Instructions for Continued Airworthiness and Installation Instructions

for BERINGER wheels and brakes on
BEECHCRAFT BONANZA

Document Reference(*)
ICA-STC-025

Project Reference
STC-025

PREPARED(**)	CHECKED(**)	APPROVED(**)
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01 Jul 2025	01 Jul 2025	01 Jul 2025

(*) I.a.w. the numbering system defined in the APDOA manual.
(**) Authorised signatories shall be as defined in the APDOA manual.

TABLE

1 LOG OF REVISIONS

Rev. No	Rev. date	Description
00	10 Jun 2025	Initial Release
01	18 Jun 2025	Addition of Bel Ray grease and installation instruction clarified
02	01 Jul 2025	Addition of ETSO-013 approval number (p4)

2 INTRODUCTION

2.1 Purpose of the document

This manual defines installation procedure and instructions for continued airworthiness for BERINGER wheels and brake assembly on BEECHCRAFT BONANZA aircrafts, for 33, 35 and 36 models.

This manual gives removal and installation instructions of BERINGER wheels and brake system STC on the BEECHCRAFT BONANZA aircrafts, and will guide to the BERINGER maintenance documents for all continued airworthiness instructions.

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

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, Amendment 4, issued 15-Jul-2015
- FAR part 23, effective January 1, 2002.

2.3 Effectivity

Type: BEECHCRAFT BONANZA aircrafts
Models: 33,35,36 models

33 Series	35 Series	36 Series
F33	V35A	36
F33A	V35B	A36
F33C		A36TC
G33		B36TC
		G36

3 GENERAL

3.1 Components list

This STC scope includes Main and Nose wheels (MLG, NLG), brakes (master cylinder, caliper, brake lines…), and axles as replacement parts to original equipment. The assemblies are listed in the table below:

Assembly / Product Name	BERINGER Reference number
Main wheel and brake assy*	AV-BECH-020
Nose wheel assy**	AV-BECH-030
Master Cylinders assy	AV-BECH-040
Main wheel SensAIR (option)	TP-006
Nose wheel SensAIR (option)	TP-005

Refer to the assembly drawings in this document below and the part list document BOM-STC-025 for complete components list included in the assemblies.

* BERINGER Main wheel and brake is certified by EASA ETSO N°21O.10087426.
** BERINGER Nose wheel is certified by EASA ETSO N° 21O.10085739.

3.2 Weight and Balance

This table below gives the total weight of BERINGER equipment without tires:

Assembly	Weight (kg)	Weight (lbs)
Left and right Main wheels and brakes	11.0	24.4
Nose wheel	1.6	3.4
Left and right Master Cylinders and Brake lines	0.6	1.3
SensAIR	<0,1	<0,2
TOTAL BRG kit	**13,3 Kg**	**29.3 Lbs**

NOTE: The data in the table above is given for information only and do not include fasteners not provided by BERINGER.
Refer to local regulation requirements to determine if mass and balance must be updated.

3.3 Tires

Refer to AFM for operational tire inflations.
Suitable tubeless (TL) tires compatible with the BERINGER rims are:

Tires	Size	Type	Minimum PLY rating	Max inflation pressure (loaded)
Main	6.00-6	Tubeless	8 PLY	45 psi / 3 bar
Nose	5.00-5	Tubeless	6 PLY	88 psi / 6 bar

3.4 Torque

All torques for BERINGER product assembly are specified in the assembly drawings included in this document.
For interface parts with aircraft, unless otherwise specified on the BERINGER assembly drawing, 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

4 INSTALLATIONS INSTRUCTIONS

4.1 Tool for installation

MLG	NLG	MC & Brake lines	Description
X	X	X	Torque wrench 10-50Nm
X			Socket 3/16'' for V-FHC-023
X			Socket 1-3/4" for axle nut
	X		Socket 1-1/2" for axle nut
		X	Socket ¼'' R14mm 6-points for banjo bolts
X			Wrench 9/16'' for AN6 screw
X			½"Ratchet
X			Lock-wire pliers
X	X		Flat pliers
X			Paint marker
X	X		Bearing grease
		X	BERINGER Bleeding kit ONC01 (optional)
X			BERINGER Tire mounting tool OT-001 (optional)
	X		BERINGER Tire mounting tool OT-002 (optional)
X			AV-BECH-003 Cutting gear plate template
X			CA 1000 Corrosion inhibitive
X	X		Bel Ray grease

