

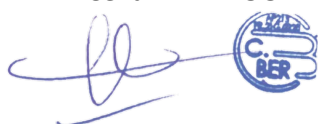
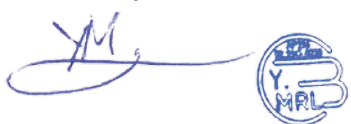
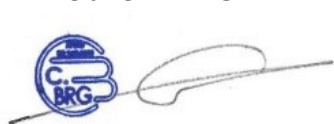
	<b>Instructions for Continued Airworthiness</b>	Project Reference <b>STC-010</b>	ICA-STC-010
			REV. 04

# Instructions for Continued Airworthiness and Installation Instructions

for BERINGER wheels and brakes on  
CIRRUS SR20/22 aircrafts (single brake)

Document Reference<sup>(\*)</sup>  
**ICA-STC-010**

Project Reference  
**STC-010**

PREPARED <sup>(**)</sup>	CHECKED <sup>(**)</sup>	APPROVED <sup>(**)</sup>
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22 Nov 2021	22 Nov 2021	22 Nov 2021

(\*) 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	13.05.2013	Initial edition
01	20.01.2014	Upgrade with wheel assembly RA-002 in the B revision, update of part list and maintenance manual
02	28.10.2015	Update of name and changes in paragraphs 3 and 4
03	13.06.2017	Update with new wheel
04	19 Oct. 2021	Administrative change: MM-STC-010 becomes ICA-STC-010: new maintenance document structure and addition of SensAIR system as an option.

## 2 INTRODUCTION

### 2.1 Purpose of the document

This manual gives removal and installation instructions of BERINGER wheels and brake system STC on the CIRRUS SR20/22 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 C26d/ETSO C26c 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-23
- FAR part 23

### 2.3 Effectivity

Type: CIRRUS

Models: SR20, SR22, SR22T

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### 3 GENERAL

#### 3.1 Components list

This STC scope includes Main and Nose wheels, brakes (master cylinder, single caliper, lines...) and axles as replacement parts to original equipment. All the assemblies are listed in NP-STC-010, 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
6" wheel SensAIR (option)	TP-006
5" wheel SensAIR (option)	TP-005

#### 3.2 Weight and Balance

BERINGER Assembly Name	Weight (Kg)	Weight (Lbs)
Main wheel and brake	4,63	10,2
Nose wheel	1,7	3,7

*(Weights are given without tires, per wheel)*

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

#### 3.3 Tires

Tires	Size	Type	Ply	Inflation pressure
Main	15x6.00-6	Tubeless	Ply rating as per latest revision of aircraft manual	Refer to latest revision of aircraft manual
Nose	5.00-5	Tubeless	Ply rating as per latest revision of aircraft manual	Refer to latest revision of aircraft manual

