



# CESSNA 152

## EXHAUSTS

Ref. CESSNA 152 - IP - 17 - 01A

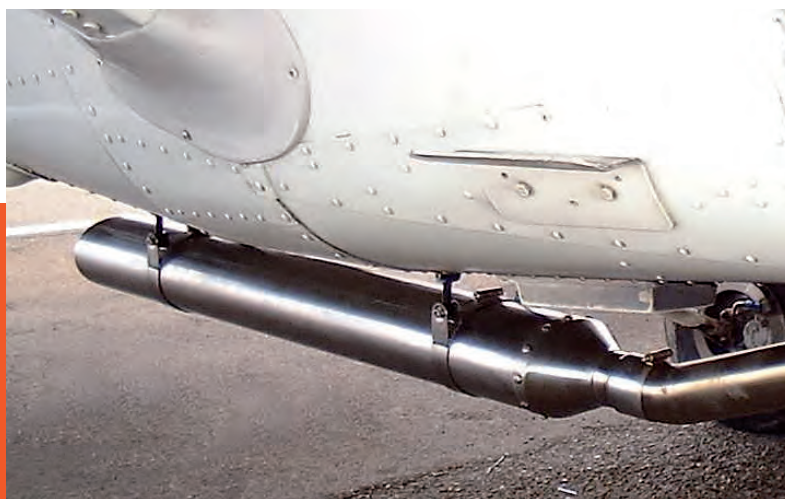


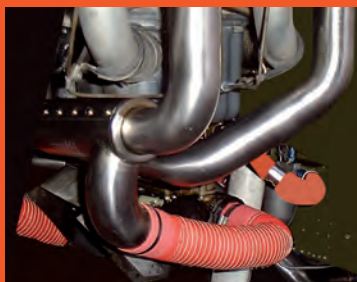
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Installation manual and maintenance program :  
édition of 07/12/2012

This document contains :

- the technical instructions of EASA N° 10043168 STC
- maintenance program



## Applicability

CESSNA152			
Engine Lycoming	Propeller	Noise level	Authorized limit noise level
0-235-L2C	McCauley 1A103/TCM6958	65 dB(A) (chap 6)	70.1 dB(A)
0-235-N2C	McCauley 1A103/TCM6958	65 dB(A) (chap 6)	70.1 dB(A)
0-235-L2C	Sensenich 72CKS6-0-54	68.8 dB(A) (chap 6)	70.1 dB(A)
0-235-L2C	Sensenich 72CKS6-0-56	68.1 dB(A) (chap 10.4b)	74.4 dB(A)
0-235-N2C	Sensenich 72CKS6-0-56	68.1 dB(A) (chap 10.4b)	74.4 dB(A)

REIMS-CESSNA F152			
Engine Lycoming	Propeller	Noise level	Authorized limit noise level
O-235-L2C	McCauley 1A103/TCM6958	72.3 (chap 10.4b)	74.4 dB(A)
0-235-N2C	McCauley 1A103/TCM6958	65 dB(A) (chap 6)	70.1 dB(A)
0-235-L2C	Sensenich 72CKS6-0-54	70.1 dB(A) (chap 6)	70.1 dB(A)
0-235-N2C	Sensenich 72CKS6-0-54	68.8 dB(A) (chap 6)	70.1 dB(A)
0-235-L2C	Sensenich 72CKS6-0-56	68.1 dB(A) (chap 10.4b)	74.4 dB(A)
0-235-N2C	Sensenich 72CKS6-0-56	68.1 dB(A) (chap 10.4b)	74.4 dB(A)

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0-235-L2C	McCauley 1A103/TCM6958	72.3 (chap 10.4b)	74.4 dB(A)
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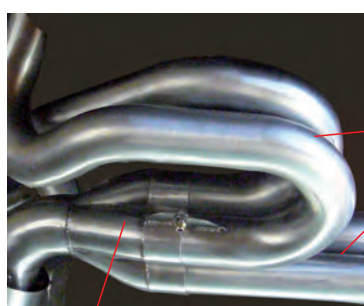