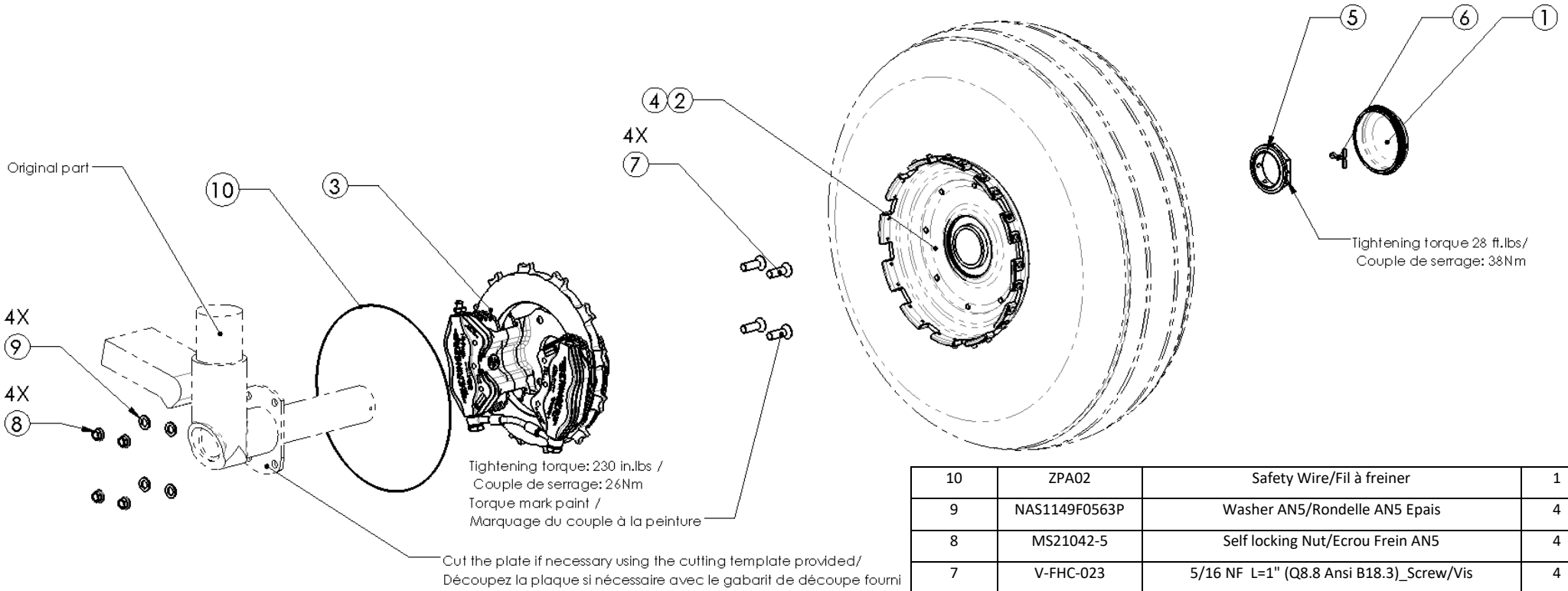
4.2 Main wheel installation

4.2.1 Assembly drawing and part list

Instructions apply for both left and right sides.

BERINGER SensAIR device is an option available for this main wheel assembly. Refer to Beringer Servicing Manuel SM-08 for installation and maintenance instructions.

Bonanza 6.00x6''HE_Main Wheel Assembly
Ref: AV-BECH-020



REP	PART NUMBER	DESCRIPTION	QTY.
10	ZPA02	Safety Wire/Fil à freiner	1
9	NAS1149F0563P	Washer AN5/Rondelle AN5 Epais	4
8	MS21042-5	Self locking Nut/Ecrou Frein AN5	4
7	V-FHC-023	5/16 NF L=1" (Q8.8 Ansi B18.3)_Screw/Vis	4
6	MS24665-362	Cotter Pin/Goupille fendue 3.175x63.5	1
5	ECR-014	1-1/2-16_Nut / Ecrou	1
4	BGE-074.1	Ø45-Ø38.1_ Sleeve / Entretoise	1
3	EA-003.13N	4P32-6-11(Mineral)_Dual Brake Caliper /Etrier de frein double	1
2	RF-016	6.00x6" HE (Ø45)_Wheel Assy / Roue freinée 6.00x6	1
1	BH-016	6"HE & 6"HL _Wheel Cap Assy / Assemblage Bouchon de Roue	1

4.2.2 Installation steps

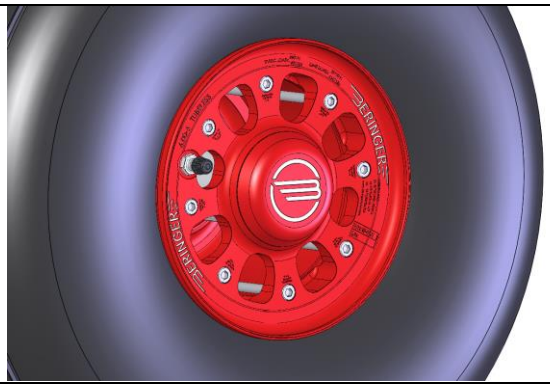
1. **Removal of the existing wheels and brakes**
   - Remove existing wheels and brakes as per the aircraft manufacturer's instructions.
   - Clean gear plate and landing gear surface to remove any rust or dirt.

2. **Assembly of the axle and caliper on the landing gear**


- In case of interference between the caliper and the gear plate, cut the plate using the cutting template provided AV-BECH-003
- Coat the plate with CA 1000 or equivalent

- Assemble the caliper and the disk on the axle
- Install the 4 screws V-FHC-023, the 4 washers NAS1149F0563P and the 4 nuts MS21042-5
- Torque the screws V-FHC-023 to 26 Nm / 230 in.lbs with torque wrench
- Mark torque on screws using torque mark paint

- Grease the axle using Bel-Ray grease
- Place the wheel on the axle
- Install the axle nut ECR-014 and torque to 38 Nm / 28 ft.lbs
- Install the new cotter pin MS24665-362 to secure the assembly

