

1. Wheel and Brake Assemblies

All wheel and brake combinations, Reference Figure 1, are matched components and qualified as such in accordance with Technical Standard Order (TSO) C26. Unauthorized substitution of wheel and brake components is a violation of the TSO of which the units are jointly qualified, and is prohibited.

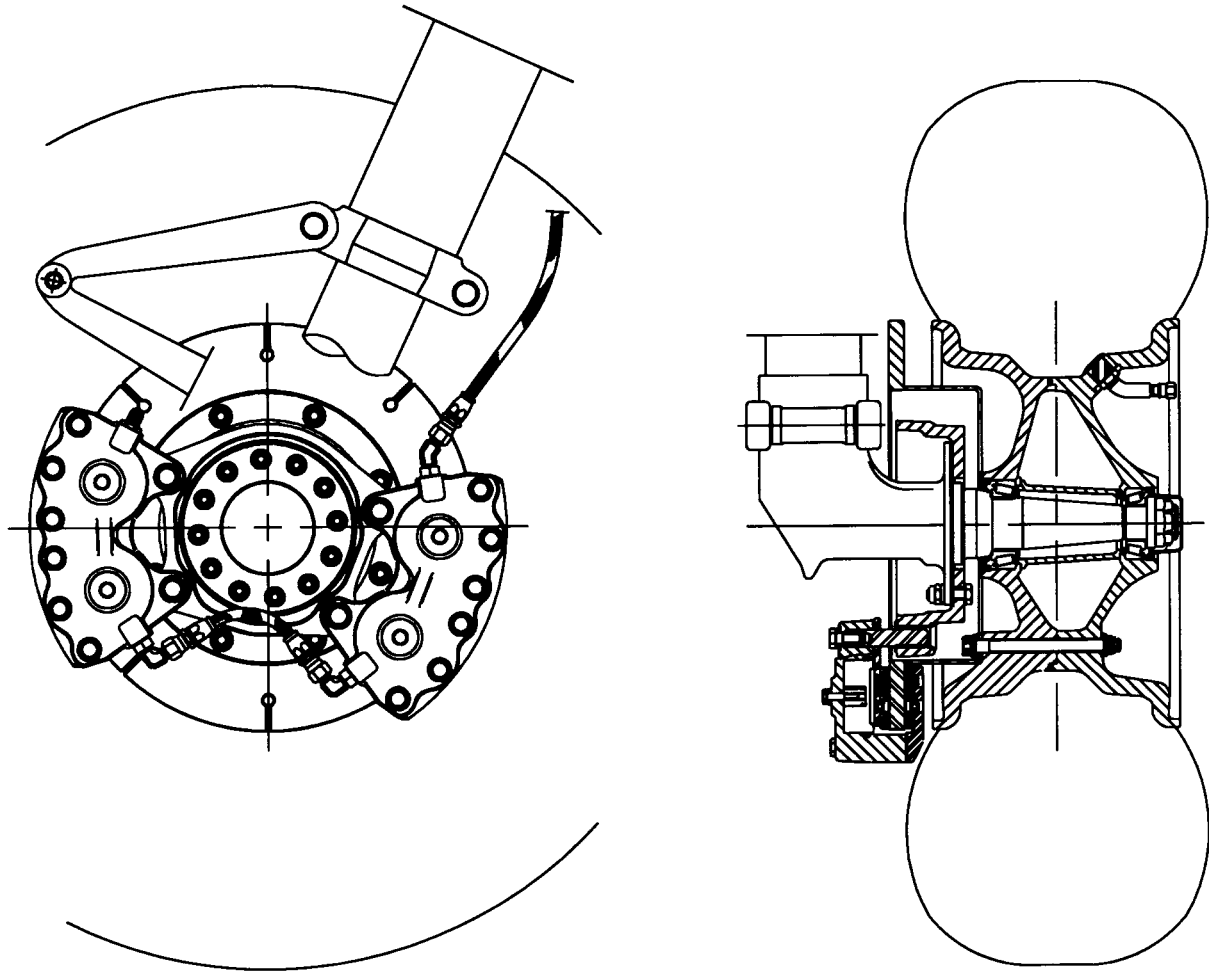


Figure 1 - Typical External Wheel and Brake

Description and Operation

2. Brake Assemblies

The brake assembly and disc combination have been designed and qualification tested in accordance with Technical Standard Order (TSO) C26 and specific aircraft requirements to properly and safely decelerate the aircraft under various conditions. Unauthorized substitution of components can compromise brake effectiveness, is a violation of the qualification basis, and is prohibited.

