

CYGNUS X1 Aircraft Maintenance Manual

Task 32-0000002

1.0 Landing Gear Tire Pressure Servicing Instructions

1. Proper Inflation Pressure Maintenance

Aircraft tires MUST be inflated and MAINTAINED at the proper inflation pressure. That is the most important factor in any tire preventative maintenance program.

NOTE: The rated pressure may not be the correct operating pressure.

2. WARNINGS, CAUTIONS, and NOTES

WARNING: AIRCRAFT TIRES SHOULD BE MOUNTED ONLY WITH THE PROPER EQUIPMENT, INSTRUCTIONS, AND OPERATOR TRAINING. SERIOUS INJURY MAY OCCUR AS A RESULT OF IMPROPER EQUIPMENT OR PROCEDURES

WARNING: USE A SUITABLE INFLATION CAGE WHEN INFLATING A NEWLY MOUNTED TIRE WHEEL (HUB) ASSEMBLY. ANY DAMAGE TO THE TIRE, THE WHEEL, AND WHEEL BOLTS OR IMPROPER PROCEDURE, MAY CAUSE THE TIRE/WHEEL ASSEMBLY TO BURST DURING THE INFLATION PROCESS, WHICH MAY RESULT IN SERIOUS OR FATAL INJURY. AIRCRAFT MECHANICS SHOULD BE AT LEAST 6 FT (2 M) AWAY FROM THE TIRE DURING INFLATION.

WARNING: ALWAYS APPROACH A TIRE/WHEEL ASSEMBLY MOUNTED ON AN AIRCRAFT FROM AN OBLIQUE ANGLE (DIRECTION OF THE TIRE'S SHOULDER).



WARNING: AIRCRAFT TIRE AND WHEEL ASSEMBLIES SHOULD BE TREATED WITH THE SAME CARE AS ANY OTHER HIGH PRESSURE VESSEL. IMPROPER HANDLING MAY LEAD TO SERIOUS INJURY.

WARNING: AIRCRAFT TIRES MUST ALWAYS BE INFLATED WITH A PROPERLY REGULATED INFLATION SOURCE.

REGULATE THE SUPPLY LINE TO A PRESSURE NO GREATER THAN 1.5 TIMES THE OPERATING INFLATION PRESSURE. INFLATING A TIRE WITHOUT A PRESSURE REGULATOR PRESENTS A RISK OF PERSONAL INJURY AND/OR DAMAGE TO EQUIPMENT.

CAUTION: BE CAREFUL WHEN HANDLING, ASSEMBLING, AND DISASSEMBLING WHEEL COMPONENTS TO AVOID DAMAGE.

WARNING: DO NOT PROBE CUTS OR EMBEDDED OBJECTS WHILE A TIRE IS INFLATED. SUCH ACTION COULD FURTHER DAMAGE A TIRE CAUSING IT TO RUPTURE RESULTING IN PERSONAL INJURY OR EQUIPMENT DAMAGE.

WARNING: A TIRE/WHEEL ASSEMBLY THAT HAS KNOWN DAMAGE SHOULD BE ALLOWED TO COOL TO AMBIENT TEMPERATURE (A MINIMUM OF 3 HOURS) BEFORE THE TIRE IS DEFLATED.

WARNING: USE CARE WHEN REMOVING THE VALVE CORE FROM AN INFLATED TIRE. USE OF A VALVE CORE REMOVAL TOOL IS RECOMMENDED. THE VALVE CORE OF AN INFLATED TIRE CAN BE PROJECTED AT A HIGH SPEED AND POSSIBLY CAUSE INJURY

3. Pressure Checks

Use a calibrated gauge with a minimum tolerance of $\pm 2\%$ of full scale, or better, and with a scale suitable to the pressure range being monitored.

- 3.1. Check the inflation pressure before the first flight of aircraft that fly daily or before each flight for aircraft that operate less frequently. Ideally this check should be done at ambient, outside conditions.

NOTE: Any measurement below 95% of nominal inflation pressure requires maintenance action (refer to Table 1 and Table 2). Underinflation increases the deflection of the tire which may result in overheating, abnormal tire wear, shortened tire life, and possible tire failure.

NOTE: Overinflation can increase tread cutting, foreign object damage (FOD), abnormal tread wear, and stress on the wheel.

- 3.2. A loaded tire will have an inflation pressure 4% higher than when unloaded (loaded pressure = 1.04 times unloaded pressure).
- 3.3. Tires should always be serviced to the maximum allowable pressure in Table 1 and Table 2 (105%).
- 3.4. Record all as found, and post service (if required) pressures in the tire inspection form.
- 3.3. Set the pressure to consider changes in ambient temperature.