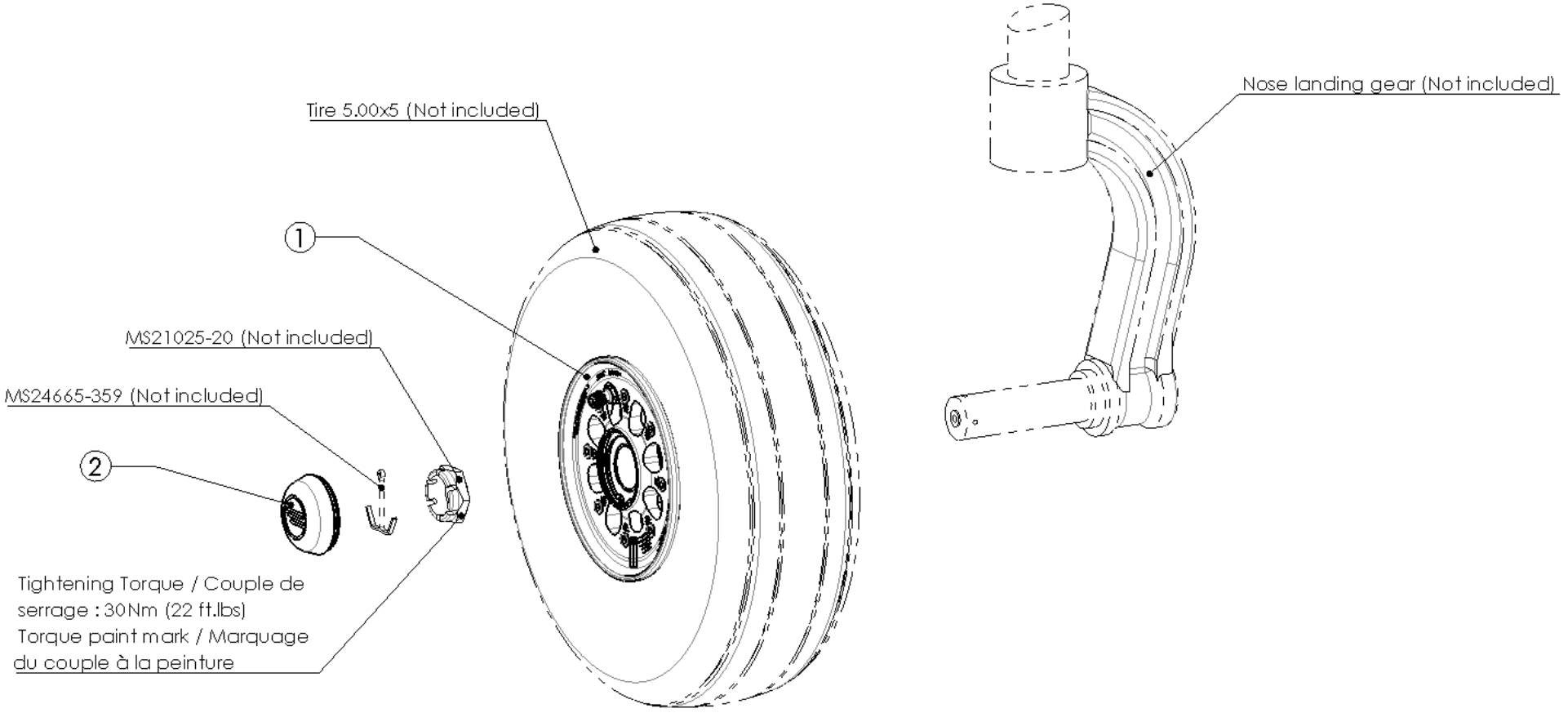
	Install the wheel cap BH-016

4.3 Nose wheel installation

4.3.1 Assembly drawing and part list

BERINGER SensAIR device is an option available for this main wheel assembly. Refer to Beringer Servicing Manuel SM-08 for installation and maintenance instructions.

Bonanza 5.00x5'' HL_Nose Wheel Assembly
Ref: AV-BECH-030



REP	PART NUMBER	DESCRIPTION	QTY.
2	BH-017	RA-018_Wheel Cap Assy / Assemblage Bouchon de Roue	1
1	RA-018	5.00x5HL"(Ø31.75)_Nose Wheel Assy / Roue AV	1

4.3.2 Installation steps of the front wheel

- Remove existing wheels and brakes as per the aircraft manufacturer's instructions.
- **Keep the axle nut** mentioned on the assembly drawing. Use a new cotter pin MS24665-359.
- Clean these parts and landing gear surface to remove any rust or dirt.

	Grease the axle on bearing paths using Bel-Ray grease
	Install front Wheel RA-018 on the axle
	• Install the original nut and torque to 38 Nm / 28 ft.lbs • Install new cotter pin to secure the assembly
	Install the wheel cap BH-017

4.4 Landing gear brake lines installation

4.4.1 Assembly drawing and part list

The landing gear brake lines are included in the hydraulic drawings. These brakes lines are common to the 3 hydraulic configurations listed hereunder :

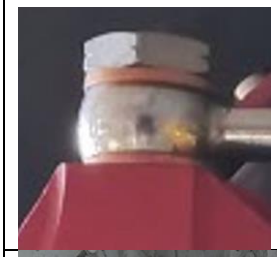
- AV-BECH-040 : Hydraulic drawing for brake pedal only on pilot side
- AV-BECH-041 : Hydraulic drawing for brake pedal on pilot and copilot side with master cylinder in series
- AV-BECH-042: Hydraulic drawing for brake pedal on pilot and copilot side with master cylinder in parallel

	AV-BECH-010.4	Bonanza (Brake caliper)_ Brake line / Durite	2
	AV-BECH-010.3	Bonanza (soute de train)_ Brake line / Durite	2
	HYD-005B	Copper Seal/ Joint cuivre	4
	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	2
REP	**PART NUMBER**	**DESCRIPTION**	**QTY.**

4.4.2 Hydraulic installation steps

	○ Remove the original brake lines from the aircraft on both sides as per manual aircraft instructions

Install banjo fitting with rear orientation



- Connect BERINGER flexible brake line AV-BECH-010.4 to the caliper and aircraft as shown
- Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90°

  USE CAUTION: Pay attention to install banjo fitting with rear orientation to avoid contact of the hose with the strut tube
- Tighten upper hydraulic fitting to torque 18 Nm (159 in.lbs)
- Ensure door clearance when retracting the landing gear. If necessary, refer to current AMM to trim gear door adequately.

- Install AV-BECH-010.3
- Tighten hydraulic fittings to torque 18 Nm (159 in.lbs)