A. Brake Description

The brake is an external caliper-type design. The cylinder (1), Ref. Figure 2, is a cast aluminum or magnesium housing. The pistons (7) are contained by the cylinder and form a pressure vessel for the brake fluid. Two anchor bolts are press fitted into the cylinder and are retained with nuts (12) and washers (13). The pressure plate (5) is held in position by the two anchor bolts. Back plate (4) is secured to the cylinder with bolts (2) and washers (3) on the opposite side of the brake disc. The back plate and pressure plate each hold brake linings (11). The cylinder is allowed to slide or float in torque plate (16) bushings. The torque plate is mounted to the landing gear axle. The caliper (cylinder assembly) is the assembly which includes the cylinder, pistons, back and pressure plates, linings, and other related components. Back plate to cylinder insulator shim (18) and piston to pressure plate insulator disc (17) are typically found on calipers that use the metallic based lining only. Specific illustrated parts breakdown for brake assemblies may be found in the product catalog.

B. Brake Operation

Hydraulic pressure, applied via the pilot's and co-pilot's master cylinders, enters the brake via lines connected to an inlet fitting on the caliper. The pressure then flows through the cylinder and forces the pistons outward against the pressure plate. The caliper should be free to slide on the torque plate assembly bushings allowing both pressure plate and back plate linings to contact the brake which will in turn contact the brake disc at precisely the same time.

The braking action generates a torque which transmits a braking force converting the kinetic energy into heat which is absorbed by the brake disc and surrounding components. This braking force is transmitted to the wheel and into the tire, bringing the aircraft to a stop. Whenever a maximum energy Rejected Take Off (RTO) has occurred the intrinsic heat buildup can be quite severe and the components are to be inspected for airworthiness and overhauled in accordance with these procedures or procedures established by the airframe manufacturer. Releasing toe pedal pressure will allow the hydraulic pressure to decay in the brake caliper removing pressure from the disc. The wheel should be free to rotate with minimal drag. Some caliper designs incorporate a mechanism on the piston that will retract the piston and attached pressure plate lining away from the disc. These units are self-adjusting and retract to obtain approximately 0.02 to 0.04 inch of lining clearance to the disc.

