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Installation and Maintenance Manual Van's RV10



Copyright Jean Marie Urlacher

*This document contains **28** pages - Original in color*

E						
D						
C						
B						
A	12/07/2018		GAILLARD.C	BERINGER.G	BERINGER.C	Edition initiale RV10 only
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Installation and maintenance manual

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MODIFICATION LIST

REV	Modifications
A	Edition initiale
B	

Référence documents

Title	Assembly reference	Rev
RV10 5.00x5" HL_Main Wheel Assy/Roue Principale	AV-VANS-520L	B
VANS RV10 5.00x5"HL_ Nose Wheel Assy/Roue Avant	AV-VANS-530	A
VANS RV10 Hose 01_ Main Wheel Hose	AV-VANS-510	A
VANS _Hose 02 Fuselage/FP	AV-VANS-511	A
VANS _Hose 03 FP/Regulator	AV-VANS-512	A
VANS _Hose 04 Regulator/MC Pilot	AV-VANS-513	A
VANS _Hose 05 MC Pilot/MC Copilot	AV-VANS-514	A
VANS_Hose 06 MC Copilot-Reservoir	AV-VANS-515	A
VANS_ Hose 07 MC pilot-FP	AV-VANS-516	A
VANS_Hose 08 Fuselage-MC Pilot	AV-VANS-517	A
VANS_Hose 09 MC pilot-Reservoir	AV-VANS-518	A
VANS_Left Master Cylinder	AV-VANS-560L	A
VANS_Right Master Cylinder	AV-VANS-560R	A
VANS_Reservoir	AV-VANS-570	A
VANS_Parking brake valve	AV-VANS-580	A
VANS_Regulator	AV-VANS-590	A

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1. General

This manual gives the installation procedures of BERINGER wheel and brake system on the Van's RV10.

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.

BERINGER brake system functioning is similar to original brake system.

CAUTION: Standard MIL-H-5606 Brake fluid is replaced by fire resistant fluid:
MIL-PRF-87257 and MIL-PRF83282, make sure that only those brake fluids are used.

Note: after each part number the (-) indicates the minor revision status starting from letter A then B, C,

2. Tightening Torque

Description	Torque tightening					
	Min		Nominal		Max	
	IN-LBS	N/m	IN-LBS	N/m	IN-LBS	N/m
AN4	90.725	10.26	95.5	10.8	100.275	11.34
AN6-65 AN6	386.65	43.7	407.1	46	427.455	48.03
HYD-003P	140.6	16.15	148	17	155.4	17.85

3. Nose wheel Kit

3.1. RV10 Tricycle landing Gear (SRVFI01)

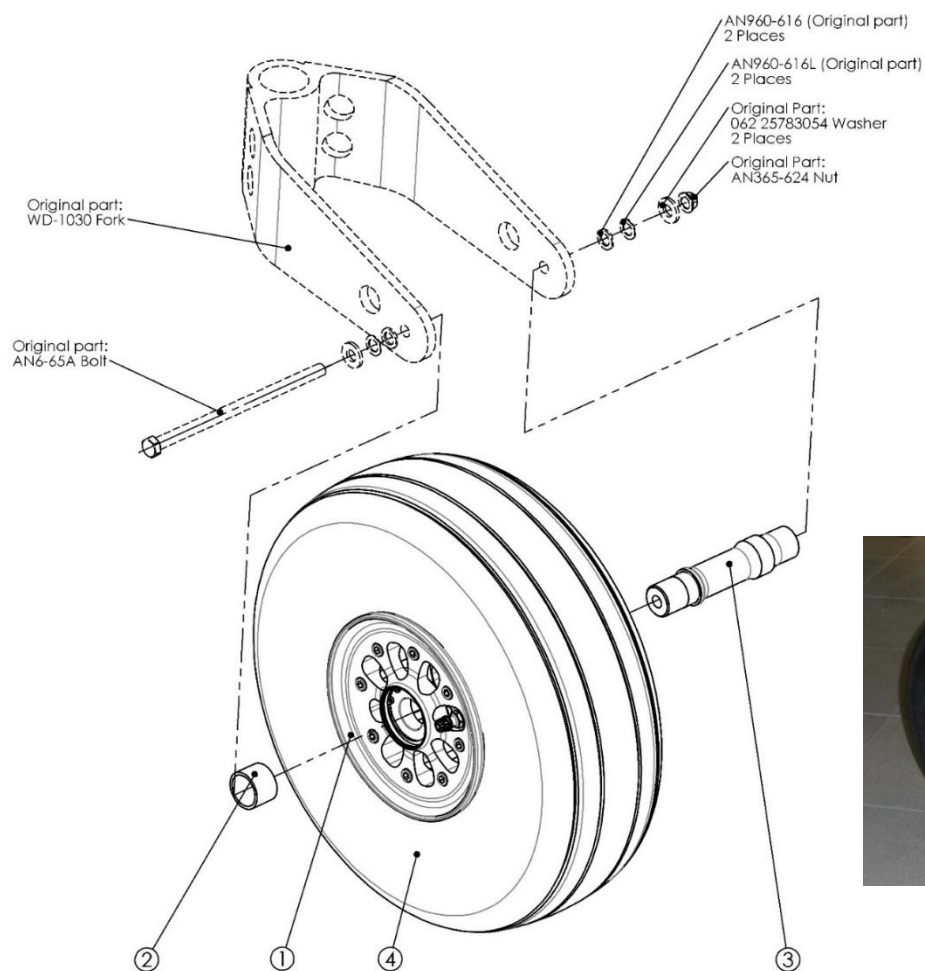


Figure 1 Nose Wheel Assy (AV-VANS-530)

4	PAA02	Tire 5,00x5"	1
3	AV-VANS-010(A)	Axle	1
2	AV-VANS-004(A)	Bearing spacer	1
1	RA-014(A)	Wheel Assy.	1
REP	PART NUMBER	DESCRIPTION	QTY.

4. Finishing Kit for main wheels

4.1. Main Wheel Assembly

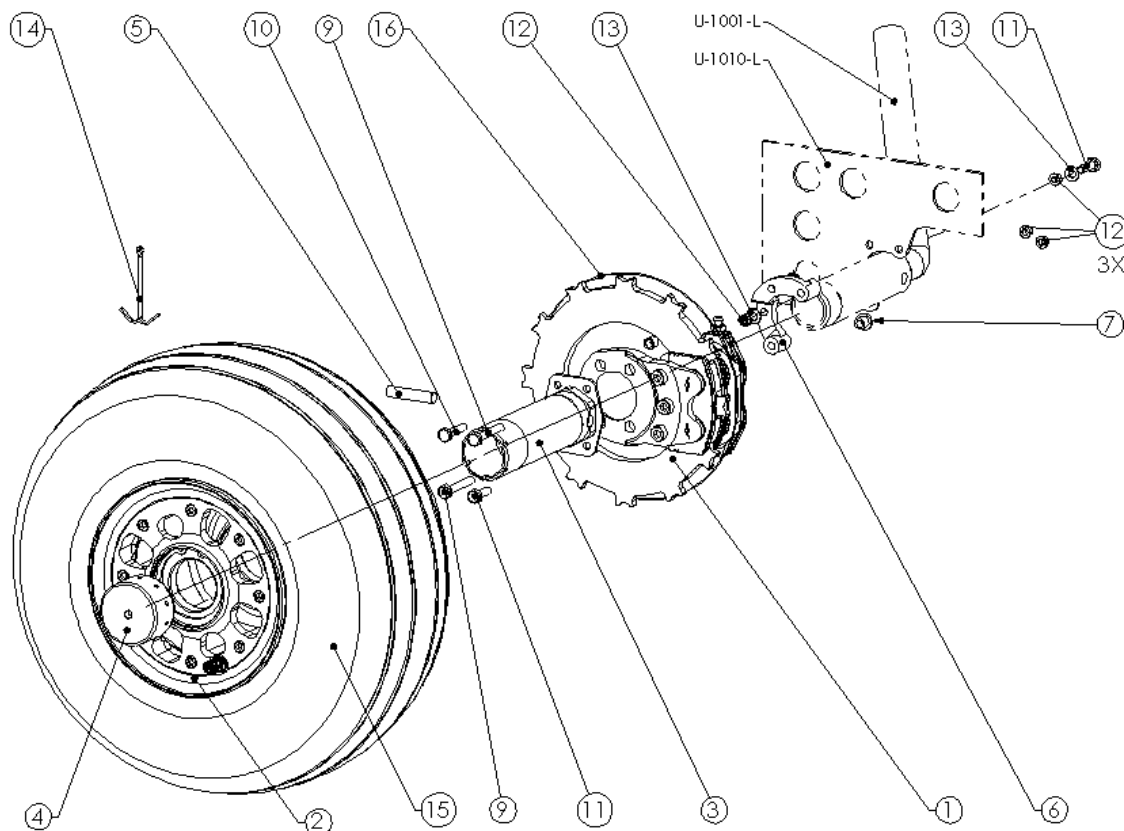
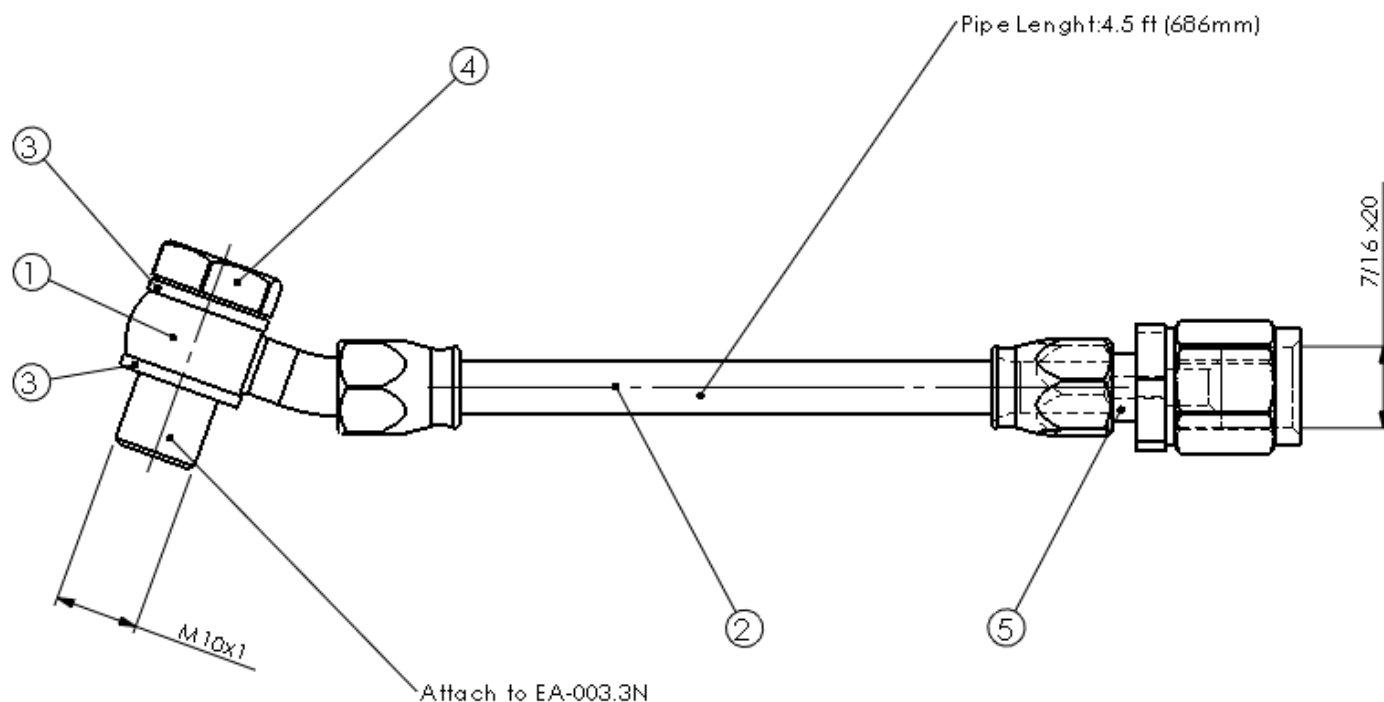


