


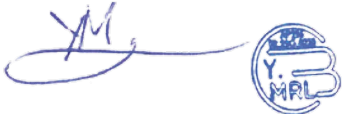

	Instructions for Continued Airworthiness	Project Reference STC-014	ICA-STC-014
			REV. 7

Instructions for Continued Airworthiness and Installation Instructions

for BERINGER wheels and brakes on
PA 28 aircraft

Document Reference(*)
ICA-STC-014

Project Reference
STC-014

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

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1 LOG OF REVISIONS

Rev. No	Rev. date	Description
0	10.012016	Initial edition
1	11.04.2016	Update with changes on paragraph 4
2	20.04.2016	Update with changes on paragraph 4
3	15.12.2016	Upgrade with nose wheels
4	06.09.2017	Upgrade with nose wheels P/N
5	02.05.2019	Change RA-016 by RA-016.1
6	13.10.2020	Addition of PA-28-140
7	19 Oct. 2021	Administrative change: MM-STC-014 becomes ICA-STC-014. 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 PA-28 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-23
- FAR part 23

2.3 Effectivity

Type: Piper Aircraft PA-28

Models: PA-28-140, PA-28-150, PA-28-151, PA-28-160, PA-28-161, PA-28-180, PA-28-181

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3 GENERAL

3.1 Components list

This STC scope includes Main and Nose wheels, brakes (master cylinder, caliper, lines...) and axles as replacement parts to original equipment. All the assemblies are listed in NP-STC-014, 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 wheels and brake	6.653	14.67
Nose wheel	1.856 (5" wheel) / 2.293 (6" wheel)	4.09 (5" wheel) / 5.06 (6" wheel)

(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	6.00-6	4 to 8	120 Mph min.	Tubeless	Not changed – refer to aircraft manual
Nose	5.00-5	4 to 10	120 Mph min.	Tubeless	Not changed – refer to aircraft manual
Nose	6.00-6	4 to 8	120 Mph min.	Tubeless	Not changed – refer to 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.

