

3 Mounting and Demounting

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.

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. A tire must be inflated from the regulated low pressure side. Tires must never be inflated from the high pressure side. The safety practices for mounting and demounting aircraft tires referenced in the aircraft and wheel manufacturers maintenance manuals should be followed.

Aircraft tires must be inflated in a safety cage.

MANUFACTURER'S INSTRUCTIONS

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.

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.

Mounting and Demounting 3

AIRCRAFT TIRE MOUNTING AND DEMOUNTING PROCEDURES AND CHECK LIST

WARNING

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

DEMOUNTING

Prior to demounting from the wheel, completely deflate the tire with a deflation cap. When all pressure has been relieved, remove the valve core. Valve cores 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).

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.

Regardless of the type of bead breaker used the proper demounting procedure is a combination of pressing against the tire sidewalls close to 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.

MOUNTING PROCEDURES

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 percent 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: Aircraft tubes are made of 100% natural rubber and will diffuse limited amounts of inflation gas. Check inflation pressure prior to each flight.

TUBE INSPECTION AND REPAIR

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). Repair or replace the tube.

3 Mounting and Demounting

CAUTION

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.

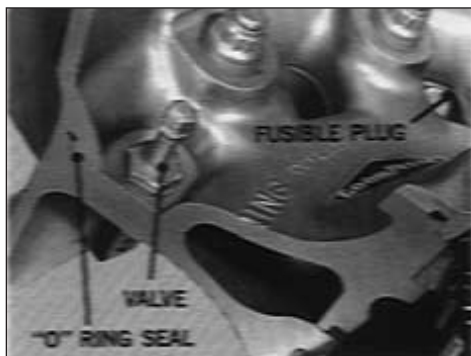
TUBELESS TIRES

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 tire with wheel valve or wheel heavy point, if indicated on wheel. If no balance dot appears on the tire, align the tire serial number and valve stem.
- 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.

If pressure drops more than 5 percent 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.



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.

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.)

Mounting and Demounting 3

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.

RELEASE PLUG

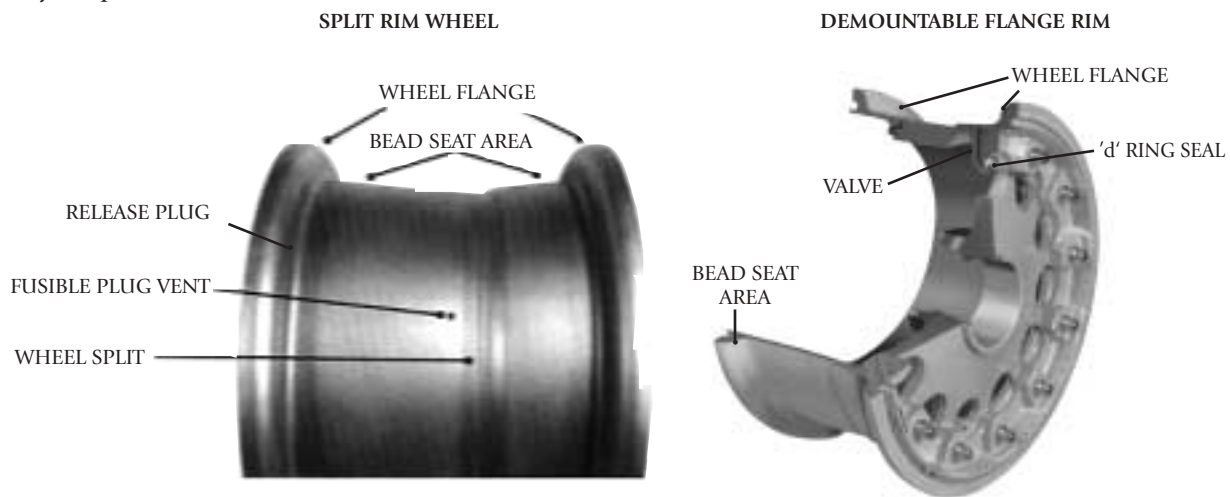
The inboard wheel half may contain a pressure release plug, a safety device that prevents accidental overinflation of the tire. If the tire is overinflated, the pressure release plug will rupture and release the tire pressure. A soap solution can be used to check a release plug to determine whether or 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

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

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. 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

BALANCING/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

CASING FLAT SPOTTING

Loaded tires that are left stationary for any length of time can develop temporary flat spots. The degree of this flat spotting depends upon the load, tire deflection and temperature. Flat spotting is most severe and more difficult to work out during cold weather. Under normal conditions, a flat spot will disappear by the end of the taxi run.

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 dynamic or static balancing is required after tire mounting, many wheels have provisions for attaching accessory balance weights around the circumference of the flange.

KARG Company manufactures a lightweight, portable, low cost tire/wheel balancer for general aviation use. This balancer (shown on the next page) will handle tire sizes from 5.00-4 to 34x9.25-16 and wheel sizes from 4 inches to 16 inches.

Mounting and Demounting **3**

T.J. KARG COMPANY INC. AIRCRAFT TIRE/WHEEL BALANCER FOR GENERAL AVIATION OPERATION



Balancing instructions for this tire/wheel balancer can be obtained from any Goodyear sales representative or from the T.J. Karg Company:

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Akron, OH 44305
Phone: (330) 630-2225
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