Figure 2 Main Wheel Assy (AV-VANS-520L)

16	ZPA02	Safety Wire/Fil a freiner	1
15	-	Tire 15x6.00-6	1
14	L-V-005	Cotter Pin 3.2x71 / Goupille fendu 3.2x71	1
13	NAS1149F0432P	Washer AN4 / Rondelle AN4 Std	2
12	MS21042-4	Self locking Nut AN4 / Ecrou frein AN4	5
11	AN4-6A	AN4 L=19.84 Screw/Vis	2
10	AN4-11A	AN4 L=29.36 Screw/ Vis AN4	1
9	AN4-15A	AN4 L=42.06 Screw/ Vis	2
8	BGE-017.3(A)	AN6/AN4 Bushing/Bague	3
7	BGE-017.1(A)	AN6/AN4 Shouldered Bushing/Bague Epaulée	1
6	AV-VANS-016L(A)	Vans RV10_ Left Fairing Spacer /Entretoise Carenage Gauche	1
5	AV-VANS-014(B)	Vans RV10_ Torque Pin/ Pion de reprise de couple	1
4	AV-VANS-012(A)	Vans RV10 Axle Nut 1.5" / Ecrou Axe 1.5"	1
3	AV-VANS-011(B)	Vans RV10 6.00x6" HE Axle 1.5"/Axe 1.5"	1
2	RF-016(A)	Vans RV10_Wheel Assy 6.00x6 HE / Roue 6.00x6	1
1	EA-003.3N(B)	2P32-6-9 Brake Caliper/Etrier de frein	1
REP	PART NUMBER	DESCRIPTION	QTY.

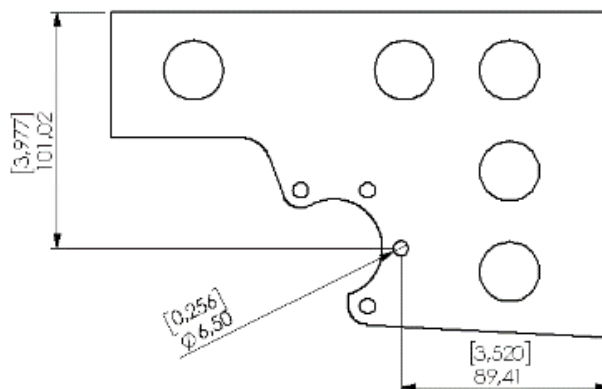
4.2. Hose Main wheel Assy Right and Left (Drawing reference: AV-VANS-510 Hose 1)



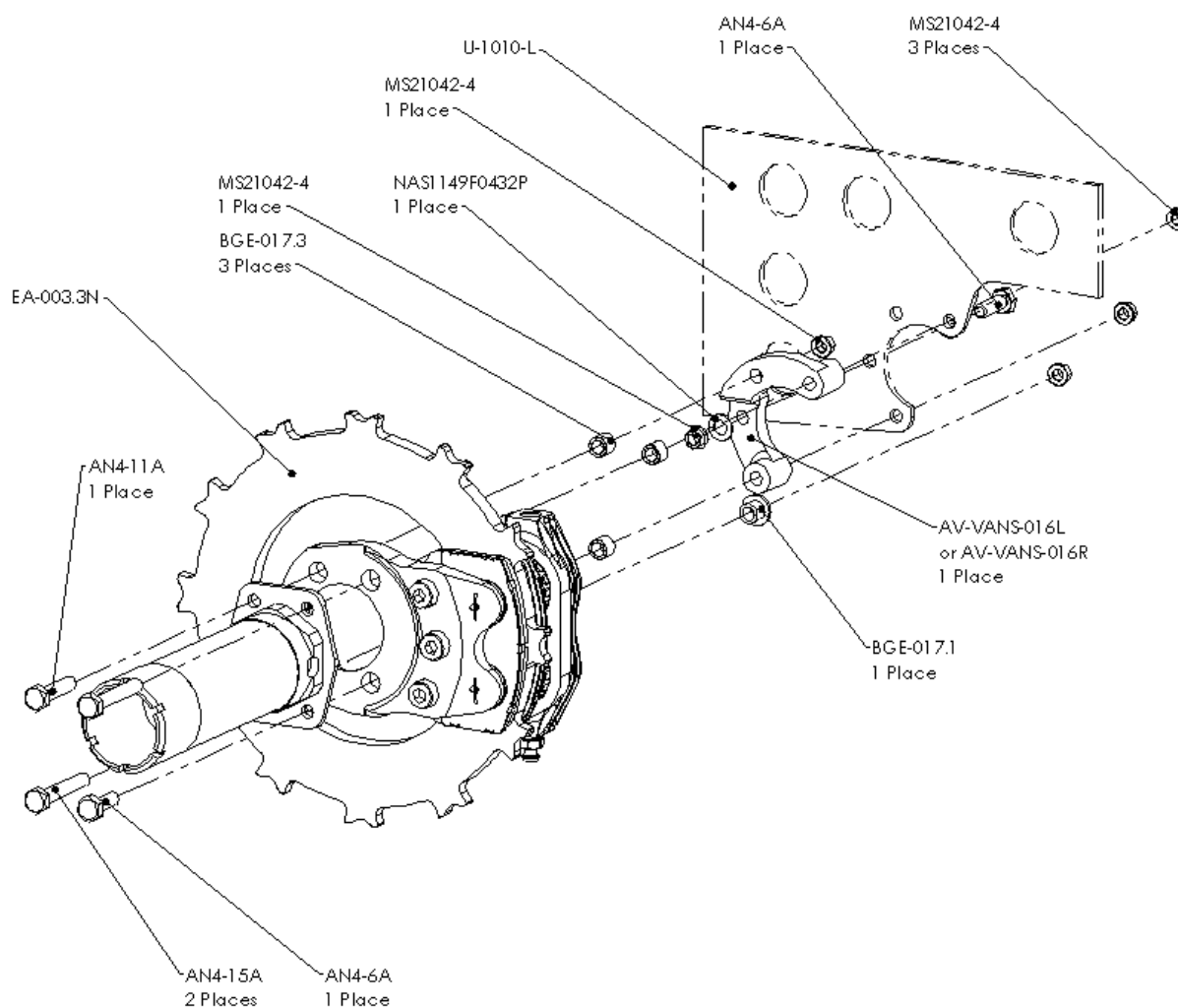
5	HYD-009OC	female fitting 7/16x20	1
4	HYD-003P	Banjo Bolt/ Vis Banjo	1
3	HYD-005B	Copper Seal/ Joint cuivre	2
2	HYD-032	Stainless steel brake hose/Durite	1
1	HYD-002OP	Steel fitting 20° /Banjo 20° Acier	1
REP	PART NUMBER	DESCRIPTION	QTY.

