Piper Turbo Arrow IV - N8332B
Operating Differences Summary – Version 5, effective 9/10/2010

As a result of the Engine and Turbocharger replacement in 2008 and several other modifications to this aircraft, there are some particular operating characteristics and differences from other aircraft that all users must be aware of. This is a summary, and users should refer to the appropriate POH Supplements and STC documentation in the logbook binder for more details.

1. Supplement numbers 2, 3, 7, and 16 from the standard issued Pilot Information Manual apply to this aircraft. Located in the FAA Approved Aircraft POH and available on the AFC web-site, are the following additional Supplements that also apply to this specific aircraft: Insight Instruments Graphic Engine Monitor (GEM-603) Supplement, Garmin GNS-530W Supplement, SGH-Turboplus Intercooler Supplement, J.P. Instruments FS-450 Fuel Scan Gauge Supplement, and an updated Power Setting Table based on the Merlyn Automatic Turbo Wastegate installation.

2. Starting the engine does not typically require use of the Electric Fuel Pump, unless ambient temperatures are less than about 20° F. Unlike normally aspirated engines, the Electric Fuel Pump is rarely necessary in flight or on the ground with this aircraft. In fact, running the electric fuel pump on the ground at low RPMs can often flood out the engine. The HIGH pump position, which requires a latch guard to be depressed, should only be used if a failure of the engine driven fuel pump is suspected. The LOW position is typically only used, for other than cold starts, to suppress vaporization of fuel in the lines, which typically occurs on especially hot days or at high altitudes (above 12,000-15,000'). Vaporization is usually indicated by significant fluctuations in fuel flow, even while throttle position is steady. The LOW position should also be used as a precaution when switching fuel tanks in flight. Use of the primer button during normal starts does not require depressing the electric fuel pump switch; it is a separate system.

3. This engine is fuel injected and turbocharged with a Merlyn Automatic Wastegate and it runs fairly lean at lower power settings. It is not uncommon to have the mixture control set back below the top of the metal safety tab on the right side during idle and taxi RPM ranges. This is especially true at higher altitude airports like Centennial. However, the mixture should never be set below the metal safety tab in flight. To prevent fouling the spark plugs and carbon build-up after engine start, the throttle should be set for 1,000 RPM, then the mixture should be leaned for maximum RPM, and finally re-adjust the throttle for 1,000 RPM. Taxi should not require more than about 1,000-1,200 RPM. Prior to engine run-up, the mixture should be enriched about half way forward from the taxi mixture position. Once run-up is complete, the mixture should be re-leaned to a taxi setting, especially if there will be a significant delay before take-off. When lined up for take-off, then set mixture full-rich for take-off and climb out.

4. The combination of the Merlyn Automatic Wastegate and the Turboplus Intercooler allows for slightly higher Manifold Pressure settings at various RPM and altitude combinations than the original aircraft setup, which had a Rajay Fixed Wastegate and no Intercooler. This is a result of the Automatic Wastegate regulating Turbocharger output based on barometric pressure, ram air, and temperature; and the increased cooling effects of the Intercooler. However, the Automatic Wastegate experiences a noticeable lag in response to throttle position changes, unlike the Fixed Wastegate. As a result, the

Manifold Pressure can climb another 5-7" after a rapid forward throttle adjustment to a certain MP setting. For this reason, pilots should not advance the throttle past 35-37" MP during normal take-offs (w/excess runway length), balked landings, practice go-arounds, practice stall recoveries, or missed approaches. "Fire-walling" the throttle should never be performed unless in an actual emergency which requires all available power, and then the throttle should be retarded once the emergency is averted and/or the "Overboost" caution light is illuminated.

Setting a maximum MP of 41" during high speed cruise is still possible in accordance with the POH, but not recommended in accordance with good operating practice. If higher MP settings close to 41" are used, these must be set slowly and gradually, and all CHT, EGT, and TIT ranges/limits listed in the POH and applicable Supplements must be observed. As a good operating practice, it is recommended that MP should not exceed 38-39" on a continuous basis at any RPM and pressure altitude combination; this will extend the life of the cylinders and other critical engine components. Leaning at high speed cruise power settings should also be performed slowly and carefully, to prevent exceeding any critical CHT, EGT, or TIT temperatures. At power settings higher than 75% (per the current Power Setting Table), a 12 GPH fuel flow is not likely possible without running too lean (and too hot). Fuel flow at these higher settings will more likely result in 13 – 14.5 GPH when properly leaned, depending on pressure altitude and temperature. The J.P. Instruments Fuel Scan Digital Gauge is more accurate than the analog fuel flow needle, but they can be crossed-referenced to ensure proper functioning of both. Leaning the mixture SHOULD NOT be performed by reference to fuel flow indication; it should be performed by reference to EGT in accordance with the GEM-603 Supplement and Pilot's Manual.