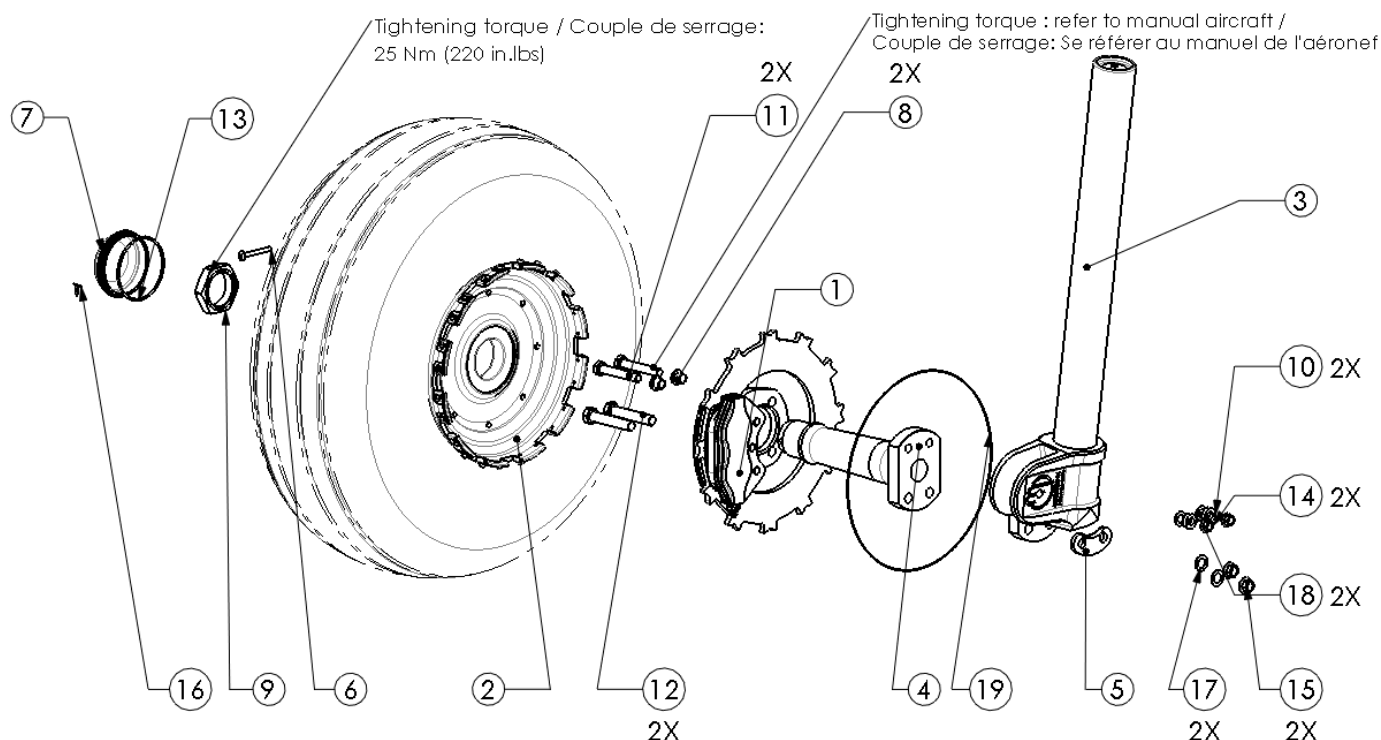
3.5 Standard product and tools

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

4 REMOVAL AND INSTALLATION

4.1 Main wheels and Brakes

BRAKE WHEEL for PA-28 WITHOUT FAIRING

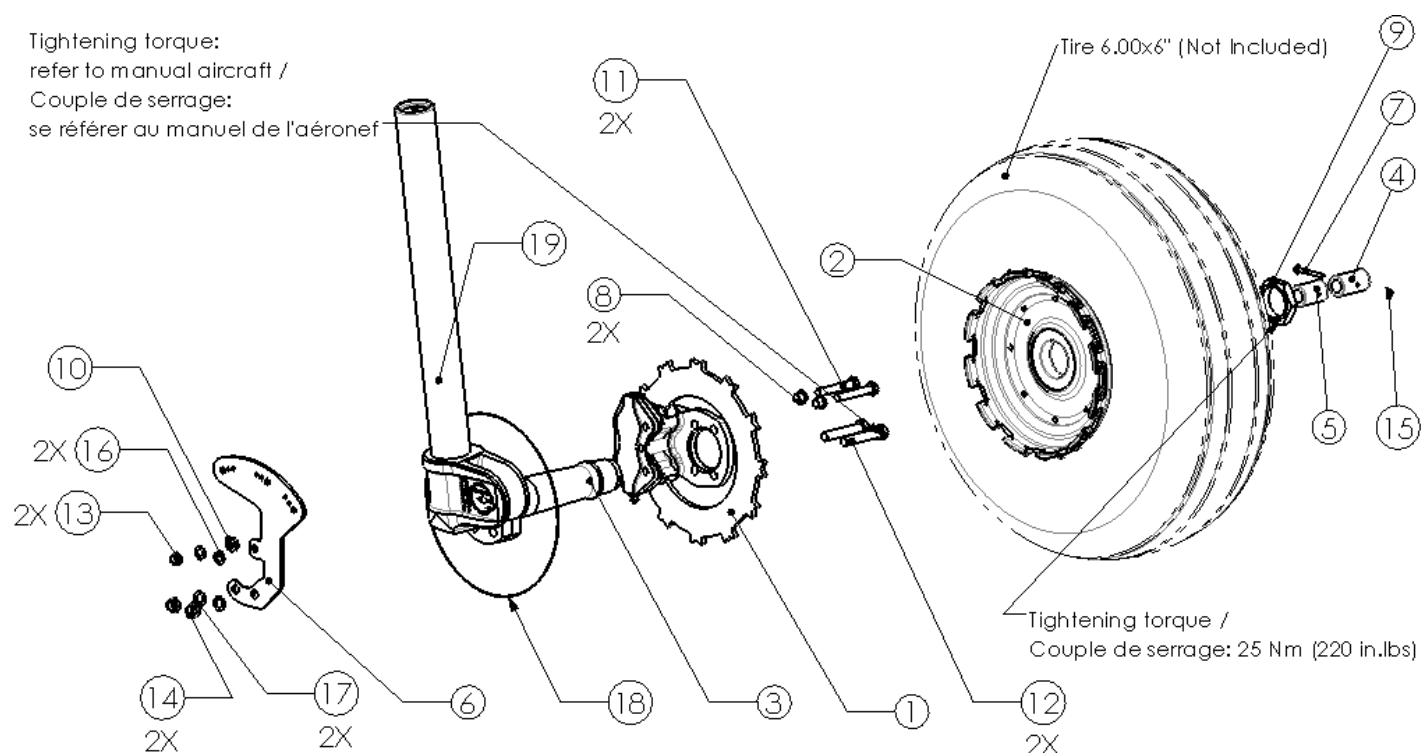


19	ZPA02	Safety Wire/Fil à freiner	1
18	NAS1149F0532P	Washer AN5/Rondelle AN5 Std	2
17	NAS1149F0632P	Washer/Rondelle AN6 Std	2
16	MS24665-132	1.58x12.7_Cotter Pin/ Goupille fendue	1
15	MS21042-6	Self locking Nut/Ecrou Frein AN6	2
14	MS21042-5	Self locking Nut/Ecrou Frein AN5	2
13	J-JTR-020N	BCH-004_O-Ring /Joint	1
12	AN6-20A	AN6_Screw / Vis	2
11	AN5-17A	AN5_Screw / Vis	2
10	RDL-012	8x14.5x4_Spacer / Entretoise	2
9	ECR-001	M35x1.5_Axle nut /Ecrou	1
8	BGE-017	AN6/8_Bushing / Bague	2
7	BCH-004	6.00x6"HL-HE_Wheel cap/ Bouchon de roue	1
6	AXE-004	4x36.5 Axle Pin / goupille	1
5	AV-PER-012	PA-28_Fairing Plate / Entretoise	1
4	AV-PER-004	PA-28_6.00x6" HE_Axle/ Fusée	1
3	AV-PER-018L (or AV-PER-018R)	PA-28 Left (or Right) Gear Leg Assembly / Assemblage de jambe de train gauche (ou droite)	1
2	RF-006	6.00x6" HE_Wheel Assy./Roue freinée	1
1	EA-003N	2P32-6-5.6_Brake Caliper / Etrier De Frein	1
REP	PART NUMBER	DESCRIPTION	QTY.

