EO 110-5-2A

ROYAL CANADIAN AIR FORCE

DISMOUNTING, MOUNTING & INFLATION OF AIRCRAFT TIRES & TUBES

REVISION
NOTICE

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Insert revised pages into basic publication.
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ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

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LIST OF RCAF REVISIONS

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INTRODUCTION

Engineering Officers are to ensure that the requirements of this EO are brought to the attention of all personnel involved in the maintenance, conservation, inspection and handling of aircraft tires and tubes.

This Engineering Order is published to conserve aircraft tires, inner tubes, and tubeless tires by outlining the proper dismounting and mounting technique; the selection of correct tires, inner tubes and tubeless tires; the correct inflation pressures under various load conditions; and finally, the necessity for wise and proper use of tools without damage to tires, inner tubes, tubeless tires, or wheels.

Wherever establishments permit, it is highly desirable that permanent tire mounting crews be appointed and trained. Repeated mounting results in greater proficiency and fewer failures resulting from human error.

Tire Bay personnel are reminded that they can provide the RCAF with a valuable service if they note a high incidence of cut tires and report to their supervisor.

In many cases, when this is brought to the attention of Flying Control or Operations, a more thorough runway and taxi strip sweeping program will remove the cause of the problem.

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GENERAL

CLASSIFICATION

1 Tires for aircraft main, nose and tail wheels are classified into eight types according to pressure, contour and profile as defined in Spec. MIL-C-5041, see EO 110-5-2.

2 Nonskid tires are tires incorporating a tread design.

3 Tubeless tire, see Figure 1-2, is primarily the same as the conventional aircraft tire, but does not incorporate an inner tube. Tubeless tires are identified by the word "Tubeless" on the tire sidewall.

4 Helicopter tires, which are identified by the word "Helicopter" on the tire sidewall, have less undertread than aircraft tires; therefore, usage of these tires as substitutes on aircraft is not permitted.

NYLON TIRES AND TUBELESS TIRES

5 To prevent formation of low out-of-round spots in nylon tires, mount new nylon tires, inflate to maximum rated inflation pressure, and allow to remain inflated for as long a period of time as possible prior to installing on aircraft. When practicable, activities having spare wheels available will have tires and inner tubes or tubeless tires mounted and fully inflated for 24 hours prior to being installed on aircraft. During this time tire should be stored on its side so it will not rest on the rolling surface of the casing.

PLAIN AND NONSKID TIRES AND TUBELESS TIRES

6 Plain tread tires are tires which have no tread design. Nonskid tires are tires which have a tread design, usually slightly varied depending upon the manufacturer of tire for RCAF use. Dimple tread tires are not considered nonskid. Tubeless tires incorporate an inner liner which takes the place of the conventional inner tubes. Tubeless tires are also marked as such on the sidewall for identification. Due to structural and traction differences in tires described above, these tires should be installed on aircraft only in like pairs. If at any time, lack of stock or other emergency make it necessary to install tires on the aircraft in dissimilar pairs, replacement of one of the tires will be made as soon as possible. It is believed that there should be no serious difference in performance for single installations due to the tread design variability except for the following:

CAUTION

Under no circumstances are dimple tread design tires to be used on any single or multiple wheel installation with tires of any other tread design.

MULTIPLE WHEEL INSTALLATION (BOGIE)

7 Dual wheels or dual wheels on a multiwheel gear configuration will be equipped with tires or tubeless tires of the same manufacturer and tread design (when available) or in lieu of the above, the tire diameters shall be matched to tolerance specified, and of the same tread design so as to insure that each tire will have the same contact area with the ground and will thereby carry an equal share of the load. When tires of a different manufacture are used, the inflated diameter will be measured and those tires having diameters within the tolerances listed below will be paired together on dual wheels. When a tire must be replaced on dual installation both tires should be ideally replaced in order to use tires of the same diameter. Serious damage can occur to a new tire when mated to another that is quite worn for example being 1/2" smaller in diameter, particularly when inflation pressures are so variable.

TOLERANCE OD	OD RANGE
1/4"	up to 24"
5/16"	25 to 32"
3/8"	33 to 40"
7/16"	41 to 48"
1/2"	49 to 55"
9/16"	56 to 65"
5/8"	66" and up

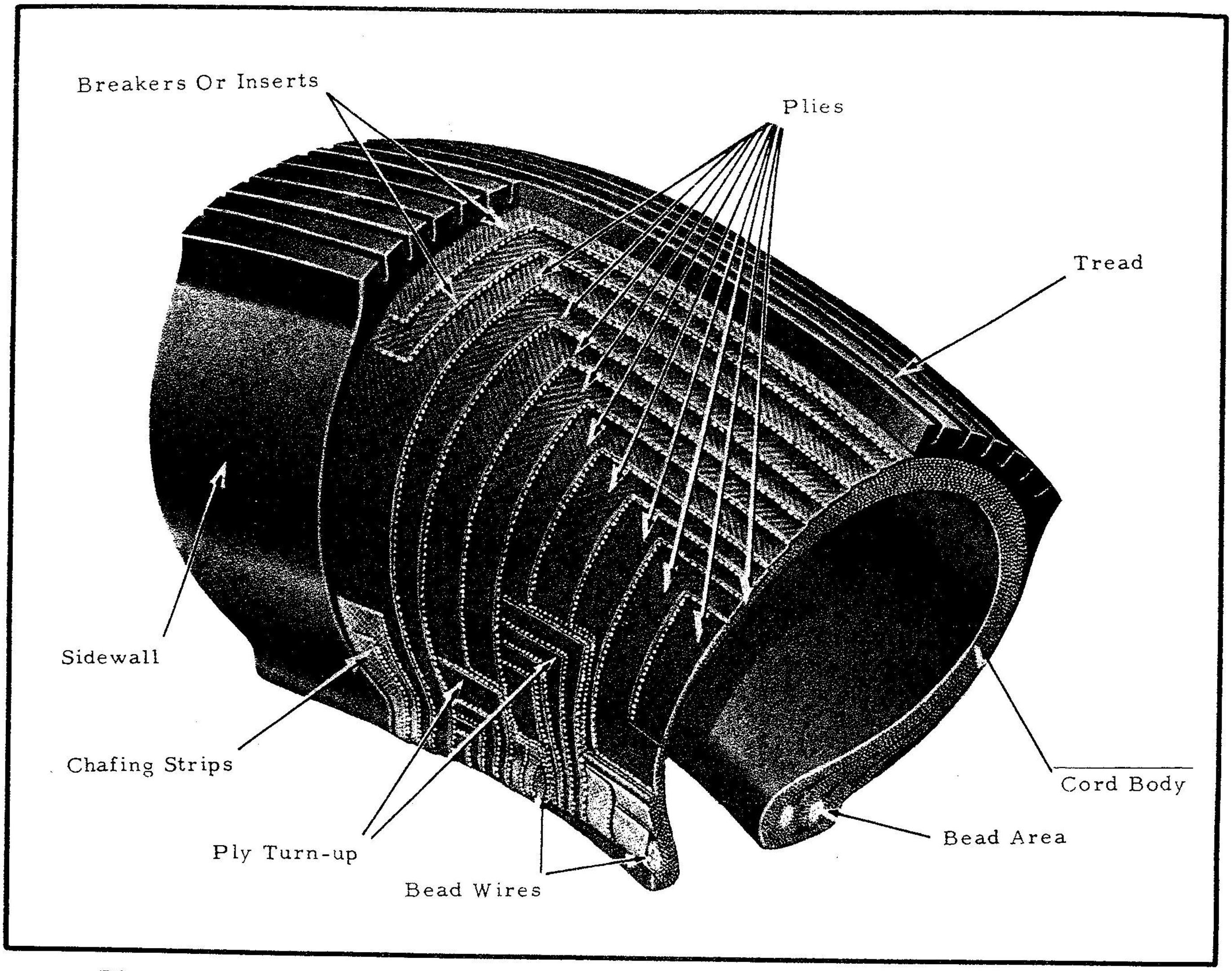

Figure 1-1 Sectional View of an Aircraft Tire Illustrating Points of Construction

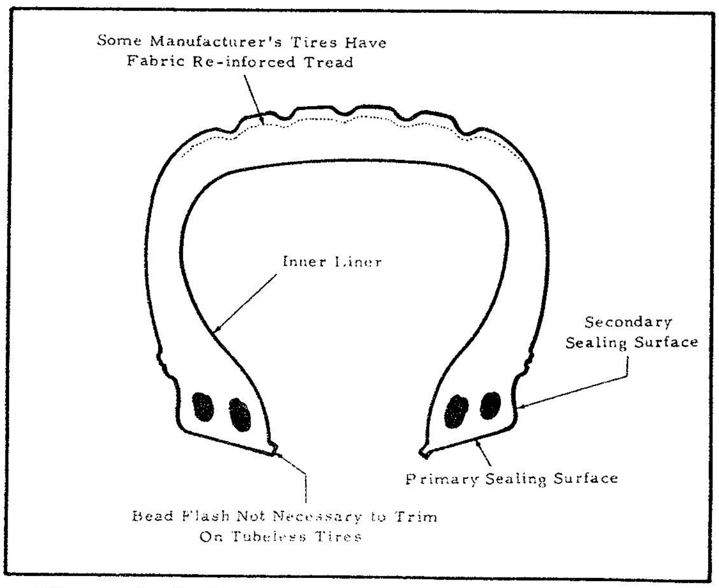

Figure 1-2 Sectional View of Tubeless Tire

PLY RATING

8 The term "ply rating" (PR) is used to identify a given tire or tubeless tire with maximum recommended load when used in a specific type of service. It is an index of tires or tubeless tire strength and does not necessarily represent the number of cord plies in a tire or tubeless tire. The ply ratings are not to be construed as indicating the number of plies which may be used in a given tire or tubeless tire construction. Tires and tubeless tires now in stock may be designated by either "ply rating" or a given number of plies of rayon or nylon. There is no permanent cross index between "ply rating" and rayon or nylon constructions, See Figure 1-1 for tire construction. Due to the different values of "ply rating", permanent comparisons cannot be established. The proper size of the tire and inner tube or tubeless tire may be learned from the application table for aircraft tires and tubes EO 110-5-1.

VALVE CORES

9 A standard valve core is being adopted for general usage in inner tubes and tubeless tire valves used by the RCAF. This valve core is an all purpose high-temperature core. Its industry identification is "C-4". This C-4 valve core (2640-21-802-3003) will replace all valve cores for all aircraft tubes and tubeless tires, after using present stock of other approved valve cores.

BALANCE POINTS OF TIRES AND TUBES

10 Tire balance marker consists of red dot permanently branded or stamped into the sidewall of the tire or immediately above the bead to indicate the light weight point of the tire. Tube balance marker positioned on the valve side of the tube, consists of a mark approximately 1/2" wide and 2" long in contrasting colour, the long axis of the mark across the section of the tube to indicate the heavy portion of the tube.

NOTE

On installation heavy point of the tube and light point of the tire must be matched.

PART 2

MOUNTING AND DISMOUNTING OF AIRCRAFT TIRES AND INNER TUBES

DISMOUNTING - GENERAL

WARNING

Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tire.

1 Additional precaution is to be observed when removing high-pressure tires. During the deflation procedure, the valve stem may become blocked with pieces of ice and it is possible that the operator not hearing any exhausting air might conclude that the tire is fully deflated. Sufficient time must therefore be allowed to elapse between the removal of the valve core and the dismantling of the wheel to ensure that the air has been completely exhausted from the tire. No probing devices are necessary to ensure that the valve hole is clear as the ice formations will break under normal ambient temperatures and allow free passage of any air remaining in the casing. This icing up process may take place several times before the tire is completely exhausted of air.

2 At the time of disassembly all major components (wheel halves - demountable, flanges etc.) are to be identified in such a manner as to assure re-assembly with the same components. Metal stamps must not be used for this purpose.

3 Aircraft tires and inner tubes can be damaged beyond repair in the process of dismounting, see Figures 2-1 and 2-2. Regardless of the type of wheel, the tire bead must be loosened from the wheel rim flange and bead seat before proceeding with dismounting. This is the most important operation in the entire procedure of dismounting. Extreme care must be exercised to prevent injury to the beads of the tire or the relatively soft metal of the wheel.

NOTE

During dismounting operations where the wheel casting is likely to contact the bench or floor, a rubber or felt mat is to be used. This will prevent damage to the anti-corrosive treatment on the casting.

4 If using bead breakers it is desirable that they should be of the screw actuated or manual operated hydraulic types. Pneumatic systems or hydraulic systems incorporating pneumatic charge accumulators should not be used for breaking beads, unless sufficient design precautions are incorporated in the tool (not dependent on the wheel) to prevent overtravel of the bead breaking head and subsequent damage to the wheel or tube valve.

NOTE

If locally fabricated or locally procured mounting equipment is to be used at any unit, prior approval for this equipment will normally be obtained by forwarding assembly drawings or photographs of the equipment to the responsible equipment branch, Air Materiel Command Headquarters for evaluation.

5 Use tire and rim demounting lubricant, Specification MIL-L-8362, Ref. 34A/2640-00-281-5688, before breaking beads when dismounting tires. A moderate amount of the lubricant shall be introduced between the tire and the rim flange.

(a) For Inner Tube Installations:- Remove hex nuts, if any, from valve stems. Push valve stem away from the seated position prior to breaking tire beads away from the flange.

(b) Use the bead breaking tool in the prescribed manner. As the tool is applied around the bead circumference, the lubricant will penetrate further into the bead flange area and will greatly facilitate the bead breaking operation.