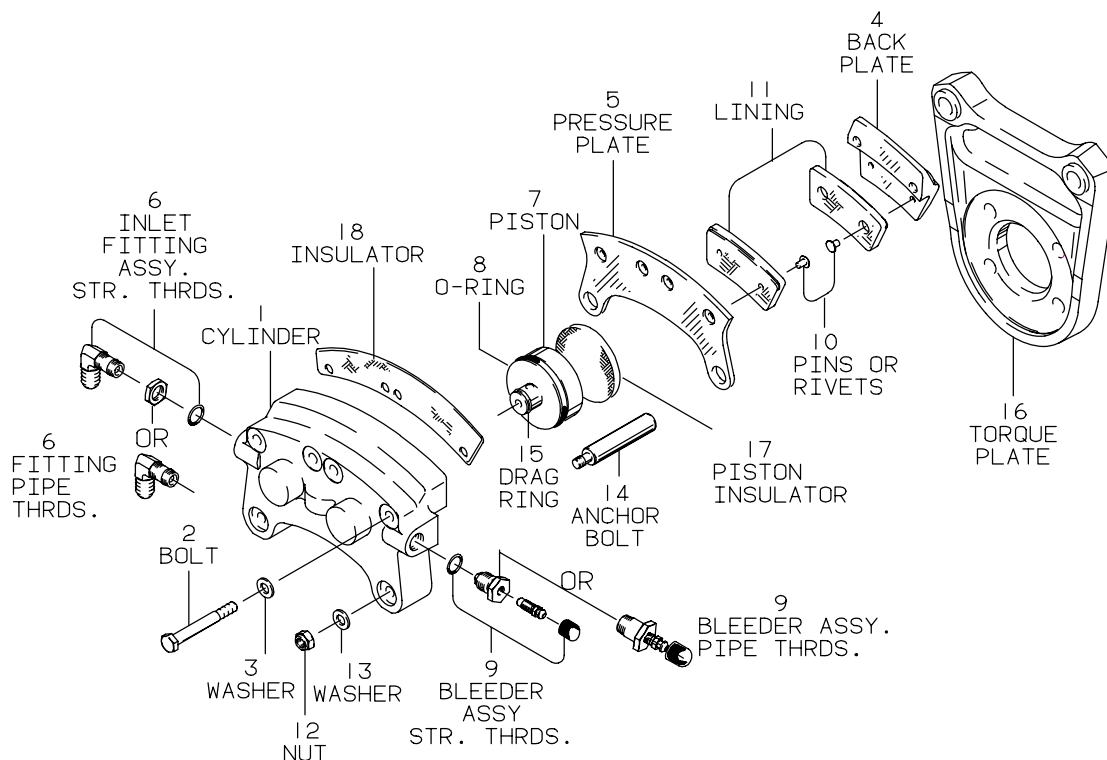


Figure 2 - Typical External Disc Brake

3. Wheel Assemblies

All aircraft wheels are designed and qualification tested in accordance with TSO C26 for a particular tire type and size matching the aircraft requirements. Operating a wheel assembly with unapproved tires, improper inflation pressures or subjected to loads in excess of its design is a violation of the wheel certification basis and is prohibited.

Description and operation of three different wheel assemblies is covered in the following text. The nose wheel assembly and the tail wheel assembly are sufficiently similar to consider together. The main wheel will be described separately. In each case, information is based on a typical wheel assembly. Specific Illustrated parts breakdown for wheel assemblies may be found in the Product Catalog.

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Wheels & Brakes



Description and Operation

CAUTION: THE FELT GREASE SEALS ARE SHIPPED DRY. THEY MUST BE LUBRICATED TO PROVIDE PROTECTION AND LUBRICANT RETENTION FOR THE BEARINGS. IF THEY ARE NOT PROPERLY LUBRICATED THEN MOISTURE CAN SOAK PAST THE FELTS AND CONTACT THE BEARINGS WHICH CAN LEAD TO BEARING FAILURE. REFER TO PARAGRAPH 3.A AND 3.B BELOW.

A. Nose and Tail Wheel Description

Wheels are made from either aluminum castings, magnesium castings, or aluminum forgings. The wheel is of the divided type, incorporating inner wheel half (10) and outer wheel half (8), Ref. Figure 3, which are fastened together with tie bolts (7), washers (6), and nuts (5). An o-ring (9) fitted between the two wheel halves provides the air seal for wheels designed to operate with tubeless tires. The wheel rotates on two tapered roller bearings (4) which seat in bearing cups, shrink fitted into the hubs. Grease seals (3) provide protection and lubricant retention for the bearings. All new product shipped will have the bearings packed with the appropriate grease (refer to [Section 300 Off-Aircraft Maintenance, paragraph 3.A. Bearing Grease](#)). Felt grease seals are shipped dry. Remove the felt seals and lightly coat all surfaces of the felt with the wheel bearing grease and reinstall prior to wheel use. Hubcaps, when used, are secured to the outboard wheel half by a snap ring (1) or three attachment screws. Full wheel covers are fastened by three attachment screws.