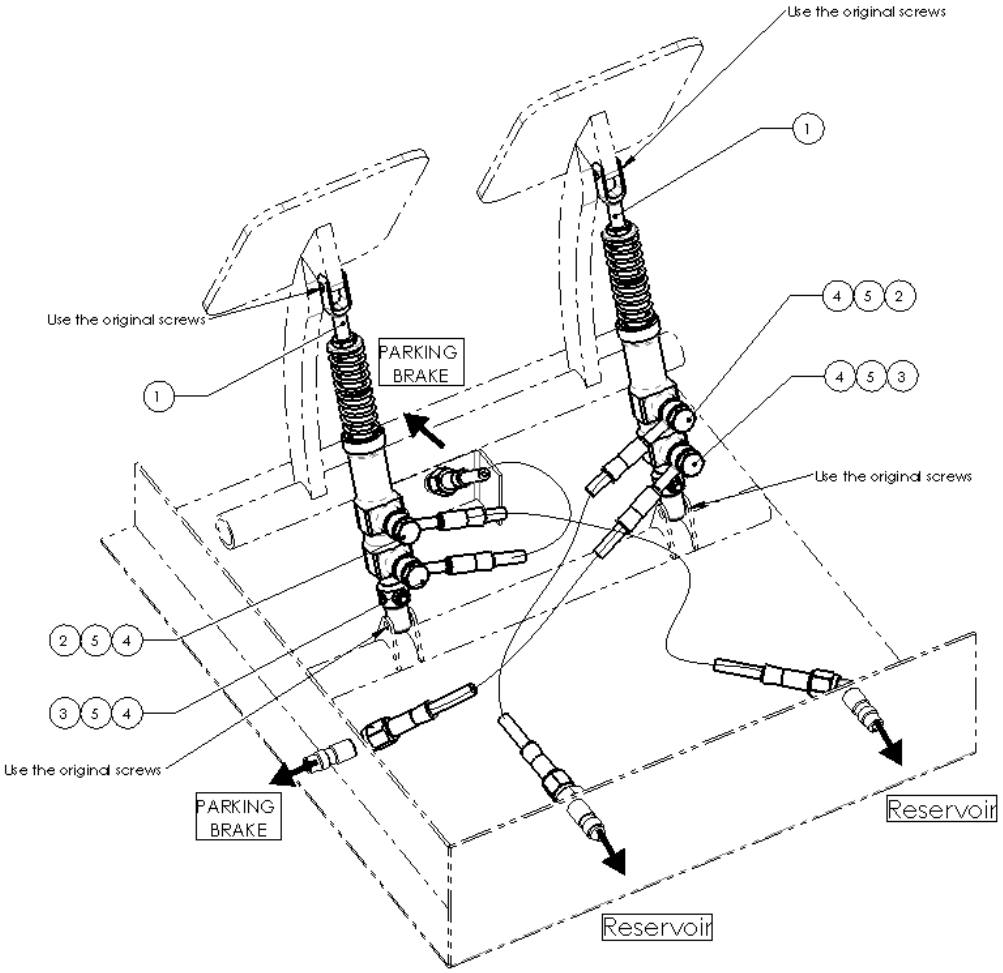
4.5 Master cylinders installation

4.5.1 Assembly drawing and part list

There are three possible configurations of master cylinder hydraulic installation depending on the version of the aircraft. The 3 hydraulic configurations and the drawing references are listed as follows :

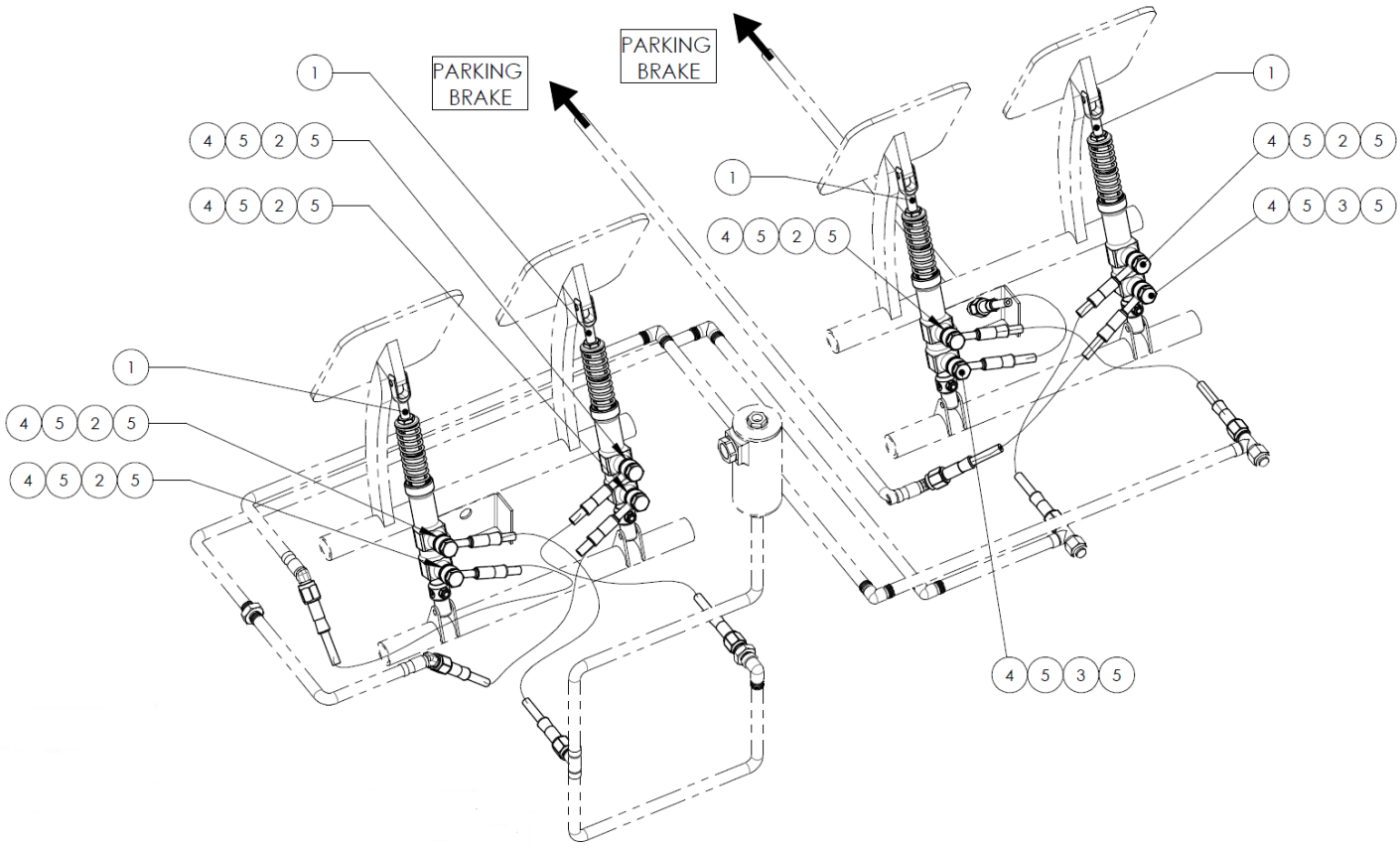
- AV-BECH-040 : Hydraulic drawing for brake pedal only on pilot side
- AV-BECH-041 : Hydraulic drawing for brake pedal on pilot and copilot side with master cylinder in series
- AV-BECH-042: Hydraulic drawing for brake pedal on pilot and copilot side with master cylinder in parallel