#### 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.

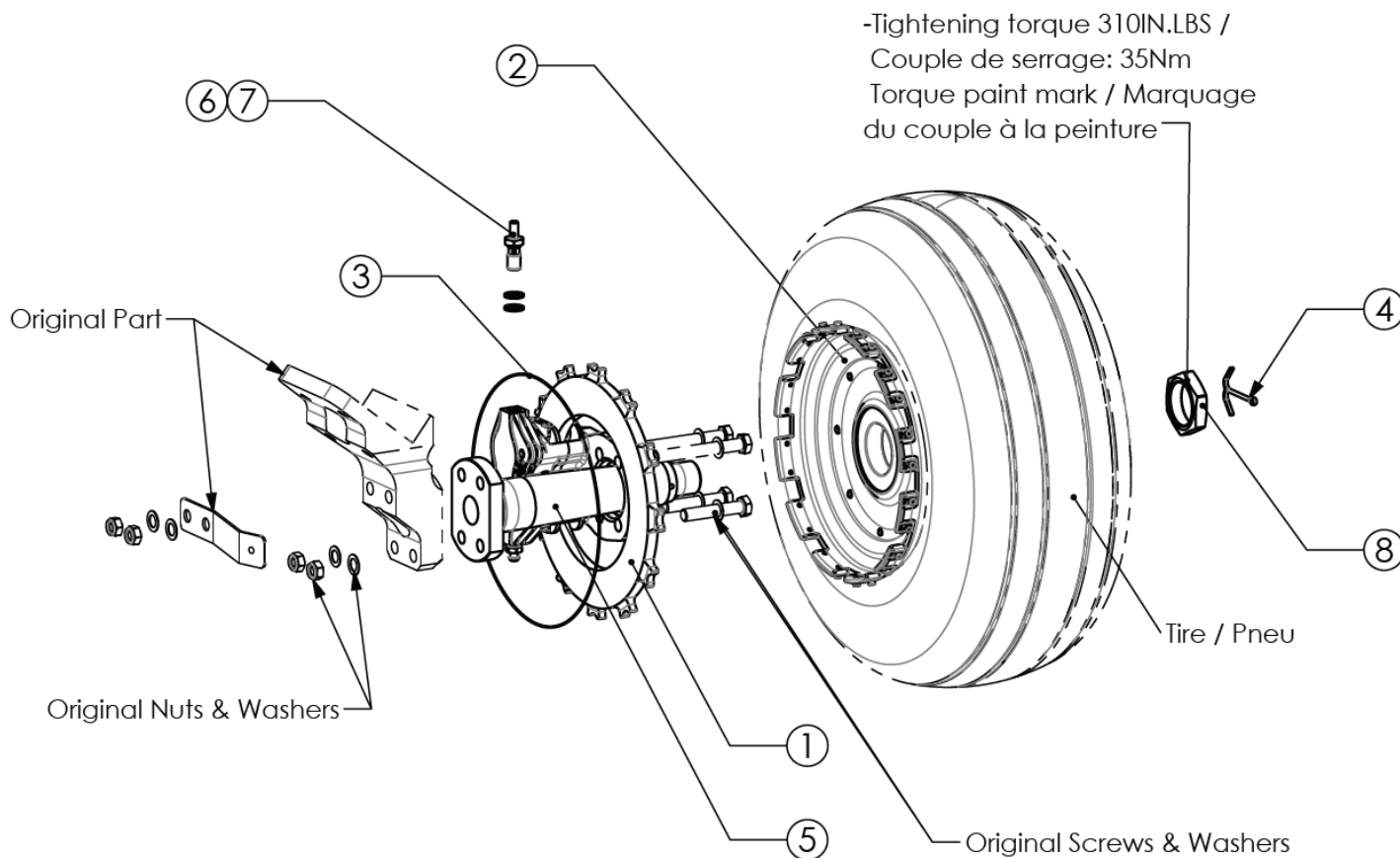
#### 3.5 Standard product and tools

- Tire lubricant : Tire lubricant or liquid soap
- Hydraulic fluid : Mineral
- Tire mounting tool: Refer to MM-02-002.
- Corrosion inhibitive sealant type CA1000 from PRC De Soto (or equivalent)
- Torque wrench
- Paint marker

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## 4 REMOVAL AND INSTALLATION

### 4.1 Main wheel and Brakes



8	ECR-001	M35x1.5_Axle nut /Erou	1
7	HYD-026C	Vis Banjo	1
6	HYD-005B	Copper Seal/ Joint cuivre	2
5	AV-CIRR-002	Cirrus SR22 6.00x6HE_Axle/ Fusée	1
4	L-V-003	Cotter Pin 3.2x50/Goupille fendue 3.2x50	1
3	ZPA02	Safety Wire/Fil à freiner	1
2	RF-006	6.00x6" HE_Wheel Assy./Roue freinée	1
1	EA-003.3N	2P32-6-9(Mineral)_Brake Caliper / Etrier De Frein	1
<b>REP</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY.</b>

**AV-CIRR-021**

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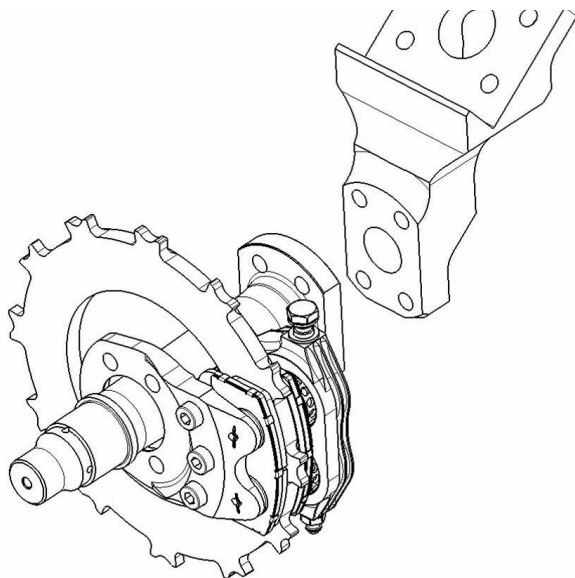
#### REMOVAL:

- Remove wheel fairings
- Remove original wheel, axle and brake assy. from the gear leg
- Remove flexible hose