(c) After the dismounting operation is complete, wipe excess fluid from the tire beads

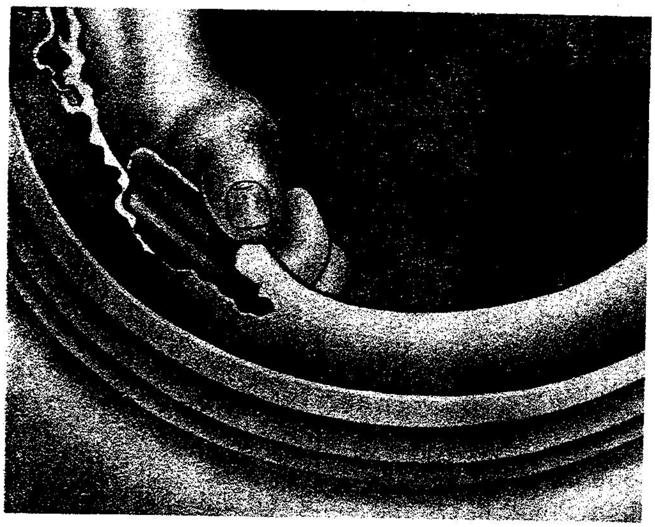

Figure 2-1 Damage Caused by Improper Use of Tools in Loosening Bead from Flange and in Prying Bead Over Rim Flange

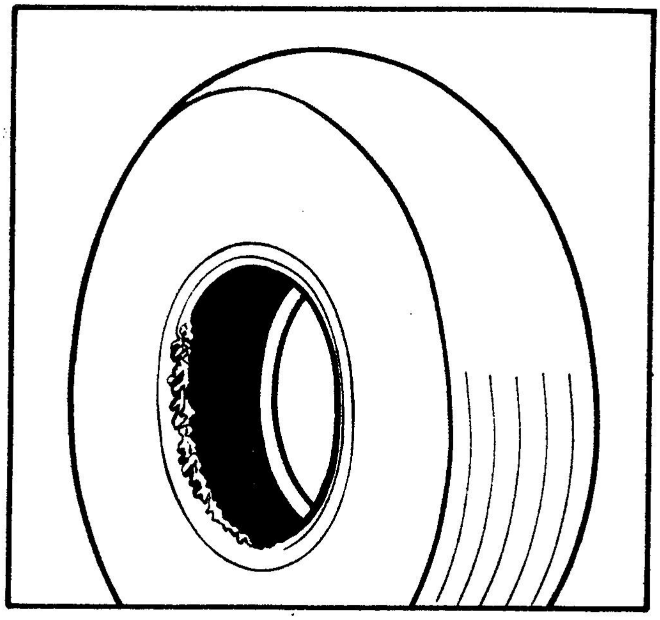

Figure 2-2 Damage on the Inside of a Tire Bead Due to Improper Tools or Use of Tools

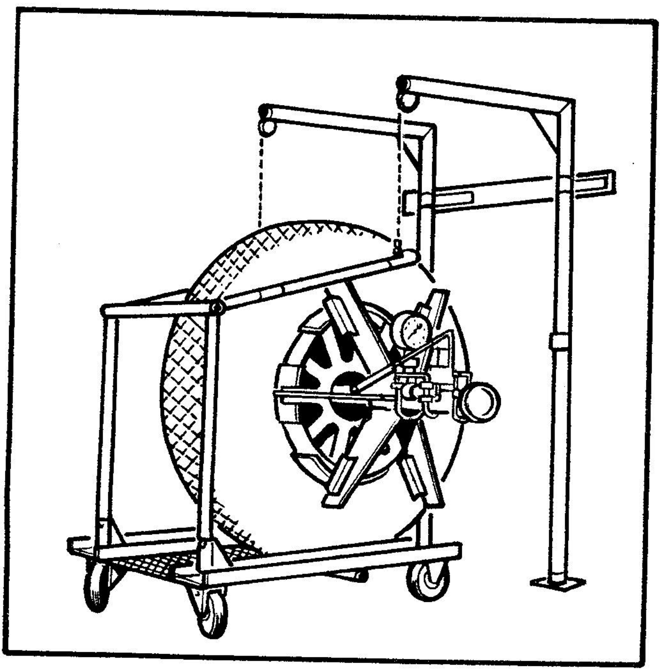

Figure 2-3 Breaking Bead from Wheel Using Bead Breaker

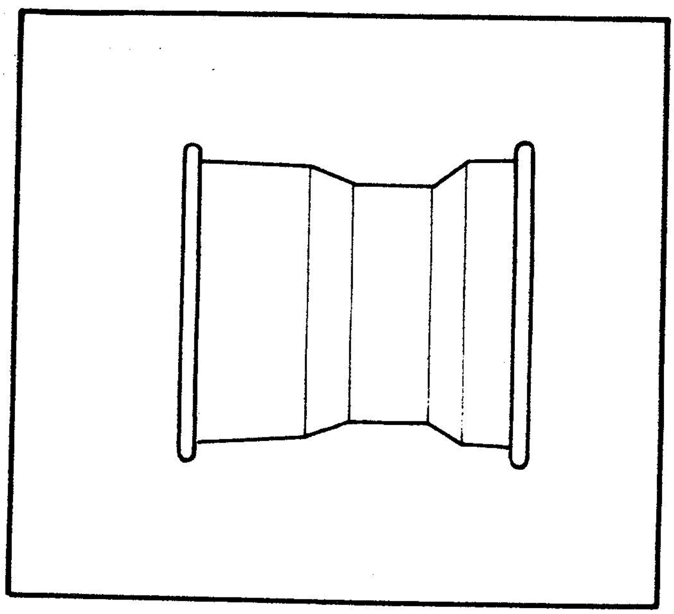

Figure 2-4 Drop Center Wheel

with a clean cloth and remove all traces of fluid from the wheel flanges using Denatured Alcohol Ref. 34A/6810-21-802-3438. (Spec. 3-GP-530).

DROP CENTER WHEELS

6 Dismount drop center wheels as follows: see Figure 2-4.

(a) Remove valve cap and apply deflator Schraeder Part 4400, to release pressure completely and then remove the valve core to release any remaining air.

WARNING

Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tire.

(b) Loosen both beads from the flanges, being careful not to damage the tire beads or the flanges of the wheel. Refer to para. 5.

(c) Lay the wheel flat with the valve side down. Force the bead into the wheel well by inserting a wooden block between the sidewall of the tire and the rim flange, see Figure 2-5.

NOTE

Large sections of tire should not be levered on or off the wheel. Frequent small bites will be more effective.

(d) With the bead opposite the valve pressed into the well, turn the assembly over. Use a tire iron to pry the bead up at the valve, see Figure 2-6. Then hold one tire iron in position between the wheel and bead, see Figure 2-7. In order to hold that part of the bead which is already pried up, continue around the tire with another tire tool taking small bites until the first bead is pried entirely over the flange.

(e) Depress the valve into the tube well and remove the tube by starting near the valve and pulling the tube out of the crown or tread side of the tire, see Figures 2-9 and 2-10.

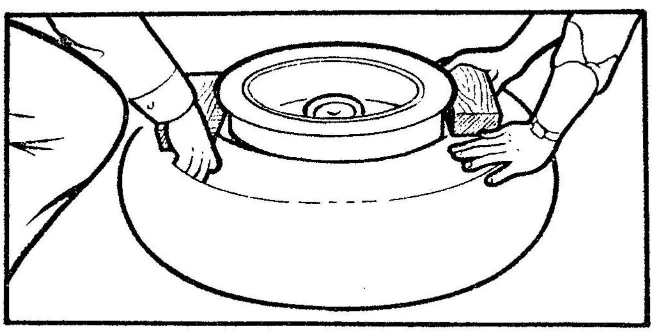

Figure 2-5 Using Wooden Blocks to Force Tire Bead into Well

(f) Stand the wheel up. Standing on the opposite side from that part of the wheel which extends through the tire, pry the other bead over the trim flange until the tire is removed see Figure 2-11.

SPLIT OR DIVIDED WHEELS

7 Dismount split or divided wheel as follows, see Figure 2-12.

(a) Remove valve cap and apply deflator Schraeder Part 4400 to release pressure completely and then remove the valve core to release any remaining Air.

WARNING

Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tire.

(b) Do not loosen or remove the nuts from the wheel tire bolts until the tire has been completely deflated. Then, and only then, proceed with further dismounting procedures.

(c) Loosen beads from rim flanges as described in para. 5. Do not use tools or methods

Figure 2-6 Prying Bead up at Valve

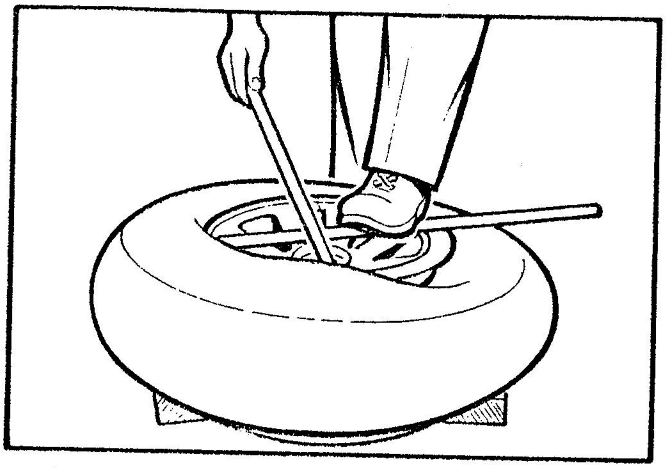

Figure 2-7 Continuing Around Tire to Pry Bead Over Flange

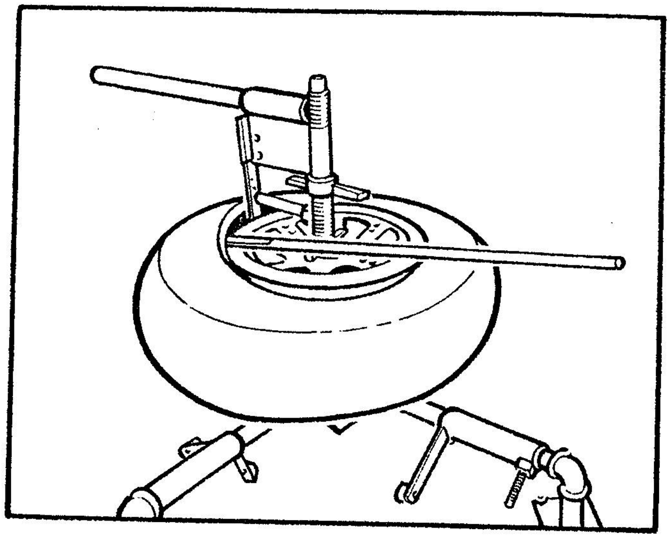

Figure 2-8 Removal of Tire with Floor Mounting Tire Remover Unit

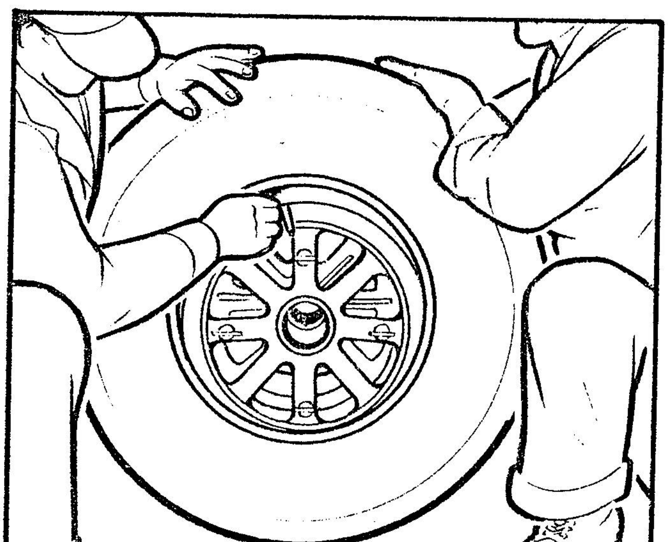

Figure 2-9 Starting to Remove Tube

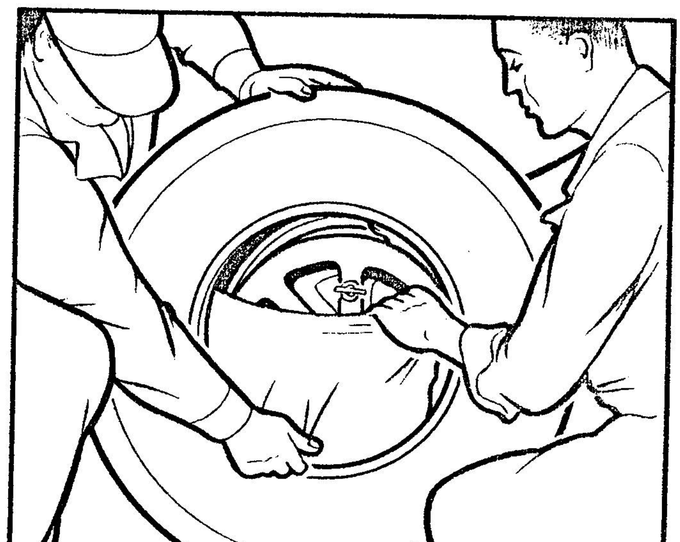

Figure 2-10 Completing Tube Removal Operation

which will injure the beads or wheels. Extra precautions will be taken to prevent bending or damaging the wheel, particularly in the flange area.

(d) Remove the nuts or tie bolts as applicable from the wheel, exercising care not to crack or bend the bolts or strip the threads.

(e) Pull out both halves of the wheel from the tire.

CAUTION

Do not use tire irons or other tools which will injure the beads or wheels.

DEMOUNTABLE FLANGE WHEELS

8 Dismount demountable flange wheels as follows, see Figure 2-13.

(a) Remove valve cap and apply deflator, Schraeder Part 4400 to release pressure completely and then remove the valve core to release any remaining air.

WARNING

Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tire.

(b) Remove hex nut, if any, from valve stem. Push valve stem up and away from the seated position prior to breaking tire beads away from the flange.

(c) Break the beads free from the wheel, refer to para. 5. After the beads are broken loose from the wheel, lay the tire and wheel assembly flat with the demountable flange side up. Use a rubber mallet to loosen the demountable flange, driving it down toward the tire, see Figure 2-14. If the demountable flange inadvertently moves when the bead is being broken, use extreme care so that the flange is depressed only far enough to remove the lock ring.

CAUTION

Extreme care must be taken when breaking the beads and removing the lock ring on some demountable flange wheels. The toe of the demountable flange on these wheels extends very close to the tube valve stem. Excessive depression of the demountable flange when removing the lock ring or of the tire bead when breaking the beads will cause damage to the rubber base of the tube valve or to the valve itself. DAMAGE OF THE TUBE IN THIS AREA DURING MOUNTING AND DISMOUNTING IS KNOWN TO HAVE CAUSED SUBSEQUENT TIRE BLOW-OUTS ON AIRCRAFT.

(d) In order to eliminate the possibility of damaging the tube valve during dismounting, the following procedure should be used.

(1) Depress valve stem into the tire as far as it will go.

(2) Use a controlled force to depress the demountable flange.

(e) Pry out the lock ring where applicable, see Figure 2-15.

(f) Pry up and remove the demountable flange, see Figure 2-16. This is more easily done by two men prying evenly from opposite sides. Care must be taken not to bend or damage the demountable flange.

(g) Turn tire and wheel over and lift wheel out of tire, see Figure 2-17.

(h) Inspect the flange gutter and flange for signs of failure or foreign material. Remove foreign material, etc.

NOTE

Keep the wheel and flange together to insure remounting of the wheel and flange as a unit.