B. Main Wheel Description

Wheels are made from either aluminum castings, magnesium castings, or aluminum forgings. The wheel is of the divided type, incorporating inner wheel half (10) and outer wheel half (8), Ref. Figure 4, which are fastened together with tie bolts (7), washers (6), and nuts (5). The brake disc (11) is attached to the wheel by the tie bolts. In a few designs, the brake disc bolts are threaded directly into inserts pressed into the back of the inboard wheel half. Wheels fall into two categories, tubeless and tube type. An o-ring (9) fitted between the two wheel halves provides the air seal for wheels designed to operate with tubeless tires. The wheel rotates on two tapered roller bearings (4) which seat in bearing cups in the hubs. Grease seals (3) provide protection and lubricant retention for the bearings. All new product shipped will have the bearings packed with the appropriate grease (refer to [Section 300 Off-Aircraft Maintenance, paragraph 3.A. Bearing Grease](#)). Felt grease seals are shipped dry. Remove the felt seals and lightly coat all surfaces of the felt with the wheel bearing grease and reinstall prior to wheel use. Hubcaps, when used, are secured to the outboard wheel half by a snap ring (1) or three attachment screws. Full wheel covers are fastened by three attachment screws.

C. Wheel Operation

The wheels, attached to the landing gear, support the tires and weight of the aircraft. The nose wheel provides a means of steering control, if so equipped. The main wheels transmit stopping forces from the brake to the ground.