AV-PER-021L or AV-PER-021R

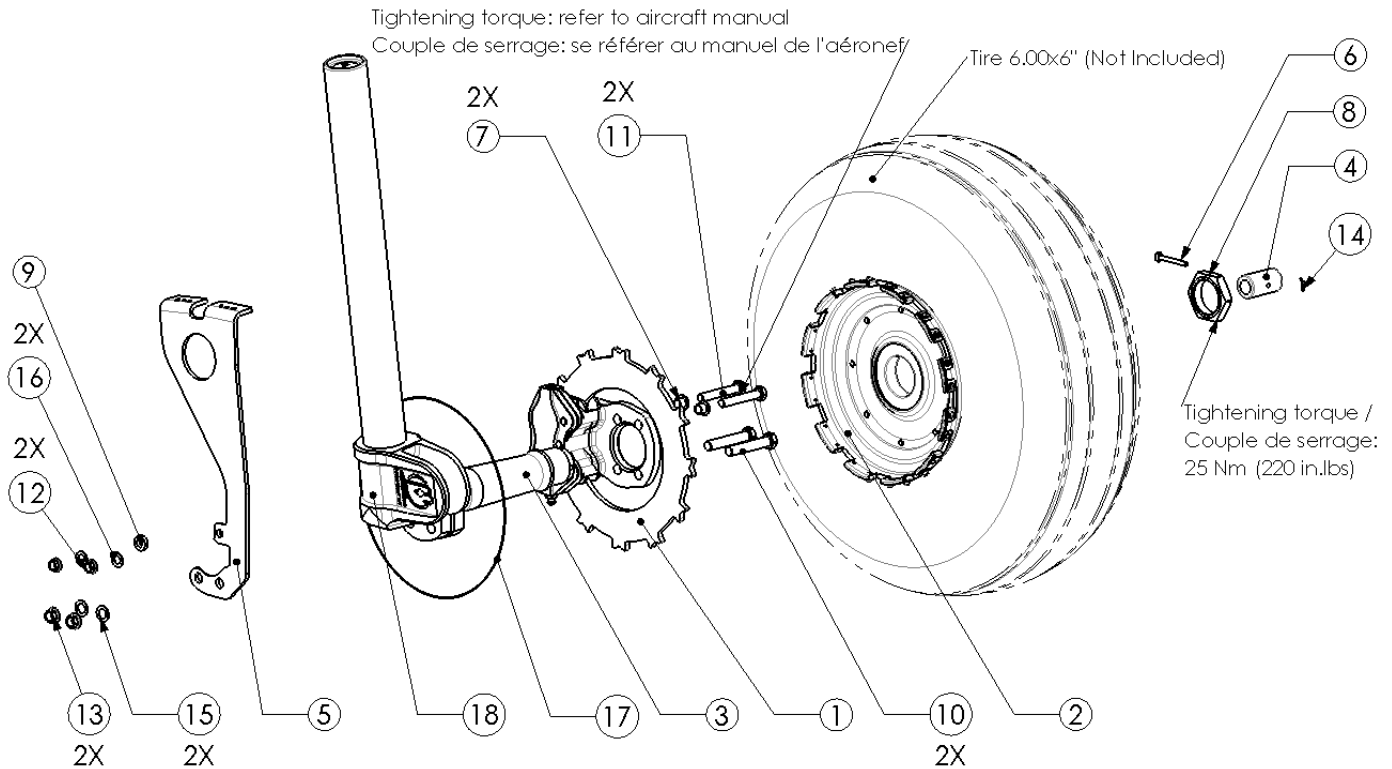
BRAKE WHEEL for PA-28 150 151 160 161

Tightening torque:
refer to manual aircraft /
Couple de serrage:
se référer au manuel de l'aéronef



19	AV-PER-018R (or AV-PER-018L)	PA-28 Right (or Left) Gear Leg Assembly / Assemblage de jambe de train droite (ou gauche)	1
18	ZPA02	Safety Wire/Fil à freiner	1
17	NAS1149F0632P	Washer/Rondelle AN6 Std	2
16	NAS1149F0532P	Washer AN5/Rondelle AN5 Std	2
15	MS24665-132	1.58x12.7_Cotter Pin/ Goupille fendue	1
14	MS21042-6	Self locking Nut/Ecrou Frein AN6	2
13	MS21042-5	Self locking Nut/Ecrou Frein AN5	2
12	AN6-20A	AN6_Screw / Vis	2
11	AN5-17A	AN5_Screw / Vis	2
10	RDL-012	8x14.5x4_Spacer / Entretoise	1
9	ECR-001	M35x1.5_Axle nut /Ecrou	1
8	BGE-017	AN6/8_Bushing / Bague	2
7	AXE-004	4x36.5 Axle Pin / goupille	1
6	AV-PER-010R (or AV-PER-010L)	PA-28_Right (or Left) Fairing Bracket / Support Carenage Droit (ou Gauche) replaces Piper P/N: 63370	1
5	AV-PER-008.1	PA-28_Fairing Spacer for ABS fairing / Entretoise pour carénage ABS	1
4	AV-PER-008	PA-28_Fairing Spacer For Fiberglass Fairing / Entretoise de Carenage Fibre	1
3	AV-PER-004	PA-28_6.00x6" HE_Axle/ Fusée	1
2	RF-006	6.00x6" HE_Wheel Assy./Roue freinée	1
1	EA-003N	2P32-6-5.6_Brake Caliper / Etrier De Frein	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-020R or AV-PER-020L			

BRAKE WHEEL for PA-28 180 181



18	AV-PER-018R (or AV-PER-018L)	PA-28 Right (or Left) Gear Leg Assembly / Assemblage de jambe de train droite (ou gauche)	1
17	ZPA02	Safety Wire/Fil à freiner	1
16	NAS1149F0532P	Washer AN5/Rondelle AN5 Std	2
15	NAS1149F0632P	Washer/Rondelle AN6 Std	2
14	MS24665-132	1.58x12.7_Cotter Pin/ Goupille fendue	1
13	MS21042-6	Self locking Nut/Ecrou Frein AN6	2
12	MS21042-5	Self locking Nut/Ecrou Frein AN5	2
11	AN5-17A	AN5_Screw / Vis	2
10	AN6-20A	AN6_Screw / Vis	2
9	RDL-012	8x14.5x4_Spacer / Entretoise	1
8	ECR-001	M35x1.5_Axle nut /Ecrou	1
7	BGE-017	AN6/8_Bushing / Bague	2
6	AXE-004	4x36.5 Axle Pin / goupille	1
5	AV-PER-011R (or AV-PER-011L)	PA-28_Right (or Left) Fairing Bracket / Support Carenage Droit (ou Gauche) replaces Piper P/N: 37880	1
4	AV-PER-008	PA-28_Fairing Spacer For Fiberglass Fairing / Entretoise de Carenage Fibre	1
3	AV-PER-004	PA-28_6.00x6" HE_Axle/ Fusée	1
2	RF-006	6.00x6" HE_Wheel Assy./Roue freinée	1
1	EA-003N	2P32-6-5.6_Brake Caliper / Etrier De Frein	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-024R or AV-PER-024L			