MOUNTING - GENERAL

9 There are many precautions to be observed prior to the mounting of aircraft tires and inner tubes. Several of the most important are as follows:

NOTE

During mounting operations where the wheel casting is likely to contact the bench or floor a rubber or felt mat is to be used. This will prevent damage to the anti-corrosive treatment on the casting.

(a) Only wheels, tires, and inner tubes, which have been rigidly inspected and found completely serviceable in accordance with EO 15-35-2 and EO 110-5-3 will be considered suitable for mounting. Examine used inner tubes carefully for bead toe chafing, thinning, buckles, heat damage, leaks, etc. Check the tube around the valve for leaks, signs of valve pad separation, and bent or damaged valve stems. Fabric base inner tubes with metal valve stems have a normal separation of the tube at the threaded base of the valve stem, see Figure 2-18. Since adhesion is not normally provided at the junction of the fabric base and at the threaded base of the valve stem, it should be noted that exposure of the cord ends at this point, where the valve stem passes through the fabric base, does not have any effect on the serviceability of the inner tube.

(b) Blisters on inner tubes between the skim coat of rubber and cord fabric are not considered as due to leakage of the tube, but rather to trapped air or solvents under the thin coating of rubber over the fabric. Heat from the brakes causes the trapped air or solvents to expand, causing blisters shown in Figure 2-19. These blisters can either be pierced with a needle or vented in a similar manner to permit the trapped air to escape, see Figure 2-20. However, care must be taken not to pierce the wall of the inner tube below the fabric base when relieving air from the blisters. The purpose of the fabric is to prevent failure of the tube due to chafing. No failures are known to have been caused by blistering where fabric base tubes are used. If no loss of air is detected when fabric reinforced tubes are inflated, tubes should be considered satisfactory for use.

(c) Balance marks on inner tubes locate the heavy point of the tube and should be matched

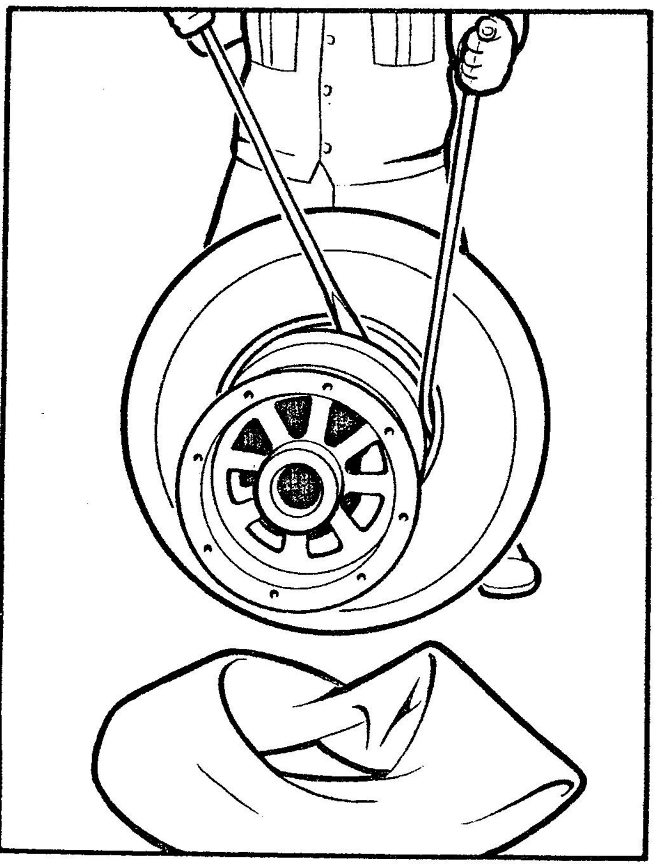

Figure 2-11 Removing Wheel from Tire Using Tire Irons

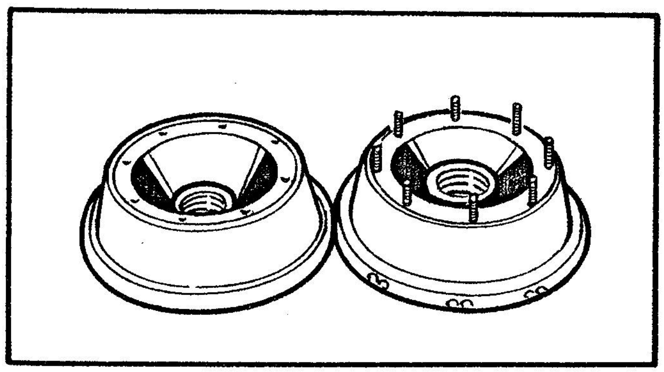

Figure 2-12 A Split Wheel

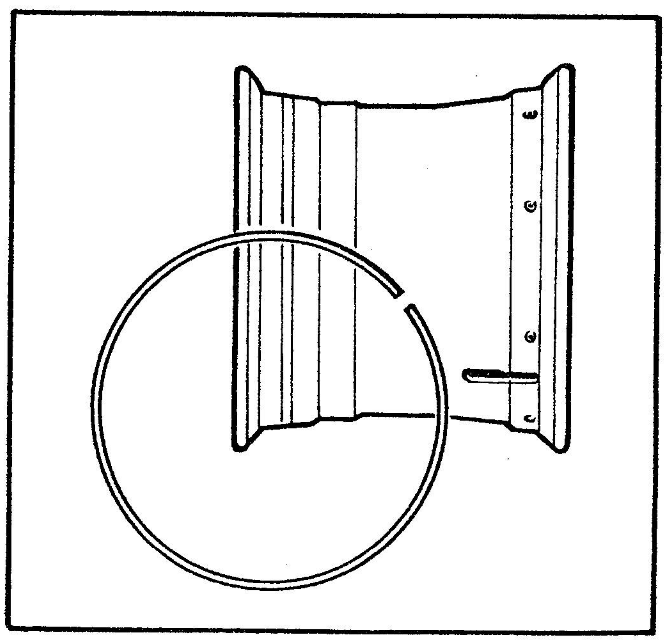

Figure 2-13 Demountable Flange Wheel

with the light point of the tire as indicated by the red balance dot, see Figure 2-21.

NOTE

Before insertion of tube lightly coat valve stem bore of wheel with a light coat of grease pneumatic (Spec. 3-GP-605) 34A/9150-21-802-4316.

(d) Place the tube in the tire in such a position to ensure that the offset valve, if used, will be on the proper side of the wheel.

(e) Use no liquid lubricant such as soap solution, oil, etc., on the tire beads or on the wheel. These types of lubricants will cause in-service slippage between the tire and the wheel. It is advisable to dust the inner tube with lubricating compound (talc), 33C/87, lightly to assist the inner tube to assume its proper position when being inflated.

DROP CENTER WHEELS

10 Mount drop center wheels as follows:

(a) When mounting tires of 8PR or more with heavy beads, or with 6PR tires of smaller diameter, it is recommended that the method of putting the wheel into the tire be utilized. However, when mounting tires of 4PR or larger tires of 6PR, the wheel should be laid horizontally with the valve hole side up and the method of putting the tire on the wheel be utilized.

(b) Lay the tire (without the tube) on the floor and lay the wheel in the tire in such a way that one flange of the wheel is started under the bead, see Figure 2-22. Insert the wheel into the tire so that the part of the bead which is over the wheel flange is in the reduced diameter cavity of the wheel-tube well. If this portion of the bead is not depressed into the wheel-tube well, extreme difficulties will be encountered in prying the remainder of the bead over the wheel flange. This, in turn, can result in kinked and torn beads or structural damage to the wheel.

CAUTION

Care must be exercised when using tire irons during mounting or dismounting procedures to preclude damage to the wheel. Tire iron damage accounts for excessive wheel scrapping.

NOTE

Before insertion of tube lightly coat valve stem bore of wheel with a light coat of grease pneumatic Spec. 3-GP-605, 34A/9150-21-802-4316.

(c) With one part of the bead in the well, pry the balance of the bead over the flange. Otherwise, the binding action will have a tendency to lift the bead when the tire tool is removed. Use a fairly thin tire tool in this operation since clearance between bead and flange is small. After the first bead is entirely on, turn the work over and lift the top bead, which is not over the flange andinsert the tube, starting at the valve, see Figure 2-23. Let part of the tube lay on the wheel so that the valve may be inserted in the valve hole, see Figure 2-24. Insert valve in valve hole and attach a valve fishing tool Schraeder Part 991, in order to hold the valve in position, see Figure 2-25.

(d) With the tube remaining deflated, stretch the base of the tube over the flange until the tube is fully inserted into the tire. Inflate tube to properly adjust itself and deflate after adjustment takes place.

(e) Using the tire iron, pry the bead so that the portion opposite the valve is in the reduced diameter cavity of the wheel-tube well, see Figure 2-26. It is important that this portion of the bead is depressed into the wheel well. If this is not done, it will be difficult or impossible to pry the remaining portion of the bead over the flange.

(f) Using a straight, thin tire iron, pry on the balance of the bead, see Figure 2-27. Be careful not to put the tire tool in too deep. Take small bites and push the tire tool toward that part of the bead already on to facilitate pulling tire tool out from between bead and flange after each bite. Continue until bead is entirely on. Check to make sure that the tube is not caught under the beads. Now refer to para. 17 for proper inflation procedures.

SPLIT OR DIVIDED WHEELS

11 Mount split or divided wheels as follows:

(a) Inspect wheel for damaged rims, tie bolts, and tie bolt nuts in accordance with applicable wheel EO.

(b) Entirely deflate tube and insert into the tire, see Figures 2-28 and 2-29. Folding the tube makes this operation easier. Install valve core, inflate until tube is rounded out, probing with fingers to relieve any trapped air, refer to Figure 2-33.

NOTE

Before insertion of tube lightly coat valve stem bore of wheel with a light coat of grease Spec. 3-GP-605, 34A/9150-21-802-4316.

(c) Insert valve hole section of wheel into tire, see Figure 2-30. Push valve stem through stem hole in wheel.

(d) Insert other side of wheel holding the valve in position, see Figure 2-31. Be careful not to pinch tube between wheel halves.

(e) Install locking nuts and tighten in a criss-cross order in increments of 20% of the torque value specified for the wheel until total value is reached. On newer type wheels, the required wrench torque will be stamped on the wheel. When values are not specified on wheel, refer to the specific wheel EO.

NOTE

Difficulties in Drawing Wheel Halves Together - Where short tie-bolts and stiff tires are characteristic of the as-

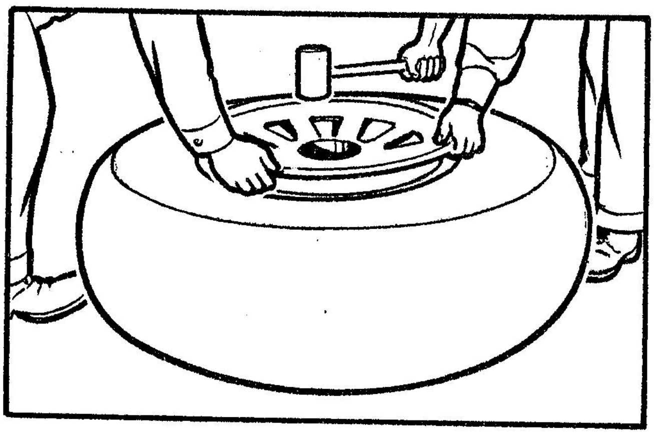

Figure 2-14 Loosening Demountable Flange

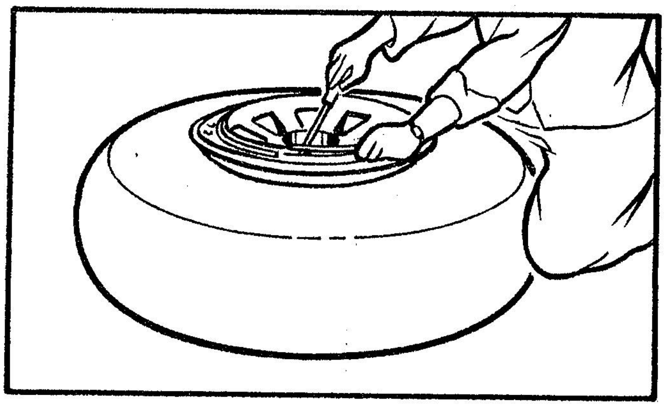

Figure 2-15 Prying out the Lock Ring

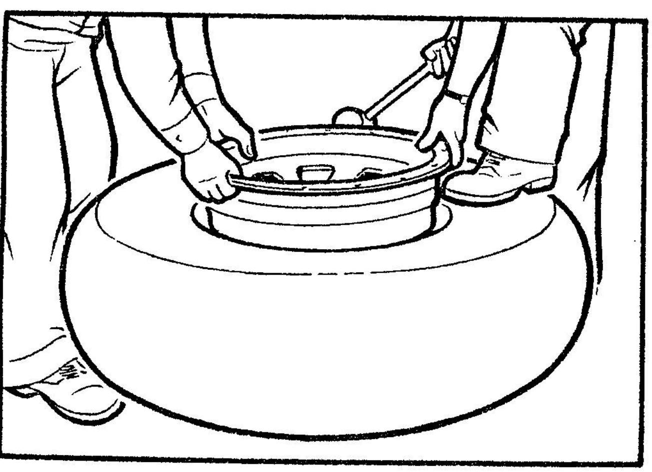

Figure 2-16 Removing Demountable Flange

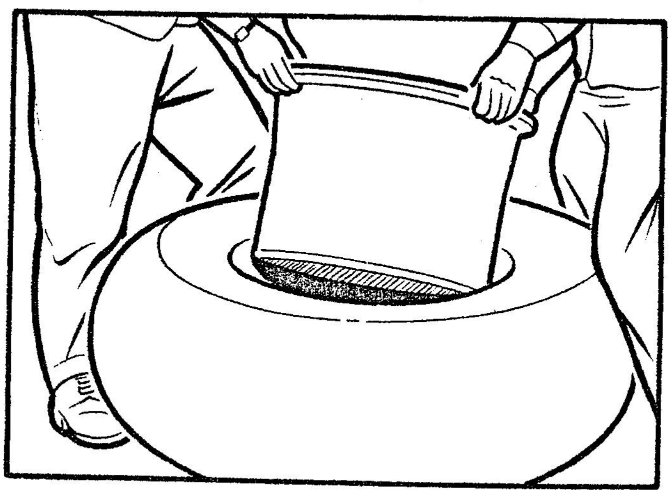

Figure 2-17 Lifting Wheel out of Tire

sembly it is often difficult to draw the wheel halves together sufficiently to engage the regular tie-bolts. If a press is not available for this purpose, two methods are useful. Long bolts with identical threads can be used in at least two opposite holes to draw the wheel sections together sufficiently to engage regular tie-bolts. After engaging regular tie-bolts to a depth of at least three threads, remove the longer bolts and replace with regular bolts. A large jack screw through the wheel hub holes may also be used to draw the wheel halves together. However, care must be taken to spread the load evenly on the wheel halves. Care must be taken to prevent damage to the wheel bearing cups when inserting the jack screw through the wheel hub.

