

## Pre-Paint>Fuselage>Undercarriage>Assemble main gear

### Objectives of this task:

In this task you will assemble the main undercarriage legs, which includes fitting the axles, disc brakes and wheels and adjusting the brakes.

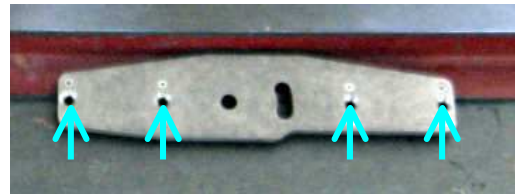
### Materials required:

Cards # J8 'Dual Brakes' and J21 'Main wheels'

Brake fluid for assembly of disc brake pistons

### Spat brackets

Fit the retained nuts to the spat mounting brackets using countersunk 3/32" rivets. There are 4 retained nuts (arrowed) on each bracket. Countersink the actual screw holes where the spat will be fitted: the countersinks will help to guide the screws into the holes when fitting the spats.



### Fit the axles and backing plates

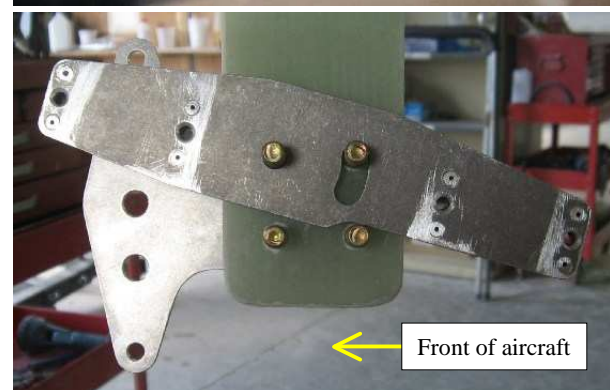
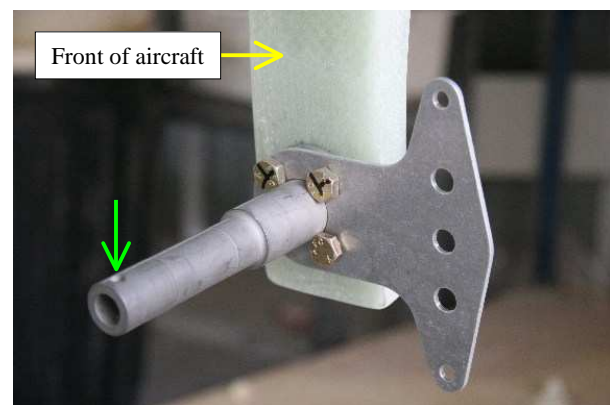
Slip the stub axle (from the 'Main wheels' card) through the mounting plate with the brake unit facing towards the front of the aircraft and fit to the main gear leg as shown in the photo at right. The chamfered face of the plate is on the side that faces the gear leg.

Align the bolt hole in the outboard end of the stub axle (arrowed in green at right) vertically and fix the plate in place 2 x AN5-16A bolts at the top and 2 x AN5-15A bolts at the bottom. The longer bolts are used at the top to allow for the spat bracket.

Fit the spat bracket to the AN5 bolts with the captive nuts facing towards the wheel and with the notched surface to the bottom as shown below right.

Fix in place with one Nyloc nut and washer on the top front bolt.

The gear leg shown in the photos on this page is a right-hand gear leg.



Fit Nyloc nuts and flat washers to the 2 bottom bolts and a Nyloc nut with a penny washer to cover the adjustable slot at the top rear bolt. This slot will allow the spat to be moved up or down during final assembly. The slot must face the rear of the aircraft.

Check that the bolt hole in the outboard end of the stub axle is positioned up and down before tightening the nuts firmly.

Use a permanent marker to identify each leg as being either a right or left leg at this point – it can save confusion when you come to fit the gear legs in the next task.