Bonanza Hydraulic Implantation: Pilot only
Ref: AV-BECH-040



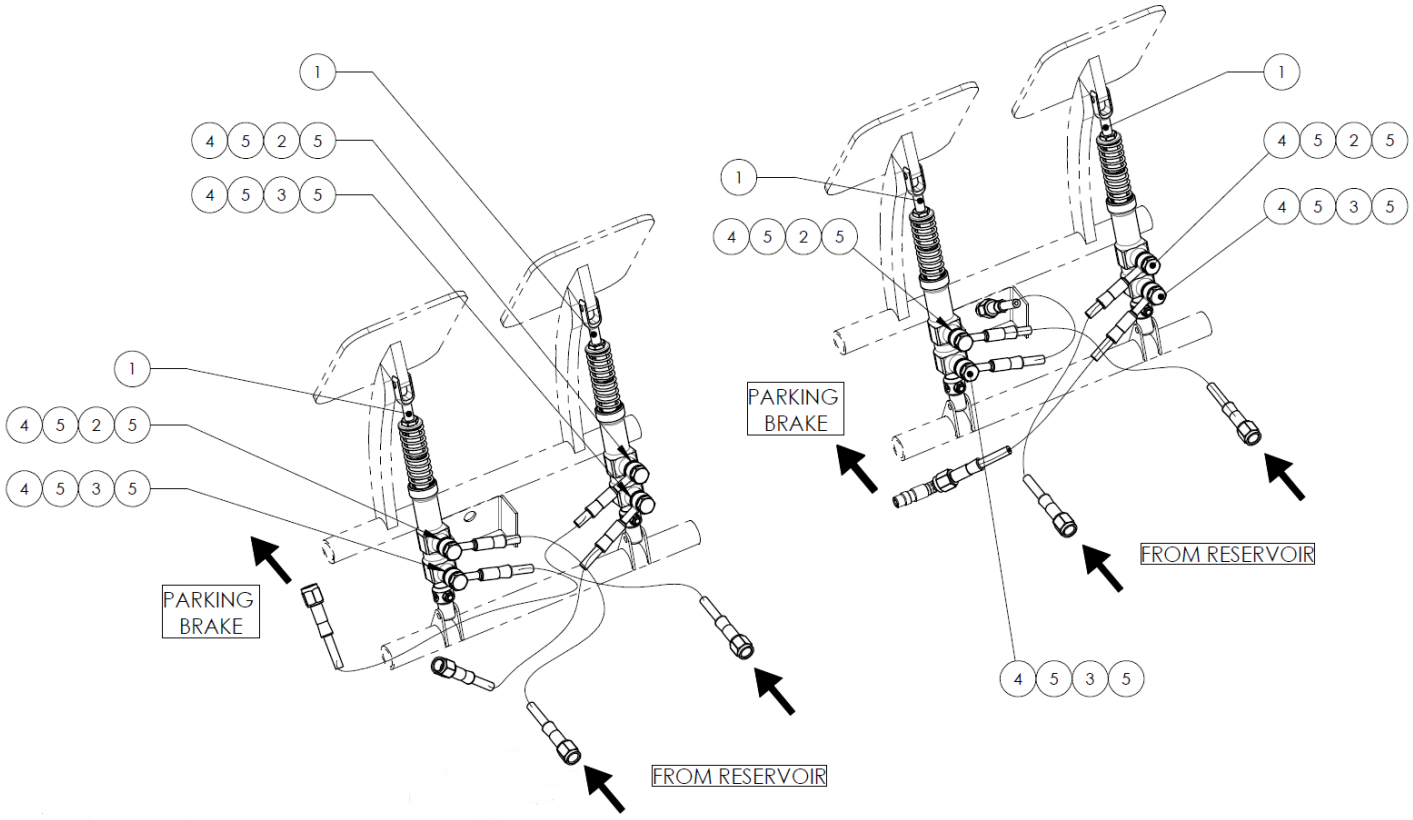
5	HYD-005B	Copper Seal/ Joint cuivre	8
4	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	4
3	AV-BECH-010.2	Bonanza (MP to FP)_ Brake line / Durite	2
2	AV-BECH-010.1	Bonanza (MP to RV)_ Brake line / Durite	2
1	MP-001.14N	MC14.5 NBR (L=223.5mm)_Master Cylinder/ Maitre-cylindre	2
REP	**PART NUMBER**	**DESCRIPTION**	**QTY.**

Bonanza Hydraulic Implantation: Pilot and copilot Master cylinders in series
Ref: AV-BECH-041



REP	PART NUMBER	DESCRIPTION	QTY.
5	HYD-005B	Copper Seal/ Joint cuivre	16
4	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	8
3	AV-BECH-010.2	Bonanza (MP to FP)_ Brake line / Durite	2
2	AV-BECH-010.1	Bonanza (MP to RV)_ Brake line / Durite	6
1	MP-001.14N	MC14.5 NBR (L=223.5mm)_Master Cylinder/ Maitre-cylindre	2

Bonanza Hydraulic Implantation: Pilot and copilot Master cylinders in parallel
Ref: AV-BECH-042



REP	PART NUMBER	DESCRIPTION	QTY.
5	HYD-005B	Copper Seal/ Joint cuivre	16
4	HYD-003P	M10x1_Banjo Bolt/ Vis Banjo	8
3	AV-BECH-010.2	Bonanza (MP to FP)_ Brake line / Durite	4
2	AV-BECH-010.1	Bonanza (MP to RV)_ Brake line / Durite	4
1	MP-001.14N	MC14.5 NBR (L=223.5mm)_Master Cylinder/ Maitre-cylindre	2