(f) The assembly is now ready for inflation. Refer to para. 18 for proper inflation procedures.

DEMOUNTABLE FLANGE WHEELS

12 Mount demountable flange wheels as follows:

(a) Check rim flange to insure that it is the proper size and type for the wheel. Malfitting or defective rim flanges will not be used.

NOTE

Flange must be mated with original wheel.

(b) Inspect wheel for damaged rims, demountable flanges and locking rings in accordance with applicable wheel EO.

(c) Insert deflated tube in tire and inflate until tube is well rounded out, refer to Figure 2-33.

NOTE

During mounting operations where the wheel casting is likely to contact the bench or floor a rubber or felt mat is to be used. This will prevent damage to the anti-corrosive treatment on the casting.

(d) Lift up and insert wheel in the tire with the valve slot in line with the valve and push the wheel as far as possible into the tire, see Figure 2-32.

(e) Place the tire so that it lies flat with the fixed flange side down.

NOTE

Before insertion of tube lightly coat valve stem bore of wheel with a light coat of grease, pneumatic Spec. 3-GP-605, 34A/9150-21-802-4316.

(f) Guide the valve through the valve hole. Use a blunt tool if necessary.

(g) Screw a valve extension onto the valve stem if necessary. Install the demountable flange evenly to prevent binding. If the rim flange is slotted, line up the slot in the flange with the slot in the wheel. A rubber mallet may be used to tap the demountable flange into place; but lead or steel hammers must not be used and no attempt should be made to pry the flange into position. If flange will not fit easily, recheck the wheel for defective rims and slots and recheck demountable rim flange for proper type and size.

NOTE

Before final assembly lockring recess and inner mating surface of demountable flange are to be very lightly coated with grease pneumatic Spec. 3-GP-605, 34A/9150-21-802-4316. This will facilitate installation and most important of all prevent fretting and corrosion at contact surfaces.

(h) Install locking ring. If locking ring has a collar, be certain that the ring is properly seated in the ring groove.

(j) The assembly is now ready for inflation. Refer to para. 19 for proper inflation procedures.

WARNING

There have been serious injuries, a few fatal, to personnel due to lack of care while inflating demountable flange wheels. Be sure the flange is not cocked or bound and inflate slowly. At very low pressure, the flange should move far enough to cover the locking ring. See that the ring is properly placed and secured, and that the flange is in the proper place before

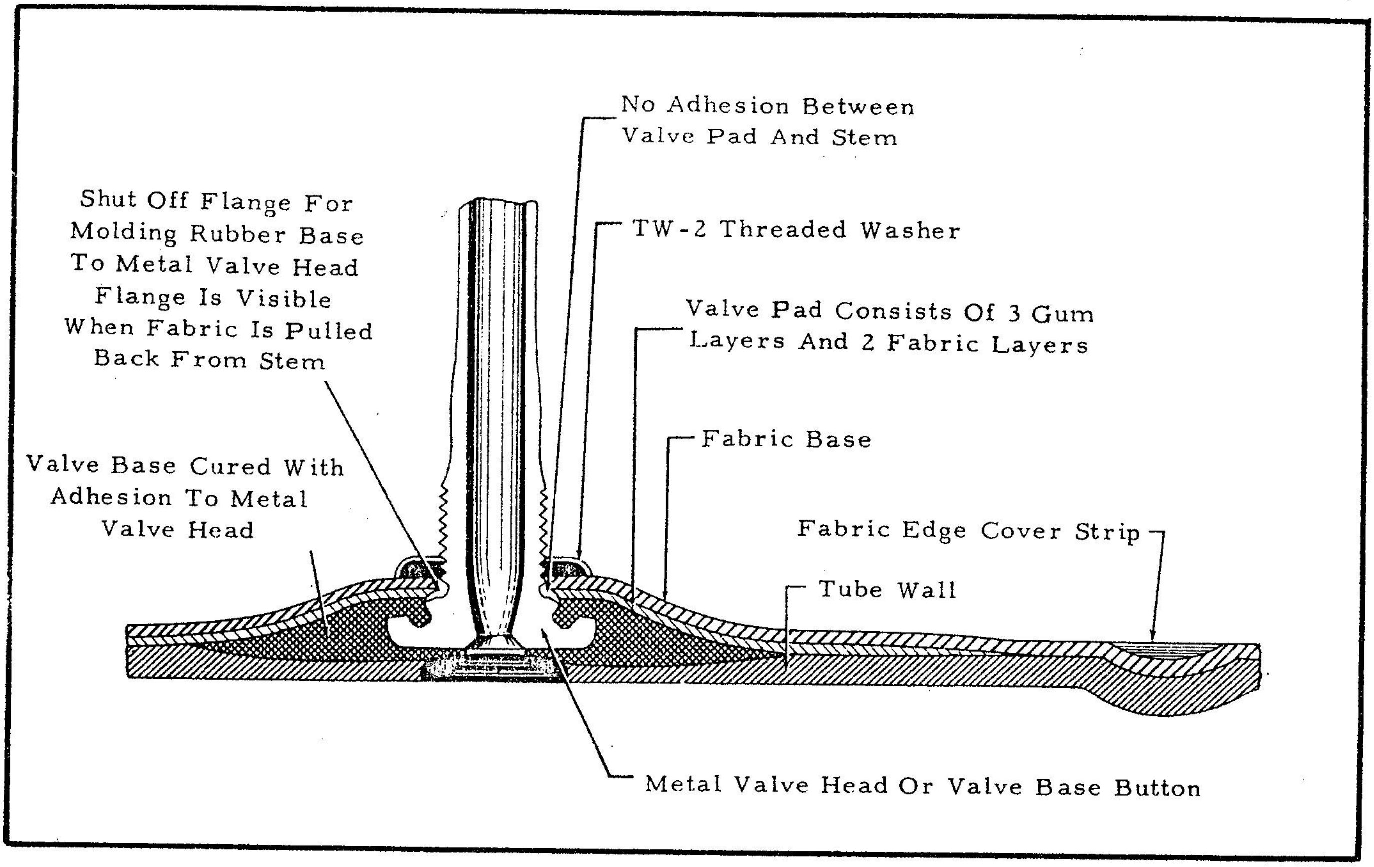

Figure 2-18 Inner Tube with Metal Valve Stem

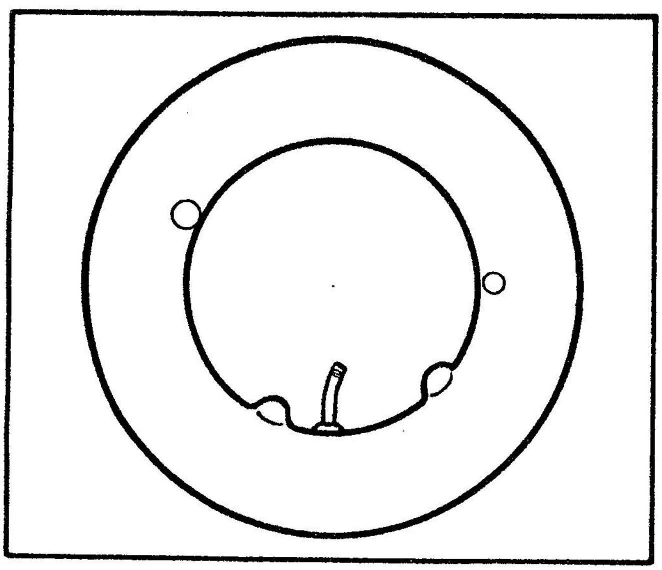

Figure 2-19 Blisters Due to Trapped Air Under Fabric Bases

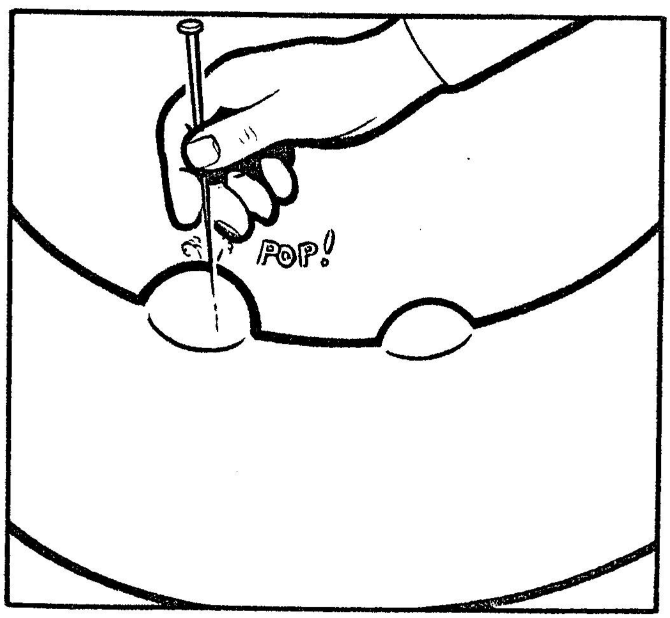

Figure 2-20 Blisters Being Pierced by Pin

exceeding 20 psi pressure. Remember the pressure is acting over the entire area of the sidewall so that this area multiplied by the pressure is the total force that can be exploded if the flange or ring yield suddenly. Unit tire shops should fabricate a cage to contain tires being inflated affording protection to the operator. This cage should be constructed to meet the approval of the local RCAF Ground Safety Committe. Every attempt should be made to eliminate the need for hand holding the air chuck during the inflation operation.

(k) On some wheels, the toe of the demountable flange is positioned very close to the inner-tube valve. When the demountable flange is depressed for insertion of the locking ring, the ledge will contact the tube valve. Care must be taken to depress the flange slowly and carefully. Never depress flange when tube valve is seated in valve hole. Do not depress flange farther than absolutely necessary to insert locking ring. During mounting, return flange as nearly as possible into position against the locking ring prior to initial inflation.

INFLATION - GENERAL

13 In some applications, (trucks, automobiles, etc.) the tire inner tube is fabricated with butyl rubber. Military aircraft tubes, because of low temperature considerations, must be constructed out of natural rubber. Natural rubber tubes are inherently poor air retainers, as air will diffuse through the material itself. This will account for the normal high daily-pressure loss experienced with aircraft tires. If the pressure loss due to diffusion is not corrected daily, the aircraft will operate the tire at deflections higher than it can tolerate, acting as the initiator of ply separation, resulting in the complete loss of the tread when the tire is rotated at high speeds or in an actual heat-incited blow-out of the tire. UNDER-INFLATION IS KNOWN TO HAVE BEEN THE CAUSE OF SEVERAL SERIOUS TREAD THROWING INSTANCES IN THE PAST. User units are therefore cautioned to check and correct tire inflation pressures daily, especially at the preflight inspection with a tire gauge rather than by visual inspection.

WARNING

Serious injury to personnel can be sustained if improper equipment is used in inflation, causing explosive failure of tire and wheel sections.

14 Many low-pressure air systems are not adequate for inflating high-pressure tires. Personnel have therefore been prone to use a high-pressure air source, such as booster pumps not designed for tire inflation. This practice has resulted in explosive failures of tires and wheel sections. Whenever booster pumps or air-pressure bottles are used as a source of pressure and the booster pump output or the pressure stored in the bottle is greater than 500 psi, a regulator shall be used enabling maintenance personnel to have a controlled line pressure of not more than 500 psi. Personnel are cautioned against the use of a high-pressure source unless the above recommendations are used.

NOTE

Ensure that the air supply used for the tire inflation is free from oil vapour, see EO 00-80-4/5.

15 In order to prevent accidents during the inflation of tires, the following procedures will be followed:

(a) Wheel sections and parts will be closely inspected for security of assembly in accordance with the applicable aircraft EO.

(b) Periodic checks of air pressure within the tire, during the inflation, will be made to avoid over inflation.

WARNING

Where a tire cage is not used tire and wheel assemblies are to be placed in an upright position during inflation. Inflating the tire from this position, see Figure 2-9, will lessen the hazard of injury in case of wheel failure from cracks, over-inflation, etc.

