

BEFORE MOUNTING

Correct mounting and demounting of aircraft tires and tubes are essential for maximum safety and economy. It is a specialized job that should be done with the proper tools and careful attention to specific instructions and established procedures.

BIAS AND RADIAL AIRCRAFT TIRE GUIDELINES

Radial aircraft tires may exhibit different characteristics than bias aircraft tires when operated under similar conditions. The following guidelines are recommended:

1. The airframe must be certified for use of radial tires in place of bias or vice versa. Questions concerning the certification of a given aircraft must be referred to the airframe manufacturer.
2. Radial aircraft tires should not be mounted on wheels designed for bias ply tires or bias tires on wheels designed for radial tires without first checking with the wheel manufacturer.
3. It is acceptable to mount bias tires on nose positions and radial tires on main positions, or vice versa, on the same aircraft.
4. For Return to Base Operation Only: In case a tire replacement is needed in a remote location, the position may be filled with an appropriate tire of the other construction for return to base operation only.

WARNING

Aircraft tires are designed to be operated up to or at rated inflation pressure. Greatly exceeding these pressures may cause the aircraft wheel or tire to explode, which can result in serious or fatal injury. Pressure Regulators should always be used to help prevent injury or death caused by over-pressurization of the tire assembly. Maintenance and use of pressure regulators should be performed in accordance with the manufacturer's instructions. The safety practices for mounting and demounting aircraft tires referenced in the aircraft and wheel manufacturers maintenance manuals should be followed.

Newly assembled tires and wheels should be inflated in safety cages.

AIRCRAFT WHEELS

Aircraft wheels made today, for tube-type and tubeless tires, are the split wheel or demountable flange variety. While this makes the job of mounting and demounting physically easy, strict attention to detail is required.

Wheel Manufacturer's Instructions

Specific instructions on modern wheels are contained in maintenance manuals available from the aircraft manufacturer or directly from the wheel manufacturer. It is inadvisable to mount or demount aircraft tires without the specific information contained in these manuals. In addition, refer to airframe manufacturer's manual on use of incline ramps and/or jacks for maintenance purposes.

Safety Precautions With Wheels

An inflated tire/wheel assembly is a potentially explosive device. Mounting and demounting of aircraft tires is a specialized job that is best done with the correct equipment and properly trained personnel. The following precautions are advisable in handling both tube-type and tubeless tires.

3 Mounting and Demounting

BEFORE MOUNTING (CONT'D)

AIRCRAFT TIRE CONDUCTIVITY

Under certain circumstances (for example during refueling), operators have concerns relative to the dissipation of static electricity for aircraft.

In those situations where buildup of static electricity is of concern, *it is important that mechanical means always be used to ground the aircraft.*

CAUTION

Do not rely on tires to dissipate static electricity.

MATCHING DUAL TIRES

When new and/or retreaded tires are installed on the same landing gear axle, the diameters do not have to be matched, as long as the dimensions are within the Tire and Rim Association inflated dimensional tolerances for new and grown tires. This will insure that both tires will carry an equal share of the axle load.

Data for new tire diameters after a 12 hour stretch period, at rated inflation pressure, are available in Goodyear's Aircraft Tire Data book. The maximum grown diameter is calculated using Tire and Rim or ETRTO formulas, and these formulas are also found in Goodyear's Aircraft Tire Data book. If help is needed with these calculations, please contact your local Goodyear representative.

MOUNTING PROCEDURES

WARNING

Failure to comply with the following instructions may cause tire/tube/wheel failure and serious injury.

IMPORTANT - INFLATION PRACTICES

(See Section 2, Proper Inflation Procedures)

1. CHECK DAILY WHEN TIRES ARE COOL
2. INFLATE TO WORST CONDITIONS
3. USE DRY NITROGEN GAS (SAFELY)
4. INCREASE PRESSURE 4% FOR TIRES UNDER LOAD
5. ALLOW 12 HOUR STRETCH AFTER MOUNTING
6. NEVER REDUCE THE PRESSURE OF A HOT TIRE
REMEMBER - 1% PRESSURE CHANGE FOR 5°F (3° C)
7. EQUAL PRESSURE FOR DUALS
8. CALIBRATE INFLATION GAUGE REGULARLY

MOUNTING PROCEDURES (CONT'D)

Bead lubrication in mounting both tubeless and tube-type tires is often desirable to facilitate mounting and seating of the beads against the wheel flanges. A light coat of talc can be used. Use the following guidelines for mounting:

- Use a clip-on chuck, an extension hose, and a safety cage for inflation.
- Use a direct reading or dial type pressure gauge with 5 psi increments that is calibrated on a regular basis.
- When inflating a tire/wheel assembly, regulate the supply line to a pressure no more than 50% higher than the tire service pressure.
- Do not inflate a tire above rated pressure to seat beads.

