

Zephyrs Need TLC too!

Imagine completing a mission and then shoving the helicopter over in the corner of the hangar until the next time it was needed – no preventive or scheduled maintenance, no inspections, no application of safety messages or maintenance bulletins. How long could you expect to do that before the helicopter had an issue?

The truth is our helicopters are finely-engineered pieces of equipment. We all recognize that and we understand that they need generous portions of TLC to remain in optimal operating condition.

The Zephyr is no different. It is a finely-engineered piece of equipment and requires at least some occasional TLC in order to remain in optimal operating condition.

The Zephyr can be a tremendous asset to the unit. But sadly, we have seen many of these finely-engineered pieces of equipment fielded or purchased by units, used, and then shoved over in the corner of the hangar until the next time they were needed – no preventive or scheduled maintenance, no inspections, no application of Service Bulletins, etc. Over time, parts like the Rotatub clutch start falling out of sync with the capstans, and the equipment itself becomes a mechanism for damaging cables.

Many times, we have heard someone say things like, “The Zephyr worked great when we first got it, but then the batteries died,” or “it started damaging cables and we stopped using it.”

When we start asking questions like...

- “Have your users been properly trained to use the Zephyr?” or
- “When was the last time you checked clutch slippage?” or
- “When was the last time you changed the capstans or at least measured the wear on the capstan grooves?” or
- “Do you keep the Zephyr plugged in when not in use?”

...we get the proverbial “deer in the headlights” look.

This article addresses FIVE things (S-C-R-A-P) that every user needs to stay on top of with the Zephyr. Otherwise, that finely-engineered piece of equipment that could be a tremendous asset to the unit...just becomes a piece of SCRAP, sitting over in the corner of the hangar collecting dust:

1. (S) – Service Bulletins

- There is a reason these are published. Yes, some are optional (advisory or informational in content) but others are mandatory. Failure to apply a mandatory Service Bulletin could result in damage to the equipment.
- In order to access Service Bulletins, you need to be registered on the Zephyr portal. You can do that at: <https://members.zephyrintl.com/> Just click on the “Sign Up” button and follow the instructions. They will want to know the serial number of the equipment that your unit has. This is partly to ensure that you have a “need to know” for the information contained in the Members Only area.

- Right now, there is no mechanism for automatically informing registered users that a Service Bulletin has been published, so be sure to periodically check the website for new ones.

2. (C) – Consumables

- Urethane-coated materials have a five-year shelf/installed life. These include:
 - Capstans x 2
 - Exit Roller
 - MagSens Encoder wheel
- NOTE: This five-year shelf-life is based on the known characteristics of Urethane – that the material gets harder over time. The harder the Urethane gets, the less the capstans can “grip” the cable. If the capstans cannot adequately grip the cable, the cable will slip (the higher the load applied, the more slippage will occur). And the more the cable slips on the capstans during operation, the more likely unintended twist can occur, even to the point of damaging a cable.
- Batteries – These 8A31DT deep-cycle batteries are great for their intended purpose, but even under ideal conditions, must be replaced every 3-5 years.
- NOTE: “Ideal” conditions include keeping the battery charger/analyzer plugged in when not in use (see “A” below). The “achilles heel” of these types of batteries is that they discharge daily (even when not used) and can be irrevocably damaged if the charge ever drops below about 50%.
- These are called “consumables” for a reason. They are used, consumed, and then replaced when needed.

3. (R) – Rotatub Measurements

- A spring scale should be used to measure clutch slippage before every use.
- Ideal clutch slippage can vary anywhere from 2 to 3 lbs of force at the top rim of the Rotatub, depending on whether or not you have the older “greased” clutch or the newer Delrin slip-pad clutch (or have applied that modification).
- The bottom line is that an improperly adjusted clutch will result in the Rotatub either turning too fast or turning too slowly, as compared to the rotation of the capstans.
 - If the Rotatub turns too fast, the cable in the Rotatub will start “climbing” the spooler, with each successive wrap higher on the spooler than the previous wrap. If that happens, you will likely run out of spooler before all of the cable is extended. And if that happens, the cable will pop out of the Rotatub and there is a good possibility that the cable will be damaged.
 - If the Rotatub turns too slowly, the cable will begin to “back up” in the Rotatub and can even spill over the edge of the Rotatub and be damaged.
 - It is **vitaly important** that the user be properly trained to recognize when the Rotatub needs to be “sped up” or “slowed down,” and this can be done manually.

4. (A) – A/C Power

- The battery analyzer/charger should be plugged in when the Zephyr is not in use. This device monitors battery charge levels and is designed to keep them in an optimal state of charge.
- **DO NOT** plug the charger in while the unit is **IN USE**. Contrary to popular belief, this does not keep the batteries from discharging and can cause the charger to overheat.

5. (P) – Pin/Groove Measurements

- A pin (or pins depending on the measuring device) is used to determine wear on the capstan grooves. The two ways to measure these grooves are:
 - 7" micrometer (requires two pins)
 - Zephyr measuring fixture (requires one pin). This measuring fixture is available via Zephyr's P/N ZMT-100-1 Zephyr Maintenance Kit.
- Measurements need to be taken on a routine basis (depending on usage) because when capstan grooves become excessively worn, they are no longer able to grip the cable as they should.
- Like the issue mentioned above when the Urethane gets hard, the more worn the grooves become, the less the capstans can "grip" the cable. If the capstans cannot adequately grip the cable, the cable will slip (the higher the load applied, the more slippage will occur). And the more the cable slips on the capstans during operation, the more likely unintended twist can occur, even to the point of damaging a cable.
- **Current Service Bulletins** mention pin/groove measurements every 30 days, with four measurements on each groove (0° or keyway, 90°, 180°, and 270°). For 3-groove capstans, that's 12 measurements on each capstan (or 24 measurements total for each Zephyr). For 4-groove capstans, that's 32 measurements for each Zephyr. Look for this to change in the near future from "every 30 days" to something a little more maintainer-friendly, based on Zephyr usage.

One additional note is that 2-3 drops of oil should be placed in the proper location every 30 days, in order to keep the capstan chain oiled.

2022 Zephyr Training Schedule

Zephyr is proud to be able to continue to offer their customers in-house **no cost** training. The training is designed to provide the highest level of success using the Rescue Hoist Ground Support Equipment (RHGSE) to new and existing users.

Training is now limited to one day with a maximum of 10 students to ensure proper social distancing.

These classes are not only geared to train the user on the RHGSE, but also to provide a means of sharing valuable experiences and lessons-learned from within the Rescue Hoist Community.

Zephyr does have a **minimum** class size of five trainees. If that minimum is not met, they will need to