4.3. Installation Main wheel Assy Left (The right is the same just symmetrical)

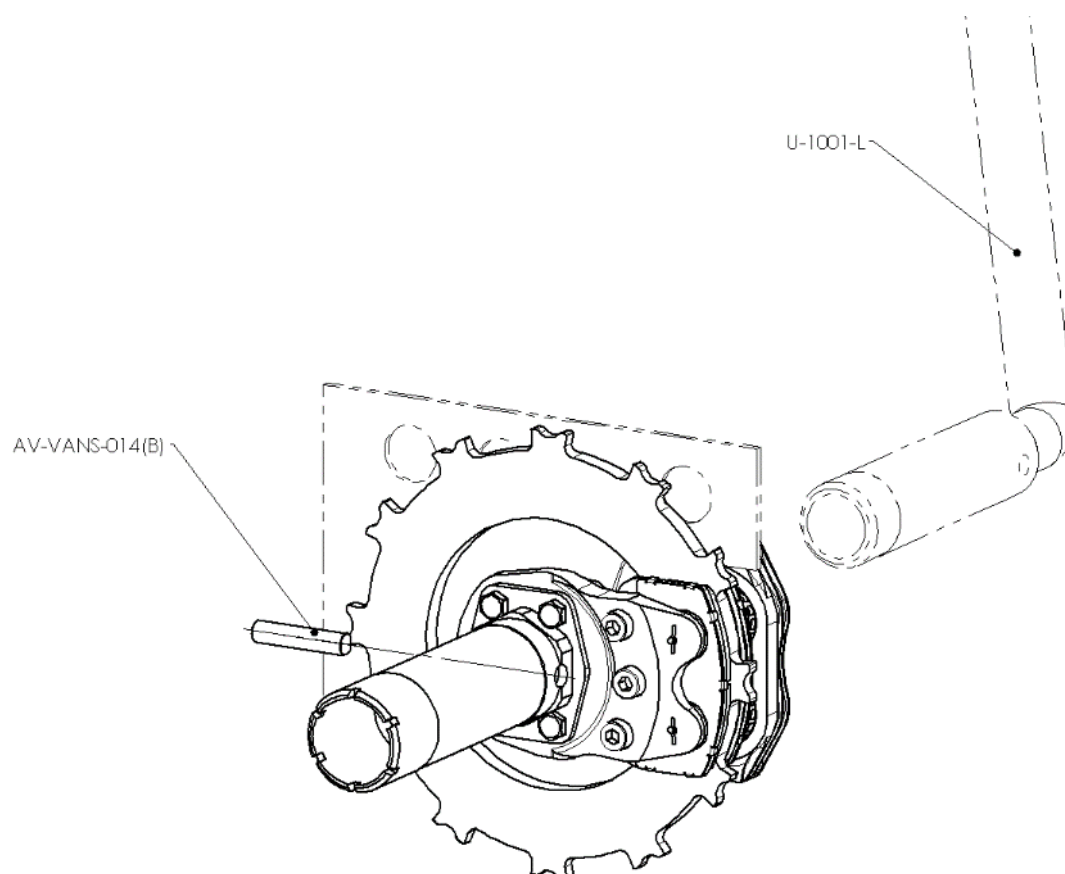
- a) Drilled the hole $\varnothing 0.256"$ (6.5mm) in to the Fairing plate U-1010-L



- b) Assemble the left brake assembly using the parts and hardware from the drawing (Torque the nuts to appropriate torque – refer §2.)

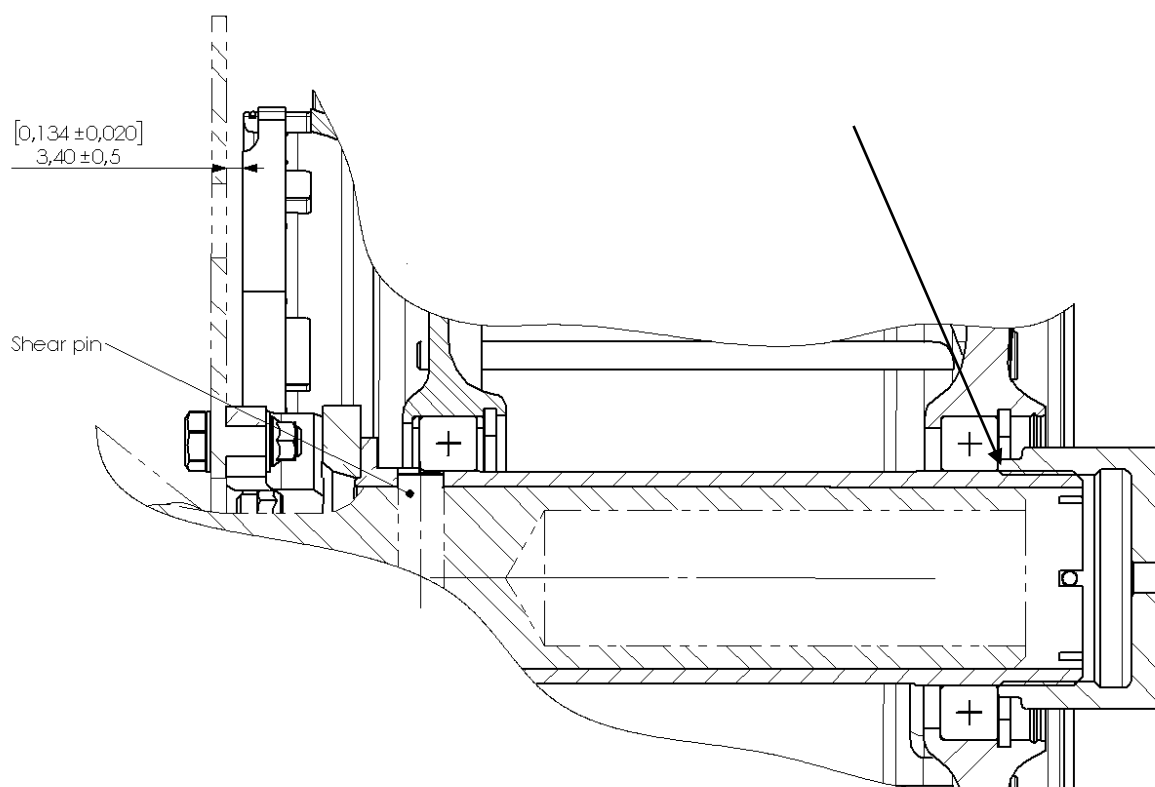


- c) Grease the landing gear leg axle and slide the left brake assembly on the axle of the U-1001-L Main Gear leg and secure it in place with the shear pin.



d) Insert the shear pin.

CAUTION: Make sure that the shear pin is fully in place and that the distance between the disc and the fairing plate is as per the next drawing



e) Apply a thin coat of grease on wheel bearings

Insert the wheel through the axle while placing the disc in wheel slots between the clips.

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

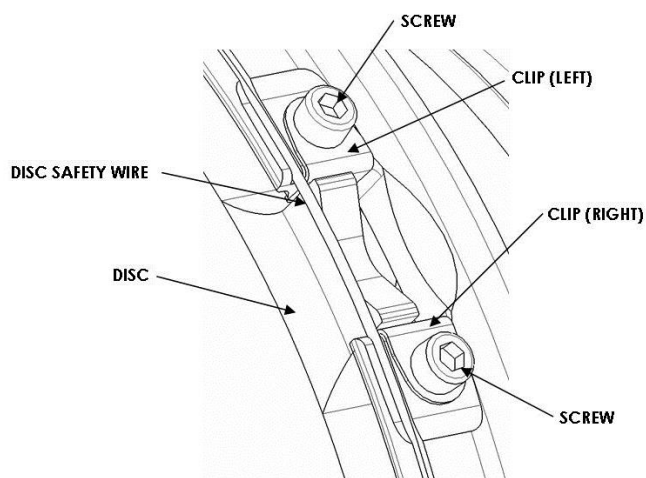
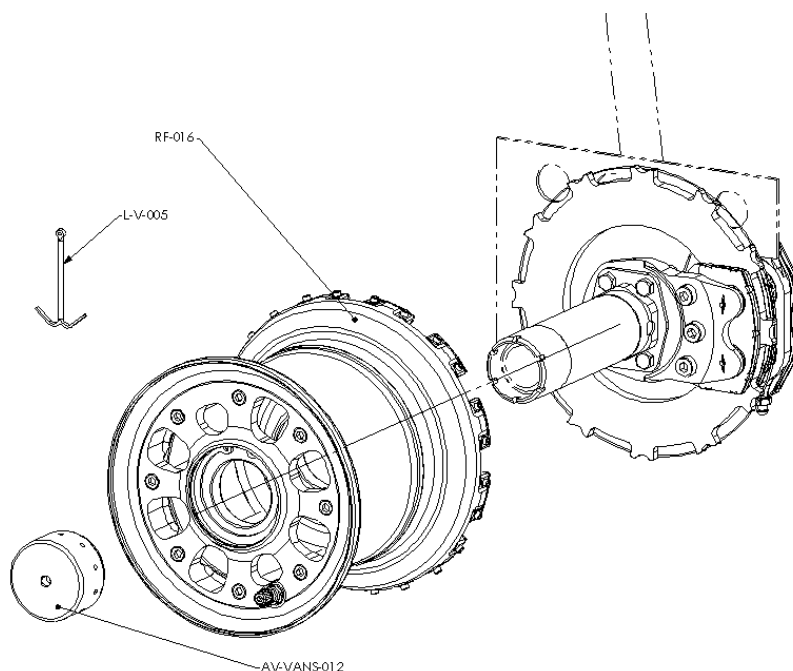
f) Apply a thin coat of grease on axle thread. Screw the axle nut to contact

g) Torque axle nut to contact by **hands, do not force. (WARNING)**

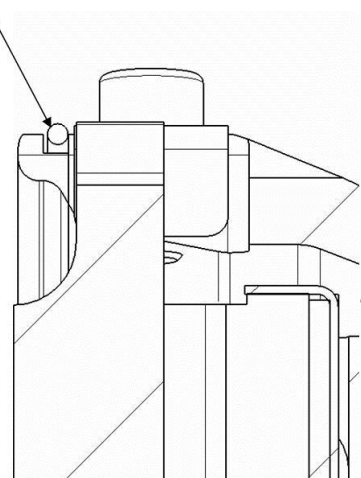
h) Insert a new cotter pin to secure the axle nut

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

- i) 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.