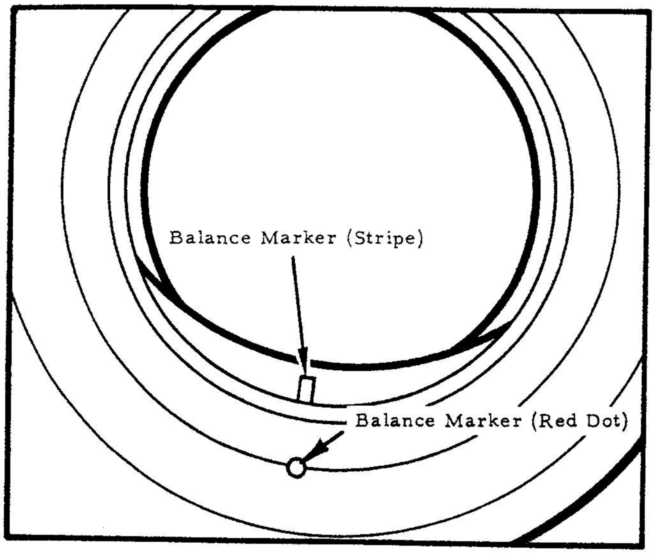

Figure 2-21 Balance Markers on Tire and Tube in Proper Positions

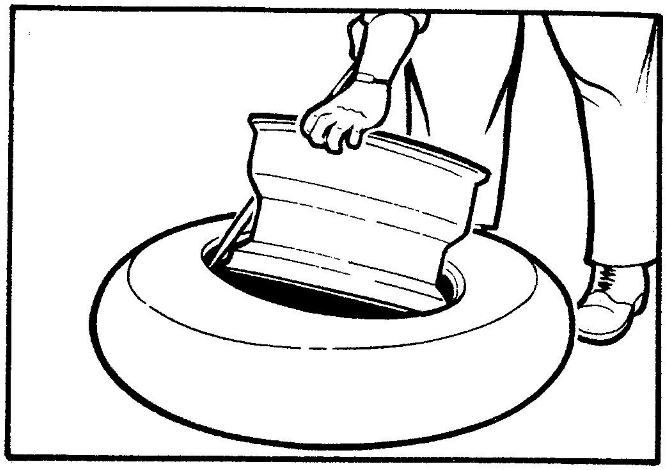

Figure 2-22 Placing Flange of Wheel Under Tire Bead to Start Mounting Operation

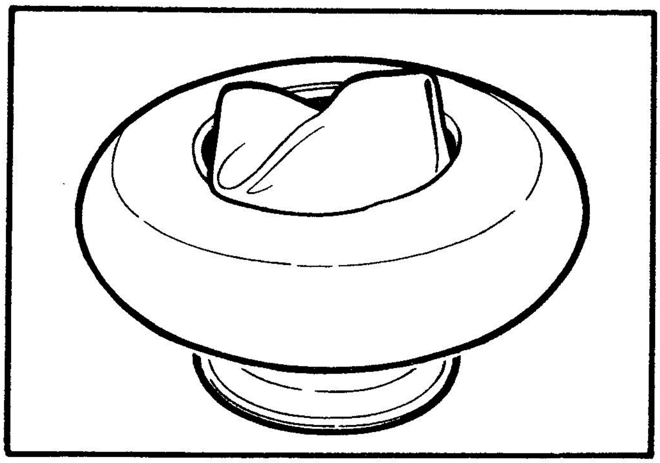

Figure 2-23 Position of Wheel, Tire and Tube Prior to Mounting Tube

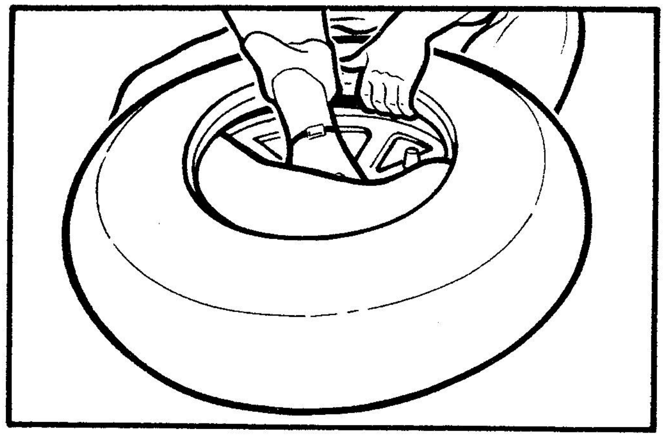

Figure 2-24 Positioning Tube to Insert Valve in Valve Hole

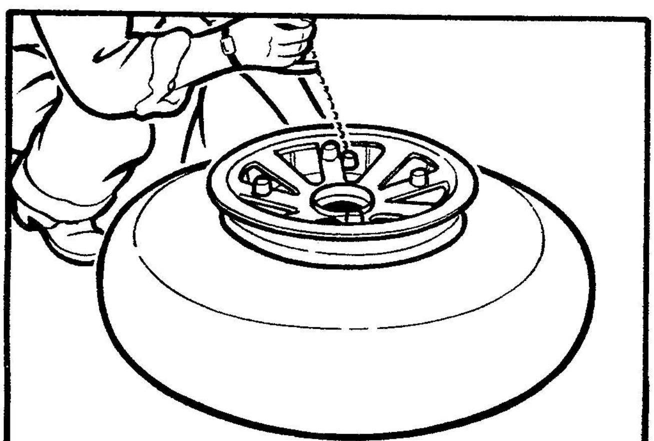

Figure 2-25 Holding Valve in Position with Valve Fishing Tool

Figure 2-26 Prying Bead over Wheel Flange

(c) Tires and wheels will be checked after inflation for signs of defects. If defects are discovered, the tire must be completely deflated and defects corrected.

RELIEVING POCKETED AIR

16 Relieve pocketed air as follows:

CAUTION

Aircraft tires are susceptible to sidewall and tread separation if extreme care is not taken during mounting. This unsatisfactory condition has appeared at widely scattered bases and is not limited to tires of any particular manufacturer. Sidewall or tread separation can be a direct result of air trapped between the inner tube and the tire until it finds a point at which it can seep into the carcass. This air will then work from cord to cord and from ply to ply until eventually it is trapped between the outermost ply and the tread or sidewall rubber. Eventually, due to pressure build-up, this air will form a blister easily detected on the sidewall but seldom detected in the crown area of the tire. A serious separation between the tread or sidewall and the carcass of the tire will result from this blistered condition. A tube leak, when present, will cause the same difficulty, Blisters caused by trapped air during the mounting operation of a tubed tire can frequently be avoided by inflating, deflating, and re-inflating the tire immediately after mounting. When sidewall blisters appear as a result of trapped air, their appearance will occur during the early part of the tire service period. If such blisters are noticed before they exceed one inch in maximum dimension, they will be relieved by puncturing with an awl. This will not affect the service life of the tire. Tires with blisters over one inch maximum dimension will be removed from service and scrapped.

(a) In order to eliminate this trapped air condition, the following mounting procedures should be followed. Prior to inserting inner tube in tire, dust inside of tire generously with lubricating compound (talc), Ref. 33C/87. Compound which settles on the tire beads will be wiped off with a cloth dampened in clear water. After the inner tube is placed in the tire and before the tire is mounted on the wheel, inflate the tube slowly until the tire beads start to spread. Probe between tube and tire with fingers to relieve possible air trapped in the shoulder area, see Figure 2-33. Resume normal mounting procedure. The inner tube may be deflated slightly if the tire beads are spread enough to hamper proper positioning of wheel parts.

(b) Venting of extra high pressure type VII and extra high pressure low profile type VIII tires assists the escape of trapped air. Therefore, venting cannot be considered as reason for relaxing instructions outlined in para. 16 (a).

(c) Venting of tires at time of manufacture was made mandatory in 1954. The two methods of venting tires by the manufacturer are:

(1) Venting by awl or drill, see Figure 2-35. These vent holes extend completely through the tire sidewall (except tubeless tires) and are marked with a ring or dot of white or aluminum paint or with a raised mold ring around the hole. Vent holes in tubeless tires do not go completely through the tire sidewall.

(2) Venting by air bleed grooves and ridges, see Figure 2-36. Some manufacturers tires (not tubeless tires) are vented by air bleed grooves in the bead face and air bleed ridges on the inside surface of the tire which channel trapped air from between the tire and inner tube to the air bleed grooves, thereby, permitting air to escape thru the grooves in the bead face.

(d) Air bleed vent ridges appearing on inner tubes are frequently considered to be mold marks. This is a fallacy, as the ridges are molded in the tubes purposely to permit trapped air to bleed to another area where it can more easily escape to the atmosphere. The type, number, and style of ridges vary with different manufacturers. Prior to November 1952 the molding of ridges was not mandatory and consequently, some tubes appear without any air-bleed provisions whatever. Vent ridges are required, on Type III tubes used at inflation pressures in excess of 100 psi and all Type VII tubes. Type III tubes not having vent ridges, when vent ridges are required, will not be

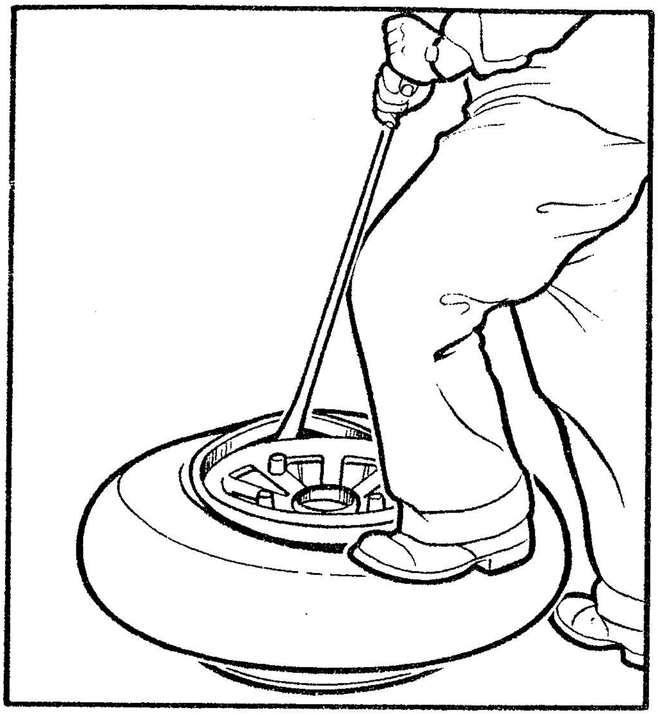

Figure 2-27 Prying Bead into Wheel Well

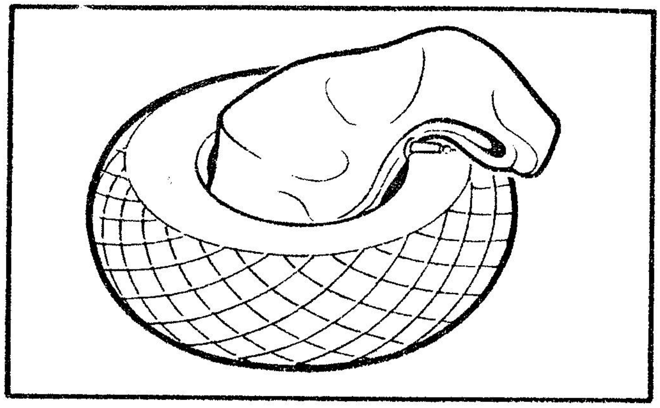

Figure 2-28 Tube Folding for Mounting

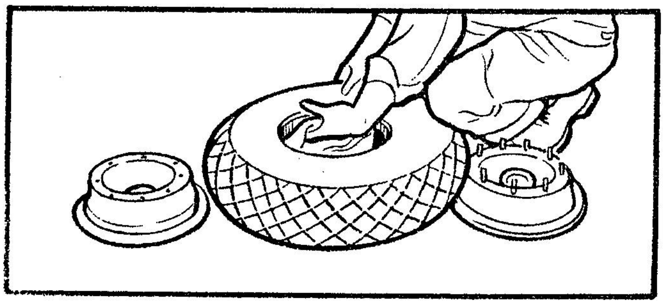

Figure 2-29 Inserting Tube in Tire

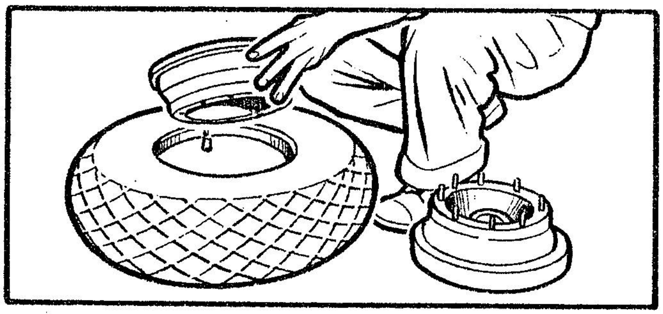

Figure 2-30 Inserting Section of Wheel with Valve Hole in Tire

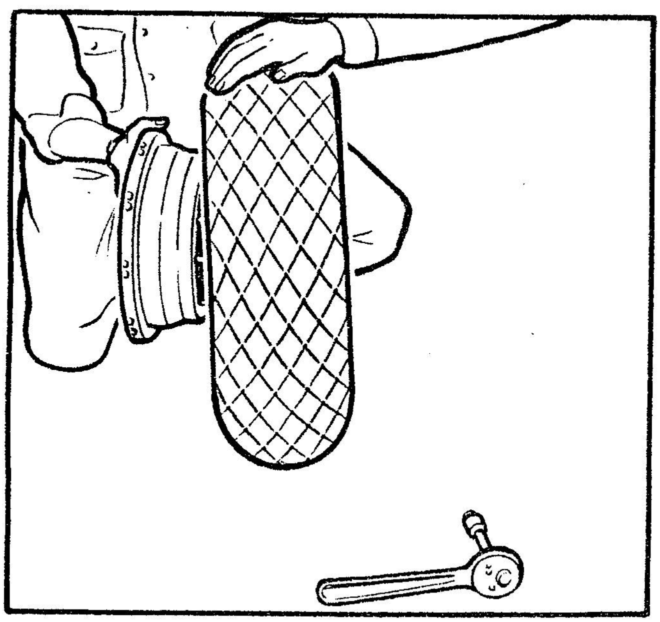

Figure 2-31 Inserting Second Section of Wheel in Tire

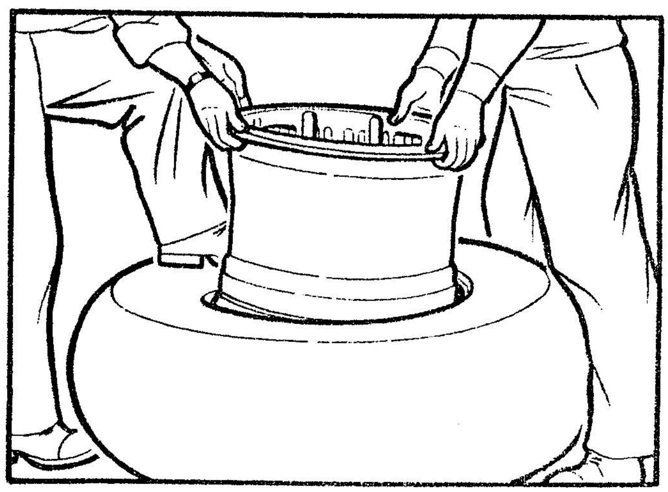

Figure 2-32 Pushing Wheel into Tire

used. Type VII tubes found without vent ridges will not be used. These tubes will be condemned and disposed of in accordance with existing instructions.

DROP CENTER WHEELS

17 Inflate as follows:

(a) Without valve core installed inflate with just enough air pressure to seat the tire beads against the rim flange.

(b) Deflate the tire completely, then install valve core and re-inflate tire to the pressure stated in column 7 of table listed in Part 5 for the applicable type and size tire. A tire gauge should be used during inflation and for pressure checks. Deflating and re-inflating relieves the pressure of folds or buckles and permits the tube to assume proper contour within the tire. After 24 hours, except in an emergency, the tire will be checked for leaks and the wheel for signs of defects. If found satisfactory, the pressure should be reduced to 20 psi for storage or shipment.

(c) Install valve cap. Every valve will have a valve cap installed; screw on firmly with finger pressure. The cap prevents dirt, oil, and moisture from entering the valve and damaging the core. It also seals air and serves as protection should a leak develop in the valve core during flight.

(d) Inflation of high pressure tires, which require pressures in excess of 100 psi, refer to para. 20.

SPLIT OR DIVIDED WHEELS

18 Inflate as follows:

(a) Check to make sure inner tube is not caught between the wheel sections or under the tire beads.

(b) Rest of the procedures are same as foregoing para. 17 (a)(b) and (c).

(c) Inflation of high pressure tires, which require pressures in excess of 100 psi, refer to para. 20.