TUBE-TYPE

- Use the correct tire and tube for the wheel assembly.
- Clean inside of tire, then lubricate lightly with talc.
- Inflate tube to slightly round, and insert in tire.
- Align yellow stripe on tube with red balance dot on tire. Align red dot with valve if no stripe on tube.
- When mounting tire and tube on wheel, be sure that wheel bolts are torqued to wheel manufacturer's instructions before inflating.
- Inflate tire in a safety cage to rated pressure.
- Deflate assembly to equalize stretch.
- Reinflate to rated pressure.
- After 12 hour stretch period, reinflate to rated inflation pressure.

Within the next 24 hours, if the pressure decreases more than 5%, it could be caused by trapped air between the tire and tube, valve core leakage, or a damaged tube.

NOTE: Check inflation pressure prior to each flight.

Tube Inspection

Since there are three reasons for air loss in a tube-type tire (a hole in the tube, a defective valve stem or valve core), finding an air leak is usually simple. The first step is to check the valve and tighten or replace the core if it is defective. If the valve is airtight, demount the tire, remove the tube, locate the leak (by immersion in water if necessary). Replace the tube.

CAUTION

For inspection use only enough pressure to round out tube. Excessive inflation strains splices and may cause fabric separation of reinforced tubes.

Reuse Of Tubes

A new tube should be used when installing a new tire. Tubes grow in service, taking a permanent set of about 25% larger than the original size. This makes a used tube too large to use in a new tire, which could cause a wrinkle and lead to tube failure.

TUBELESS TIRES

A new O-ring seal with the correct part number should be used at each tire change following the wheel manufacturer's specifications.

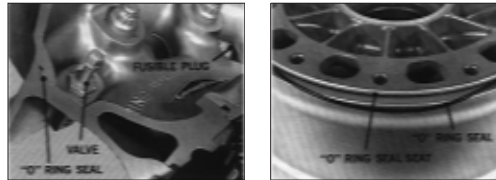
- Check for word "Tubeless" on sidewall.
- Make sure tire is clean inside.
- Clean the bead base with a cloth dampened with denatured alcohol. Allow bead seat area to dry.
- Align red balance dot on the tire with wheel valve or wheel heavy point (if indicated on wheel). If no red dot appears on the tire, look in the liner for a balance pad. Align this area to the valve or heavy spot on the wheel. If no balance pad is in the tire, then align the tire serial number to the valve or heavy spot on the wheel.
- Be sure that wheel bolts are properly torqued per the wheel manufacturer's instructions.
- Inflate tire in a safety cage using dry nitrogen to rated pressure.
- After 12-hour stretch period, reinflate to rated inflation pressure with dry nitrogen.

3 Mounting and Demounting

MOUNTING PROCEDURES (CONT'D)

If pressure drops more than five percent (5%) in the next 24 hours:

- Check with water or soap solution for loose or defective valve, valve core, valve seal, fuse plug, pressure release plug, O-ring seal, wheel base and flanges.
- If no leaks are found, rerun 24 hour diffusion check. If pressure still drops more than 5%, disassemble tire/wheel assembly.
- Check wheel O-ring seal for condition, proper size and type, and lubricant.
- Check wheel for cracks, porosity, fuse plug or pressure release plug malfunction.



TUBES IN TUBELESS TIRES

A Goodyear tubeless aircraft tire can be used (with a tube) in place of the same size tube-type tire if the tube-type tire has the same or lower speed and ply ratings. Ensure that any manufacturing stickers on the tire innerliner are removed to prevent damage to the tube. When the tube and tubeless tire are initially mounted some air may be trapped between the tire and tube. Since tubeless tires have much thicker innerliners than tube-type tires, any air trapped will take longer to escape and will slowly reduce the inflation pressure as it does so. During the first two weeks after mounting, monitor the inflation pressure carefully and reinflate as required.