Safety wire
Ø1mm (0.040 in)



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

CAUTION: Brake lines and hydraulic schema are different from original. Make sure they are installed properly. The brake system will not work if brake lines are not installed correctly.

4.3.1. Installation Hose Main Wheel

- a) Assembly following §4.2 (Caution length of the Stainless steel brake hose must be adjusted)
- b) On the brake caliper : install Hose Main Wheel
- c) Torque tighten the banjo bolt see §2

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

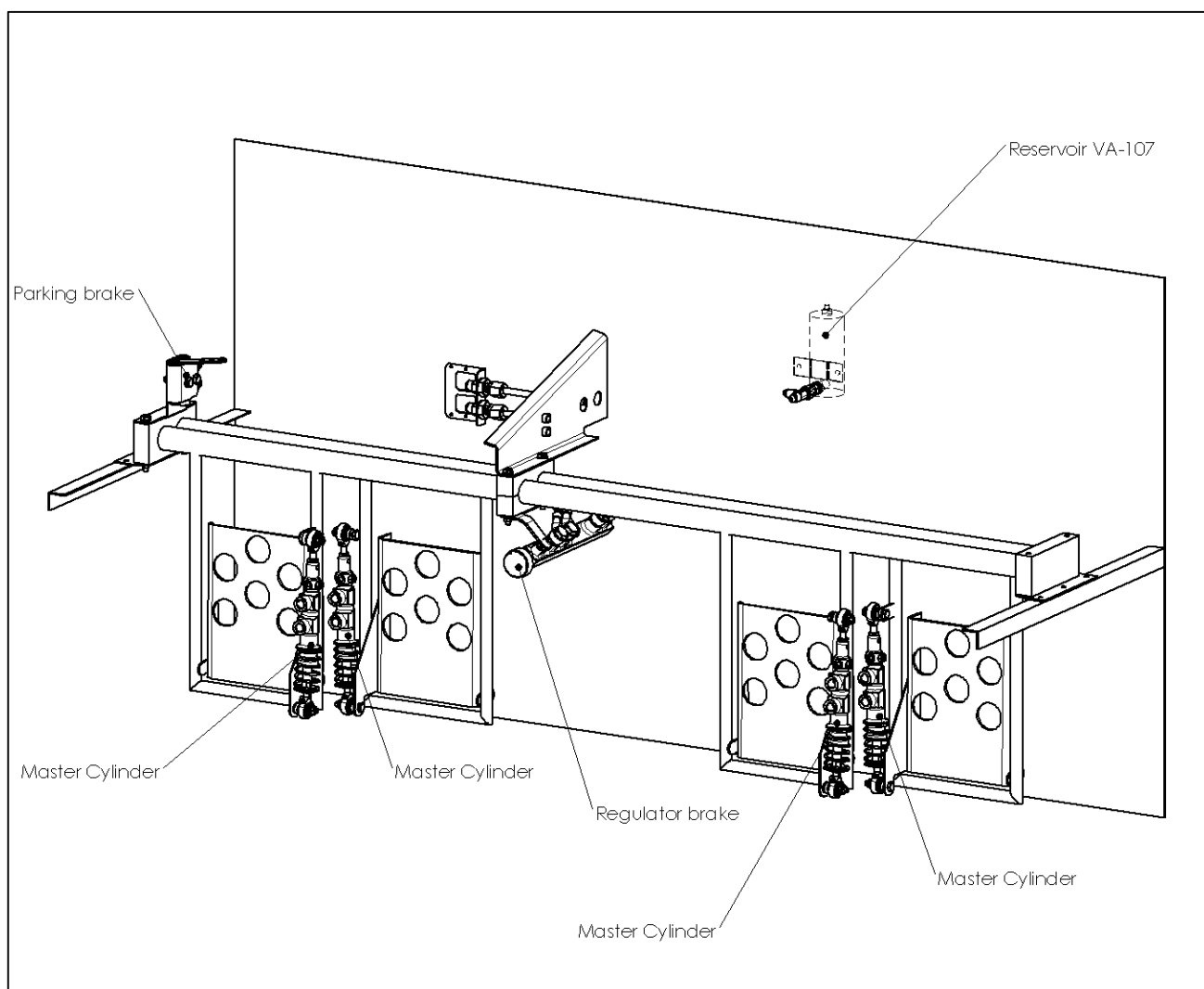
CAUTION: Copper seals cannot be re-used after being locked because they may leak. They must be changed each time the fitting is removed.

5. Fuselage Kit

5.1. Fuselage Kit RV10

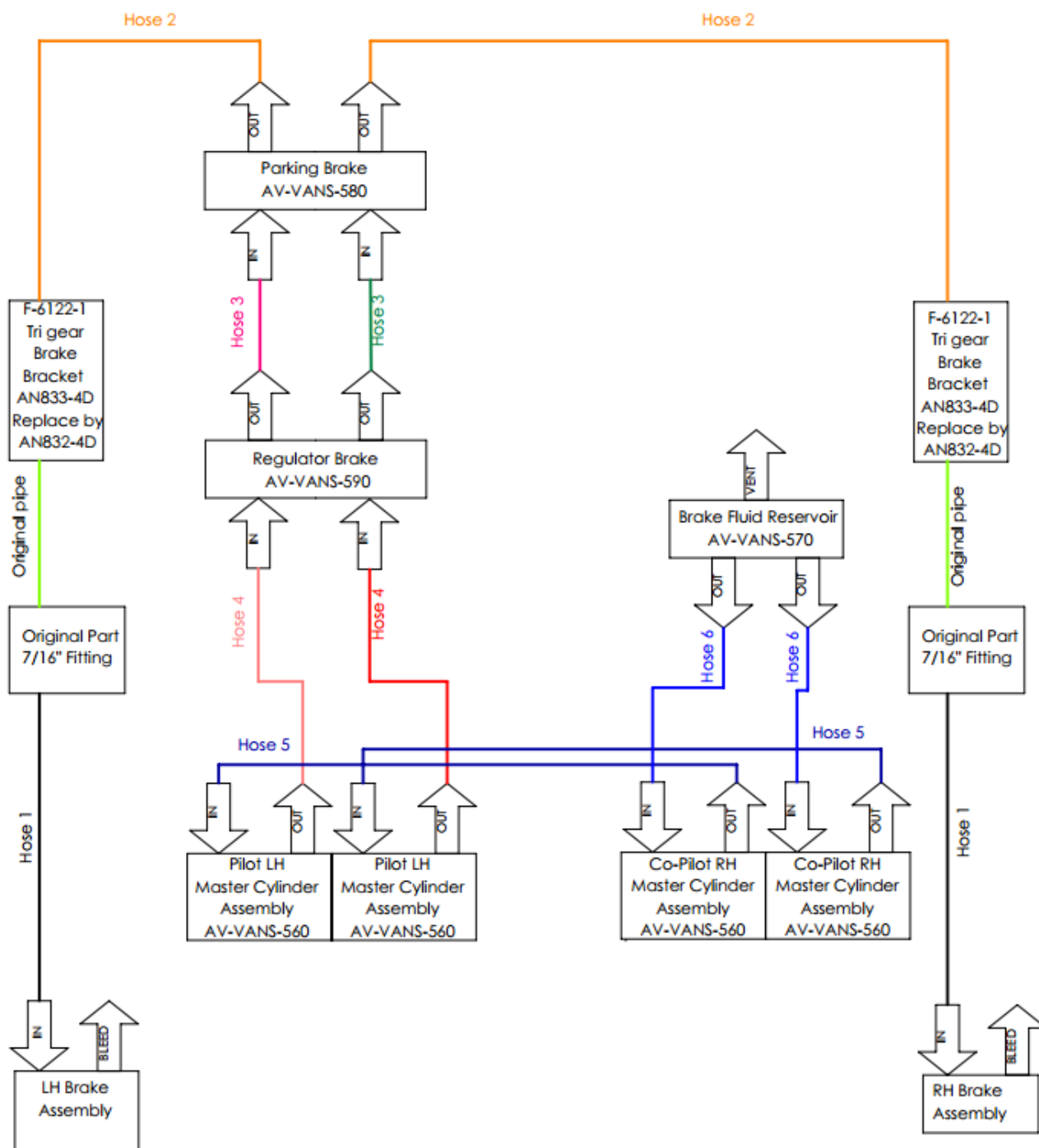
In the fuselage Kit, BERINGER offers 4 optional.

- Basic Kit only Pilot Master cylinder.
- Basic Kit + Copilote Master cylinder.
- Basic Kit only Pilot Master cylinder + Parking brake valve.
- Basic Kit + Copilote Master cylinder + Parking brake valve.
- Regulator Kit.
- Parking brake valve Kit.

