

	Instructions for Continued Airworthiness	Project Reference STC-015	ICA-STC-015
			REV. 02

Instructions for Continued Airworthiness and Installation Instructions

for BERINGER wheels and brakes on LS4 aircraft

Document Reference^(*)
ICA-STC-015

Project Reference
STC-015

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(*) I.a.w. the numbering system defined in the APDOA manual.

(**) Authorised signatories shall be as defined in the APDOA manual.

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1 LOG OF REVISIONS

Rev. No	Rev. date	Description
00	07.12.2016	Initial edition
01	19 Oct. 2021	Administrative change: MM-STC-015 becomes ICA-STC-015 and includes new maintenance document structure and addition of SensAIR system as an option.
02	23 Aug 2023	EA-017E supersedes EA-006E

2 INTRODUCTION

2.1 Purpose of the document

This manual gives removal and installation instructions of BERINGER wheels and brake system STC on the LS4 aircrafts and guide you toward BERINGER maintenance system for continued airworthiness instructions.

NOTE: These BERINGER products have been fully tested and certified on the aircraft.

NOTE: Wheels and brake assemblies are TSO C26/ETSO C26 approved, for detailed maintenance and overhaul procedures, please refer to the Servicing Manuals of BERINGER, in §6.

CAUTION: Substitution of parts by other than originally certified parts may cause failure of brake system. BERINGER quality process assures that replacement parts are produced and controlled with the same quality level as originally certified.

2.2 Applicable Certification Requirements

- CS-22 amdt 3, issued 15 Sept 2021.
- FAR part 23

2.3 Effectivity

Type: LS

Models: LS4, LS4-a, LS4-b

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3 GENERAL

3.1 Components list

This STC scope includes Main wheel and brakes (master cylinder, caliper, lines...) and axles as replacement parts to original equipment. All the assemblies are listed in NP-STC-015, at the last revision.

For the assembly detailed composition to piece part, refer to the BERINGER Illustrated Part Catalogues (IPC) that are available in the maintenance documents MM-0x-001, sorted per product family, see §6.

In option, BERINGER pressure measurement device is available for this STC:

Assembly / Product Name	BERINGER Reference number
5" wheel SensAIR (option)	TP-005

3.2 Weight and Balance

BERINGER Assembly Name	Weight (Kg)	Weight (Lbs)
Main wheels and brake	2.45	5.40

(Weights are given without tires, and per wheel)

Refer to local regulation requirements to determine if mass and balance must be updated.

3.3 Tires

Tires	Size	Ply rating	Speed index	Type	Inflation pressure
Main	11x4.00-5	8	-	Tubeless	4.8 bars – 70 PSI

3.4 Torque

All torques for BERINGER product assembly are specified in the installation instructions in this document or in the maintenance working cards.