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Wheels & Brakes



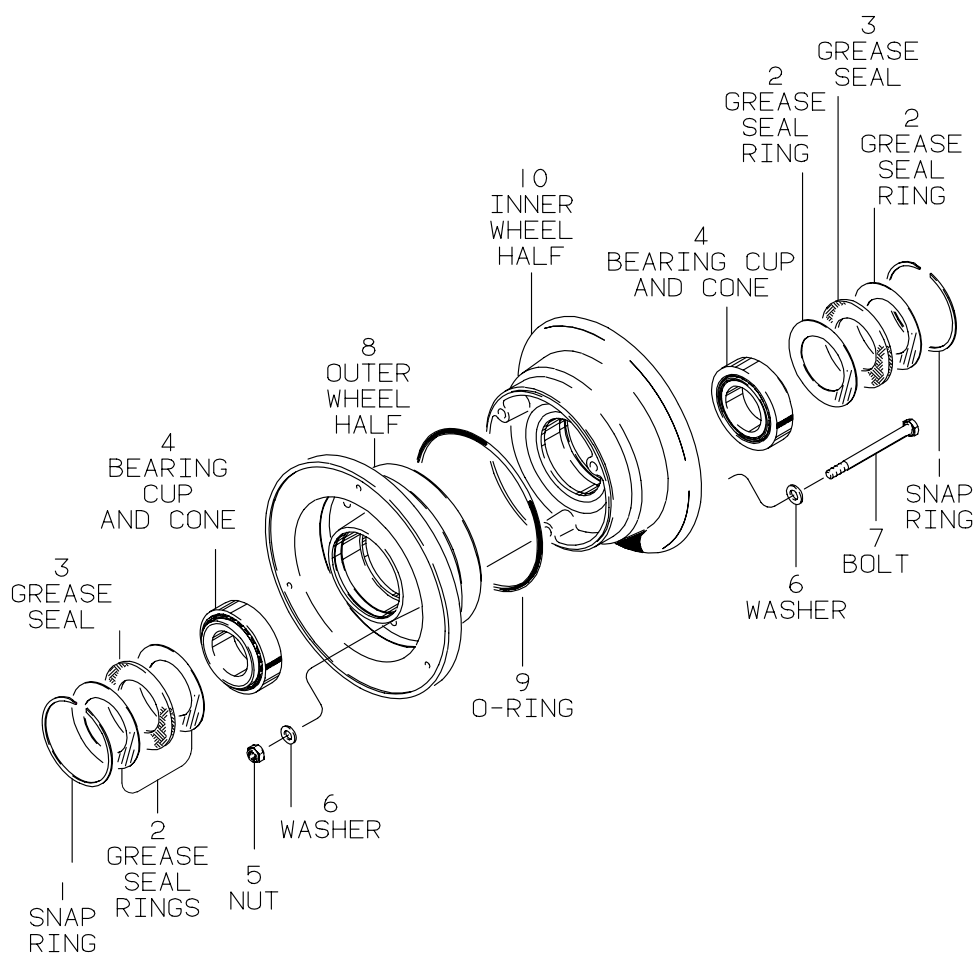


Figure 3 - Typical Nose/Tail Wheel Assembly

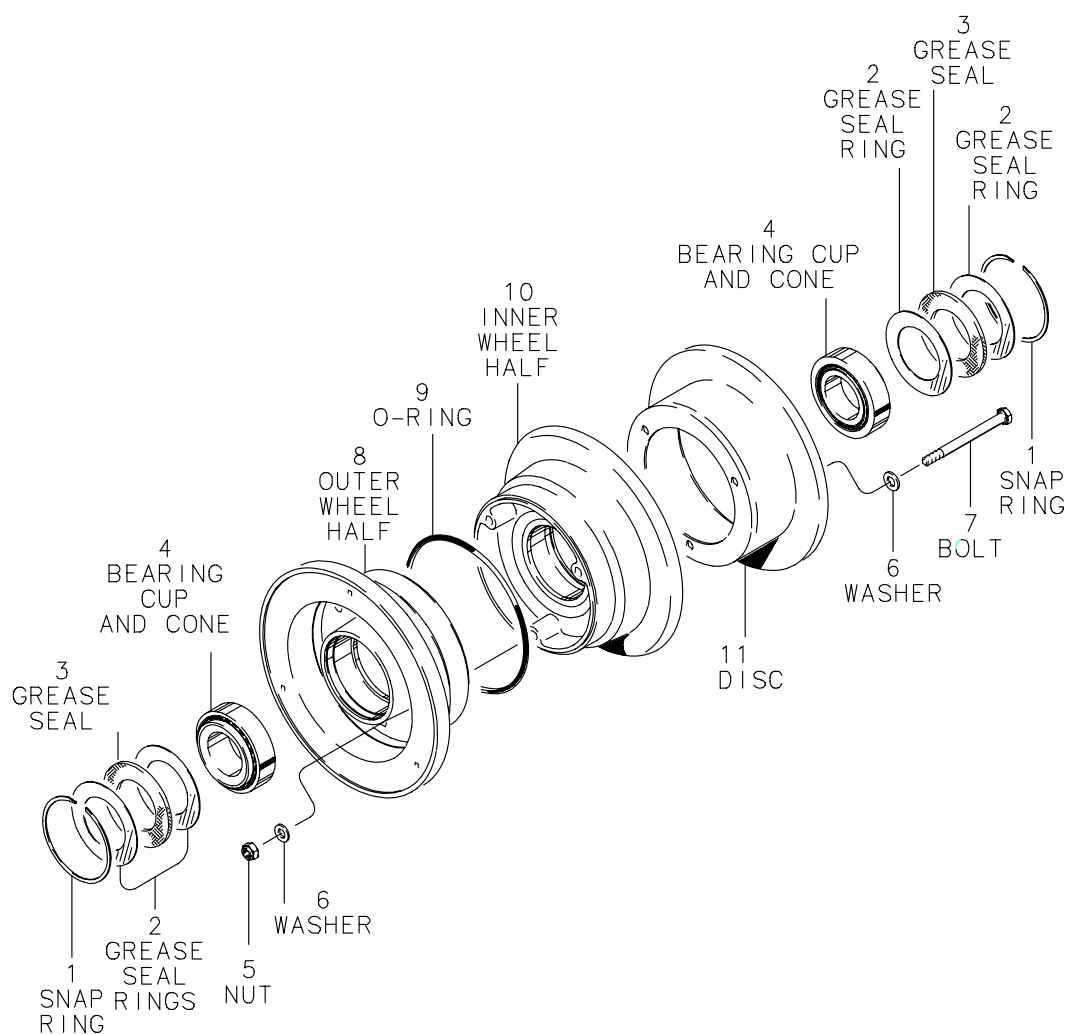


Figure 4 - Typical Main Wheel Assembly