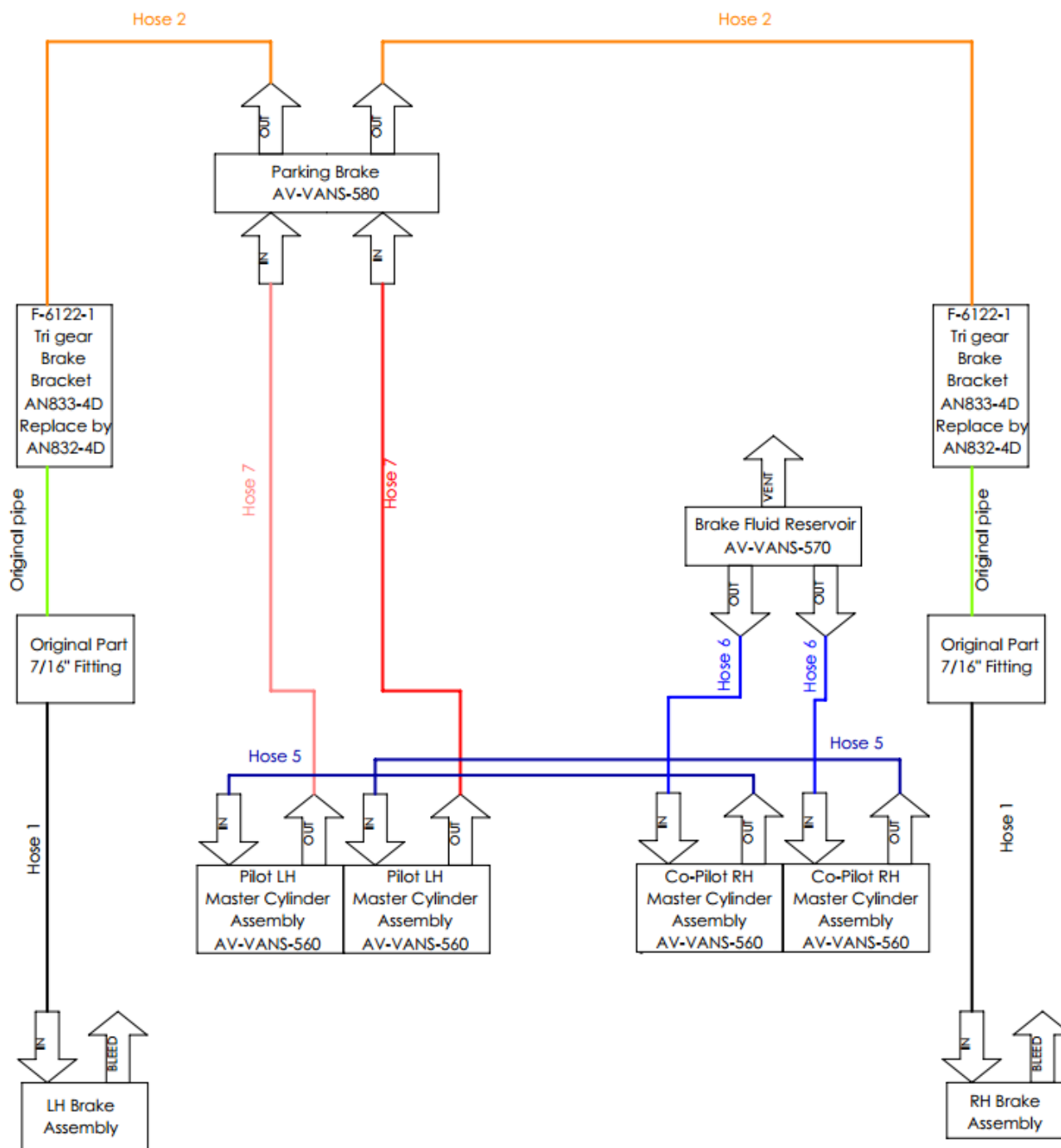


5.1.1. Full Hydraulic diagram (Drawing reference AV-VANS-550)

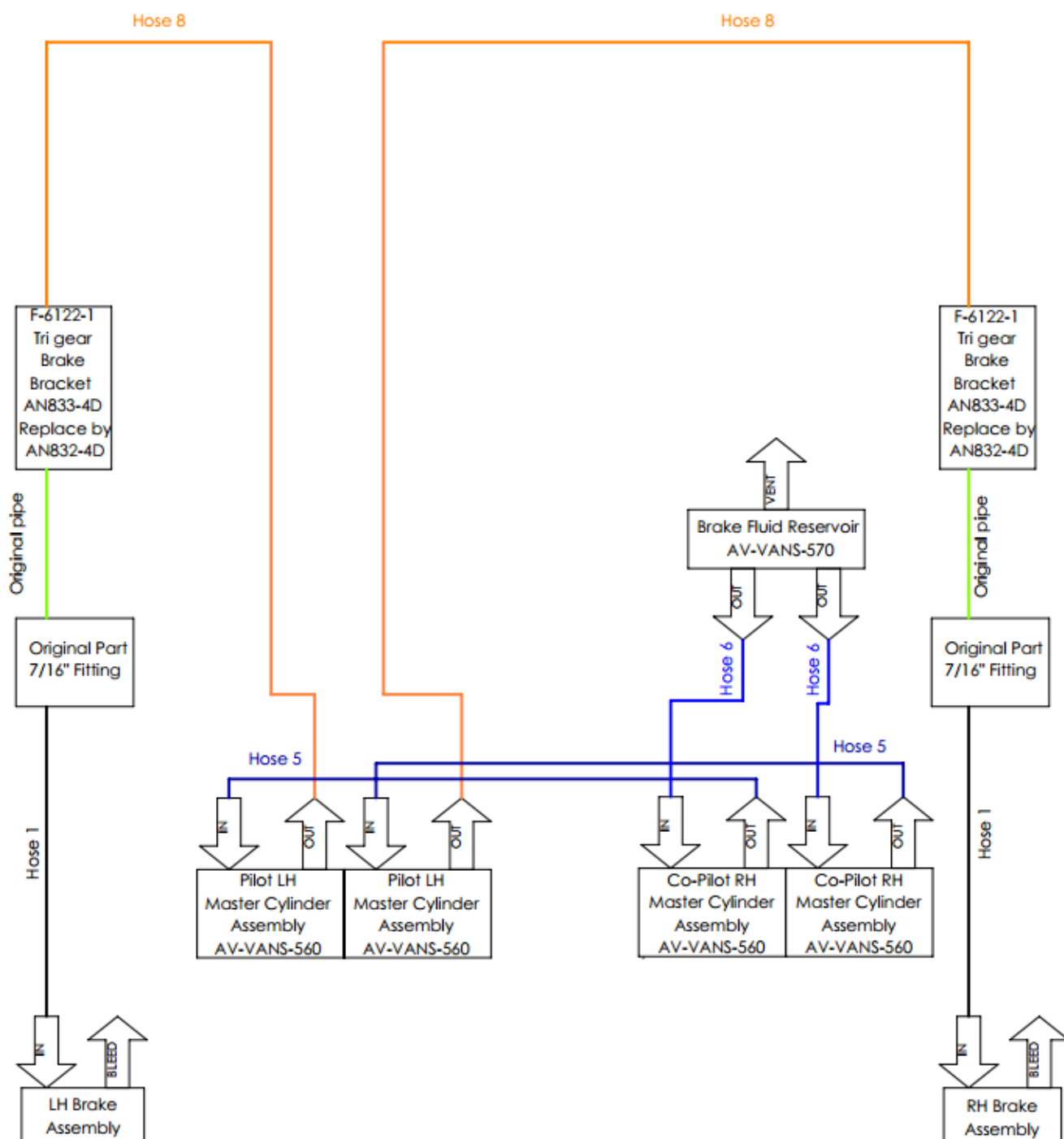
5.1.1.1 Basic+parking+copilot+regulator Kit (SRVFU04)+ (SRVFU06).



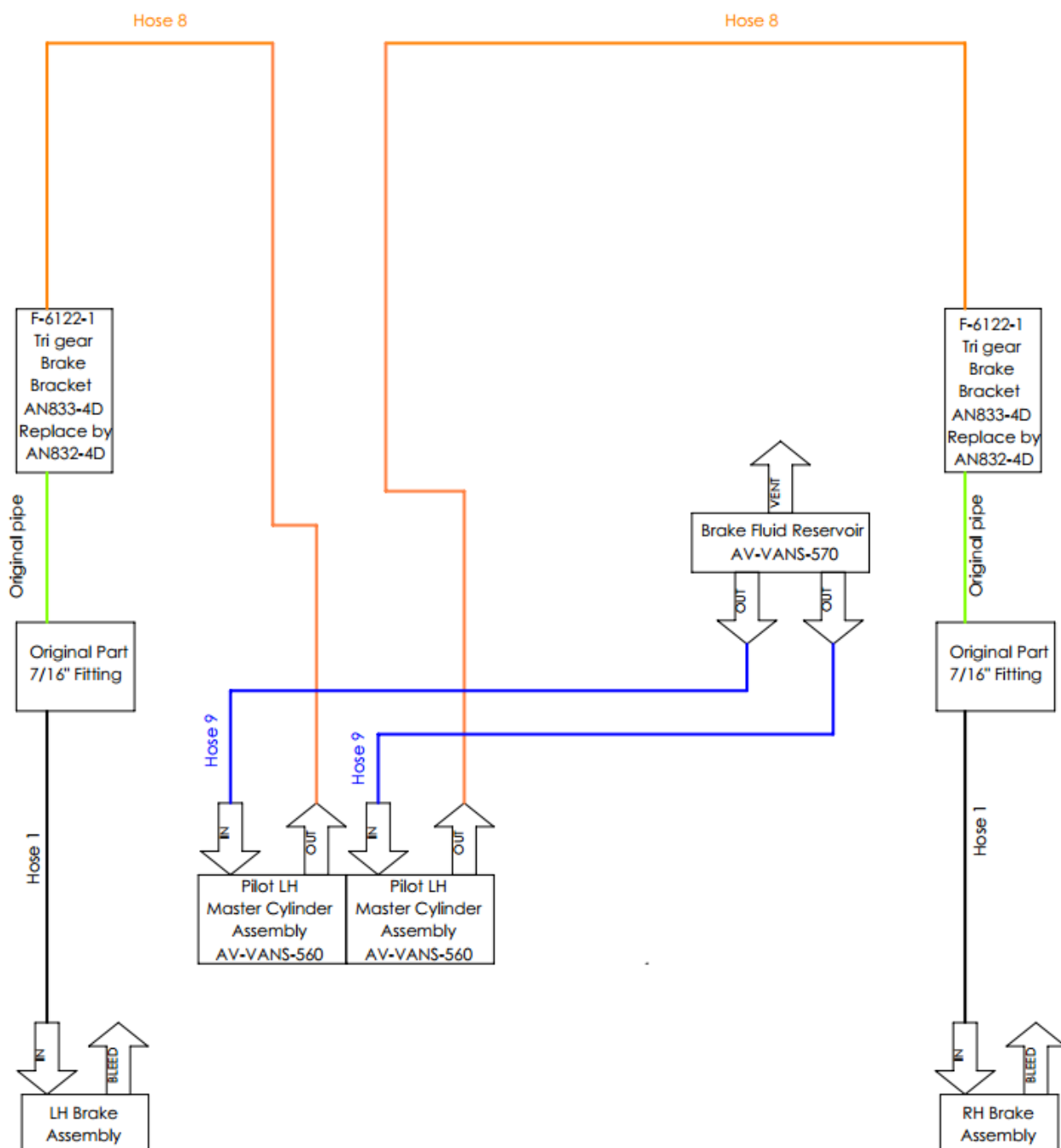
5.1.1.2 Basic+parking+copilot Kit(SRVFU04)