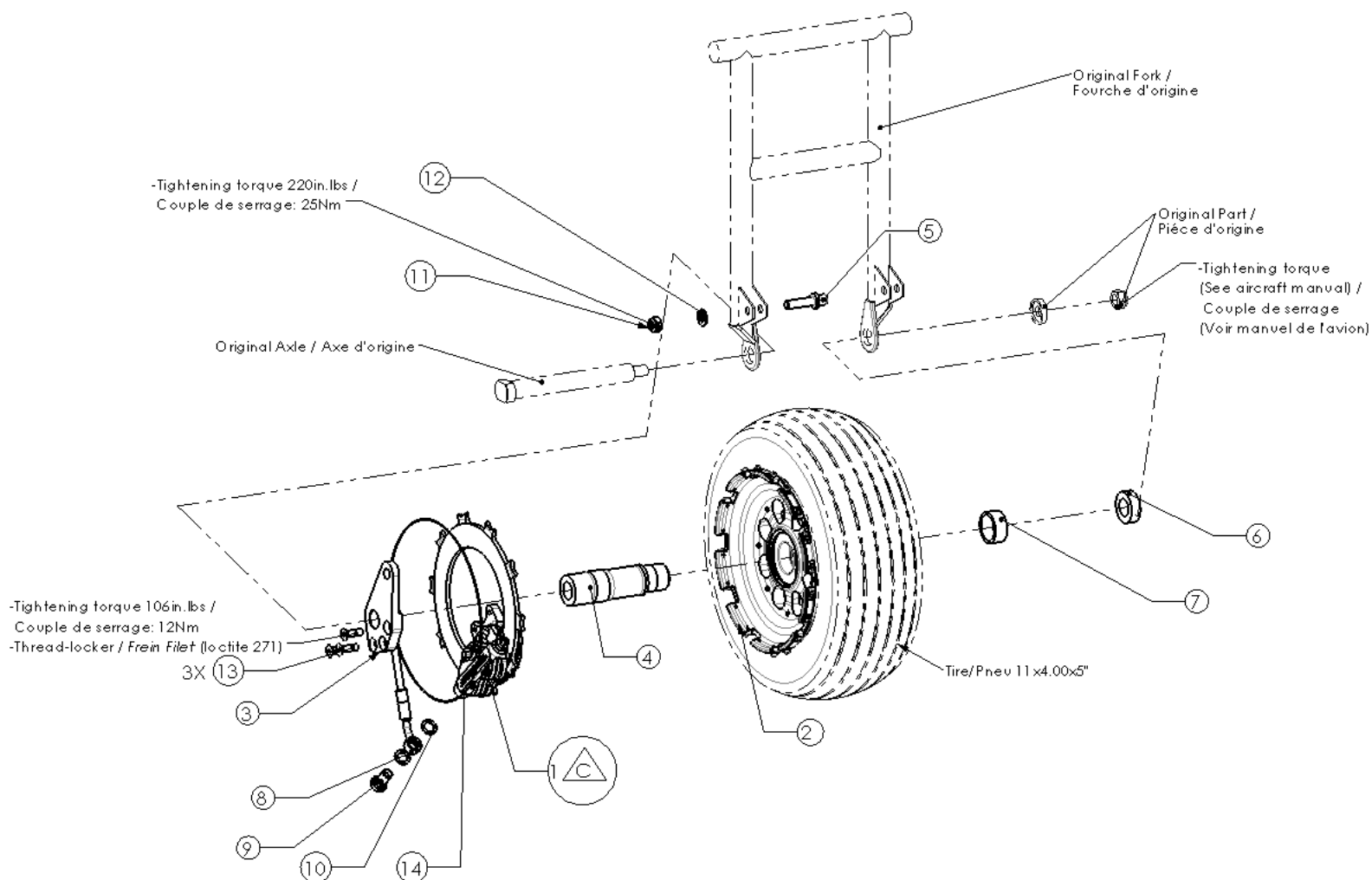
For interface parts with aircraft, unless otherwise specified by BERINGER, all fasteners should be torqued as per Aircraft Manual.

3.5 Standard product and tools

- Tire lubricant : Tire lubricant or liquid soap
- Hydraulic fluid : Dot 4
- Tire mounting tool: To refer to MM-02-002.
- Torque wrench
- Paint marker
- Bearing grease

4 REMOVAL AND INSTALLATION

4.1 Main wheel and Brake



14	ZPA02	Safety Wire/Fil a freiner	1
13	V-FHC-001	M6x20 (Q10.9)_Screw/ Vis	3
12	R-AP-007	Z8_Washer / Rondelle	1
11	E-HN-004	Self-locking Nut M8/ Ecrou NL M8	1
10	HYD-005B	Copper Seal/ Joint cuivre	2
9	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	1
8	AV-LSP-011	LS4 (limiteur, Etrier)_Brake Line / Durite	1
7	AV-LSP-005	LS4 4.00x5"Std _Spacer / Entretoise	1
6	AV-LSP-004	LS4 4.00x5" Std_Washer / Rondelle	1
5	AV-LSP-003	LS4 4.00x5"Std_Torque Screw / Vis Reprise Couple	1
4	AV-LSP-002	LS4_4.00x5"Std_Sleeve/Entretoise	1
3	AV-LSP-001	LS4 4.00x5" Std_Caliper Plate / Platine Etrier	1
2	RF-020	4.00x5" Std (25-30)_Main Wheel Assy/ Roue Freinée	1
1	EA-017E	2P27-6-4.2 (T1 M6 DOT4)_ Brake Caliper / Etrier de frein	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-LSP-020			

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REMOVAL:

- a) Remove the old system: wheel, brake, axle
- b) Remove cable

NOTE: The wheel axle is not changed and remains the same.

