Visibility"

If anyone has any other suggestions, please let me know so that we can share with our members.

Have Fun, Fly Safe, and Fly Smart,

As always,

Fly Smart, Fly Safe, Have Fun, and don't forget the "This is Stupid" Abort Now.  Button  
Jim Hudson - Safety/Membership Director

**“Tools” That Tell Engine Health**  
**Submitted by Jim Eyre,**  
**Director of Maintenance**

One subject generating talk among aircraft owners is that of engine condition. Everyone wants their engine to last forever and get concerned when there may be indications that it won't. Most owners believe their engine will make it to the manufacturer's recommended overhaul time, Time Between Overhaul (TBO) and few want to operate their aircraft with engines that have gone beyond this magical number of hours referred to as TBO.

Many engines can and do have serious troubles long before TBO while a much smaller number of engines not only make it to TBO but are in such good shape that they could go many hours beyond TBO. Such is the O-320-E2D 160 HP Lycoming mounted in N-4464R. Thus far we have carefully gone several hundred hours beyond TBO. TBO is really an arbitrary number that the engine manufacturer comes up with after experiences with a large number of that engine model. It is an hour number beyond which the manufacturer says that continued operation is likely to cause such wear that the overhaul will be less economically practical than if the engine is overhauled at the recommended TBO. TBO can be a useful number for making some maintenance decisions.

The technical staff of the Cessna Pilots Association and our own great mechanics are believers in making engine maintenance decisions based on engine health rather than engine hours. The big question with this sort of thinking is how does one go about determining the engine's health? What we base our decisions on are the indications we are given by the use of “tools” that are available to help us determine an engine's health.

**Tool –Oil Consumption**

As the parts of an engine that have metal to metal contact with each other, either all the time or part of the time, wear, clearances become greater. This allows more room for oil to go by valve guides, piston rings, bearings, etc. As this occurs there is more opportunity for oil to make its way by the various sealing devices and either be consumed in the combustion process or make its way out the crankcase breather tube and of course onto the belly of our aircraft.

An engine will use some oil, how much depends on the model engine, its condition and the use it is subjected to. As a general rule aircraft used for training will use more oil than the same aircraft used for pleasure flight. This is due to the unusual attitudes and the on-off power applications associated with training. Those engines with a lot of hours will generally use more oil than low time engines. We also find that as an engine gets closer to the 50 hour oil change interval more oil is used. The type of oil, frequency of use and change can all have a bearing on oil consumption. Our club uses a high quality Phillips X/C 20W-50 and adheres to a 50 hour oil change. While it is difficult to say exactly what the proper oil consumption for an aircraft engine should be, over time we have generated some general guidelines for t-craft engines. Hence it is quite important that members log any oil put into an engine especially if adding oil above our recommended maximum (see aircraft check list PREFLIGHT item Oil Level).

Continental engines will generally use more oil per hours of operation than Lycoming engines. Continental engines can also use an excessive amount of oil when their crankcases are kept full to the brim. It is a well-known fact that an O-470 in a Cessna 182 will use a lot more oil when the sump is kept at the 9-10 quart or above mark rather than if the oil level is maintained in the 7-8 quart range. The reason is that the camshaft mounted low in the engine case will throw a lot of oil around and out the breather when the oil level in the sump is very high. Welcome to plane wash day and on a creeper spraying the bellies.

Oil consumption is valuable as a tool for telling an engine's health in two ways. First is when the oil consumption gets flat out excessive. Obviously if an aircraft engine in one of our Cessnas is using a quart of oil an hour, this engine is not in good health. The grey area is when the engine is using a quart in every three to four hours. Is it time to tear the engine apart or can it run on? This is a situation where we look at all of the “tools” available before making a decision.

What should get our attention as pilots and owners is when oil consumption changes. If an aircraft has been using a quart of oil every ten hours and suddenly is using a quart in every five hours, the reason needs to be determined. It may be something simple such as the aircraft being used recently for training or touch and goes. The oil consumption may return to normal when aircraft is used more for non-training maneuvers. Or maybe a new partner is now flying the aircraft and has taken to adding oil above the stated max before each flight (not following checklist). These are simple things to deal with. However if the cause of increased oil consumption is not readily apparent, then it is time to bring other engine health “tools” into play.

#### **Tool – Oil Filter Inspection**

All t-craft engines have a spin-on oil filter similar to that on most vehicles. At each oil change the filter is removed and replaced with new. The used filter is cut open with a special tool and then the paper filter element is cut from the housing for inspection. The paper filter is spread out on paper towel to help soak up residual oil from filter. A few flecks of metal and carbon are normal. The question is how much trapped material is too much? There is no clear cut answer to this question. A few flecks of metal is nothing to be concerned with and a filter jammed with metal indicates an engine that has destroyed itself. It is a subjective call between us and our maintenance shop as to how much is too much.

Determining the type of metal in the filter can help in figuring out where the metal came from. Bronze can be determined by color and if found would make one suspicious of valve guide wear; copper would lead us to think of bearings. However the two most common metals likely to show up in the filter are iron/steel and aluminum. A magnet can be used to figure out if the particles are ferrous and thus coming from a steel part such as a cylinder wall, lifter or gear. Not being attracted by a magnet would indicate aluminum which is almost always piston material. Further analysis, if desired, can be obtained by sending material to a laboratory.