5.1.1.3 Basic+copilot (SRVFU02)



5.1.1.4 Basic (SRVFU01)

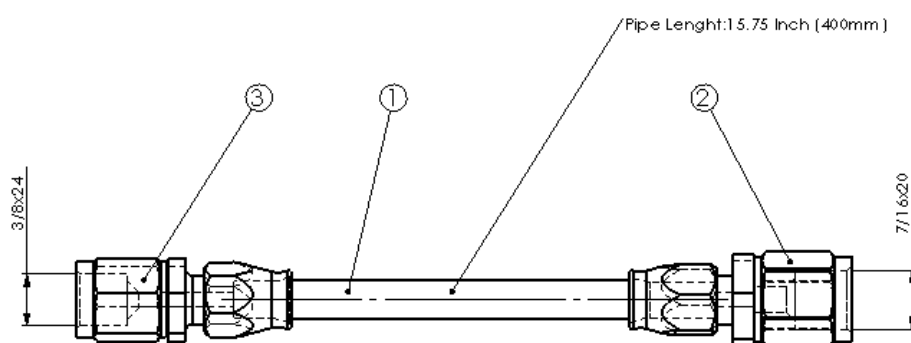


5.1.2. Brake line

5.1.2.1 Hose 01 (Main wheel / Fuselage)

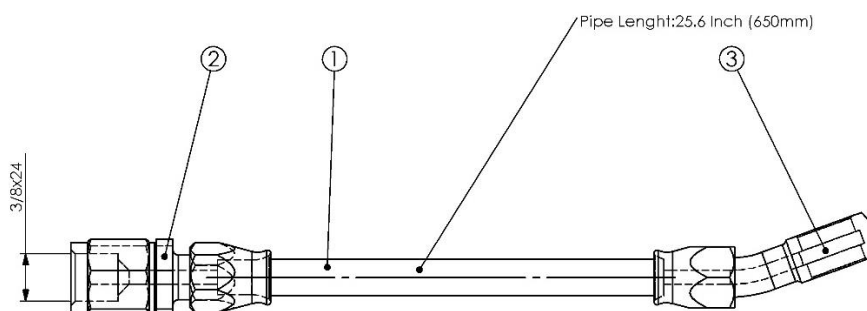
- See §4.2

5.1.2.2 Hose 02 (Fuselage/FP) (AV-VANS-511)



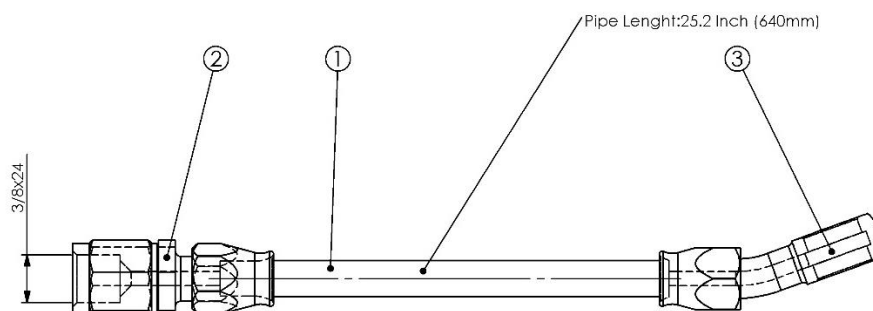
3	HYD-008OP	female fitting 3/8x24	1
2	HYD-009OC	female fitting 7/16x20	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.3 Hose 03 (FP/Regulator) (AV-VANS-512)



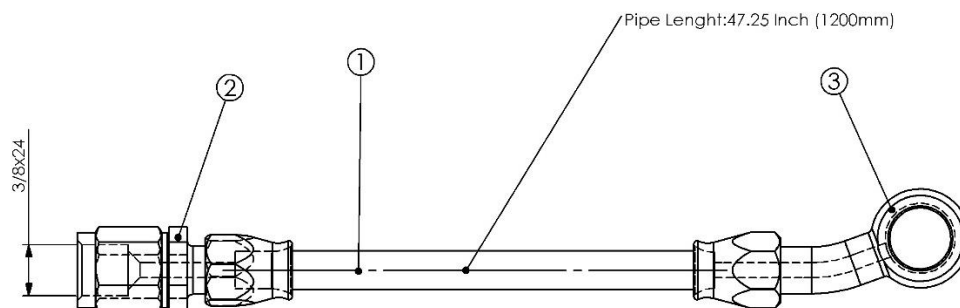
3	HYD-002OP	Banjo	1
2	HYD-008OP	female fitting 3/8x24	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.4 Hose 04 (Regulator/MC Pilot) (AV-VANS-513)



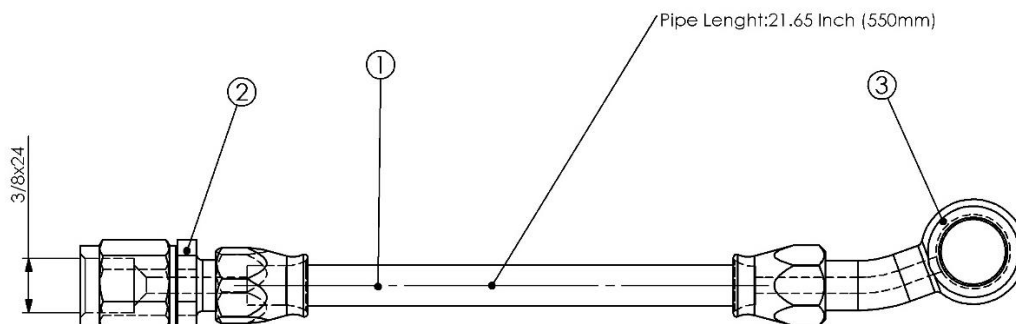
3	HYD-002OP	Banjo	1
2	HYD-008OP	female fitting 3/8x24	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.5 Hose 05 (MC Pilot/MC Copilot) (AV-VANS-514)



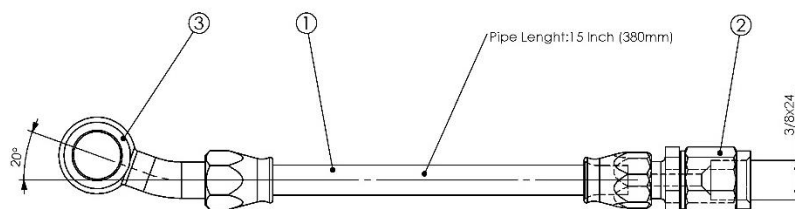
3	HYD-022OP	Banjo	1
2	HYD-008OP	female fitting 3/8x24	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.6 Hose 06 (MC Copilot-Reservoir) (AV-VANS-515)



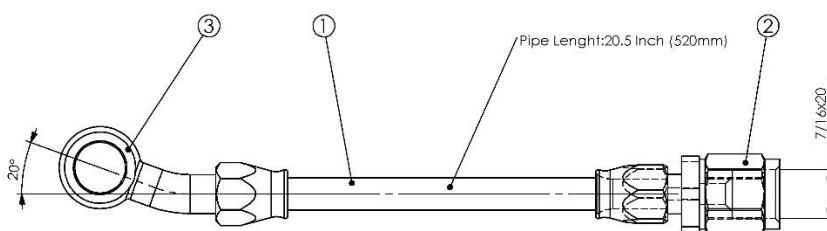
3	HYD-022OP	Banjo	1
2	HYD-008OP	female fitting 3/8x24	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.7 Hose 07 (MC pilot-FP) (AV-VANS-516)



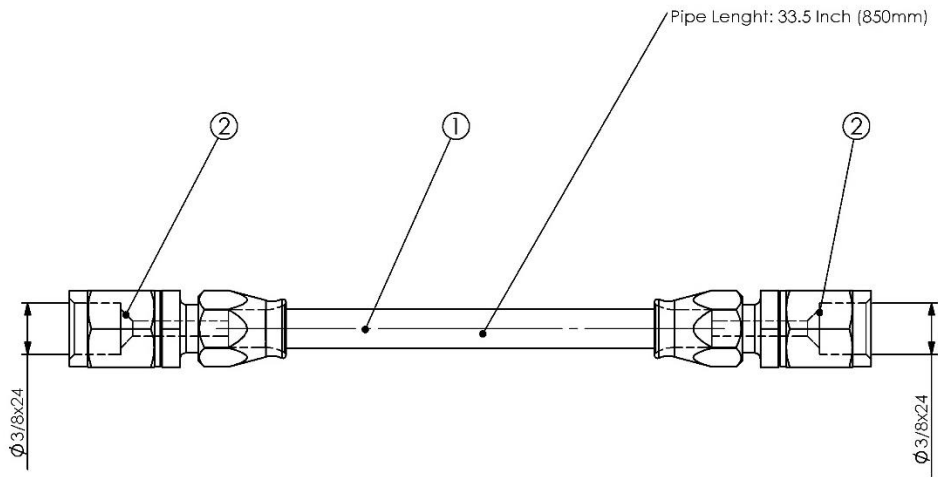
3	HYD-022OP	Banjo	1
2	HYD-008OP	female fitting 3/8x24	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.8 Hose 08 (Fuselage -MC pilot) (AV-VANS-517)