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REMOVAL:

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

INSTALLATION:

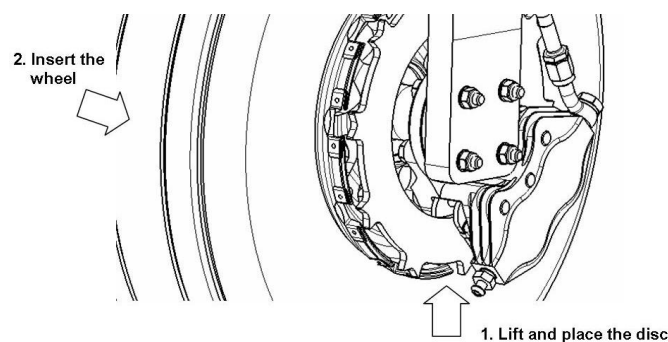
The strut tube and stub axle come together as they are press-fitted at the factory.

- Place the axle and the brake assembly in position on the stub axle, place the fairing bracket if required.
- 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
- Install the 4 bolts, bushings, fairing bracket, washers and the 4 self-locking nuts.

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

- Torque the nuts to appropriate torque
- Apply a thin coat of grease on wheel bearings
- 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

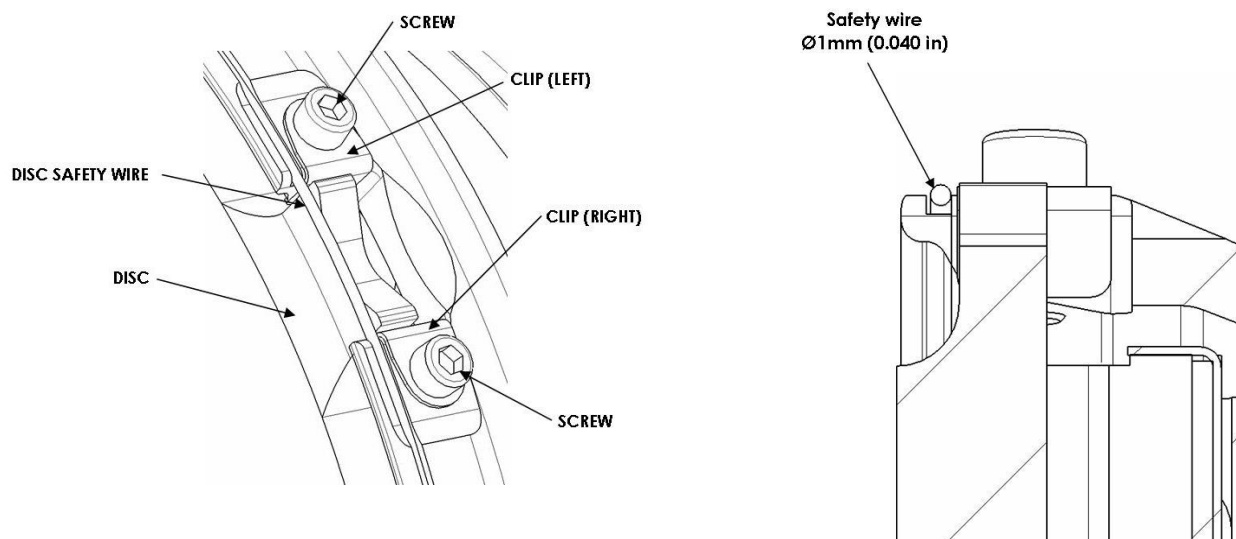


- Apply a thin coat of grease on axle thread. Screw the axle nut to contact
- Torque axle nut to 40 N.m (350 in-lb)
- Insert the fairing spacer, pin and secure with a new cotter pin

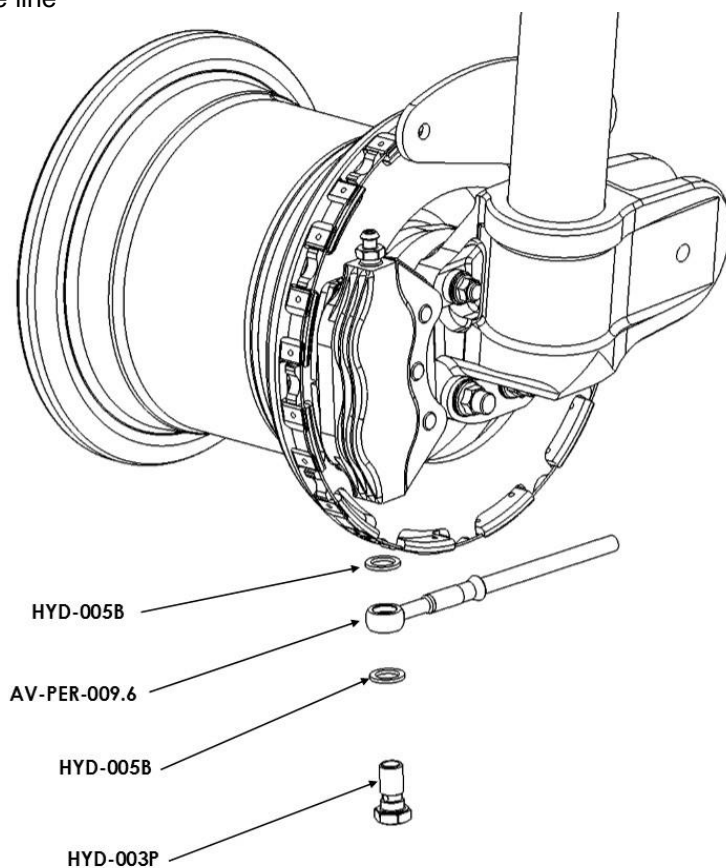
CAUTION: Cotter pin must be in place to prevent the loose of axle nut.