INSTALLATION:

Prior to installation:

- Wheel and tire are already mounted and pressure tested
- Brake assembly is fixed on the caliper plate

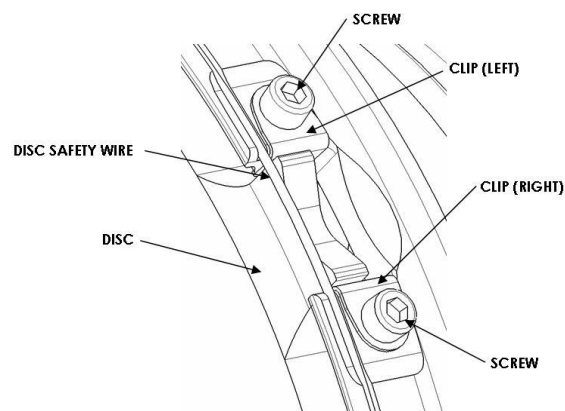
- a) Replace one screw on brake side by the part : AV-LSP-003
- b) Insert the wheel spacer inside the wheel
- c) Insert the disc into the caliper: do not disassemble the caliper
- d) Place the disc, caliper, caliper plate into the wheel, locate the caliper plate onto the axle.
- e) Insert the bearing spacer onto the axle (valve side).
- f) Present the entire assembly in the landing gear fork
- g) Insert the axle washer and then insert all the way through the original steel axle.
- h) Place the axle washer and nut, torque tighten to the appropriate torque

NOTE: Check that the caliper is in place and not moving
Check that the wheel has no axial play

- i) Place the safety wire all around the disc and twist it on 8mm.

CAUTION: The safety wire must be in place to prevent the disc from going out the slots

NOTE: Check that the wheel is turning freely with hand





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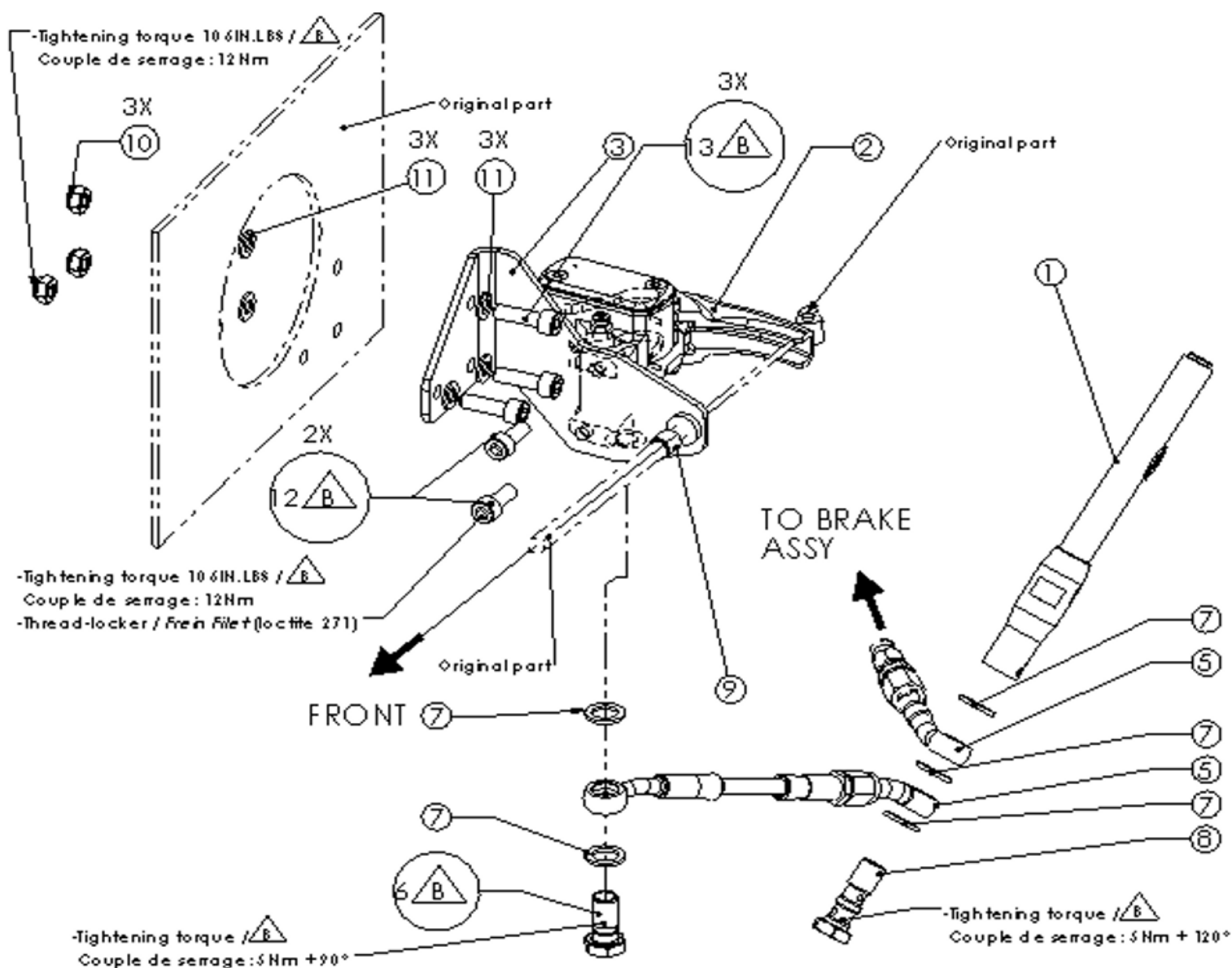
4.1 SensAIR installation