DEMOUNTABLE FLANGE WHEELS

19 Inflate as follows:

WARNING

Personnel have been standing on, sitting on, or leaning over the demountable flange side of the wheel during the inflation process. This practice is very dangerous and should be discontinued immediately. If the demountable flange should not be seated properly, it will explode from the rim with a violent reaction which could cause fatal, or serious injury to the servicing personnel. Every attempt should be made to eliminate the need for holding the air chuck while performing the inflation operation.

(a) Be sure the flange is not cocked or bound. Without valve core installed, inflate with just enough air pressure to seat the tire beads against the rim flanges. At very low pressure, the flange should move far enough to cover the locking ring. See that the ring is properly placed and secured, and that the flange is in the proper place before exceeding 20 psi pressure. Check the demountable flange frequently to ensure that it is seating properly.

(b) Rest of procedures are same as foregoing para. 17(b) and (c).

(c) Inflation of high pressure tires, which require pressures in excess of 100 psi, refer to para. 20.

INFLATING HIGH PRESSURE TIRES

20 Inflate as follows:

(a) High pressure tires are tires which require pressures in excess of 100 psi.

(b) Check to make sure the inner tube is not caught under the tire beads and/or between the wheel sections.

(c) Install the valve core and inflate to 20 psi. Do not seat the tire beads. The tire should then stand for a period of one hour, except in an emergency, to permit any remaining air to bleed from the shoulder area before the inner tube vent ridges are compressed from ad-

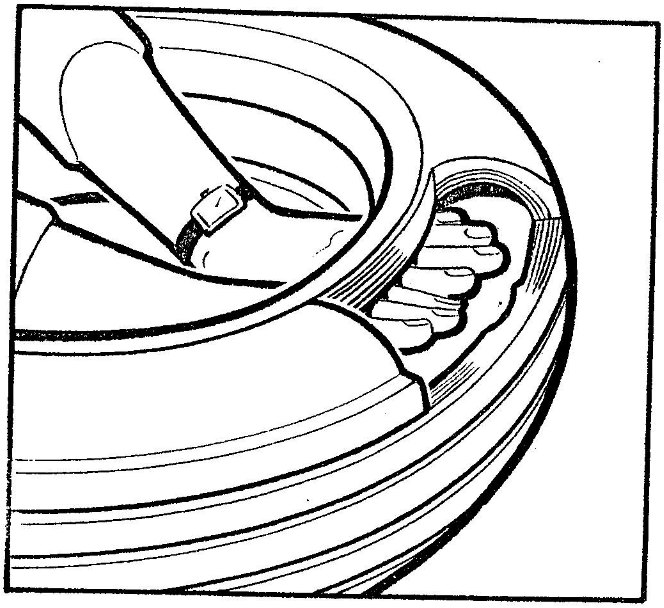

Figure 2-33 Method of Probing to Permit Escape of Trapped Air

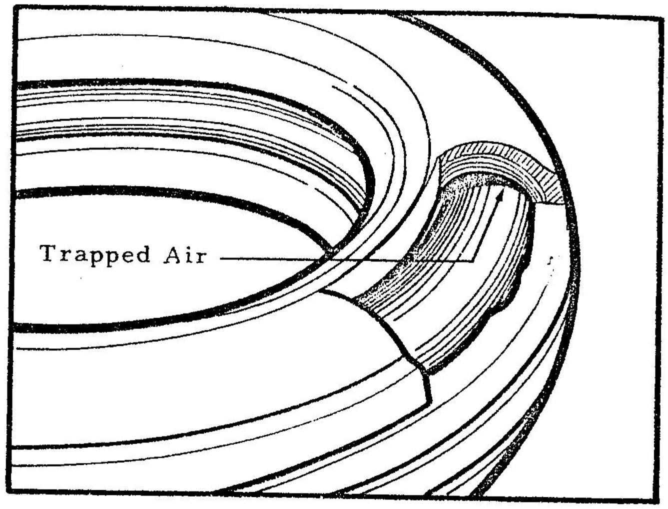

Figure 2-34 Window Cut in Tire to Show Location of Trapped Air

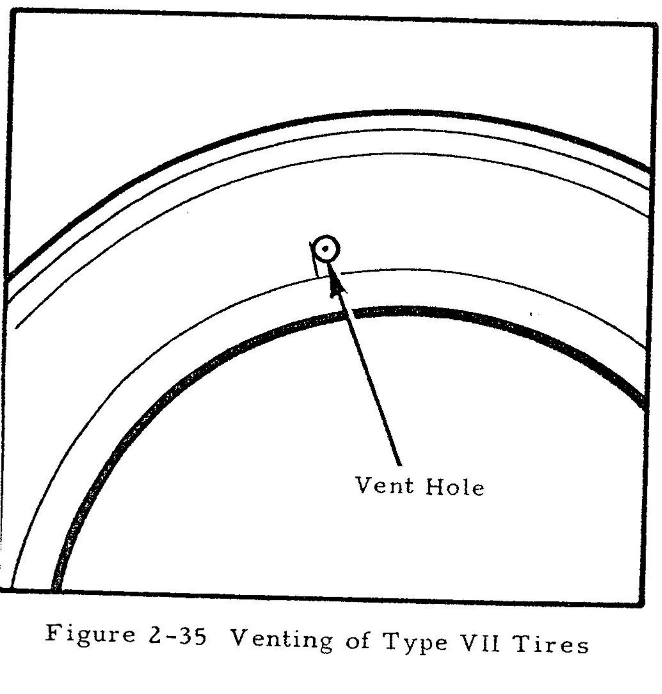

Figure 2-35 Venting of Type VII Tires

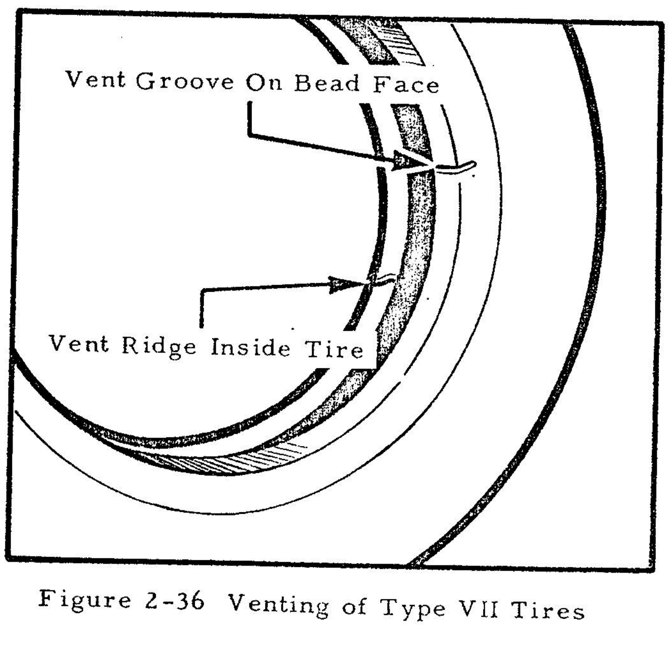

Figure 2-36 Venting of Type VII Tires

ditional pressure. After the one-hour period, the pressure will be increased to no less than that specified in column 7 of Table listed in Part 5 for the applicable type and size to seat the tire beads against the rim flanges. With the demountable flange wheels, check frequently to ensure that the flange is seating properly. Deflate the tire completely using deflator. Then re-inflate tire to the pressure stated in column 7 of table listed in Part 5 for the applicable type and size tire. A tire gauge should be used during inflation and for pressure checks. Deflating and re-inflating relieves the pressure of folds or buckles and permits the tube to assume proper contour within the tire.

(d) Having completed the above proceed as follows:

(1) After the tire has been inflated to the maximum rated pressure, except in case of an emergency, the tire will be allowed to stand for 24 hours and the expected loss due to tire stretch be replaced. The total air lost should not exceed 5 per cent in a 24 hour period under normal conditions. Pressure loss in excess of 5 per cent within 24 hours, after tires have been inflated at least 24 hours and re-inflated to compensate for stretch, is considered excessive. In the event the pressure loss for the second 24 hour period exceeds 5 per cent install a new tube. If the pressure is statisfactory after the pressure check reduce the pressure to 20 psi for storage or shipment.

(e) Install valve cap. Every valve will have a valve cap installed, screw on firmly with finger pressure. The cap prevents dirt, oil, and moisture from entering the valve and damaging the core. It also seals air and serves as protection should a leak develop in the valve core during flight.

PART 3

DISMOUNTING AND MOUNTING OF AIRCRAFT TUBELESS TIRES

DISMOUNTING - GENERAL

1 Dismounting is accomplished as follows:

WARNING

Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tubeless tire.

(a) Remove valve cap and apply deflator, to release pressure completely and then remove the valve core to release any remaining air.

(1) An additional precaution is to be observed when removing high-pressure tires. During the deflation procedure, the valve stem may become blocked with pieces of ice and it is possible that the operator not hearing any exhausting air might conclude that the tire is fully deflated. Sufficient time must therefore be allowed to elapse between the removal of the valve core and the dismantling of the wheel to ensure that the air has been completely exhausted from the tire. No probing devices are necessary to ensure that the valve hole is clear as the ice formations will break under normal ambient temperatures and allow free passage of any air remaining in the tire. This icing up process may take place several times before the tire is completely exhausted of air.

(2) At the time of disassembly all major components (wheel halves - demountable flanges etc.) are to be identified in such a manner as to ensure re-assembly with the same components. Metal stamps must not be used for this purpose.

NOTE

During dismounting operations where the wheel casting is likely to contact the bench or floor, a rubber or felt mat is to be used. This will prevent damage to the anti-corrosive treatment on the casting.

(b) Break beads from both flanges by applying pressure in even increments around the entire sidewall as close to the tire beads as possible.

CAUTION

Do not pry between flange and bead with sharp tools, or the wheel and tire may be damaged destroying their sealing and structural qualities.

(c) Remove nuts, bolts and washers which secure the wheel sections of divided style wheels or remove flange from demountable flange type wheel.

(d) Remove tire.

(e) Remove wheel seal carefully and place on clean surface. Re-use of seals is authorized only if replacement seals are not available.

INSPECTION AND CLEANING OF TIRE, WHEEL AND SEAL PRIOR TO MOUNTING

TIRE INSPECTION

2 Inspect and clean as follows:

(a) Check tire for word "tubeless" on sidewall.

(b) Visually inspect the tire with emphasis on bead area for shipping or handling damage.

(c) Before mounting make certain that tire is free of foreign material, ensure bead areas are clean by wiping with a cloth dampened with denatured alcohol Spec. 3-GP-530, 34A/6810-21-802-3438.

CAUTION

It is imperative that the tire beads do not become contaminated with any grease whatsoever.

WHEEL INSPECTION

3 Inspect and clean as follows:

(a) Check wheel for tubeless identification.

(b) Check for deep scratches, nicks, or other damage in flange bead seat, wheel and flange register areas, "O"-ring sealing surfaces, and see that these areas are wiped free of foreign material.

(c) Inspect wheel sections and sealing of drive key screws which may extend into tube well.

NOTE

At each disassembly of the wheel, clean the seal mating surface with a cloth dampened with denatured alcohol Spec. 3-GP-530, 34A/6810-21-802-3438.

CAUTION

Do not use Isopropyl Alcohol.

(d) Check valve for proper sealing and security of valve locking nut.

(e) Inspect tube-well area of wheel and keep well painted.

NOTE

Mating surfaces of wheel sections on flanges should have only one mist coat of zinc chromate primer.

SEAL INSPECTION

4 Inspect and clean as follows:

NOTE

Seals will be replaced at each tire change. Re-use of seals is authorized only if replacement seals are not available. Inspection of seals to be re-used will be in accordance with paras. 4 and 6.

(a) Clean seal with denatured alcohol.

(b) Inspect seal for damage or excessive deformation.

CAUTION

Do not apply stretch to the seal while cleaning and inspecting. Enlargement would result to the extent that the seal would not fit when re-use is desired.

MOUNTING - GENERAL

5 Mounting procedure for tubeless tires are generally the same as for tires with tubes except for the addition of an "O"-ring seal between the wheel halves, see Figure 3-1.

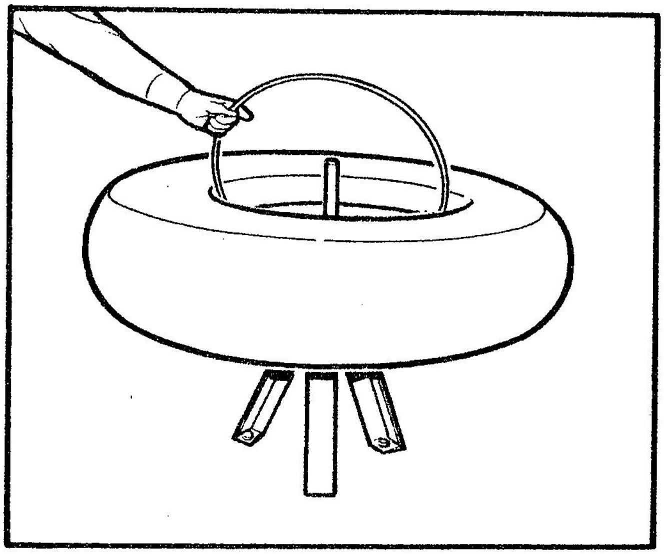

Figure 3-1 "O"-Ring Seal Used When Mounting Tubeless Tire

DIVIDED TYPE WHEELS

6 Mounting is accomplished as follows:

(a) Lubricate wheel seal with a light film of Dow Corning DC-4 compound Spec. MIL-I-8660-1, 33G/5970-00-224-5276.

(b) Install wheel seal on wheel half.

NOTE

Seal should be equalized on wheel and not twisted. If seal is re-used it should be installed as near as possible to its original position. The seal should not be re-used unless it has had at least a 48 hour recovery period.

(c) Clean the tire beads and wheel bead seat areas with a cloth dampened in denatured alcohol. Place wheel section containing seal on flat surface and position the tire on wheel half with the red balance dot at the valve stem.

CAUTION

Care should be taken to avoid misaligning or damaging the wheel seal.

(d) Position other wheel section in tire and align the bolt holes; then install the wheel bolts as follows:

(1) Compress wheel sections enough to allow installation of four bolts, washers and nuts 90° apart; draw up evenly until wheel halves seat, then install remaining wheel bolts, washers, and nuts.

NOTE

When countersunk washers are used on wheel half bolts, the countersink should face the bolt heads.

(2) Tighten all bolts in increments of 20% of the torque value specified on the wheel until total value is reached.

NOTE

Bolts shall be tightened in a criss-cross order to prevent dislocating of wheel seal.

DEMOUNTABLE FLANGE TYPE WHEELS

7 Mounting is accomplished as follows:

(a) Clean the tire beads and wheel bead seat areas with a cloth dampened in denatured alçohol, position tire on wheel with red dot at valve stem.