- Place a new safety wire (stainless steel 1mm – 0.040”) in the ring groove all around the wheel. This safety wire must be in place to secure the disc.

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



- k) Insert the strut tube in the landing gear
- l) Connect the compass as per the aircraft maintenance manual.
- m) Connect the brake line



- n) After the bleeding of the brake system, install wheel fairings as specified in the aircraft maintenance manual. If there is no fairing install the wheel cap.



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- o) Check the tire inflation pressure as per the aircraft manual
- p) After the bleeding of the brake system, install wheel fairings as specified in the aircraft maintenance manual. If there is no fairing install the wheel cap.



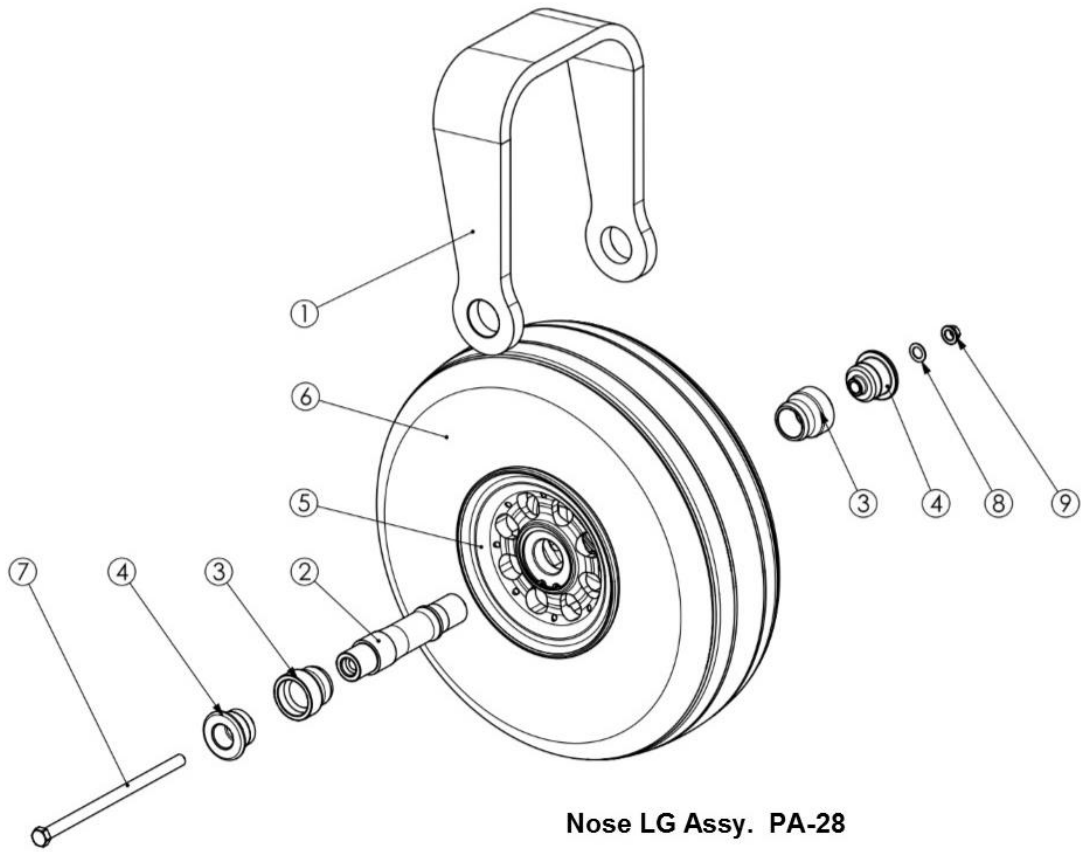
Instructions for Continued
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4.2 Nose Wheel