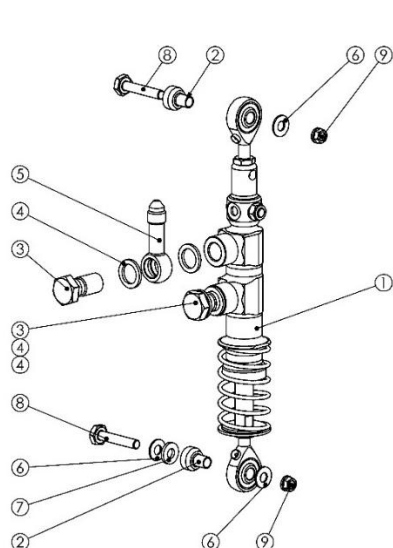
3	HYD-022OP	Banjo	1
2	HYD-009OC	female fitting 7/16x20	1
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.2.9 Hose 09 (MC pilot-Reservoir) (AV-VANS-518)

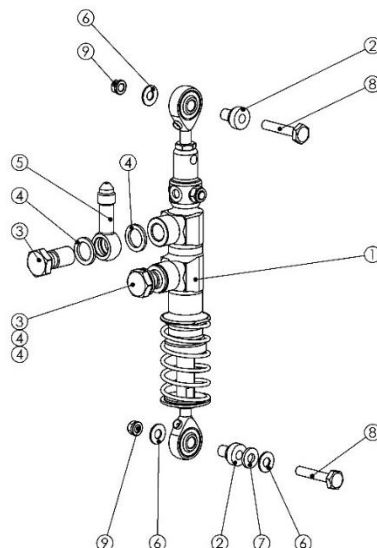


2	HYD-008OP	female fitting 3/8x24	2
1	HYD-032	Stainless steel brake hose	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.3. Assembly Master cylinder right and left (Drawing reference AV-VANS-560)

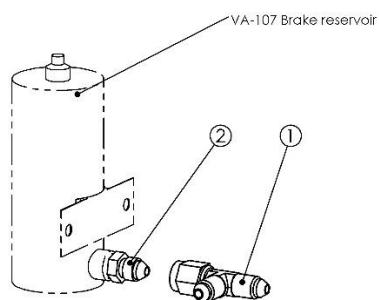


9	M S21042-3	Self locking Nut	2
8	AN3-10A	Axle bolt	2
7	NAS1149F0363P	Washer	1
6	NAS1149F0332P	Washer	3
5	HYD-019VC	Banjo	1
4	HYD-005B	Copper Seal	4
3	HYD-003P	Banjo Bolt	2
2	BGE-011(A)	Ball end	2
1	MP-002.6N(A)	Master cylinder	1
REP	PART NUMBER	DESCRIPTION	QTY.



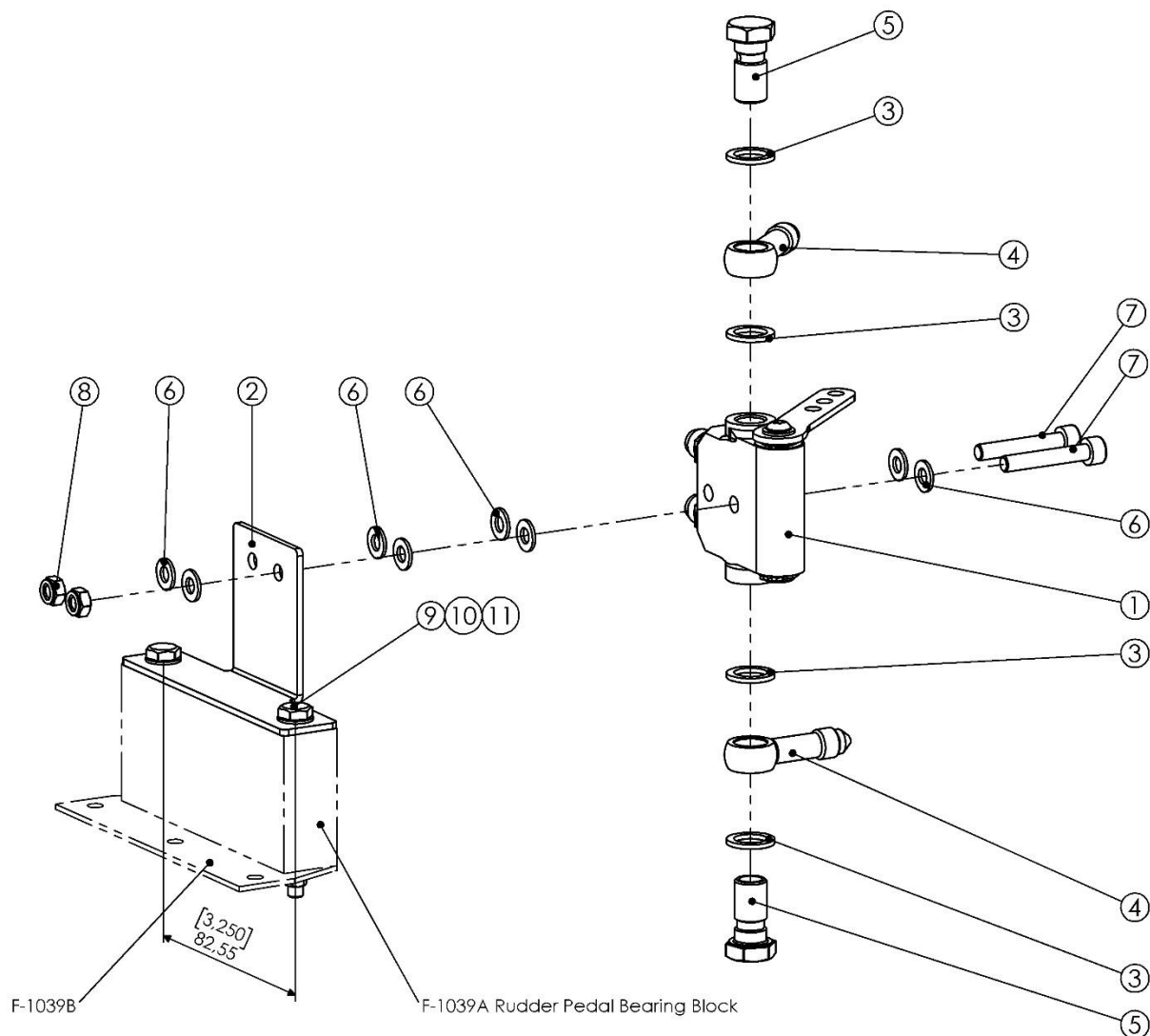
9	M S21042-3	Self locking Nut	2
8	AN3-10A	Axle bolt	2
7	NAS1149F0363P	Washer	1
6	NAS1149F0332P	Washer	3
5	HYD-019VC	Banjo	1
4	HYD-005B	Copper Seal	4
3	HYD-003P	Banjo Bolt	2
2	BGE-011(A)	Ball end	2
1	MP-002.6N(A)	Master cylinder	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.4. Assembly Brake reservoir (Drawing reference AV-VANS-570)



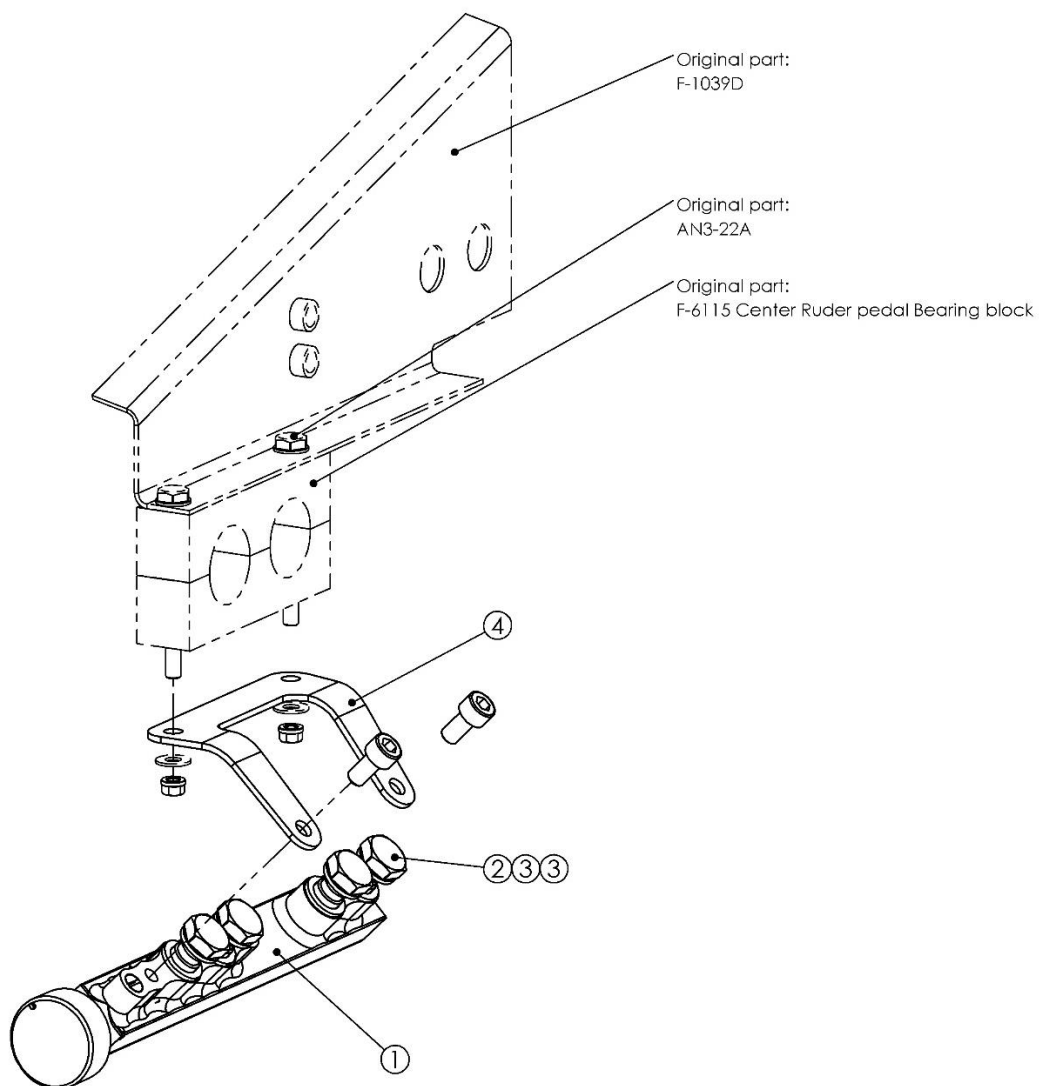
2	HYD-024D	Adaptator	1
1	HYD-042D	T 3/8"	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.5. Assembly Parking brake valve(Drawing reference AV-VANS-580)