(b) Lubricate wheel seal with a light film of Dow Corning DC-4 Compound Spec. MIL-I-8660-1, 33G/5970-00-224-5276, and install on the flange sealing surface in accordance with specific wheel EO.

(c) Install demountable flange on wheel and secure.

WARNING

There have been serious injuries, a few fatal to personnel due to lack of care while inflating demountable flange wheels. Be sure the flange is not cocked or bound and inflate slowly. At very low pressure, the flange should move far enough to cover the locking ring. See that the ring is properly placed and secured, and that the flange is in the proper place before exceeding 20 psi pressure.

INFLATION - GENERAL

8 Inflate as follows:

(a) Install the valve core and inflate to the pressure stated in column 7 of table listed in Part 5 for applicable type and size tire. Dual inflation is not necessary for tubeless tires. A tire gauge should be used during inflation and for pressure checks.

(b) After the tire has been inflated to the maximum rated pressure, except in case of an emergency, the tire will be allowed to stand for 24 hours and the expected loss up to 10% due to tire stretch replaced. The total air loss for a tubeless tire and wheel assembly should not exceed 5% in a 24-hour period under normal conditions. Pressure loss in excess of 5% within 24-hours, after tires have been inflated at least 24-hours and re-inflated to compensate for stretch, is considered excessive.

NOTE

When checking for pressure variations over a period of time, due allowance must be made for any substantial change in ambient temperature and the pressure loss due to application of the gauge.

(c) In the event the pressure loss for the second 24-hour period exceeds 5%, re-inflate the tire to rated pressure and check the complete assembly for leaks. Painting the tire with a soapy solution aids in checking for leaks. Continuous seepage in the form of small bubbles at a very slow rate is not basis for rejection. All tubeless tires will normally seep air at a very slow rate at the vent holes. Should the tire show leakage at a fast rate with large bubbles, then it has been damaged or is defective. Loss of air known to be confined to the bead seat area in the case of tires with a normal operating pressure of 150 psi and lower, over inflation of tire by 25% of normal operating pressure is permissible in order to create a better seat in this area. Tire to remain at this pressure for a period of 24-hours at room temperature. Reduce to operating inflation pressure and make a further check for leaks.

CAUTION

Ensure over inflated tires are marked as such on sidewall of tire using white chalk. Tire pressure shall be lowered to normal operating inflation value before leaving component shop.

(d) Tubeless Tires - Sidewall or tread blisters can occur in tubeless tires as a result of diffused air which has passed through the inner liner or from inner liner defect (cracks, blisters, open splices, holes, etc.), which may inadvertently occur during service or which may be missed during final inspection. In as much as the tubeless tire and wheel is a pressure-tight assembly, it is obvious that the inner liner of a tubeless tire is subjected to pressure at all times, while inflated, much the same as an inner tube used with a tube-type tire. In the case of an inner tube, the air diffused through the tube can escape around the valve stem hole, wheel drive key holes, or the tire vent holes. The air that diffuses through the inner liner of a tubeless tire is trapped in the carcass of the tire. This trapped air then wicks its way through the carcass until relieving itself through the tire vent holes which have been provided for this function, see Figure 2-35. Vent holes in tubeless tires extend through the sidewall rubber and into the carcass for a limited depth (not completely through the tire sidewall as in the case of tube-type tires). Venting further prevents pressure buildup in the carcass and eliminates the possibility of ply separation and blisters between the sidewall or tread rubber and the carcass. Diffused air is lost through the vent holes at all times; however, this air loss is minor. The total air loss for a tubeless tire and wheel assembly should not exceed 5 per cent in a 24 hour period under normal conditions. When sidewall blisters appear as a result of trapped air, their appearance will occur during the early part of the tire service period. If such blisters are noticed before they exceed one inch in maximum dimension, they will be relieved by puncturing with an awl. This will not affect the service life of the tire. Tires with blisters over one inch maximum dimension will be removed from service and condemned.

NOTE

Following initial inflation, tubeless tires with inflation pressures in excess of 150 lb are to be observed for indications of separation and blisters. When blisters are encountered on tires with extra high inflation pressures, the problem may be resolved by inflating the tire to 150 psi for a period of 4 to 6 hours, followed by the normal inflation period described above.

(e) Tubeless tire and wheel assemblies, should not be dismantled until both wheel (wheel seals and valve seal) and tire are inspected for source of pressure loss. If the pressure is satisfactory after the pressure check, reduce the pressure to 20 psi for storage or shipment.

(f) Install valve cap. Every valve will have a valve cap installed, screw on firmly with finger pressure. The cap prevents dirt, oil, and moisture from entering the valve and damaging the core. It also seals air and serves as protection should a leak develop in the valve core during flight.

PART 4

MARKING AND INSPECTION OF TIRES AND WHEEL RIMS TO DETERMINE TIRE SLIPPAGE AND BALANCING OF TIRES, TUBES AND WHEELS AS ASSEMBLIES

PURPOSE

1 To reduce the possibility of tire and tube failure due to slippage of tires and to provide a means of detecting tire slippage, all tube type tires will be marked and registered with the wheel rims.

MARKING

TUBE TYPE TIRES

2 Paint a mark one inch in width and two inches in length across the tire sidewall and wheel rim to extend one inch on the tire sidewall and one inch on the wheel rim. On wheels having a demountable flange and locking ring the mark will be placed on the permanent flange side of the wheels. When installation or conditions, such as dual wheels, make the slippage marks difficult to see, it is permissible to paint marks on the demountable flange side. The mark should extend across the flange onto the center portion of the wheel. Use cellulose nitrate lacquer white Spec. 1-GP-134.

NOTE

Do not paint the locking ring.

TUBELESS TYPE TIRE

3 Slippage marks are not required on tubeless tires, however this does not preclude their use should it be deemed necessary because of low inflation pressure of that particular tire or the circumstances under which the aircraft is operating.

INSPECTION

4 Inspection daily of all aircraft on which wheels and tires are marked for indication of tire slippage is mandatory. If markings do not register, slippage is evident. If a wheel is returned for tire slippage, completely dismantle and check for internal damage. If on inspection items check OK, re-assemble. Remove former slippage marks and paint on new marks.

BALANCING

5 It is not necessary for RCAF or aircraft contractor personnel to recheck balance condition of any one component, or of mounted tire, tube and wheel assemblies prior to installation on aircraft. Contractors or RCAF service personnel will not make changes in a tire, tube, or wheel assembly, for the purpose of bringing the item or assembly within the specified limit of unbalance when it is beyond the tolerance without specific approval by AMCHQ or when so authorized under provisions of the contract. If the assembly indicates excessive unbalance when properly mounted, the equipment will be replaced and a UCR raised regarding the defective equipment.

PART 5

AIRCRAFT TIRE INFLATION PRESSURE

GENERAL

1 This Part will be used as a guide in preparing tire pressure instructions in -2 handbooks, but does not supersede these -2 handbooks. This EO may also be used by the Aircraft Maintenance Engineering Officer as tentative pressure instructions if -2 handbook instructions result in unsatisfactory tire service and performance. In this case, consult AMCHQ to correct the situation. Disregard any tire pressure instructions molded into the tire sidewalls.

NOTE

For normal winter operations hangared aircraft are to have inflation pressure increased by 10%.

When local outside air temperatures are such that the basic 10% increase is deemed inadequate, CTSOs are authorized to promulgate Unit Maintenance Orders defining corrected pressures to compensate for the difference between hangar and outside air temperatures on a calendar basis - based on the following:

(a) 10°C (18°F) temperature difference add 5% + 5 psi.
25°C (45°F) temperature difference add 10% + 5 psi.
40°C (70°F) temperature difference add 15% + 5 psi.
55°C (100°F) temperature difference add 20% + 5 psi.

(b) The corrections in (a) are to be calculated on a monthly basis based on monthly average outside air temperature.

DETERMINATION OF CORRECT TIRE INFLATION

2 Determine correct inflation of all landing gear tires once a day at preflight inspection. The tire pressures will be based on the maximum known gross load of the aircraft for that day. Air will not be bled from tires on subsequent inspection to conform with gross loading unless a period of 6 hours has elapsed since the last flight. WHEN CHECKING TIRE INFLATION PRESSURES USE ACCURATE PRESSURE GAUGES, UNSERVICEABLE AIRCRAFT WILL HAVE A TIRE INFLATION PRESSURE CHECK EVERY 48 HOURS.

INFLATION OF MAIN WHEEL TIRES

3 Inflate main wheel tires as follows:

(a) The main wheel tire pressure is designed for the actual static load on the tire. These loads will be accurately determined from weight and balance reports, actual weighing of the aircraft or similar methods.

(b) The in-service inflation pressure is based on the rated static load and inflation pressure of the tire. These pressures are initial pressures without load (the inflation pressures may increase by up to about 4% when load is applied).

(c) The inflation pressure is determined by the equation:

$$P = \frac{L}{L_r}(P_r)$$

Where: P = Initial inflation pressure to be used.

P_r = Rated inflation pressure of the tire.

L = Actual static load on the tire.

L_r = Rated static load of the tire.

(d) Figure 5-2 is a tabulation of this equation for main wheel tires at five loading conditions.

(e) Helicopter tires will be inflated for the actual static load when installed on main, nose or tail wheels, see paragraph 3(b). Figure 5-3 is a tabulation of inflation pressures for helicopter tires at five loading conditions.

(f) Aircraft tires of nylon ply construction may be used on helicopters. The tire load rating for helicopter applications is 1.67 times the standard aircraft static load rating. The rated inflation pressure for helicopter usage is 1.50

times the aircraft rated inflation pressure. When helicopter tires are not available, aircraft tires of the same size may be used if the actual tire load does not exceed 1.67 times the aircraft tires rated static load.

INFLATION OF TAIL WHEEL TIRES

4 Inflate tail wheel tires as follows:

(a) The tail wheel tire pressures are designed for the actual static tire loading. These loads should be accurately determined from weight and balance reports or actual weighing of the aircraft.

(b) Inflate tail wheel tires in accordance with Figure 5-4. The pressures listed are initial pressures and will increase approximately four percent under load.

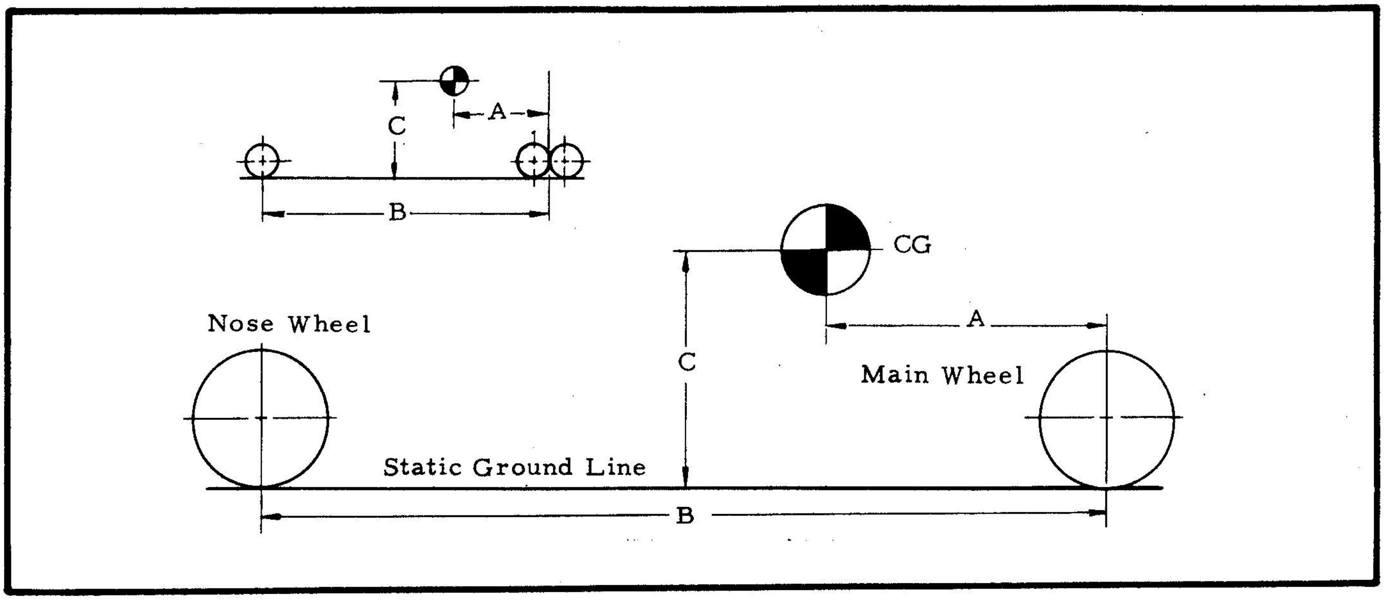

Figure 5-1 Aircraft C of G Location

INFLATION OF NOSEWHEEL TIRES

5 Inflate nose wheel tires as follows:

(a) Type VI tires will be inflated in accordance with Figure 5-5 which is a table of dynamic load and inflation pressure ratings of type VI tires.

(b) When tires listed in Figure 5-2 are used on aircraft nosewheels, inflate the nosewheel tires to the equivalent static load $L_{e.s.}$, see equations 5(c) and 5(d).

$$P = \frac{L_{e.s.}}{L_r}(P_r)$$

Where: P = Initial inflation pressure to be used.

$L_{e.s.}$ = Equivalent static load of the tire.

L_r = Rated static load of the tire.

P_r = Rated inflation pressure of the tire.

(c) The actual nosewheel static load L_s is determined by the following equation:

$$L_s = \frac{W(A)}{N_n(B)}$$

Where: W = Aircraft weight (in pounds).

N_n = The number of nosewheels.

A = Distance from C of G to main wheel center.

B = Wheelbase of aircraft, see Figure 5-1.

The braking load L_b is the reaction experienced, with an aircraft deceleration of ten feet per second (10 fps^2), and is determined by the formula.

$$L_b = \frac{.31C(W)}{(N_n)B}$$

Where: c = Height of C of G from static ground line, see Figure 5-1.

(d) The equivalent static load $L_{e.s.}$ is obtained by dividing the total dynamic load L_d (the sum of the actual static load L_s and the braking load L_b) by the dynamic load factor F_d of the nosewheel tire as follows:

$$L_{e.s} = \frac{L_s + L_b}{F_d} = \frac{W(A + .31C)}{N_n B F_d}$$

The dynamic factor F_d for tires are:

Type I	1.40
Type II	1.35
Type III	1.40
Type IV	1.40
Type VI	1.00
Type VII	1.35
Type N	1.35

(e) The dynamic load rating of a tire is the static rating (loads listed in column 7 of Figures 5-2 and 5-4 multiplied by the dynamic factor, (listed above).