INFLATION PRESSURE LOSS IN TUBELESS ASSEMBLIES

Since there are many causes for inflation pressure loss with a tubeless assembly, a systematic troubleshooting approach is advisable for minimum maintenance costs. Moreover, when chronic but not excessive inflation pressure loss exists, other factors such as inaccurate gauges, air temperature fluctuations, changes in maintenance personnel, etc., may be the source. If a definite physical fault is indicated, a troubleshooting procedure similar to the one outlined below is recommended. (See wheel manufacturer's maintenance/overhaul manual for details pertaining to specific wheels.)

Valve

Before deflating and removing tire, check the valve. Put a drop of water or soap solution on the end of the valve and watch for bubbles indicating escaping pressure. Tighten valve core if loose. Replace valve core if defective and repeat leak test to check. Check the valve stem and its mounting for leaks with a soap solution. If a leak is detected, deflate the tire/wheel assembly and replace the valve core and/or valve assembly. Make certain that every valve has a cap to retain inflation and prevent dirt, oil, and moisture from damaging the core.

Fusible Plug

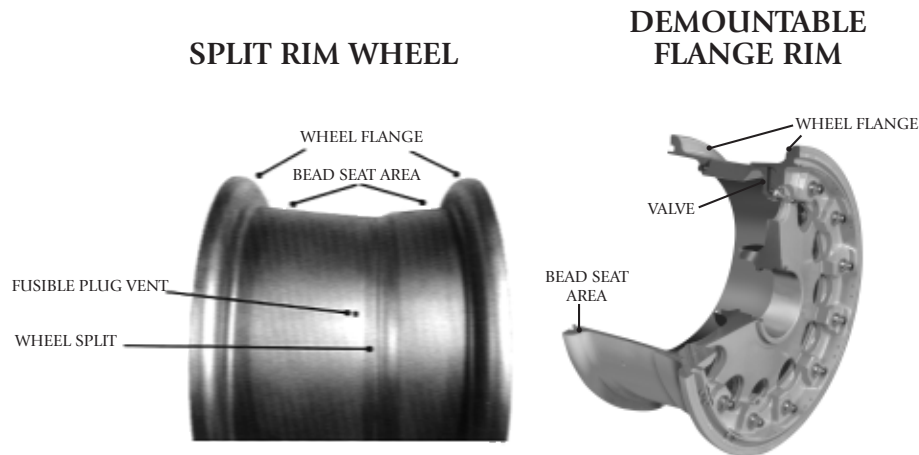
The fusible plug may also be defective or improperly installed. Use a soap solution to check fusible plugs for leaks before removing tire. Leaks can usually be pinpointed to the plug itself (a poor bond between the fusible material and the plug body) or to the sealing gasket used. Be sure the gasket is one specified by the wheel manufacturer and that it is clean and free of cuts and distortion.

If excessive heat has caused a fusible plug to blow, the tire may be damaged and should be replaced. After a fuse plug in a wheel blows, the wheel should be checked for soundness and hardness in accordance with the applicable wheel maintenance/overhaul manual. If the tire has not rolled, it can be sent to a retreader for inspection and retreading.

INFLATION PRESSURE LOSS IN TUBELESS ASSEMBLIES (CONT'D)

Release Plug

The inboard wheel half may contain a pressure release plug, a safety device that prevents accidental overinflation of the tire. If the tire is overinflated, the pressure release plug will rupture and release the tire pressure. A soap solution can be used to check a release plug to determine whether or not it is defective.



Wheel Base

Gas escaping through a cracked or porous wheel base is usually visible in an immersion test. Consult the wheel manufacturer's manual for rim maintenance and repair.

O-Ring Seal

A defective o-ring seal can usually be detected in an immersion test. Check to see that wheel bolts are properly torqued.

Beads And Flanges

Check the bead and flange areas of a tire for leaks before demounting. This can be done either by immersion or by using a soap solution. Any of the following factors can cause gas loss:

- Cracks or scratches in wheel bead ledge or flange area.
- Exceptionally dirty or corroded wheel bead seating surfaces.
- Damaged or improperly seated tire bead.

Tire Carcass

Before demounting, use an immersion test or soap spray to determine if the tire itself has a puncture. If a puncture is found in the tread or sidewall, the tire must be scrapped.