SensAIR system is an optional device located inside the tire, around the rim.

Refer to SM-08 document to get installation procedure, available on BERINGER Website.



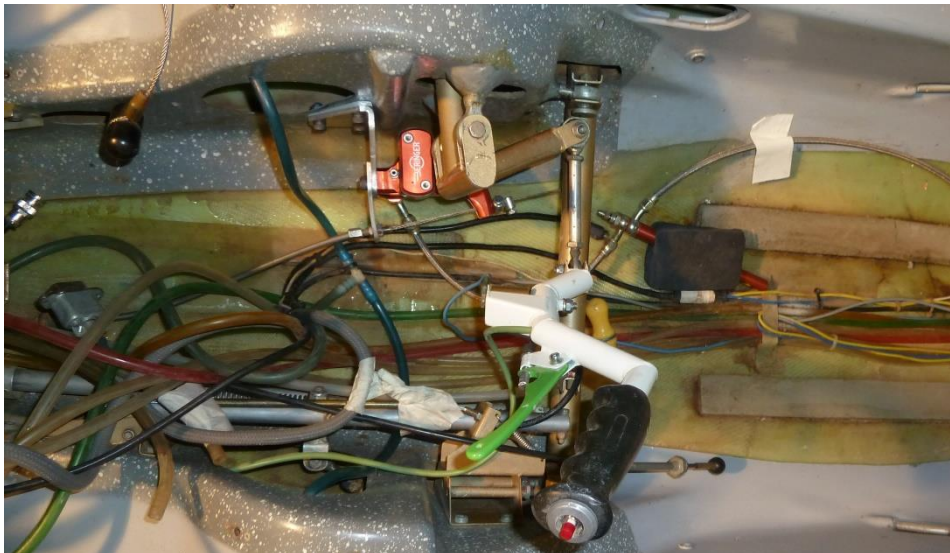
4.2 Master Cylinder



13	V-CHC-058	M6x20 (Q12.9)_Screw/Vis Chc	3
12	V-CHC-040	M6-12 (Q12.9)_Screw / Vis	2
11	R-AP-009	Washer Z6/ Rondelle Z6	6
10	E-HN-003	M6_self-locking Nut/Ecrou NL	3
9	TEC-001	Screw/ Tendeur Câble	1
8	HYD-030P	Banjo Bolt / Vis banjo double	1
7	HYD-005B	Copper Seal/ Joint cuivre	5
6	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	1
5	HYD-002VC	Hydraulic fitting/Raccord banjo 20°	2
4	AV-LSP-010	LS4(MM, Limiteur)_Brake Line / Durite	1
3	AV-LSP-006	LS4 MM_Support plate / Platine Support	1
2	MM-002.1E	MM (LS4)_Hand Master Cylinder / MCM	1
1	LM-002E	25 Bars (Dot 4)_Pressure limiter / Limiteur	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-LSP-030			

The master cylinder and his support should be fixed under the instrument panel.