## Assemble the brake pads

Fit the brake pads to the backing plates: there are 2 types of backing plates – flat and U channel.

Both types take the same pads, but the shorter rivets are used on the flat backing plate.



Face the angled side of the pad to the outside of the backing plate as shown in the photo of completed pads below right. Each brake pad is held in place by 3 rivets and the fitting process is as follows: fit all 3 rivets from the recessed hole in the pad through the pad and through the backing plate. Note that fitting the third rivet may need a slight touch with a drill to ease the rivet through the last hole.

Seat the rivets by tapping the heads to make sure that each rivet is fully through the pad and the backing plate, then turn the assembly over and rest the head of the rivet on a protrusion\* and flare the rivet using a tapered punch then use a flat punch to mushroom the end of the rivet over. The rivets should not be able to move when correctly fitted.



\*In the factory we use a simple jig that holds the backing plates over studs at each end and has 3 raised screws to hold the rivets up – you can see it in the riveting photos above.

You could make up something similar in your workshop by screwing 3 screws into a solid wooden bench (use a backing plate for the spacing), all at the same height so that the brake pad just clears the bench and the head of each screw touches the head of each rivet, then place each brake pad and backing plate over them and use them to punch against.



Check each brake pad and backing plate assembly carefully to see if there are any cracks in the pad, particularly around the end rivet holes. If there are any cracks call your dealer for a replacement pad and rivets: do **not** fit a cracked brake pad.

The brake pad and backing plate assembly will be referred to as simply a *pad* from this point on. The U channel pad is the *outer pad* and the flat plate pad is the *inner pad*.

## Assemble the brake calipers

In this step you will assemble the hydraulic disc brake calipers.

Cleanliness is essential when working with hydraulic brake parts, so clean your working area and your hands thoroughly before starting this step.



Use compressed air to clean any dust and dirt from the inside of the brake calipers and pistons. Apply brake fluid to the O-rings and fit one to each piston, then apply a smear of brake fluid to the inside of the caliper and fit the pistons to the calipers: press the piston gently into the caliper with the cupped side of the piston facing outwards.

Thread and tighten a bleed nipple into the lower fitting on the caliper (*under* the Jabiru logo) and push a blanking plug into the top fitting as shown at right – the brake lines will be fitted later in *Post-Paint* and the blanking plug will keep the caliper sealed until then.



Wash any brake fluid off your hands with soap and water – it can irritate sensitive skin.

Refer to the drawing on the next page for an overview of the brake system.

**Parts List**

ITEM	PART NUMBER	DESCRIPTION	QTY
1	6207124-5	INTEGRAL 1.25" CYLINDER BRAKE CALIPER.	1
2	AZ2-03	BRAKE FITTING	1
3	6100094-4	NIPPLE BRAKE BLEEDER	1
5	6000994-3	BRAKE PAD	1
6	6A015F0D-4	BONDED (OPT) BRAKE PAD OUTER MOUNTING PLATE.	1
7	P00082N	3/16" FERRULE (NYLON BRAKE LINE)	1
8	RV/C214	O-RING	1
9	R120	RIVET	6
11	AN4-14A	BOLT	2
12	AN680-416	1/4" FLAT WASHER	2
13	PX0029N	BRAKE SPRING	2
14	6207224-6	1.25" BRAKE PISTON	1
15	MS21045-428	1/4" HIGH-TEMP LOCK NUT	2
16	6A018A0D-2	1.5" BONDED BRAKE PAD ASSY	1
17	6A015D0D-3	MOUNT PLATE - 1.5" BRAKE CYLINDER	1

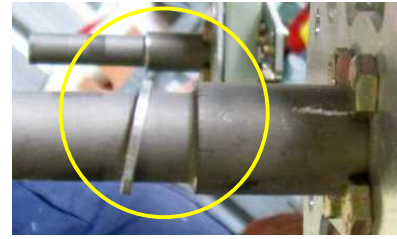
**NOTE:**  
 1. RIGHT SIDE ASSEMBLY SHOWN PNG. 6207023.  
 LEFT SIDE OPPOSITE PNG. 620752N.  
 2. BRAKE HOSE STUB NOT SHOWN. ENSURE 3.0-3.9mm OF HOSE PROTRUDES THRU FERRULE.