#### INSTALLATION:

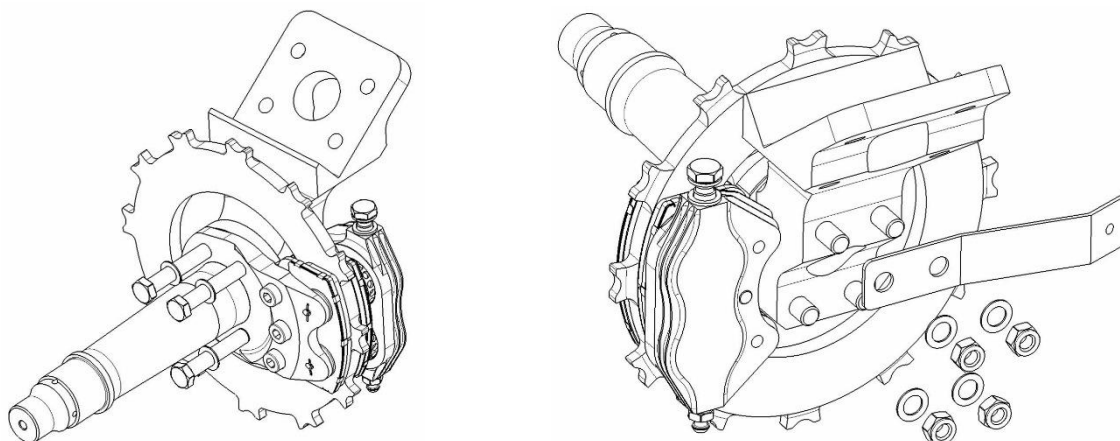
Brake calipers are fixed at the same place with same bolts as original brake unit.

- Apply a thin coat of corrosion inhibitive sealant type CA1000 from PRC De Soto (or equivalent) on next contact surfaces:
  - between axle and caliper
  - between axle and LG
  - on axle bolts and washers
- Place the axle and the brake assembly in position on the gear leg.



- Install the 4 bolts, 8 washers and the 4 self locking nuts. Place the fairing attachment plate.

**NOTE:** Bolt head must be on wheel side, use one thin washer under each bolt head.

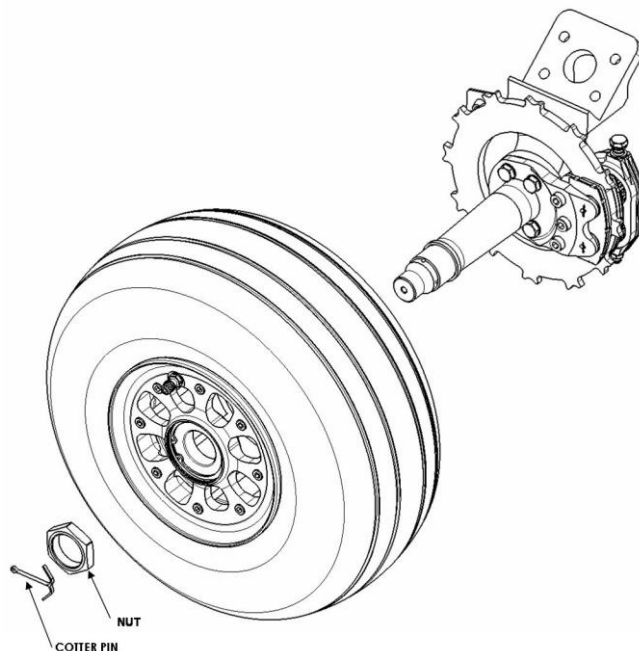


- Torque the nuts to appropriate torque – refer to the aircraft maintenance manuals for axle bolt torque value



- e) Apply a thin coat of grease on wheel bearings
- f) Insert the wheel through the axle while placing the disc in wheel slots.