NOTE: Changes in ambient temperature will cause a corresponding change in inflation pressure (gauge pressure). A 3°C (5°F) decrease in temperature will result in a 1% decrease in inflation pressure. An increase in temperature will cause a corresponding increase in the inflation pressure. (Example: A temperature drop of 28°C (50°F) will result in a pressure loss of 10%.)

NOTE: The ambient temperature will vary over the course of the day, from location to location, and from season to season. The tire pressure specified by the airframe manufacturer for each aircraft configuration is required to carry the load of the aircraft. This pressure value is needed regardless of the ambient temperature. While it is not practical to make small adjustments, the pressure should be set for the most adverse conditions (coldest temperature expected for operation).

NOTE: Other methods exist in the tire industry that may be used to estimate the pressure adjustment due to changes in temperature. They will provide a value that may be slightly different due to rounding.

Table 1: Nose Gear Tire Servicing

Measure cold psi %	PSI	Tire Condition	Required Actions
Greater than 105%		Overinflated	1. Record pressure and ambient temperature in aircraft log. 2. Make a 2nd reading confirming the 1st reading at a similar ambient temperature. 3. Adjust pressure as required
100 - 105%		Normal Operating Range	1. No action required, Normal Range
95 – 99%		Acceptable daily pressure loss	1. Inflate to the maximum of the Normal Operating Pressure Range.

90 – 94%		Underinflated	<ol style="list-style-type: none"> 1. Inspect for cause of pressure loss. 2. Inflate to the maximum of the Normal Operating Pressure Range. 3. Record the tire pressure and the ambient temperature in the log book. Continued operation is permitted. 4. Check tire pressure 24 hours after pressure adjustment. <ol style="list-style-type: none"> 4.1. If tire pressure is within Normal Operating Pressure Range ($\leq 5\%$ loss over 24 hours), continued operation is acceptable. 4.2. If tire pressure loss is again greater than 5% loss over 24 hours, remove tire/wheel assembly from the aircraft and investigate the cause of pressure loss.
80 – 89%		Unacceptable pressure loss	<ol style="list-style-type: none"> 1. Remove tire/wheel assembly from the aircraft. 2. Investigate the cause of pressure loss. The tire should be removed from the wheel and thoroughly inspected for damage. 3. Final disposition of the tire to be determined after inspection by a qualified repair station.
Less than 80%		Unacceptable pressure loss	<ol style="list-style-type: none"> 1. Remove tire/wheel assembly from aircraft. 2. If mounted in twin or dual configuration, remove the adjacent (mate) tire/wheel assembly from aircraft. 3. Replace both tires.
0%		Flat	<ol style="list-style-type: none"> 1. If pressure loss occurred while rolling, scrap the tire and mate.

Table 2: Main Gear Tire Servicing

Measure cold psi %	PSI	Tire Condition	Required Actions
Greater than 105%		Overinflated	<ol style="list-style-type: none"> 1. Record pressure and ambient temperature in aircraft log. 2. Make a 2nd reading confirming the 1st reading at a similar ambient temperature. 3. Adjust pressure as required
100 - 105%		Normal Operating Range	<ol style="list-style-type: none"> 1. No action required, Normal Range
95 – 99%		Acceptable daily pressure loss	<ol style="list-style-type: none"> 1. Inflate to the maximum of the Normal Operating Pressure Range.
90 – 94%		Underinflated	<ol style="list-style-type: none"> 1. Inspect for cause of pressure loss. 2. Inflate to the maximum of the Normal Operating Pressure Range. 3. Record the tire pressure and the ambient temperature in the log book. Continued operation is permitted. 4. Check tire pressure 24 hours after pressure adjustment. <ol style="list-style-type: none"> 4.1. If tire pressure is within Normal Operating Pressure Range ($\leq 5\%$ loss over 24 hours), continued operation is acceptable. 4.2. If tire pressure loss is again greater than 5% loss over 24 hours, remove tire/wheel assembly from the aircraft and investigate the cause of pressure loss.
80 – 89%		Unacceptable pressure loss	<ol style="list-style-type: none"> 1. Remove tire/wheel assembly from the aircraft. 2. Investigate the cause of pressure loss. The tire should be removed from the wheel and thoroughly inspected for damage. 3. Final disposition of the tire to be determined after inspection by a qualified repair station.
Less than 80%		Unacceptable pressure loss	<ol style="list-style-type: none"> 1. Remove tire/wheel assembly from aircraft. 2. If mounted in twin or dual configuration, remove the adjacent (mate) tire/wheel assembly from aircraft. 3. Replace both tires.
0%		Flat	<ol style="list-style-type: none"> 1. If pressure loss occurred while rolling, scrap the tire and mate.

NOTE: A maximum daily pressure loss of 5% or less is considered acceptable for a 24-hour period (TSO, AC 20-97B, SAE ARP5265) (At same ambient temperature).