**SECTION B-B. SCALE (1:1)**

DS	3	7/12/07	SCALE	VAR	ISS. DATE
DM	2	25/5/04	VAR	1	23/6/02
THIS DRAWING IS COPYRIGHT AND MUST NOT BE COPIED WITHOUT THE CONSENT OF AVTECH P/L			DWG No		
DO NOT SCALE			6207023-3		
DIMENSIONS IN MILLIMETRES			TITLE		
LIMITS UNLESS SPECIFIED OTHERWISE ± +0.5			INTEGRAL 1.25" CYLINDER BRAKE CALIPER ASSY		
PROJECTION REFER TO PART DRAWINGS.			DRAWN		
MATERIAL			APPR.		
			AVTECH P/L		
			A.C.N. 010 786 973		
			HINKLER AIRPORT		
			BUNDEBERG 4670		
			SHEET 1 OF 1		
			A3		

## Assemble the brake and wheel

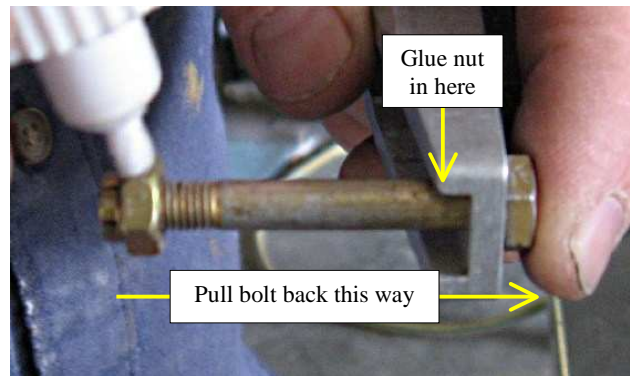
Firstly and very importantly place the alloy washer (#6A028B0D on the 'Main wheels' card) on the stub axle with the tapered inner side **towards** the gear leg and **away** from the wheel – this washer (circled at right) provides a square surface for the inner wheel bearing to butt up to.



Now we can fit the appropriate wheel (left or right) to each gear leg and then fit the brake system.

Fit the wheel to the stub axle and secure with the axle extension, fitting an AN3-12A bolt through the extension and the axle from the top with a lock nut on the bottom.

Take the U channel backing plates and the steel lock nuts. Fit a bolt through the backing plate from the pad side and into the nut and very carefully apply a drop of Superglue to 2 opposite flats of the steel lock nut and then pull the steel lock nut back into the U channel as shown arrowed at right to glue the nut into the U channel:



Take care not to glue the bolt into the nut!

Look carefully at the drawing on the previous page to see how the brake assembly fits together.

As you can see from the drawing the outer pad goes on the outside of the wheel disc, while the inner pad goes between the wheel disc and the brake mounting plate and the hydraulic caliper goes behind or inboard of the inner mounting plate.

2 AN4-14A bolts, each with a washer, secure the whole assembly and each bolt has a spring that is fitted over the bolt and which holds the brake pads apart. In the factory we fit the top bolt first with no spring in order to get the correct alignment and then fit the bottom bolt and spring, then go back to the top bolt and fit the spring.



## Adjust the brakes

The objective is to have a wheel that will turn freely while at the same time not having the brake pads too far away from the disc.

In order to achieve this it may be necessary to slightly bend the brake mounting plate away from the disc – loosen the main bolts just enough that the outer pads are 1 or 2mm away from the disc and check just the clearance between the inner backing plate and inner pads.

If the inner pad is rubbing and making it difficult to turn the wheel, gently bend the brake mounting plate slightly away from the disc until the wheel can turn freely but with the pad just touching the disc.