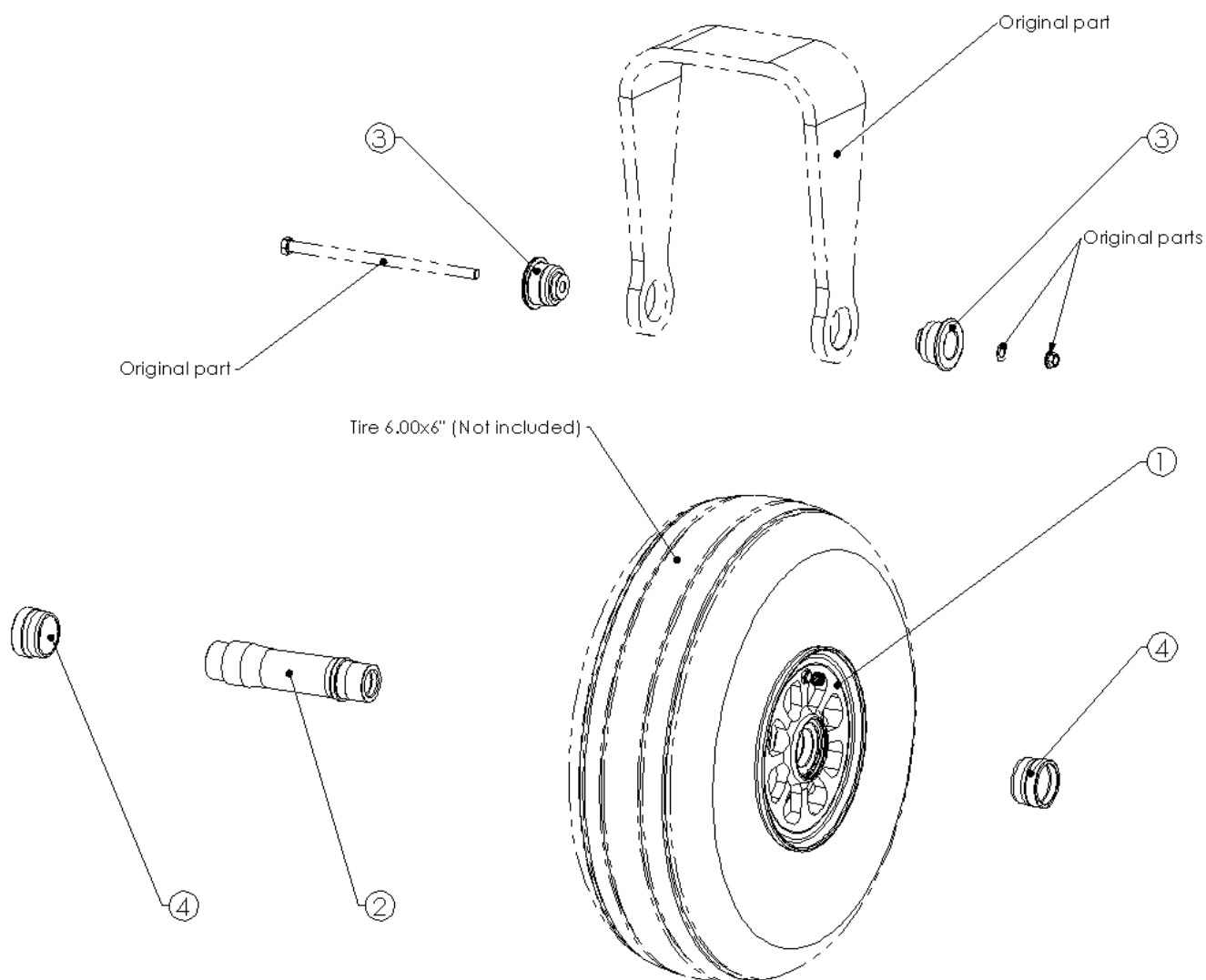
NOSE WHEEL for PA 28, 150 151 160 161



9	Original Part - not included in the STC	Self locking Nut	1
8	Original Part - not included in the STC	Washer	1
7	Original Part - not included in the STC	Axle bolt	1
5	RA-014	Wheel Assy.	1
4	AV-PER-006	Axle End	2
3	AV-PER-007	Spacer	2
2	AV-PER-005	Axle	1
1	Original Part - not included in the STC	NLG Fork	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-031			

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NOSE WHEEL for PA 28, 180 181



4	BGE-048.1	AXP-006.1 (L=26.4)_Bearing Spacer / Entretoise Rlt	2
3	BGE-047.1	AXP-006.1 (Ø38.1)_Axle End / Embout de Fourche	2
2	AXP-006.1	6.00x6"LE (Ø40-35)_Nose Wheel Axle / Axe AV	1
1	RA-016.1	6.00x6" LE (Axe 40-35)_Nose Wheel assy/ Roue Avant	1
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-030			

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REMOVAL:

- Remove wheel fairings
- Remove original axle and wheel from the fork

INSTALLATION:

NOTE: The larger 6.00-6 nose wheel is for the larger fork used on the PA-28-180 and PA-28-181, other types are using the standard 5.00-5" wheel.

- Apply a light coat of grease in wheel bearings
- Insert the axle in the wheel and then the bearing spacers on both sides.
- Place the assembly inside the fork
- Insert the axle ends on both sides
- Insert the original axle bolt, washer and self-locking nut, screw the nut to contact and tighten to the appropriate torque

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

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

4.3 SensAIR installation

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

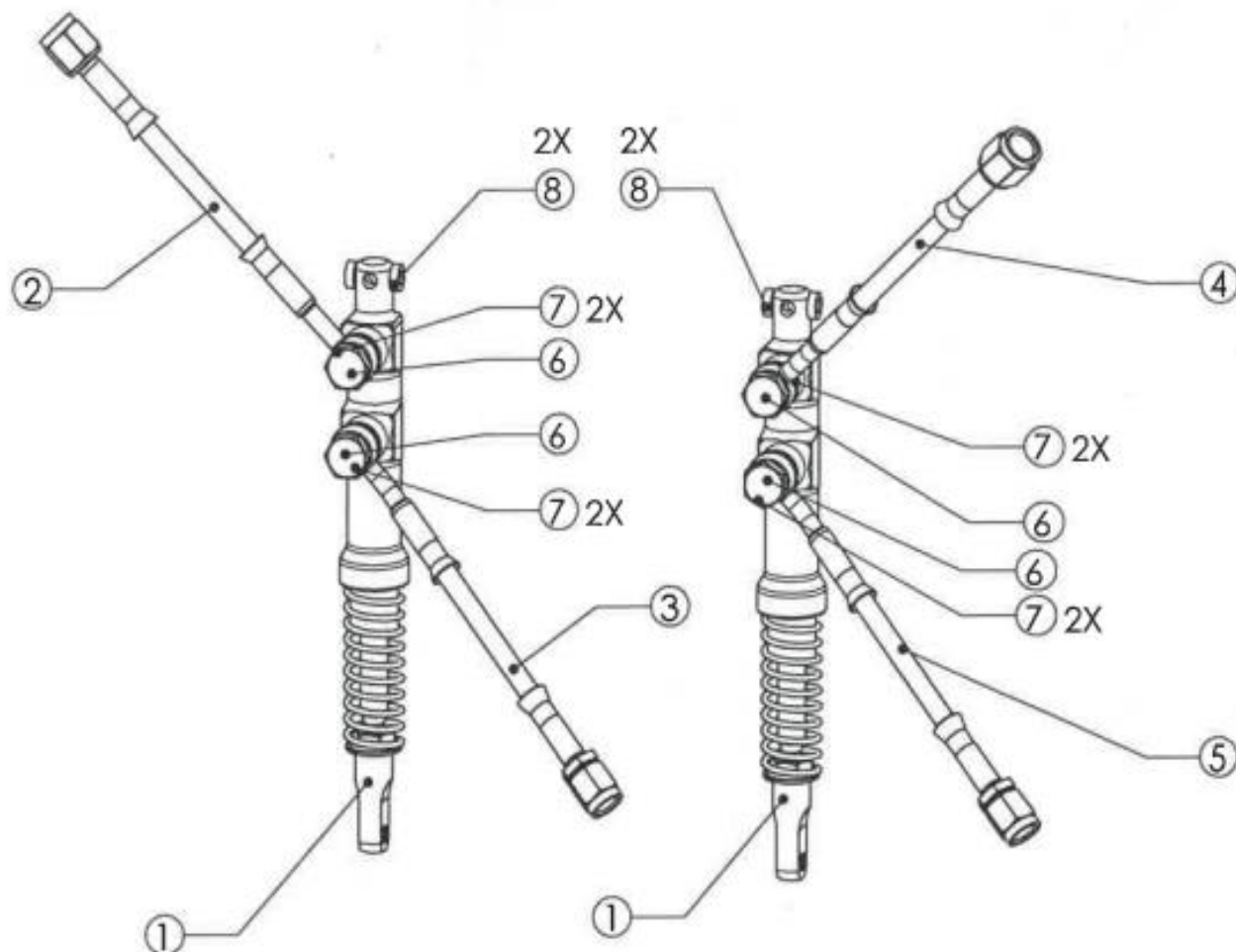
Refer to SM-08 document to get installation procedure, available on BERINGER Website.