4.5.2 Hydraulic installation for brake pedal only on pilot side

This procedure applies to aircraft models with **brake pedal only on pilot side (AV-BECH-040).**

	○ Remove the original brake lines on pilot side from the aircraft as per manual aircraft instructions ○ Remove original master-cylinders on pilot side by unscrewing the fasteners on each end ○ Keep the fasteners for installation of BERINGER master-cylinders
	○ Install BERINGER master cylinders on rudder pedals ○ Use original fasteners with new cotter pins parts to secure the installation

- Connect the two flexible brake lines AV-BECH-010.1 from reservoir outlets to the inlets of the pilot master-cylinders
- Connect the two flexible brake lines AV-BECH-010.2 from outlets of the master-cylinders to the firewall fittings leading to calipers
- Tighten hydraulic fittings to firewalls fittings to torque 18 Nm (159 in.lbs)
- Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90°
- Ensure free travel of the rudder pedal in every position and good curve and tension on the brake lines.

4.5.3 Hydraulic installation for brake pedal on pilot and copilot side with master cylinder in series

This procedure applies to aircraft models with **brake pedal on pilot and copilot side with master cylinder in series (AV-BECH-041).**

	○ Remove the original brake lines on pilot side from the aircraft as per manual aircraft instructions ○ Remove original master-cylinders on pilot side by unscrewing the fasteners on each end ○ Keep the fasteners for installation of BERINGER master-cylinders
	○ Install BERINGER master cylinders on rudder pedals ○ Use original fasteners with new cotter pins parts to secure the installation

	○ Connect the two flexible brake lines AV-BECH-010.1 from copilot outlet firewall fittings to the inlets of the pilot master-cylinders ○ Connect the two flexible brake lines AV-BECH-010.2 from outlets of the pilot master-cylinders to the firewall fittings leading to calipers ○ Tighten hydraulic fittings to firewalls fittings to torque 18 Nm (159 in.lbs) ○ Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90° ○ Ensure free travel of the rudder pedal in every position and good curve and tension on the brake lines.
	○ Remove the original brake lines on copilot side from the aircraft as per manual aircraft instructions ○ Remove original master-cylinders on copilot side by unscrewing the fasteners on each end ○ Keep the fasteners and cotter pins for installation of BERINGER master-cylinders

- Install BERINGER master cylinders on rudder pedals
- Use original fasteners with the original pins and cotter pins parts to secure the installation

- Connect the two flexible brake lines AV-BECH-010.1 from reservoir outlets on firewall to the inlets of the copilot master-cylinders
- Connect the two flexible brake lines AV-BECH-010.1 from master-cylinders outlets to the firewall fittings leading toward the inlet of the pilot master-cylinder
- Tighten hydraulic fittings to firewalls fittings to torque 18 Nm (159 in.lbs)
- Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90°
- Ensure free travel of the rudder pedal in every position and good curve and tension on the brake lines.

4.5.4 Hydraulic installation for brake pedal on pilot and copilot side with master cylinder in parallel

This procedure applies to aircraft models with **brake pedal on pilot and copilot side with master cylinder in parallel (AV-BECH-042).** Pay attention of not removing any check valves from the system.

	○ Remove the original brake lines on pilot side from the aircraft as per manual aircraft instructions ○ Remove original master-cylinders on pilot side by unscrewing the fasteners on each end ○ Keep the fasteners and cotter pins for installation of BERINGER master-cylinders
	○ Install BERINGER master cylinders on rudder pedals ○ Use original fasteners with the original pins and cotter pins parts to secure the installation