**NOTE:** Do not force, the disc has to be properly positioned to fit inside wheel slots

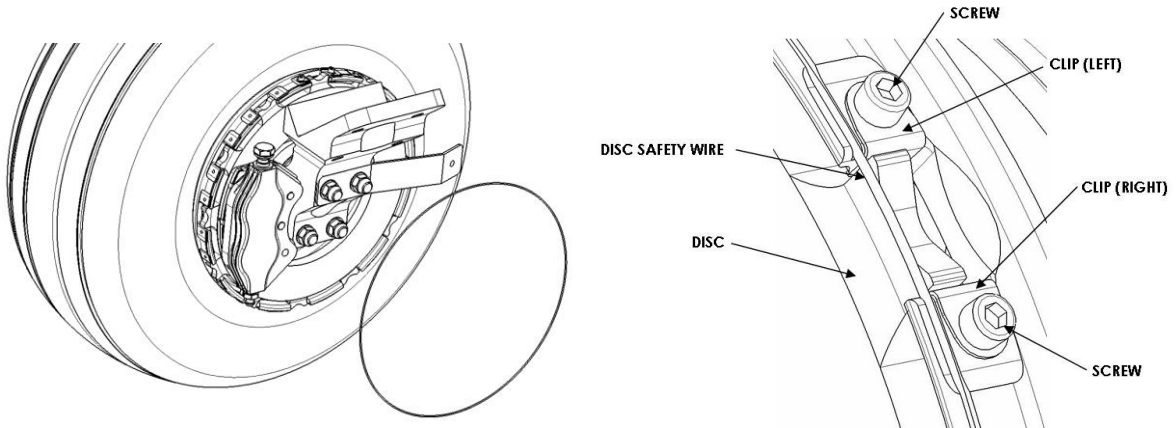


- g) Apply a thin coat of grease on axle thread. Screw the axle nut to contact
- h) Torque axle nut to 35 N.m (350 in-lb)
- i) Insert a new cotter pin to secure the axle nut

**CAUTION:** Cotter pin must be in place to prevent the loose of axle nut.

- j) Place a new safety wire (stainless steel 1mm – 0.040") in the ring groove all around the wheel.

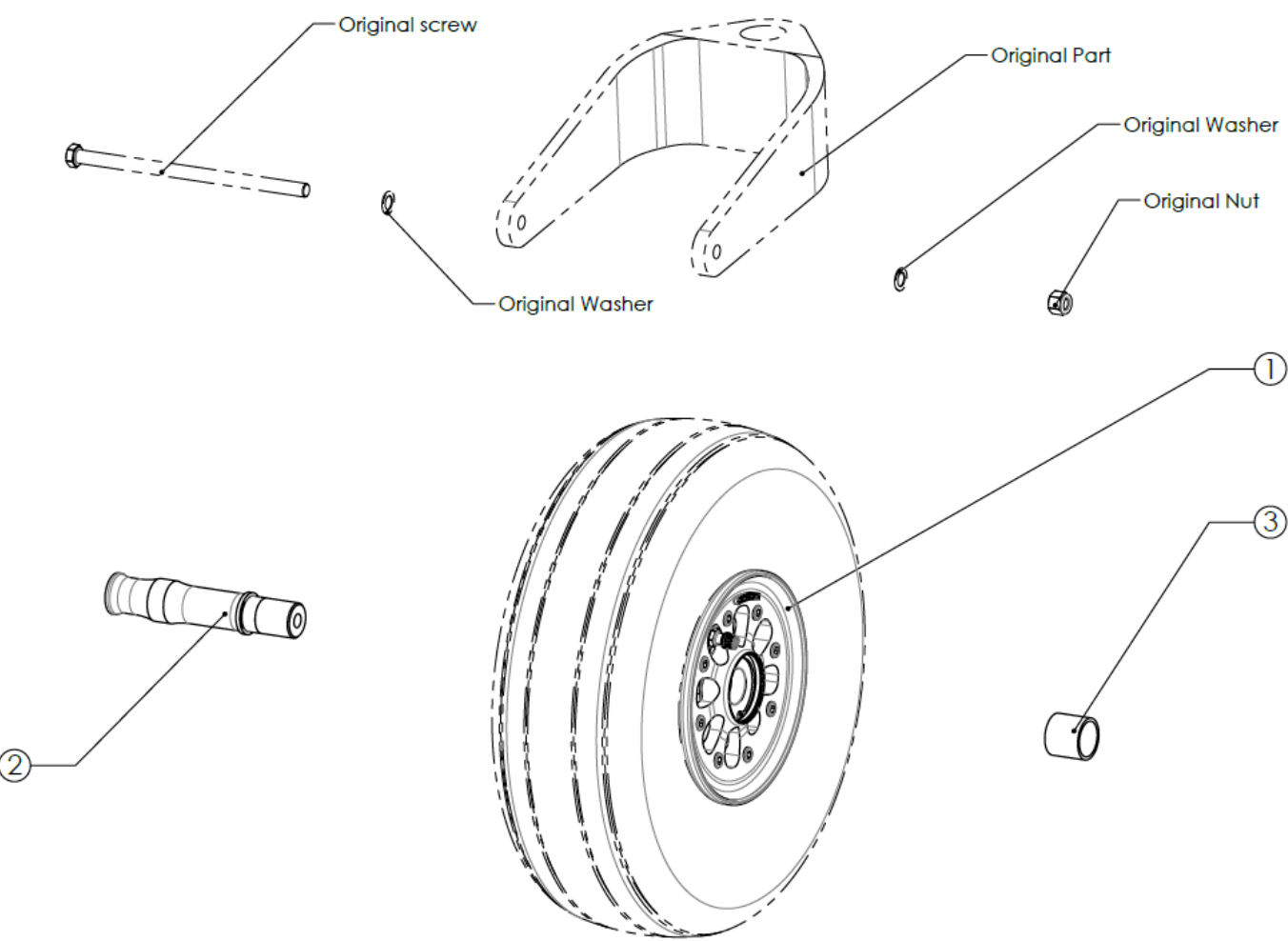
**CAUTION:** This safety wire must be in place to secure the disc.