Lastly, it is recommended that during climb out, especially steeper climbs with less cooling airflow, that MP should be reduced to approximately 33", and the Mixture should be left in full-rich for the entire climb out. Climbing at too high a MP setting with a leaned mixture will quickly exceed CHT limits and damage the engine. It is important to remember, especially during warm weather months, that **the only ways to manage temperatures on this aircraft are airspeed, power setting, and mixture, since there are no cowl flaps**. **Therefore, it may be necessary to fly with a higher than normal mixture setting for the given ambient conditions, just to augment engine cooling capability** while flying with high power settings. **Never exceed a TIT of 1,650° as indicated on the Insight 603 Graphic Engine Monitor (GEM).** If you are going to operate near the maximum power and temperature limits of this engine, please ensure you are very familiar with Pages 24-30 of the Insight 603 GEM Pilot's Guide and the Four-page GEM Supplement located on the AFC web-site.

5. This aircraft was originally equipped with a Backup Gear Extension System, but this function has been disabled in accordance with the applicable Piper Service Bulletin. Therefore, the landing gear system operates as a normal landing gear system without this option installed. Consequently, **the pilot retains all responsibility for ensuring the landing gear is extended for landings**.

Current Gear Warning functions that are installed and active in this aircraft are as follows:

a) – When the Throttle is retarded to $\leq$ 14" MP in flight and the landing gear is not down and locked, the red "Warning Gear Unsafe" light will illuminate and the gear warning horn will sound (90 cycle per minute beeping sound).

b) – When flaps are extended beyond 10° and the landing gear is not down and locked (regardless of throttle position), the red "Warning Gear Unsafe" light will illuminate and the gear warning horn will sound. This warning function will occur during short field take-off /climb out and practice power-off (approach) stall recovery situations since landing gear is typically retracted before the flaps are reduced from 25° to 10°; this is normal and the horn and light should go out once the flaps are retracted to 10° or full up.

To conduct training on Emergency Gear Extension with this system, the instructor can now pull out the Landing Gear Motor Circuit Breaker (CB) out to simulate a failure of the normal gear extension system. Consequently, the student would lower the normal gear handle with a negative result. Then the proper response would be to simply push and hold the Emergency Gear Lever between the seats to the full down (Emergency Extension) position until the three down and locked gear indications are seen. This emergency lever manually releases hydraulic pressure to allow the gear to free-fall with spring assistance on the nose gear. This should be performed at the appropriate speed per the POH and the aircraft yawed or pitched as necessary to assist in locking the gear down. Once there are 3 Green Lights, release the Emergency Gear Lever, allowing it to spring back to the normal position. To resume normal operations and retract the gear, simply push the Gear Motor CB back in and raise the normal gear handle. As per the POH, normal gear extension and retraction should happen in about 7 seconds and the "Warning Gear Unsafe" light will flash whenever the gear is in transit.

6. Because of the T-tail design of this aircraft, the stabilator is not in the normal prop-wash airflow like a conventional tail. Therefore, this stabilator loses some pitch control authority at higher airspeeds than a conventional tail. As a result, rotation for takeoff and flaring during landing require a more pronounced, but smooth pull aft on the control wheel; and then often requires a relaxing of back pressure on the control wheel once airborne. Typical errors experienced by pilots new to the aircraft include over-rotating on takeoffs and flat landings. One technique to avoid these errors is to trim the pitch ½ -¾ " aft of the neutral indicator, holding a little forward pressure on the yoke during the takeoff roll and during descent to landing, and then smoothly releasing the pressure and pulling slightly aft during the rotation or the flare.

I ________________________________ (NAME), ASPEN FLYING CLUB MEMBER# _________ HAVE READ AND UNDERSTAND THE SPECIFIC OPERATING DIFFERENCES FOR AIRCRAFT N8332B.

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Pilot's Signature Date