11	MS21042-3	Self locking Nut	2
10	NAS1149F0332P	Washer	4
9	AN3-22A	Axle bolt	2
8	E-HN-002	self-locking Nut	2
7	V-CHC-041	Screw	2
6	R-AP-004	Washer	8
5	HYD-003P	Banjo Bolt	2
4	HYD-019VC	Banjo	2
3	HYD-005B	Copper Seal	4
2	AV-VANS-015(A)	Support	1
1	FP-001 (A)	Parking Brake	1
REP	PART NUMBER	DESCRIPTION	QTY.

5.1.6. Assembly Regulator (Drawing reference AV-VANS-590)



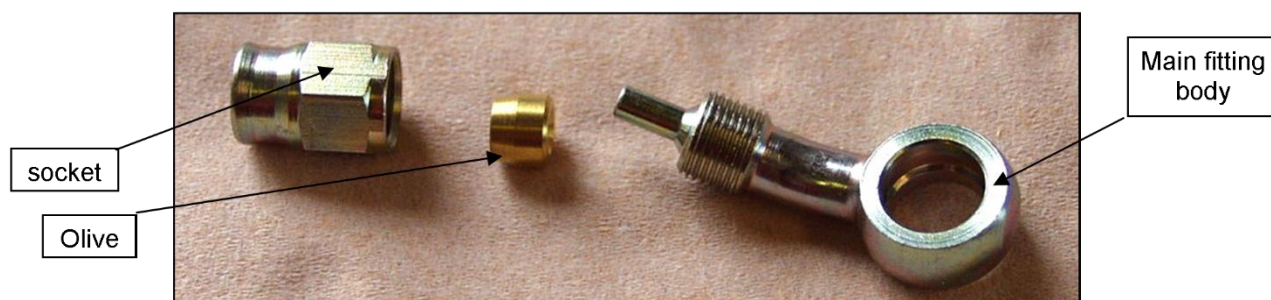
4	AV-VANS-006 (A)	Elbow	1
3	HYD-005B	Copper Seal	8
2	HYD-003P	Banjo Bolt	4
1	RE-001N(B)	Regulator	1
REP	PART NUMBER	DESCRIPTION	QTY.

6. Brake line

See on YOUTUBE:

- BERINGER tech Tip #2

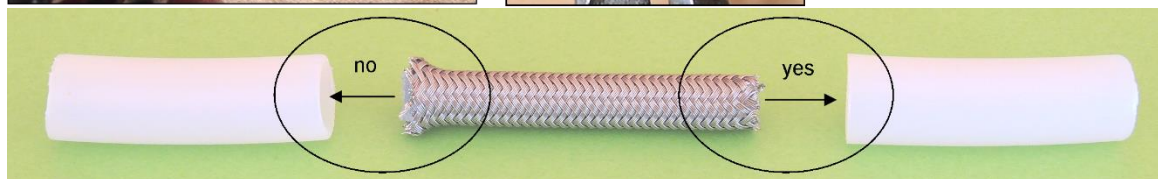
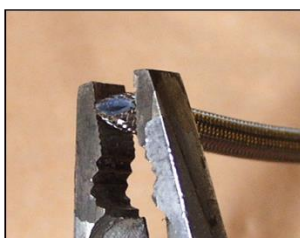
A. Banjo Assembly



B. Cut the hose



- Using a fine tooth saw blade or cutter plier, cut hose to the required length.
- Clean any loose debris from both the cut ends and inside the hose.
- Then use a flat pliers to make the hole circular, as shown on the picture below.

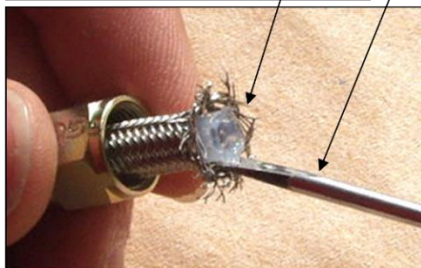


C. Put the nut in the hose



Flare out stainless steel from PTFE tube
(5mm length min.)

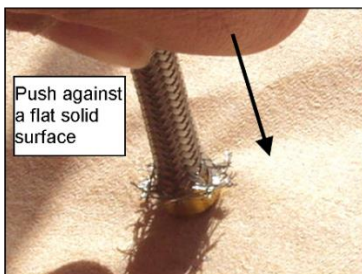
Use a fine screwdriver



D. Put the olive



Push the olive onto the end of PTFE inner tube and under the stainless steel braid. Make sure that all stainless steel filaments are outside of the olive.



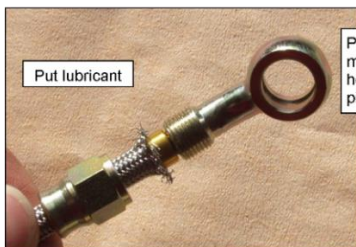
Push against a flat solid surface



PTFE tube must be in contact with the olive

Make sure that PTFE tube is fully homed in the olive.

E. Put the banjo



Put lubricant

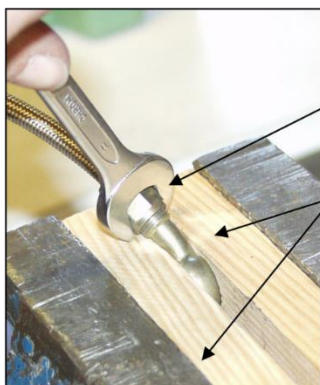
Push between hands the main fitting body and hose as shown on left picture.

Turn with hand the main fitting body to start threading the socket as shown on picture below.



Lubrificant: Drop off oil or WD40 on the thread

F. Tightening torque the socket



Torque tightening the socket at 10N.m to 15N.m (90 IN-LBS to 132 IN-LBS)

Maintain with wood plates to preserve the main fitting body

7. Maintenance

7.1. Equipment concerned

- Nose wheel :
 - P/N: RA-014
- main wheel :
 - P/N: RF-016
- brake assemble:
 - P/N: EA-003.3N

Notes :

- L and R indicates the Left and Right brake assembliesDisassembly – Reassembly – Tire change

7.2. Maintenance Manual Equipment concerned

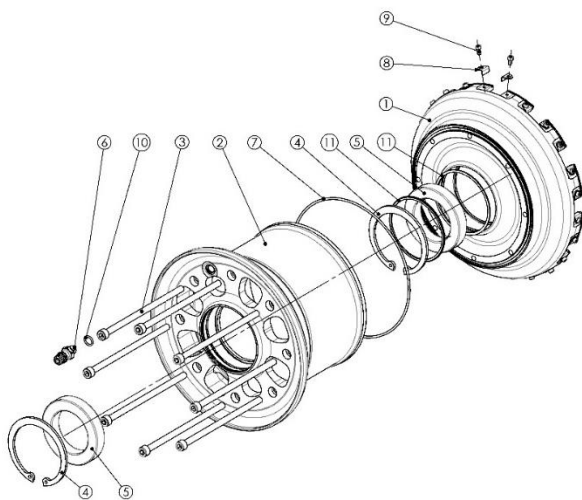
For RA-014 see MM-ETSO-007.

For RF-016 and EA-003.3N see MM-ETSO-001 (RF-016 it's same that RF-006 only Bearing and Outer Wheel Half change).

For Assembly tire see on YOUTUBE:

- BERINGER tech Tip #1

7.2.1.1 6.00-6 Main wheel assembly RF-016(A):



11	BGE-025(A)	Spacer	2
10	J-JTR-017N	O-Ring	1
9	V-CHC-005	Clip Screw	24
8	CLP-001(B)	Clip	24
7	J-JTR-007N	O-Ring	1
6	A-001	Valve	1
5	B-BE-014	BEARING	2
4	C-AL-006	CIRCLIP	2
3	V-CHC-004	Screw	8
2	JAE-024(A)	Outer Wheel half	1
1	JAI-012(B)	Inner wheel half	1
REP	PART NUMBER	DESCRIPTION	QTY.

	Torque		Threadlocker
Wheel screw	12 N.m	105 in-lb	medium strength (Loctite 243 recommended)
Clip screw	1.5 N.m	13 in-lb	high strength (Loctite 271 recommended)