- a) Position the master cylinder as on the pictures next. Make sure there is around 20mm between the master cylinder and the controls.



- b) Drill the 3 fixing holes using the support as a template
- c) Bolt the master cylinder and plate to the fuselage rib.
- d) Cut the Bowden cable to the appropriate length, the Bowden cable must not be straight or in tension.
- e) Place the Bowden cable and cable through the master cylinder
- f) Use one or two cable stop
- g) Leave around 2mm of play between the lever and the cable stop
- h) Check carefully that the master cylinder is not touching anything when moving the stick in all positions

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NOTE: The lever of master cylinder can be adjusted in distance with the thumbwheel at the lowest point of the master cylinder

- i) Position the pressure limiter as per the next picture:



- j) Secure the limiter with straps and foam so it cannot move.

4.3 Brake Fluid

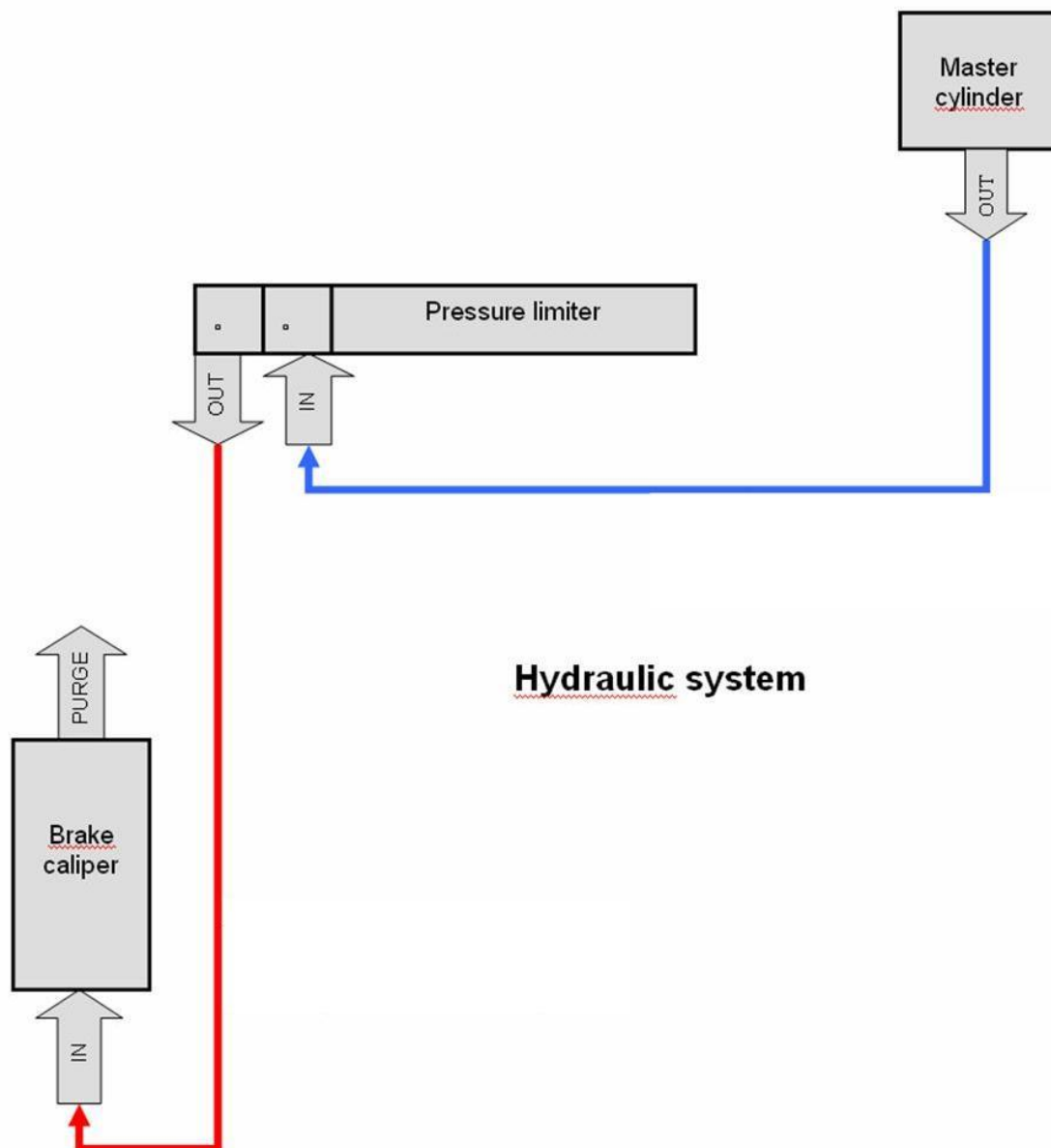
Brake fluid required by the new brakes is DOT4. Please make sure that only DOT4 is filled in the system.

