Towplane Let Down Procedure

The let down procedure we use is based purely on experience. I have not worked for Lycoming and unfortunately, don't have an A&P or AI certificate, but I admire those who do! In the past we towed with Super Cubs, Cessna 150-150, Maule 235, Citabria 7KCAB and we added our first Pawnee in 1987. Our tow "fleet" presently consists of three Pawnees. Though this is subject to change as having all single seat towplanes has its drawbacks. When training or checking out a towpilot, a two-seat towplane is the way to go! We have had seven engines (Lycoming O540) rebuilt or overhauled. We buy new cylinders each time and have an extremely knowledgeable mechanic, Len McCullough, work on our engines. All have gone to full TBO. We have never cracked a cylinder. Cracked cylinders are caused by super cooling. This abrupt cooling causes cracks in the aluminum cylinder head. These cracks first appear at the exhaust port of the cylinder.

Think of the engine as a workhorse, a Clydesdale, if you will, since you may have seen them on a recent beer commercial. When exercising a horse, you begin with a slow walk to warm up. Then progress to a trot and finally a canter. Afterward, you must cool her down. Cooling consists of decreasing activity gradually to a walk. Walking activity is continued until her temperature decreases. Soon there is no sign of labored breathing and she is cool to the touch. (Caution: Do Not place your hand on the Pawnee's engine). Cooling down a horse is done by gradually reducing muscle exertion. Visualize the post race scene at the Derby. After the race, the horses trot around the track and then finally walk. If you want your "workhorse" to last, don't ride her hard and put her up wet.

Start the engine and let it run to warm up. In the summer months this point is nearly moot, as the outside temperature in near 100 degrees! In the winter, the warm up time is considerably more, directly related to the outside air temperature. The oil temperature gauge and the cylinder head temperature gauge are good indicators and instruments you should monitor while in flight.

A 3000 foot tow should take 10 minutes from take off to the next hook up. Take off with full power; climb at full power, mixture rich. As the glider releases, we take a descending turn to the left as generally practiced in the United States. Be aware if you are towing a pilot who has been trained outside of the US. You may well spot him out of the top of your windscreen as you begin your descent. In Europe, they train sailplane pilots to make a left turn off tow, exactly opposite of our procedure. Beware, you may meet him unexpectedly if you are not careful.

During this initial descending turn to the left, ease the power back to 2300.
Our Pawnees run 2450 to 2500 at full power. So (whatever you are running at full), just put the nose over and ease it back 200 or 300 RPM. This keeps the power on and the engine warm, while reducing it's workload. We can hear a power reduction on the ground and instinctively know if it is too fast. Chopping the power drastically or pulling it off too fast will cause the towplane's owner (perhaps an entire club) to wince. If you ***ease*** the throttle back just 200 RPM, it is akin to music to a towplane driver's ears.

Run it at 2300 for a little descent, say 500 feet then ease the throttle back just a little to 2250. Continue the descent for a minute or more to 2000 feet AGL. Each gauge you have in each plane is going to be slightly different. Each gauge is unique to that engine

and that particular airframe. Hence, for comparison sake, the figures of airspeed, descent rate and cylinder head temperature may vary slightly.

If you descend at 100 to 110 MPH and 2200 RPM, you should be coming down approximately 1000 feet a minute or a little less. Visualize keeping the muscles warm in a “cool down jog”. You are reducing the engine “exertion” yet keeping enough power on to keep it warm. The cylinder head temperature (provided you have one) should not drop below 300 degrees.

As you get closer to pattern altitude, for example, 1500 feet AGL, ease the power back a bit more to 2100 RPM. Continue to keep your airspeed at 100 MPH and your descent rate at approximately 800 to 1000 feet a minute. Continue to keep the engine running with power all the way through to the pattern. Depending on your pattern, or lack of one, ease the power back once again to 1800. You should be in the pattern now. Keep power on throughout downwind and base. Reduce power to “off” on short final. I tend to land without power, so I don’t fly through the field!

Additional engine cooling will now take place while you are taxing to the next sailplane. If you are through towing, just shut down and it will continue to cool naturally with ambient air. However, if you are taxing or idling, keep some power to the engine. As an engine gets older, the rings may wear and it will leak a little oil into the combustion chamber on the intake stroke. It may leak a little oil by the valve guides as well. If you keep 1000 RPM for example, on the engine while taxing or waiting for the sailplane pilot to go through a checklist, this will keep the engine warm. Keeping some heat on the engine will burn the oil off the plugs. This prevents the bottom plugs from fouling.

The towplane should be hooked up to the next sailplane as quickly as possible with safety as the guideline. Turnaround time should be minimal. Encourage your sailplane pilots to be completely ready for the tow when their turn comes. If the tow plane has to sit and wait, this wastes valuable engine time and burns gas. Bottom line- costing your club or operation unnecessary money.

Treat your tow plane like a workhorse. In reality, it may have 180, 235 or 260 horses on board! Keep it warm and gradually reduce the power for a gentle cool down. Thanks to Bret Willat of Sky Sailing and Bob Bruce of Boerne Stage for their input.