TIRE OVERLOADING

6 Tires must not be overloaded beyond their rated loads, except in emergencies, the overload inflation pressures are based on the tire loads, as given by the equation in 3(b).

$$P = \frac{L}{L_r}(P_r)$$

NOTE

For values between weights given in Figure 5-2, see para. 7. Use this method to find required inflation pressure.

7 Use of Figures 5-2 to 5-5 inclusive.

(a) Select type, size and ply rating of tire from Columns 1 and 2.

(b) From weight and balance data of the aircraft determine the load on the wheels.

(c) Divide this load by the number of tires which share it.

(d) From columns 3, 4, 5, etc. determine two loads given in these columns which bracket the load per tire.

(e) Use an inflation pressure between the two bracketing pressures which would correspond to the load per wheel which has been determined.

(f) Example:-

(1) A Neptune aircraft has 56" tires with 20 ply rating.

(2) Suppose from weight and balance data the weight on the main wheels is 62000 lb.

(3) Two tires take this load; so the load per tire is 31,000 lb.

(4) Columns 6 and 7 give loads of 30000 lb. and 35000 lb. which bracket this load.

(5) Hence inflation pressure is:

$$85 + \frac{31000 - 30000}{35000 - 30000} \times (100 - 85)$$

$$= 85 + \frac{1}{5} = 88 \text{ psi}$$

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type I Tires						
27	10	2750 35	3550 45	4300 55	4700 60	5500 lbs. load 70 psi
30	8	2300 25	2750 30	3700 40	4150 45	4600 lbs. load 50 psi
33	10	4000 35	5100 45	6300 55	6900 60	8000 lbs. load 70 psi
36	12	5250 35	6000 40	8300 55	9000 60	10500 lbs. load 70 psi
44	12	7500 35	9600 45	10700 50	13000 60	15000 lbs. load 70 psi
47	14	8750 35	11200 45	12500 50	15000 60	17500 lbs. load 70 psi
56	20	17500 50	23800 65	26200 75	30000 85	35000 lbs. load 100 psi
65	26	21500 45	28500 60	35500 75	40000 85	45000 lbs. load 95 psi
Type II Tires						
26 x 6	10	2600 65	3150 80	3950 100	4550 115	5150 lbs. load 130 psi
30 x 7	10	2700 55	3200 65	3950 80	4450 90	5200 lbs. load 105 psi
32 x 8	10	4150 65	5100 80	6100 95	7000 110	8000 lbs. load 125 psi
34 x 9	12	5000 55	6300 70	7700 85	9000 100	9950 lbs. load 110 psi
Type III Tires						
8.00-4	4	450 10	580 13	680 15	810 18	900 lbs. load 18 psi
5.00-5	4	430 15	570 20	660 23	740 26	800 lbs. load 28 psi
6.00-6	4	570 13	660 15	880 20	970 22	1100 lbs. load 25 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type III Tires (Cont'd)						
6.00-6	6	830 20	1050 25	1250 30	1450 35	1750 lbs. load 42 psi
6.00-6	8	1280 30	1700 40	1920 45	2120 50	2350 lbs. load 55 psi
7.00-6	6	800 15	1060 20	1250 25	1500 30	1900 lbs. load 38 psi
8.50-6	4	800 10	1040 13	1200 15	1440 18	1600 lbs. load 20 psi
6.50-8	6	1220 25	1470 30	1720 35	1960 40	2300 lbs. load 47 psi
6.50-10	6	1300 25	1800 35	2700 40	2330 45	2700 lbs. load 52 psi
7.50-10	6	1330 20	1670 25	2000 30	2330 35	3000 lbs. load 45 psi
8.50-10	6	1320 15	1750 20	2200 25	2640 30	3250 lbs. load 37 psi
8.50-10	8	2000 25	2400 30	2800 35	3600 45	4400 lbs. load 55 psi
11.00-12	8	3500 25	4200 30	4900 35	5600 40	6300 lbs. load 45 psi
8.90-12.50	4	800 10	1040 13	1200 15	1440 18	1600 lbs. load 20 psi
9.50-16	10	4700 45	5800 55	6800 65	7900 75	8900 lbs. load 85 psi
12.50-16	10	5900 35	6800 40	8500 50	9300 55	11000 lbs. load 65 psi
12.50-16	12	6000 35	7700 45	9400 55	11100 65	12800 lbs. load 75 psi
15.00-16	10	6900 30	8100 35	9200 40	11500 50	12200 lbs. load 53 psi
16.00-16	14	8750 35	11200 45	13700 55	15000 60	17500 lbs. load 70 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type III Tires (Cont'd)						
17.00-16	12	8700 30	11600 40	13100 45	14500 50	16000 lbs. load 55 psi
15.50-20	14	10200 45	12500 55	14800 65	17100 75	20500 lbs. load 90 psi
15.50-20	20	16000 70	19400 85	22800 100	26300 115	29700 lbs. load 130 psi
17.00-20	16	12100 45	16100 60	18800 70	20000 75	25500 lbs. load 95 psi
17.00-20	22	17200 65	21200 80	25200 95	30500 115	34500 lbs. load 130 psi
18.00-20	20	15000 50	19600 65	22500 75	25500 85	30000 lbs. load 100 psi
20.00-20	20	17500 45	23500 60	27300 70	31000 80	35000 lbs. load 90 psi
20.00-20	22	20200 50	26300 65	30300 75	34800 85	38500 lbs. load 95 psi
19.00-23	16	14500 40	16300 45	21800 60	23600 65	29000 lbs. load 80 psi
25.00-28	30	29000 45	35500 55	42000 65	48500 75	55000 lbs. load 85 psi
Type IV Tires						
29 x 13-5	6	2000 15	2550 19	3050 23	3450 26	4000 lbs. load 30 psi
30 x 13-6	6	2300 13	2850 16	3550 20	4100 23	4625 lbs. load 25 psi
35 x 15-6	6	2900 13	3600 16	4500 20	5150 23	5600 lbs. load 25 psi
Type VII Tires						
16 x 4.4	6	1000 50	1200 60	1500 75	1600 80	1700 lbs. load 85 psi
18 x 4.4	6	900 45	1200 60	1500 75	1800 85	2100 lbs. load 100 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VII Tires (Cont'd)						
18 x 4.4	8	1700 80	2050 95	2550 120	3000 140	3300 lbs. load 155 psi
18 x 4.4	12	1910 110	2700 155	3040 175	3490 200	4350 lbs. load 225 psi
18 x 5.5	8	1450 50	1750 60	2200 75	2600 90	3050 lbs. load 105 psi
18 x 5.5	12	2550 85	3250 110	3850 130	4450 150	5050 lbs. load 170 psi
18 x 5.5	14	3330 115	4050 140	4760 165	5480 190	6200 lbs. load 215 psi
19 x 6.00-8	10	2300 60	2700 70	3100 80	3700 95	4275 lbs. load 110 psi
20 x 4.4	10	1985 90	2430 110	2870 130	3310 150	3750 lbs. load 170 psi
20 x 4.4	12	2500 110	3500 155	4000 175	4500 200	5150 lbs. load 225 psi
20 x 5.5	12	3075 90	3760 110	4440 130	5470 160	6150 lbs. load 180 psi
22 x 5.5	8	1430 60	2420 75	2900 90	3540 110	4350 lbs. load 135 psi
24 x 5.5	12	5050 155	5700 175	6200 190	6840 210	7500 lbs. load 230 psi
24 x 5.5	14	5170 160	6460 200	7750 240	8730 270	9700 lbs. load 300 psi
24 x 7.7	10	2700 45	3300 55	3900 65	4500 75	5100 lbs. load 85 psi
24 x 7.7	14	3600 60	4530 75	5470 90	6680 110	8200 lbs. load 135 psi
25 x 6.75	16	5500 120	6880 150	8250 180	9520 210	11000 lbs. load 240 psi
25 x 6.75	18	7400 105	8950 200	10300 230	11600 260	13000 lbs. load 290 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VII Tires (Cont'd)						
26 x 6.6	12	4100 85	5300 110	6600 130	7300 150	8000 lbs. load 165 psi
26 x 6.6	14	5000 105	6200 130	7600 160	8600 180	10000 lbs. load 210 psi
27 x 6.50-15	14	6100 120	7100 140	8100 160	9850 185	10900 lbs. load 215 psi
28 x 7.7	12	3360 55	3970 65	4580 75	5190 85	5800 lbs. load 95 psi
29 x 7.7	16	6900 110	8800 140	10600 170	12000 190	13800 lbs. load 220 psi
30 x 7.7	12	5150 85	6100 100	7600 125	8800 145	10000 lbs. load 165 psi
30 x 8.8	18	9050 125	11800 160	13300 180	15000 200	16500 lbs. load 220 psi
30 x 8.8	20	9530 135	12200 170	14100 195	16400 225	18700 lbs. load 255 psi
32 x 6.6	14	6750 130	8800 170	10400 200	12000 230	13500 lbs. load 260 psi
32 x 8.8	12	5700 70	6900 85	8150 100	9750 120	11000 lbs. load 135 psi
32 x 8.8	14	6500 85	8000 105	10000 130	11500 150	13000 lbs. load 170 psi
32 x 8.8	18	7900 100	9900 125	11800 150	13800 175	15800 lbs. load 200 psi
32 x 8.8	22	9400 120	12600 160	15700 200	18800 240	22000 lbs. load 280 psi
34 x 9.9	14	7000 75	8850 95	10700 115	12100 130	14000 lbs. load 150 psi
36 x 11	14	7000 55	8900 70	10800 85	12000 95	14000 lbs. load 110 psi
36 x 11	18	10750 90	13200 105	14950 120	18100 135	18500 lbs. load 155 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VII Tires (Cont'd)						
36 x 11	20	11400 95	13200 110	15600 130	18000 150	21000 lbs. load 175 psi
36 x 11	22	11600 100	14500 125	17500 150	20900 180	23300 lbs. load 200 psi
38 x 11	14	7100 60	9500 80	11800 100	14200 120	15400 lbs. load 130 psi
39 x 13	14	9000 60	10500 70	12000 80	13500 90	15000 lbs. load 100 psi
40 x 12	14	7600 50	9200 60	10700 70	13000 85	14500 lbs. load 95 psi
40 x 12	20	13600 90	15900 105	18950 125	22000 145	25000 lbs. load 165 psi
44 x 13	20	12400 70	15300 90	19400 110	23000 130	26500 lbs. load 150 psi
44 x 13	26	17500 100	22000 125	26500 150	31500 180	35000 lbs. load 200 psi
46 x 9	16	11000 120	13700 150	16500 180	19300 210	22000 lbs. load 240 psi
49 x 17	24	15200 60	20300 80	25400 100	30400 120	35500 lbs. load 140 psi
49 x 17	26	20000 80	24000 95	29000 115	34000 135	39000 lbs. load 155 psi
56 x 16	24	23000 90	27500 110	35000 140	40000 160	45000 lbs. load 178 psi
56 x 16	32	30000 120	37500 150	45000 180	52500 210	60000 lbs. load 240 psi
56 x 16	36	30900 120	40600 160	50800 200	60900 240	71000 lbs. load 280 psi
Type VIII Tires						
31 x 16.50-16	22	11500 135	14900 175	17900 210	20400 240	23300 lbs. load 275 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VIII Tires (Cont'd)						
31 x 11.50-16	22	14900 175	17000 200	19100 225	21200 250	23300 lbs. load 275 psi
36 x 11.50-16	22	11500 135	14900 175	17900 210	20400 240	23300 lbs. load 275 psi

Figure 5-2 Aircraft Tires - Main Wheels

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
5.00-5	6	1400 54	1500 58	1600 62	1700 66	1800 lbs. load 70 psi
5.00-5	10	1100 45	1340 55	1590 65	1830 75	2150 lbs. load 88 psi
6.00-6	6	1400 35	1600 40	1800 45	2000 50	2200 lbs. load 55 psi
6.00-6	8	1940 55	2120 60	2470 70	2820 80	3000 lbs. load 85 psi
7.00-6	6	1600 32	1800 36	2000 40	2200 44	2400 lbs. load 48 psi
6.50-10	6	2400 49	2600 53	2800 57	3000 61	3200 lbs. load 65 psi
7.50-10	6	3200 48	3400 51	3600 54	3800 57	4000 lbs. load 60 psi
8.50-10	6	3700 43	3900 45	4100 47	4300 50	4500 lbs. load 52 psi

Figure 5-3 Helicopter Tires

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
8.00	6	210 25	290 35	330 40	410 50	450 lbs. load 55 psi
10.00	8	360 25	430 30	500 35	575 40	650 lbs. load 45 psi
12.50	8	900 40	1120 50	1350 60	1600 70	1800 lbs. load 80 psi
14.50	8	1000 40	1250 50	1500 60	1750 70	2000 lbs. load 80 psi
17.00	10	1600 40	1800 45	2200 55	2600 65	3000 lbs. load 75 psi
23.00	10	2350 35	3000 45	3400 50	4000 60	4700 lbs. load 70 psi
26.00	12	3200 35	4100 45	5000 55	5500 60	6400 lbs. load 70 psi
30.00	10	4400 40	4900 45	6000 55	7100 65	8200 lbs. load 75 psi
5.00-4	6	550 25	770 35	880 40	980 45	1200 lbs. load 55 psi
9.00-6	10	2250 30	2600 35	3400 45	3800 50	4500 lbs. load 60 psi
10.00-7	12	3550 40	4450 50	5300 60	6200 70	7100 lbs. load 80 psi
Type IV Tires						
12 x 5-3	4	600 30	700 35	900 45	1100 55	1200 lbs. load 60 psi
Type VII Tires						
10-1/2 x 4	8	570 40	700 50	920 65	1050 75	1200 lbs. load 85 psi
12-1/2 x 4-1/2	10	850 35	1080 45	1320 55	1550 65	1800 lbs. load 75 psi

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VII Tires (Cont'd)						
14-1/2 x 5	10	1120 35	1450 45	1760 55	2100 65	2400 lbs. load 75 psi
17-1/2 x 6-1/2	12	1600 40	2000 50	2400 60	2800 70	3200 lbs. load 80 psi

Figure 5-4 Aircraft Tires - Tail Wheels

Tire Size	Ply Rating	Static Load Per Tire and Inflation Pressure				Rated Static Load
1	2	3	4	5	6	7
Type VI Tires						
16 x 5.80-8.50	10					2200 lbs. load 100 psi
19 x 6.80-10	6					3200 lbs. load 80 psi
22 x 7.25-11.50	8					4600 lbs. load 80 psi
40 x 14.00-20	14					17700 lbs. load 105 psi

Figure 5-5 Nose Wheel Only