- k) After the bleeding of the brake system, install wheel fairings as specified in the aircraft maintenance manuals.



4.2 Nose Wheel



Weight (Without tire)/Masse : 1702g

3	AV-CIRR-004	Bearing spacer	1
2	AV-CIRR-003	Nose wheel axle	1
1	RA-014	Nose wheel	1
REP	PART NUMBER	DESCRIPTION	QTY.

AV-CIRR-030

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REMOVAL:

- a) Remove wheel fairings
- b) Remove original axle and wheel from the fork

INSTALLATION:

- a) Apply a light coat of grease on wheel bearings
- b) Insert the axle in the wheel and then the bearing spacer on the other side.
- c) Place the assembly inside the fork
- d) Insert the original axle bolt with washers, screw the nut to contact and tighten to the appropriate torque
- e) Insert cotter pin to secure the nut

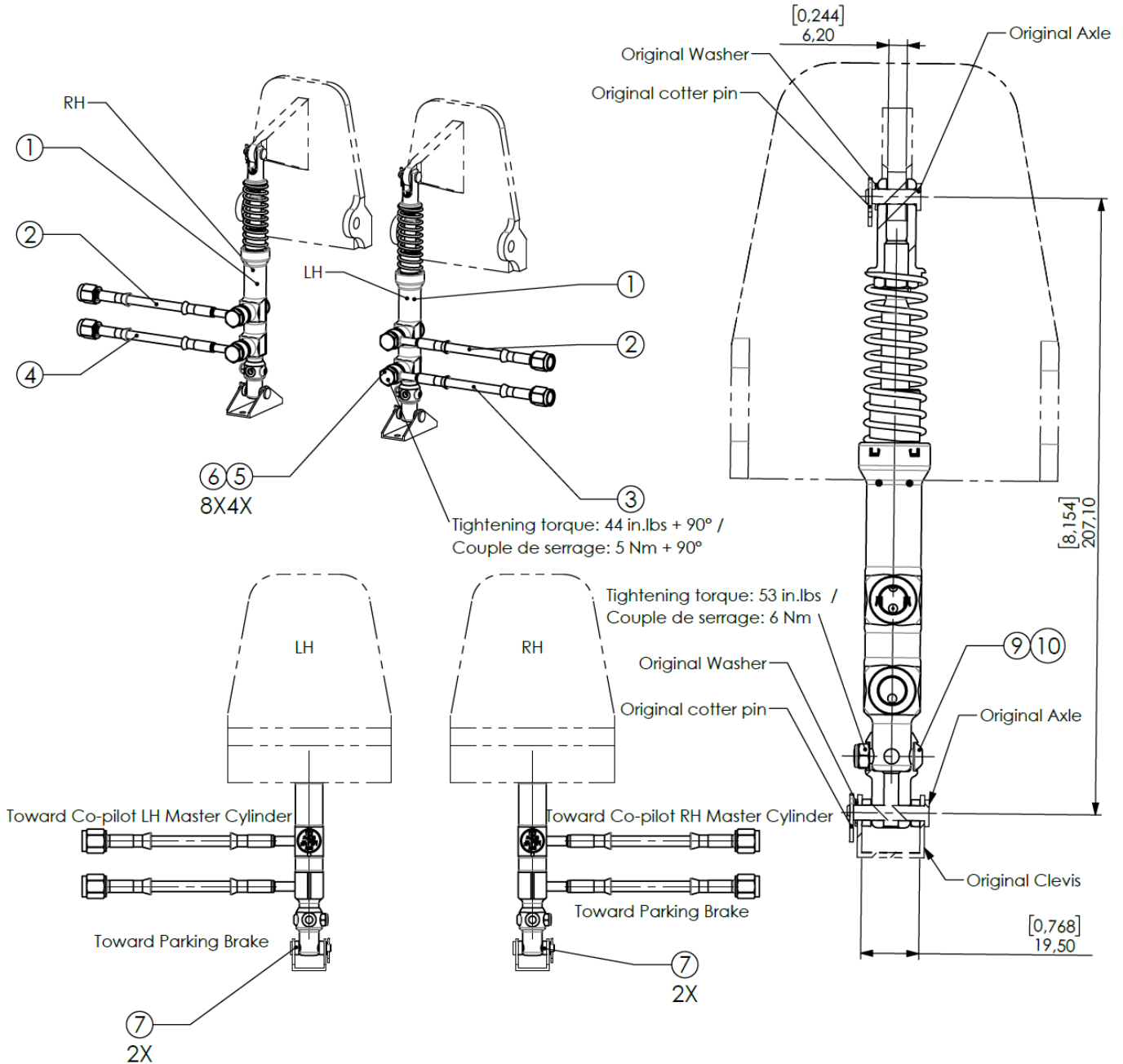
**CAUTION:** Make sure that the wheel is turning freely but without lateral play.