CAUTION: Using other fluid will damage all the seals of the system

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4.4 Brake lines – Hydraulic schema

Next is the hydraulic schematic of the brake system :



- Place the new brake line in the same place as the old Bowden cable.
- The banjo is going onto the master cylinder, the other fitting is not made to allow going through the hole in the landing gear compartment.
- Assemble the hydraulic fitting on caliper side at the required length, as per the BERINGER procedure **MM-00-002** - Hydraulic lines, available on BERINGER Website.
- Torque tighten the banjo bolts to 5 N.m + 90° , Do not twist the brake lines
- Use the plastic clamps to fix the brake lines

WARNING: A wrong positioning of brake lines may block the controls, make sure that all is positioned and fixed properly with no interferences with the controls.

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- f) Place the brake lines and torque tighten the banjo bolts to 5 N.m + 90°, Do not twist the brake lines
- g) Use the plastic clamps to fix the brake lines
- h) Fix the pressure limiter with plastic clamps to the cables in the back of the fuselage

WARNING: A wrong positioning of brake lines may block the controls, make sure that all is positioned and fixed properly with no interferences with the controls.

- i) Fill the system from the caliper with brake fluid **DOT4** and only **DOT4** (yellow color used in cars or motorbikes). All other type of fluid is forbidden.

CAUTION: Using another fluid will damage the seals.
If red or green mineral oil has been used, all the parts must be sent back to Beringer to replace the seals

NOTE: To bleed the system properly it is recommended to use a bleeder pump.
Do not try to fill the reservoir and pump, it will not work. Use a bleeder pump or a syringe and push from the caliper.

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5 INITIAL USE

BERINGER brakes need to be bled and conditioned prior to use.

For procedure instructions, refer to the following manuals available on BERINGER website:

- BRAKE BLEEDING procedure MM-00-003
- BRAKE CONDITIONING procedure MM-01-002

Completing the procedure conforms the brakes to the STC requirements. However, note that the brake performance will continue to improve during the first few hours of use.

6 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

All instructions for continued airworthiness are provided through the Servicing Manuals (SM) and Maintenance Manual (MM) of BERINGER.

- The Servicing Manuals (SM) sums-up the parts replacement scheme, the maintenance intervals, troubleshooting and the Maintenance Working Cards to be used for each BERINGER assembly.
- The Maintenance Manual (MM) describes each maintenance step for all BERINGER products.

Refer to the maintenance guide **SM-00** for **general guidance**.

The SM breakdown structure is as follows:

Servicing Manual Reference	Product Type	Product Reference
SM-01	Brake Assembly	EA-xxx
SM-02	Nose/Tail wheel	RA-xxx
SM-02	Main wheel	RF-xxx
SM-03	Control-stick Master-Cylinders	MM-xxx
SM-03	Longitudinal Master-Cylinders	MP-xxx
SM-04	Parking Brake	FP-xxx
SM-05	Brake Pressure regulator	RE-xxx
SM-06	Brake Pressure limiter	LM-xxx
SM-07	Shock Wheel	LL-xxx
SM-08	SensAIR device	TP-xxx
SM-09	Tyre 5x2.00-3.7 & 6x2.00-3.7	PAR-xxx
SM-10	Carbon Fairing	CR-xxx

All documents are all available on:



BERINGER website: www.beringer-aero.com/Support
Go to Support section.

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7 ASSOCIATED DOCUMENTS

Document reference	Document title
BOM-STC-015	Part Nomenclature
MM-00-002	Hydraulic lines
MM-00-003	BRAKE BLEEDING procedure
MM-01-002	BRAKE CONDITIONING procedure
SM-00	BERINGER PRODUCTS MAINTENANCE GUIDE
SM-02	Wheels Servicing Manual

Refer to the latest revision.