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Trailing Link Suspension for the Challenger Ultralight



This design has progressive spring rate suspension with a full six inches of travel.

The trailing link design works well in rough terrain by moving back and up when hitting rocks or obstacles during landing. This systems progressive suspension has a light (smooth) initial impact and will increase to several hundred pounds if needed during a high impact landing. Such as high speed nose first or stalling above the runway landing. With the trailing link design there is no binding due to the angle of impact.



Bolt on replacement for the standard factory nose gear on the single or two place Challenger ultralight aircraft with no modifications required to the airframe. The main frame tube is 4130 chrome- molybdenum tube steel and is TIG welded together.

Designed for rough field conditions and hard landings on pavement that would damage your factory landing gear. Extended testing on rough field operations and in use on student rental aircraft.

The steering angle remains stock during taxiing to help maneuver in tight areas and moves to a caster as the impact is transferred into the suspension not the air frame. This helps reduce side load on all of the landing gear.

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Full compression is just under the force needed to start bending airframe components.

Optional spring loads may be used for lighter/heavier aircraft and runway surface conditions (tall thick grass and extreme rough terrain.) The flexibility of this system helps you to adjust to your landing environment.



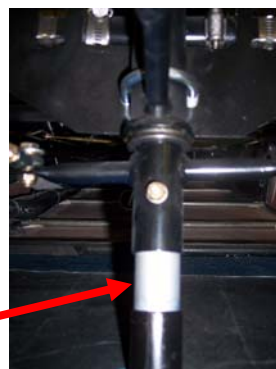
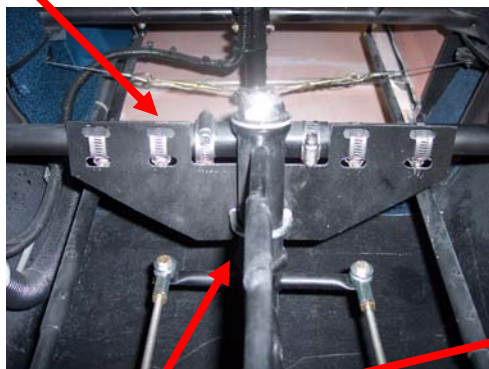
Wheel sizes form 4 inch to 6 inch may be used

Installation of Nose Gear:

Pre-inspection of existing landing gear is recommended:

Inspection areas from Challenger Notices include:

- **The nose wheel support cross tube and attachment clamps.**
 - Failure of the worm drive clamps (hose clamps), and failure of the cross tube has been reported. A successful solution has been to manufacture a new upper bracket then drill and install two AN bolts.



- **Nose gear:**
 - The nose wheel assembly on the Challenger has been reported to fail directly below the lower bearing of the steering tube. Owners have also reported failure of two support rods that are welded to this steering tube, failure happens at the area of the welds.

The trailing link nose gear is a replacement nose gear assembly that was designed to directly replace the factory gear on a single or two place Challenger ultralight aircraft without modification to the airframe. See your owner's instruction manual for additional instructions.

Weight and balance should always be verified after installation of any new equipment.

Nose Gear assembly installation the air frame:

1. After passing your pre-inspection verify that the tail rudder assembly is inline and secure from movement. This step is needed to align rudder peddles and steering control arm.
2. Verify the rudder peddles are square with each other and make adjusts as required.
3. The steering control arm and rudder peddles need to be parallel to each other and adjustments can be made by removing both $\frac{1}{4}$ AN bolts and turning the $\frac{1}{4}$ inch ready rod in or out to align. See your owner's manual for further details.
4. Place the Trailing Link Suspension on the steering tube and alien to track in a straight line with the aircraft.
5. Verify you have a minimum of 1 $\frac{1}{2}$ inch clearance between the top of the spring shaft nut and the bottom of the aircraft nose.

6. If possible use the existing holes from the original nose gear. Transfer the hole orientation as required and install a new ¼ AN bolt assembly. Torque to approximately 100 inch pounds.
7. We recommend installing a nose gear brace. Using a 1/8" or 3/16" thick aluminum plate, cut out as in the photo. After cutting the plate, sides are 1.25" and bottom is 4.5".



HARDWARE USED:

- **Aluminum Plate: 12" Long X 4" Wide X 1/8 or 3/16" Thick.**
- **4 ea. Universal Hose Clamps: 1/2"X1-1/4".**
- **U-Bolt = 1-1/4"**

Wheel and tire installation:

Important Note: Installing your wheel assembly requires the correct spacers to be used to prevent binding of the pivot points on the Trailing Link Suspension. Axle spacers are supplied for some rim configurations but the outer spacer may need to be modified or replaced to center your wheel. The inner axle spacer is the correct length and must be used to allow proper movement of the suspension.

1. Install the wheel on the Trailing Link Suspension using the supplied inner axle spacer. Preferred location of the wheel/tire assembly is to keep it as compact as possible. Minimum clearance between the tire and the lower spring support is a ¼ inch. Additional modifications to the pivot arm are at the buyers risk and should not be closer than ½ inch and inline with the two existing holes.

Note: Some rims have offset bearings and the outer spacer will not be the same length.

2. Center the wheel on the inner axle; verify the rubber tire will not rub on the nose gear.
3. Measure the distance from the bearing to the inner side of the pivot arm on both sides. Cut the outer spacer as required to achieve equal spacing of the wheel/tire. The outer wheel alignment spacer will need a minimum of .005 gap after axle torque (144 inch pounds) to prevent bearing binding.
4. Final assembly: After the spacers are made and checked for clearance assemble the parts and tighten the SAE 8, ¼ -20 axle nut to 144 inch pounds of torque.
5. Check wheel alignment and verify axle and steering tube bolts are in torque.
6. Remove tail rudder holding fixture.
7. Verify the nose gear movement is smooth and has no binding. Push hard on the wheel with your foot and the pivot arm should move back to the stops in one step. If binding occurs check your axle spacer by losing or removing the wheel and retest. If this resolves the binding make small adjustments to the modified axle assembly by adding or removing spacers as required. Next torque axle assembly and retest.

Pre flight or hard landings

1. Check for loose bolts, cracks in welds/ bent parts and replace all damaged parts as required.
2. Remember that the Challenger stock nose wheel mounting assembly is susceptible to damage and with this nose gear a hard landing may not be noticed. A pre-flight of the internal support system is a good thing to do.
3. See: Inspection areas from Challenger Notices

Maintenance

1. Keep the nose gear clean and free of dirt to reduce wear. No oiling is required.
2. The UHMW upper pivot arm bushing preload may become loose and need to be tightened after several landings. Adjust the 3/8 lock nut to the point that there is a small amount of drag during compression of the springs when moving the pivot arm. Do not over tighten this bushing. Check for binding and adjust as required to maintain a smooth movement. The pivot arm should move back to the stops in one step.
3. Check for wear on the spring guides and clean under spring plate.

IMPORTANT!

Release and Indemnification:

Due to its use, the buyer must determine the airworthiness and application at his/her own risk.

The buyer accepts Custom Flight Systems LLC products with the understanding that it (on behalf of itself and successors) thereby agrees to release seller and the manufacturer from any and all liability for loss, damage or harm arising out of the negligence or product liability. The buyer further waives, on behalf of its insurers and subrogees, any such claim made by any of them in subrogation.

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