- f) Check tire inflation pressure
- g) Install the fairing as specified in the aircraft maintenance manuals.



## 4.3 Master Cylinders

### Pilot Master Cylinder Assembly



10	E-HN-002	M5_self-locking Nut/Ecrou	2
9	V-BHC-003	M5x20(A2)_Screw /Vis	2
8	PGT-002(A)	MC12.2_Extender/Prolongateur	2
7	RDL-010(A)	9-5.1-3_Spacer / Entretoise	4
6	HYD-005B	Copper Seal/ Joint cuivre	8
5	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	4
4	AV-CIRR-001.9	Brake Line 9	1
3	AV-CIRR-001.8	Brake Line 8	1
2	AV-CIRR-001.6	Brake Line 6	2
1	MP-003N	MC12.2 NBR (188) _Master Cylinder/ Maitre cylindre	2
REP	PART NUMBER	DESCRIPTION	QTY.

AV-CIRR-044

9	AV-CIRR-001.7	Cirrus_Brake Line 7	1
8	E-HN-002	M5_self-locking Nut/Ecrou	2
7	V-BHC-003	M5x20(A2)_Screw /Vis	2
6	PGT-002	MC12.2_Extender/Prolongateur	2
5	RDL-010	9-5.1-3_Spacer / Entretoise	4
4	HYD-005B	Copper Seal/ Joint cuivre	8
3	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	4
2	AV-CIRR-001.6	Brake Line 6	3
1	MP-003N	MC12.2 NBR (188)_Master Cylinder/ Maitre cylindre	2
<b>REP</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY.</b>

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#### REMOVAL:

- Disconnect inlet and outlet hose
- Remove and discard the cotter pins
- Remove clevis pins and washers
- Remove flexible lines with fittings
- Install blanking cap on all open connections

**NOTES:** Same master cylinders are used on pilot side and co-pilot side.

Fluid reservoir is not changed by this STC

Position of pedals remains the same as original equipment

#### INSTALLATION:

- Pre-assemble the master cylinder with the extender, the two brake lines, banjo bolts and copper seals

**NOTE:** Refer to the hydraulic schema to choose the corresponding brake lines

- Torque tighten the banjo bolt to 5 Nm + 90° (45 in-lbs +90°)

**CAUTION:** Do not lubricate the hydraulic threads with any grease.

**NOTE:** If under torque is applied there may be a leakage, if over torque is applied the banjo bolt may broke or damage the internal thread

**CAUTION:** Copper seals cannot be re-used after being locked because they may leak. They must be changed each time the fitting is removed.

- Do a check of brake pedal to make sure it moves easily and free of parasite friction
- Lubricate the new or polished clevis pins with grease MIL-G-81322

**NOTE:** Clevis pins must be like new and free of scratches

- Lubricate inner bore of master cylinder body and clevis with grease MIL-G-81322

- Insert master cylinder body in the fixing on floor, place the two spacers and insert the axle. Place the washer and cotter pin.

**NOTE:** a small play should be observed between master cylinder body and his fixing.

- Present master cylinder clevis in front of pedal assembly. No lateral effort should be applied to position the master cylinder clevis at the right place

**CAUTION:** Wrong adjustment of master cylinder will cause premature wear, and possible failure of master cylinder

- Insert clevis pin with washer and cotter pin
- Move brake pedal and check for any parasite friction.
- Check that when brake pedal is released the master cylinder is fully extended

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**CAUTION:** Master cylinder length axle to axle is 207mm (8.15 in) this dimension is adjusted at factory and should not be changed.