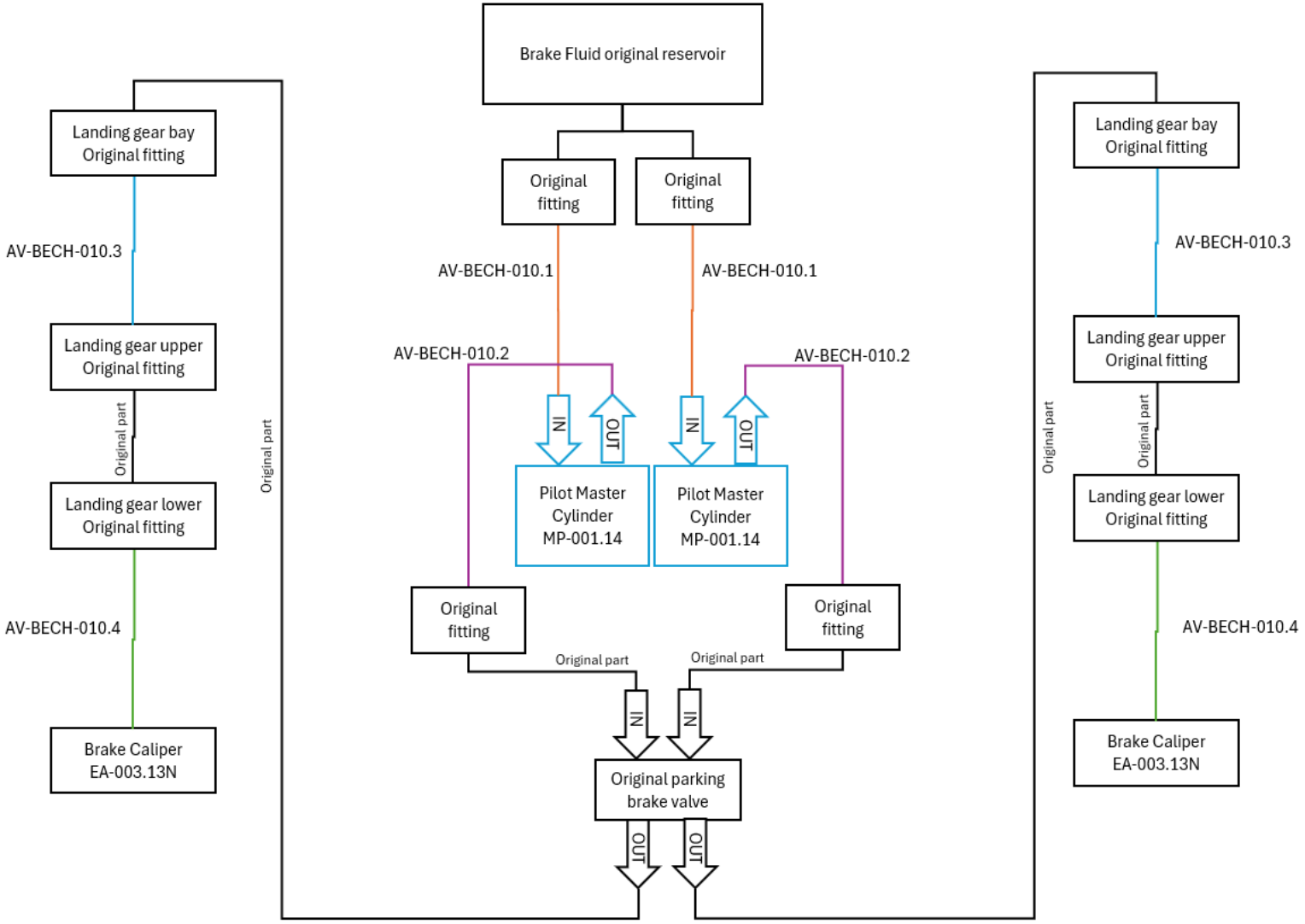
	○ Connect the two flexible brake lines AV-BECH-010.1 from reservoir outlets on firewall to the inlets of the pilot master-cylinders ○ Connect the two flexible brake lines AV-BECH-010.2 from pilot master-cylinders outlets to the firewall fittings leading toward the calipers ○ Tighten hydraulic fittings to firewalls fittings to torque 18 Nm (159 in.lbs) ○ Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90° ○ Do all the checks required to ensure free travel of the rudder pedal in every position and good curve and tension on the brake lines.
	○ Remove the original brake lines on copilot side from the aircraft as per manual aircraft instructions ○ Remove original master-cylinders on copilot side by unscrewing the fasteners on each end ○ Keep the fasteners and cotter pins for installation of BERINGER master-cylinders

- Install BERINGER master cylinders on rudder pedals
- Use original fasteners with new cotter pins parts to secure the installation

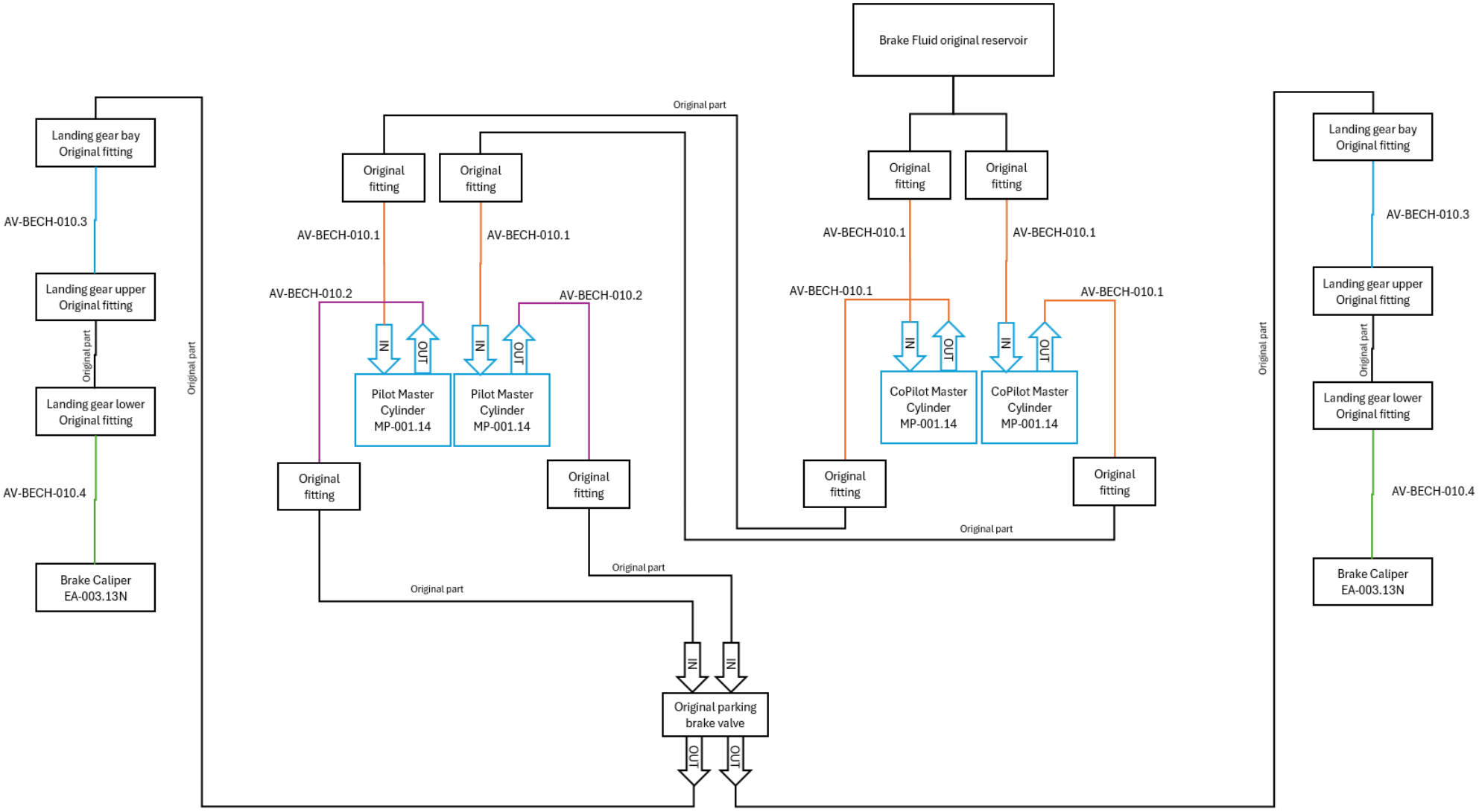
- Connect the two flexible brake lines AV-BECH-010.1 from reservoir outlets to the inlets of the copilot master-cylinders
- Connect the two flexible brake lines AV-BECH-010.2 from outlets of the copilot master-cylinders to the firewall fittings leading to calipers
- Tighten hydraulic fittings to firewalls fittings to torque 18 Nm (159 in.lbs)
- Tighten the banjo bolt HYD-003P on the caliper at torque 5 Nm (44 in.lbs) + 90°
- Do all the checks required to ensure free travel of the rudder pedal in every position and good curve and tension on the brake lines.