#### **Tool – Oil Analysis**

Oil filter inspection detects the larger pieces of material that might be in an engine, oil analysis counts the microscopic particles of material that are contained in the engine oil. Oil analysis is simply a tool to show how the engine is wearing internally and it will not point to any parts that might fail suddenly without prior wear or where parts are breaking apart in chunks rather than wearing out. An example of this would be lifter spalling which leads to camshaft failure. Of course this sort of problem where chunks of metal are coming off of parts should be detected by the oil filter inspection.

#### **Tool – Compression Tests**

Compression testing is the old standby for testing an engine’s health. This is done to our engines during 100 hour and Annual Inspections. In this test air is pumped into a cylinder through a spark plug hole while the piston is positioned at Top Dead Center (TDC). If the cylinder wall, piston rings, piston, valves and valve seats (all components that form the combustion chamber seal of the cylinder) all sealed perfectly there would be no air leakage and the cylinder would hold the amount of air pumped in. Of course no cylinder seals perfectly but by measuring the amount of air that is leaking out and determining where it is leaking we can get a good idea of the condition of the combustion chamber seal in that particular cylinder. The industry accepted standard is to apply 80 PSI of air pressure to the cylinder and measure the amount of air pressure that is retained in the cylinder while the 80 PSI is being applied. There is no clear cut regulations as to how much pressure a cylinder should retain to be considered healthy but generally any cylinder that measures 70/80 is considered to be in good shape, 60/80 is acceptable and below this is the area for concern. By comparing compression results over time it gives us a good picture of what is going on with each cylinder.

Where leakage is occurring is as important as how much leakage is occurring. If one hears air coming out the induction system then the air is leaking by the intake valve. Air noises at the oil filler spout indicates that air is making its way by the piston rings into the engine case. This type of leakage is commonly called blow-by. If air is heard from the exhaust pipe it means that air is leaking around the exhaust valve. Some discretion in this area is required as it could be serious and can only get worse with time.

While a compression test is a very useful tool to telling the health of the valve sealing and piston ring sealing, it must be remembered that a compression check is testing the combustion chamber seal at the top of the stroke only; pitting of the cylinder walls or wear at mid-stroke will not be detected.

#### **Tool – Borescope**

A borescope is an optical device that is inserted through a spark plug hole into a cylinder much like a device from a proctologist used for medical inspections in, shall I say, tight, dark places. The most basic borescopes are simply a tube with lens and a light. These can be used to look at cylinder walls for signs of damage or glazing. Some have ability to take pictures such as one our mechanics use.

Generally we won't be performing a borescope inspection unless one of our other "tools" indicates a need to. Let's say that we have high oil consumption but compression remains fairly good. This might be cause for doing a borescope inspection. A kind of golden hue to the cylinder walls would be an indication that the piston rings hadn't seated properly and the cylinder walls are glazed. This will cause high oil consumption. A borescope inspection might reveal a score mark on one cylinder indicating a broken ring. Instead of doing a full top overhaul only one cylinder need be replaced.

#### **Tool – Trend Monitoring**

More of a subjective tool than the other tools. Over the years and hours our aircraft have flown we have gained experience with them and fairly well know their individual behaviors. We learn how they start and run. We learn what each engines normal oil pressure and temperature are, what the usual cylinder head temperatures are and how fast the prop changes RPM during run up. Any deviation from the norm and we start determining why. As pilots and owners it is important that we monitor our aircraft for subtle changes from one flight to the next and also over a longer period of time. Bringing observations to the attention of your Director of Maintenance (DOM) allows them to be discussed with our maintenance shop and the reasons determined.

**Summary** It is extremely rare for an engine to experience a catastrophic failure without giving some warning in some fashion. By using the "tools" in the manner prescribed one can closely monitor an engine's health. I would be reluctant to have any confidence in an engine that even though it might be low time was indicating difficulties by way of one or more of these "tools". On the other hand I would not hesitate to operate an aircraft engine, i.e. 64R, beyond the manufacturer's recommended TBO if indications from these "tools" were positive.

#### **SOLO**

Greg Graybadger



**Calendar of Events:**

September 8<sup>th</sup> – Board Meeting 19:00

September 11<sup>th</sup> – 7:30 – 16:30 Idaho Division of Aeronautics 2<sup>nd</sup> Annual Safety Stand-down. Riverside Hotel, Garden City.