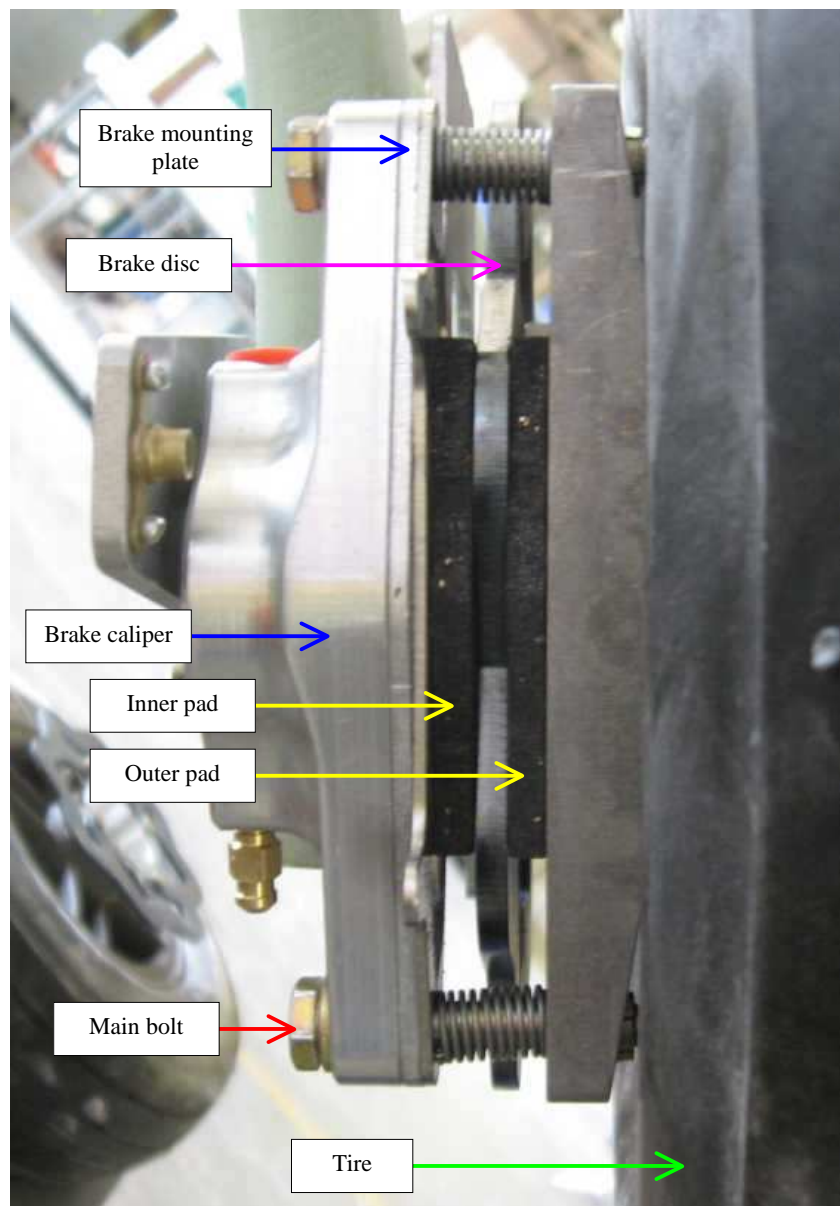
Now tighten the main bolts up until the outer pad just starts to bind on the disc and then back the bolts off slightly, perhaps one third to one half of a turn. At this point the wheel should turn freely and the brake pads should still be very close to the disc.

In the photo at right you can see the finished brake assembly, fully adjusted.

Note that there is very little clearance between the disc and the brake pads.

Note also the springs on the bolts that hold the pads apart.

At the left of the photo you can see the spat bracket with the captive nut visible.



This completes the *Pre-Paint>Fuselage>Undercarriage>Assemble main gear* task.