4.6 Hydraulic schematic

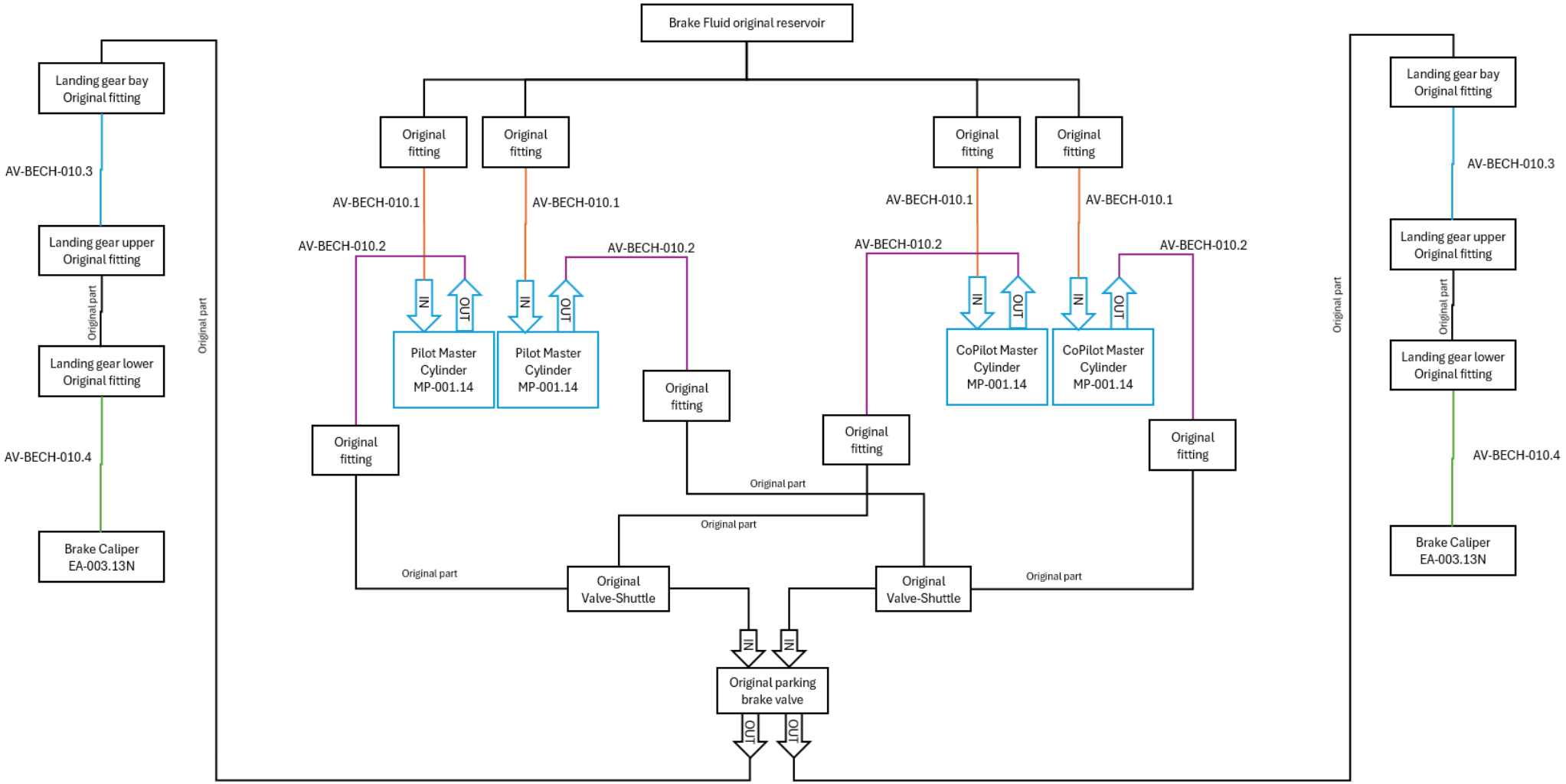
Hydraulic diagram brake pedals <u>on pilot side only</u> (AV-BECH-040):



Hydraulic diagram brake pedals on pilot and copilot side <u>with master cylinders in series</u> (AV-BECH-041):



Hydraulic diagram brake pedals on pilot and copilot side <u>with master cylinders in parallel</u> (AV-BECH-042):



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	Pressure regulator	RE-xxx
SM-08	SensAIR device	TP-xxx

All documents are all available on:

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

7 AIRWORTHINESS LIMITATIONS SECTION

EASA statement :
The airworthiness limitations section is approved and variations must also be approved.

FAA statement :
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.
There are no new (or additional) airworthiness limitations associated with this equipment and /or installation.

8 ASSOCIATED DOCUMENTS

Document reference	Document title
BOM-STC-025	Part List
SM-00	BERINGER PRODUCTS MAINTENANCE GUIDE
SM-01	Brakes Servicing Manual
SM-02	Wheels Servicing Manual
MM-00-004	Hydraulic Lines and Connections
MM-00-003	BRAKE BLEEDING procedure
MM-01-002	BRAKE CONDITIONING procedure
MM-00-005	Standard tightening torque

Refer to the latest revision.