- k) Make sure that the pins are secured with cotter pins
- l) Do the same operation for each master cylinder
- m) Then connect brake lines to original fittings

**CAUTION:** Brake lines must not touch other parts or be twisted

#### 4.4 Brake Fluid

Brake fluid required by the new brakes is per MIL-PRF-87257. The sticker on the fluid reservoir must be replaced by the new one delivered in the kit.

**CAUTION:** Standard MIL-H-5606 Brake fluid is replaced by fire resistant fluid: MIL-PRF-87257, make sure that only this brake fluid is used.

#### 4.5 Parking brake Valve

Parking brake valve is not changed and remains the same

**CAUTION:** Parking brake valves are not made by BERINGER, refer to manufacturer for maintenance procedures and service life.

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## 4.6 Brake lines - Hydraulic Schema

Brake lines are made from Teflon and stainless steel hose braided.

**CAUTION:** Brake lines and hydraulic schema is different from original. Make sure that new brake lines are connected properly. The brake system will not work if brake lines are not connected properly.

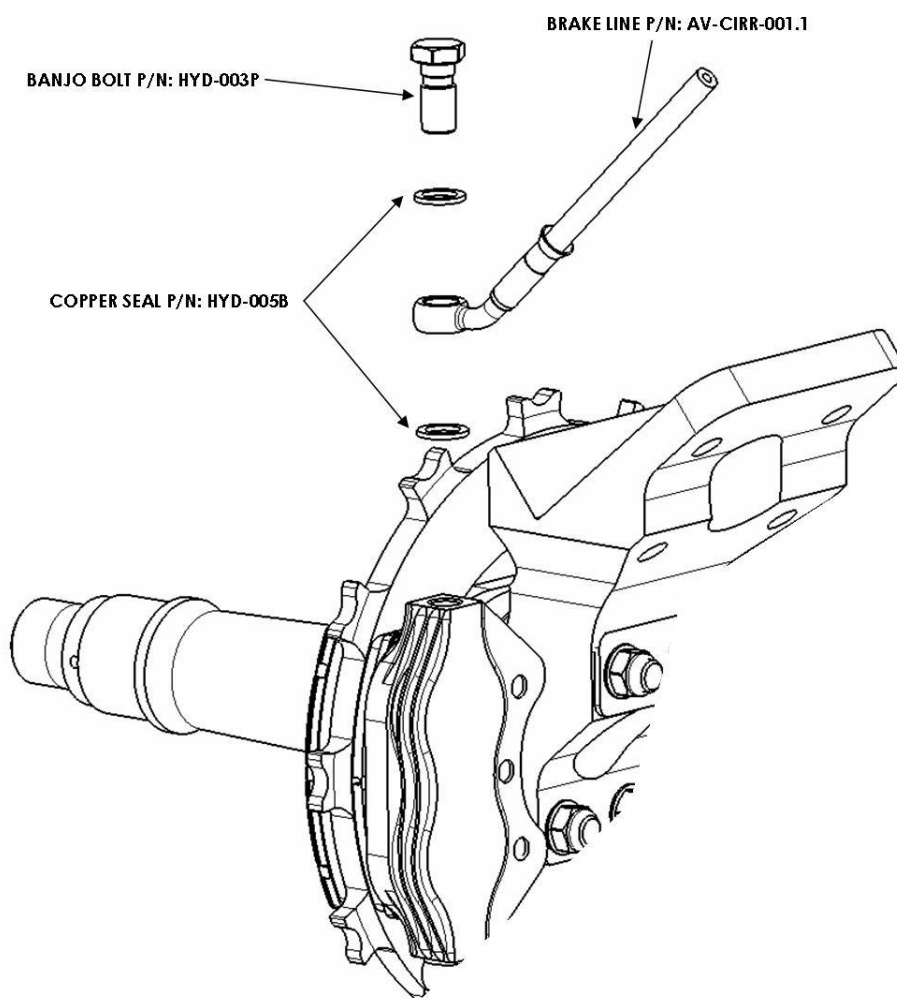
### INSTALLATION:

- On the brake caliper : install flexible brake line AV-CIRR-001.1
- Torque tighten the banjo bolt to 5 Nm + 90° (45 in-lbs +90°)