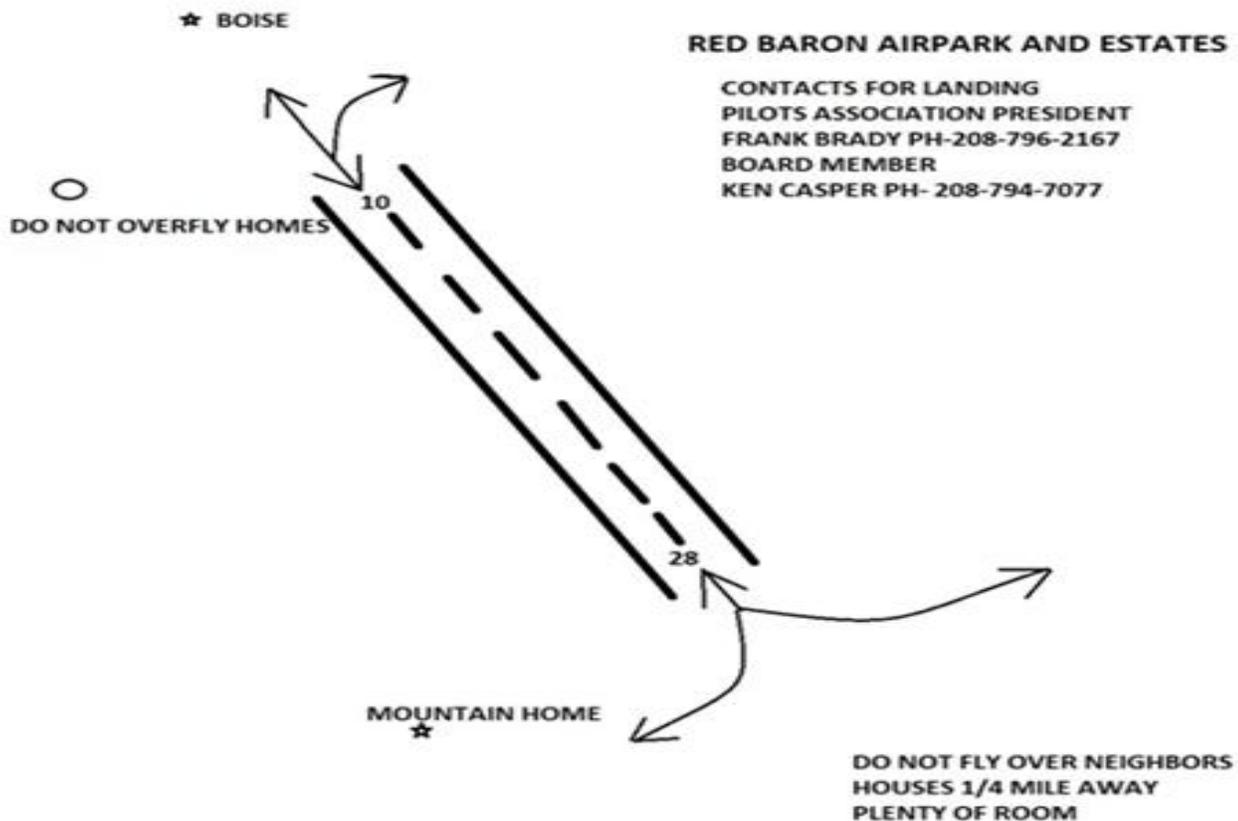
September 12<sup>th</sup> – Hood River, Or. fly In – contact Jim Eyre to coordinate.

September 17<sup>th</sup> 19:00-21:00 AOPA Air Safety, Cross Country Challenge, The Boise Hotel & Conference Center, 3300 Vista Ave, Boise, ID.

September 19<sup>th</sup> – 12:00 BBQ fly-in (or drive) at Red Barron Airpark and Estates. T-Craft has been invited to this event by Ken Casper, friend of member Darin Barnes. He has 2 lots for sale at a discounted rate of \$15,000. The airport pattern instructions are listed below. RSVP Ken Casper 208-794-7077.

1ID4 20 NM SE of BOI <http://www.redbaronestates.com>

September 29<sup>th</sup> – 19:00 General Membership Meetings resume. General Business and Presentation by Preston Rufe – Airport Design / Instrument approach/departure considerations.



LANDING ON RUNWAY 10  
TURN LEFT OR STRAIGHT IN

LANDING ON RUNWAY 28  
TURN RIGHT OR LEFT TO AVOID OVERFLIGHT OF HOMES

TAKE OFF RUNWAY 10  
TURN RIGHT OR STRAIGHT OUT TO 500 FT BEFORE LEFT TURN

TAKE OFF RUNWAY 28  
TURN RIGHT OR LEFT TO AVOID OVERFLIGHT OF HOMES.

RUNWAY IS 2949 FEET LONG BY 50 FEET WIDE PAVED

RADIO FREQUENCY 122.9 for traffic

**The paving project around the T-Craft hanger is completed. All of the aircraft are back in the hanger. Thanks to James Eyre from moving the birds around and to our aircraft mechanic for assisting him.**

**Notice the new striping on the east side of the hangar. It replaces the old yellow stripe that was placed too close to the T-Craft hanger. Kudos to the Nampa painting crew.**

**Just a friendly reminder: When you finish a flight, remember to clean the windscreen and the leading edges of the wings. Clean the windscreen with the cleaner/polisher in the blue can. Clean the leading edges with water from the bucket. Then spray pledge on the leading edges.**

**Also remember when closing doors, please don't slam them. Pull them closed gently, then lock them. The locking mechanism will make them snug and secure.**

**Thank you.**