Casing Vents (Weep Holes)

All tubeless tires have been vented in the lower sidewall area. These vents prevent separation by relieving pressure buildup in the casing plies and under the sidewall rubber. These vent holes (marked by green dots) will not cause undue pressure loss and do not close. Covering them with water or a soap solution may show an intermittent bubbling, which is normal.

Pressure Retention Test

When no leaks can be found on the prior checks, a pressure retention test must be performed. The tire should be inflated to operating pressure for at least 12 hours before starting the test. This allows sufficient time for the casing to stretch, but can result in apparent inflation pressure loss. The tire must be reinflated after the stretch period to operating pressure. Allow the tire to stand at constant temperature for a 24-hour period and recheck pressure.

3 Mounting and Demounting

TIRE BALANCING AND LANDING GEAR VIBRATION

It is important that aircraft wheels and tires be as well balanced as possible. Vibration, shimmy, or out of balance is a major complaint. However, in most cases, tire balance is not the cause.

Other factors affecting balance and vibration are:

- Flat-spotted tire due to wear and braking
- Out of balance wheel halves
- Installation of wheel assembly before full tire growth
- Improperly torqued axle nut
- Improperly installed tube
- The use of non aircraft tubes
- Improperly assembled tubeless tire
- Poor gear alignment
- Bent wheel
- Worn or loose gear components
- Incorrect balancing at wheel assembly

In addition, pressure differences in dual mounted tires and incorrectly matched diameters of tires mounted on the same axle may cause vibrations or shimmy.

With some split wheels, the light spot of the wheel halves is indicated with an "L" stamped on the flange. In assembling these wheels, position the "L's" 180 degrees apart. If additional static balancing is required after tire mounting, many wheels have provisions for attaching accessory balance weights around the circumference of the flange.

AIRCRAFT TIRE/WHEEL BALANCER FOR GENERAL AVIATION OPERATION



Balancing instructions for this tire/wheel balancer can be obtained from Desser Tire & Rubber Company: 800-AIR-TIRE (800-247-8473).

NOTE: The T.J. Karg Company tire/wheel balancer is no longer available.

DEMOUNTING

CAUTION

A tire/wheel assembly that has been damaged in service should be allowed to cool for a minimum of three (3) hours before the tire is deflated.

The two types of demounting equipment used are “full-circle” and “semi-circle” bead breakers. With both types of bead breakers, the desired procedures are a combination of pressing against the tire sidewalls close to the edge of the wheel flanges and controlling the lateral movement of the bead breaker rings after contacting the tire sidewalls. This procedure assures the maximum lateral force against the tire to demount it without internal tire damage or kinking the tire beads.

1. Prior to demounting the tire from the wheel, it should be completely deflated with a deflation cap.
2. After all the pressure has been relieved, remove the valve core. Remember that valve cores still under pressure can be ejected like a bullet. If wheel or tire damage is suspected, approach the tire from the front or rear, not from the side (facing the wheel).
3. Leave the wheel tire bolts tight until after unseating the tire beads. If the bolts are loosened or removed before unseating the tire beads, the wheel mating surfaces may be damaged.
4. If “full-circle” type bead breaking equipment is used, the appropriate bead breaker flange ID should be approximately 1 inch larger than the aircraft flange OD. For example, an H40x14.5-19 tire is mounted on a 19 inch diameter wheel with a 1.4 inch flange. So, 19 inch wheel diameter plus twice the wheel flange height of 1.4 inches plus the 1 inch clearance adds up to 22.8 inches, which is rounded to give a bead breaker flange ID of 23 inches. Also, the bead breaker flanges should be equipped with rubber or plastic pads to prevent lateral movement after contacting and compressing each tire sidewall approximately 1.5 inches and to prevent damage to the aircraft wheel.
5. If “semi-circle” type bead breaking equipment is used, the same press tools are used for all size tires, but the press tools are raised or lowered to position them for each tire at the level of the center of the wheel and as close to the wheel OD as possible. This type of bead breaking equipment is equipped with sensors that prevent lateral movement after the press tools have compressed the tire approximately 3.5 inches (1.75 inches per side) and contacts the wheel. The tire can be turned on the bead breaker rollers and the breaking action repeated until the tire beads are unseated