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4.4 Master Cylinders

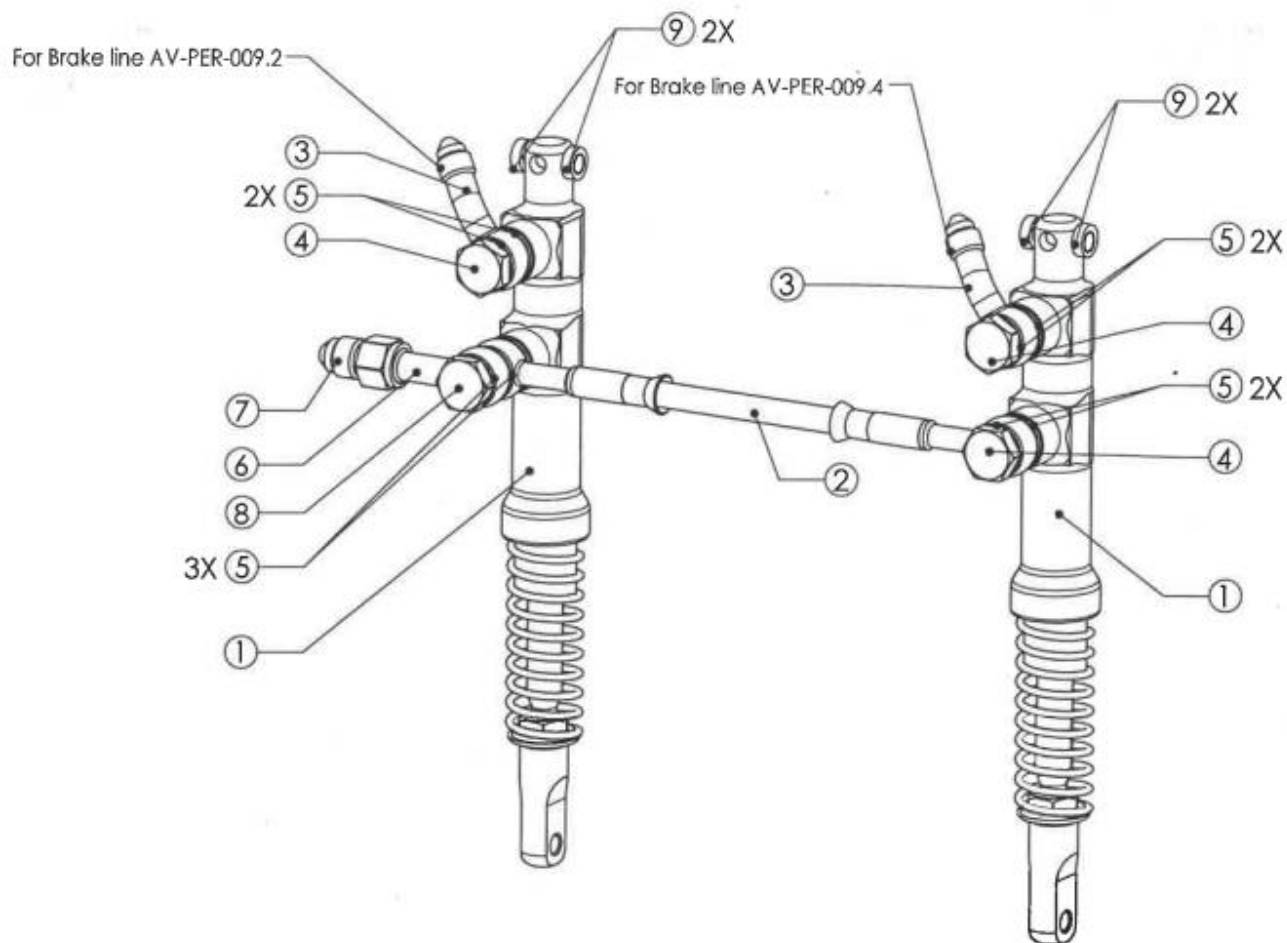
Master cylinders LH for PA-28



8	RDL-010	9-5.1-3_Spacer / Entretoise	4
7	HYD-005B	Copper Seal/ Joint cuivre	8
6	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	4
5	AV-PER-009.4	PA-28 Brake Line_MC Pilote/ MC Copilote	1
4	AV-PER-009.3	PA-28 Brake Line_MC Copilote / Fuselage	1
3	AV-PER-009.2	PA-28 Brake Line_MC Pilot /MC Copilote	1
2	AV-PER-009.1	PA-28 Brake Line_MC Pilote / Fuselage	1
1	MP-003.5N	Minéral MC12.2 (L=192)_Master Cylinder/ Maitre cylindre	2
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-041L			