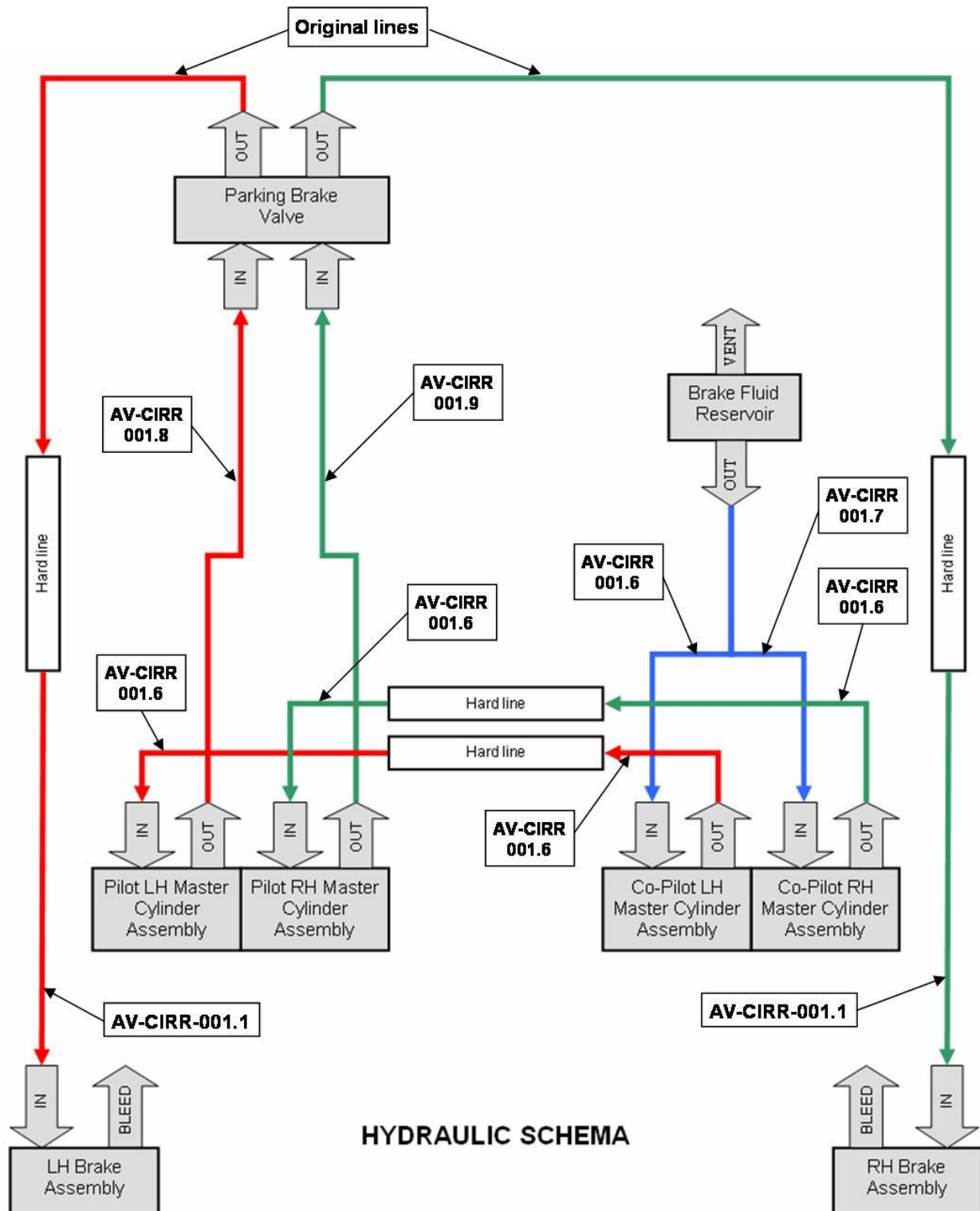
**CAUTION:** Do not lubricate the hydraulic threads with any grease.

**NOTE:** If under torque is applied there may be a leakage, if over torque is applied the banjo bolt may broke or damage the internal thread

**CAUTION:** Copper seals cannot be re-used after being locked because they may leak. They must be changed each time the fitting is removed.









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

**All documents are all available on:**



BERINGER website: [www.beringer-aero.com/Support](http://www.beringer-aero.com/Support)  
Go to Support section.

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## 7 AIRWORTHINESS LIMITATIONS SECTION

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved.

## 8 ASSOCIATED DOCUMENTS

Document reference	Document title
NP-STC-010	Part Nomenclature
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.*