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Master cylinders RH for PA-28



9	RDL-010	9-5.1-3_Spacer / Entretoise	4
8	HYD-030P	Banjo Bolt / Vis banjo double	1
7	HYD-025D	3/8x24-7/16x20_Fitting / Adaptateur	1
6	HYD-019VC	3/8x24_Hydraulic fitting/ banjo droit à visser	1
5	HYD-005B	Copper Seal/ Joint cuivre	9
4	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	3
3	HYD-002VC	Hydraulic fitting/Raccord banjo 20°	2
2	AV-PER-009.5	PA-28_Reservoir Brake Line / Durite Reservoir	1
1	MP-003.5N	Minéral MC12.2 (L=192)_Master Cylinder/ Maitre cylindre	2
REP	PART NUMBER	DESCRIPTION	QTY.
AV-PER-041R			

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NOTE: 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

REMOVAL:

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

INSTALLATION:

- a) Pre-assemble the master cylinder with the brake lines, banjo bolts and copper seals

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

- b) Torque tighten the banjo bolts to 5 N.m +90° (44 lb-in +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.

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

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

- e) Lubricate inner bore of master cylinder end and eye bolt with grease MIL-G-81322

- f) Insert master cylinder body in the fixing on the fire wall and insert the axle. Place the washer and cotter pin.

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

- g) Present master cylinder eye bolt in front of pedal rod. No lateral effort should be applied to position the master cylinder eye bolt at the right place

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

- h) Insert clevis pin with washer and cotter pin
- i) Move brake pedal and check for any parasite friction.
- j) 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 192mm (7.5 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 should not touch other parts or be twisted

4.5 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.

4.6 Parking brake

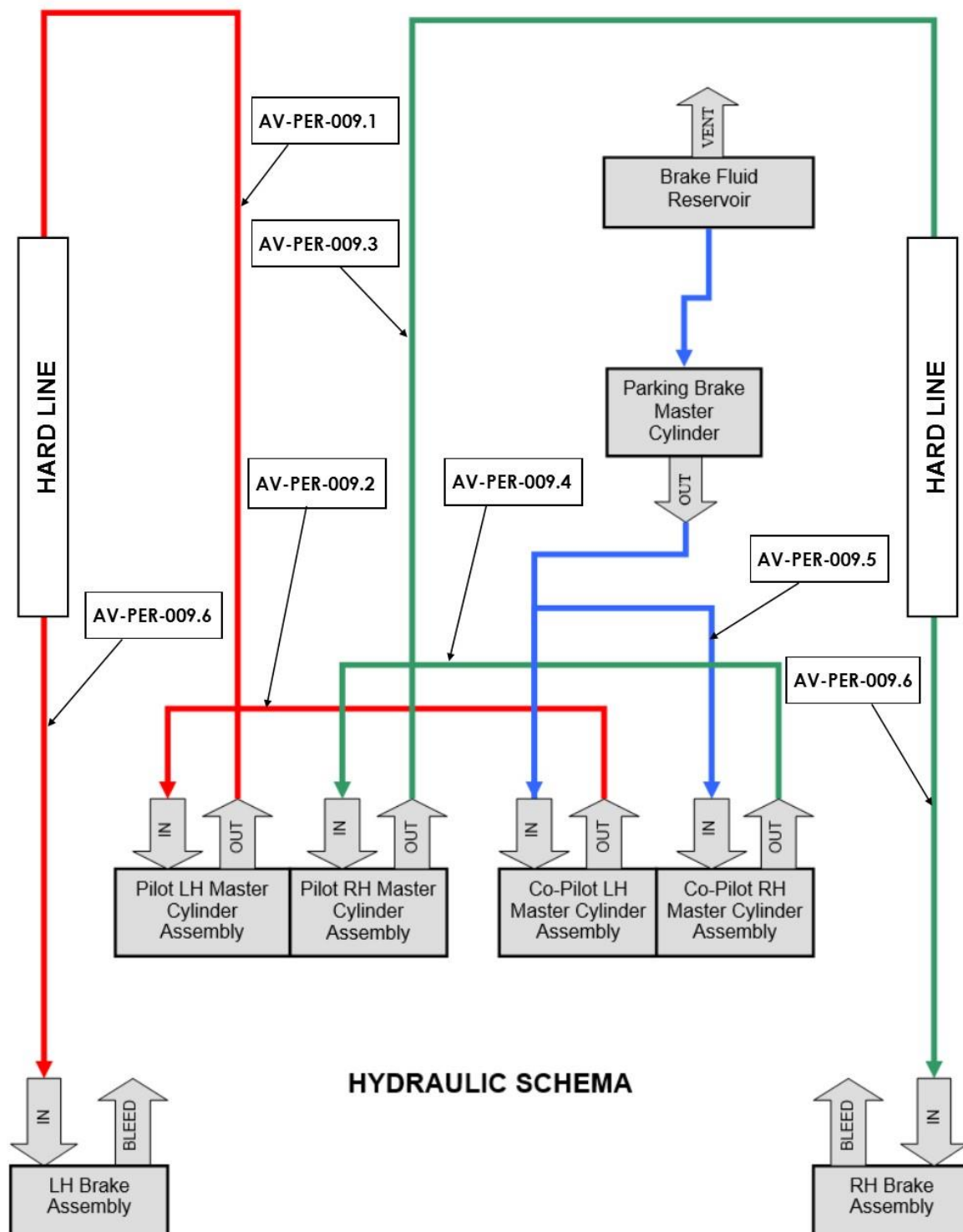
Parking brake function is made by a single master cylinder. This master cylinder is not changed by this STC and remains the same.

4.7 Brake lines - Hydraulic Schema

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

CAUTION: Brake lines are 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.

Below is the hydraulic schema.



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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 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-014	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.