CHABORD CESSNA 152 EXHAUST PART LIST- Réf. nomcessna152-01b - STC. 10043168 rev 0					
REF KIT : CESSNA152-00A					
SET		UNDER-SET			
Designation	Ref	Designation	Ref	material	Qty
Primary exhaust 10		exhaust flange	CABRI90A	Inox 316L	4
		101 primary tube n°1	CESSNA152COL1a	Inox 316L	1
		102 Primary tube n°2	CESSNA152COL2a	Inox 316L	1
		103 Primary tube n°3	CESSNA152COL3a	Inox 316L	1
		104 Primary n°4	CESSNA152COL4a	Inox 316L	1
		105 bracket	CESSNA17261A	Inconel	3
4in1 manifold 4	CESSNA1524a	106 Aviation nut	ECROUAVION90a	XC38Pb	8
		41 4in1	CESSNA15241a	Inox 316L	1
		42 4in1 manifold	CESSNA15242a	Inox 316L	1
		bracket	MORAN61a	Inconel	3
		43 Screw TH M5x10	00965 10	Inox	3
4in1 manifold bracket 7	CESSNA1527B	44 Simmonds locking nuts M5	5080PH115	Inox	3
		73 Support 4in1	CESSNA15273a	15CDV6T	1
		72 Spacer 4in1	CESSNA15272b	15CDV6T	1
		Screw CHC M6x25	0094625	Inox	2
		Simmonds Locking nuts M6	6100PH135	Inox	2
Swivel tube 6	CESSNA1526a	71 4in1 clamp	CESSNA15271a	Inconel	1
		Screw CHC M6x35	0094635	Inox	1
		Simmonds locking nuts M6	5080PH135	Inox	1
Assy under cockpit muffler bracket 3	CESSNA1523a	31 under cockpit bracket	CESSNA15231a	15CDV6T	2
		32 rods	CESSNA15232a	15CDV6T	4
		33 Muffler clamp	CESSNA15233a	Inconel	2
		Screw CHC M6x25	0094625	Inox	8
		ScrewCHC M6x35	0094635	Inox	2
		Nylstop locking nut M6	03916	Inox	8
Muffler 15	CESSNA15215a	central structure	CESSNA15215-03a	Inox perfo	1
		inlet part	CESSNA152157a	Inconel	1
		Connecting rod	MOUSQU4a	Inox 316L	2
		dynamic cone	CESSNA152153a	Inox 316L	1
		inler muffler wall	CESSNA152154a	Inox 316L	1
		Outlet muffler wall	CESSNA152155a	Cf plans	1
		central muffler wall	CESSNA152156a	Inox 316L	1
		muffler envelope	CESSNA152158a	Inox 316L	1
		Screw Chc M6x35	0094635	Inox	1
Carburator-heat box 1	CESSNA1521a	Simmonds locking nuts M6	6100PH135	inox	1
		carburator-heat sheet	MORAN77a	Inox 316L	1
		Carburator-heat washer	MOUS67a	Inox 316L	1
		U carburator-heat bracket	MOUS1080a	Inconel 625	3
		Screw M4x8	1231048	Inox	11
Cabin-heat box 2	CESSNA1522a	Washer D4	1494410	Inox	11
		half moon developped	MORAN75a	Inox 316L	2
		cabin-heat washer	MORAN1060a	Inox 316L	2
		21 Screw M4x8	1231048	Inox	18
Cold air intake cone 8	CESSNA1528a	22 Washer D4	1494410	inox	18
cabin hot air bend 5	CESSNA1525a	cold air cone sheet	CESSNA1528-61b	Inox 316L	1
Elastic rods 86	861601	hot air sheet bend	CESSNA1525-60a	Inox 316L	1
Carburator-heat flexible ducting	CESSNA15211a			Rubber	9
inlet cabin-heat flexible ducting	CESSNA15212a	11		Néoprène	1
cabin-heat outlet flexible ducting	CESSNA15213a	12		Néoprène	1
Tire-wraps cerflex D50	972BVPE	13		Néoprène	1
		14		Inox	6

## Technical Characteristics

This exhaust is designed to enhance engine performance :

### 1- The Primary Tubes



Primaries tubes

4 in 1 manifold

- Each primary exhaust tube is 700mm, optimal length based on engine manufacturer specifications (stroke, bore, valve opening and closing, etc.) and of available space inside engine cowling.
- Each of the tubes has the same volumetrical neutral fibre length. The primary tubes' respective lengths ensures that each cylinder produces identical power, reduces fuel consumption and diminished engine vibration by about 60%, which produced increased cockpit comfort.
- The principle of channelling the four primary tubes, into a single collector ( 4 in 1 ) and then into a single exhaust allows the various gazes to mix and increases torque and engine power.
- The exhaust flanges are made from inox 316L. The primary tubes and the collectors are made from Inconel 625, an alloy whose high heat resistance ensure excellent reliability to the exhaust system.



4 in 1

Collector



Flange

Aviation nut

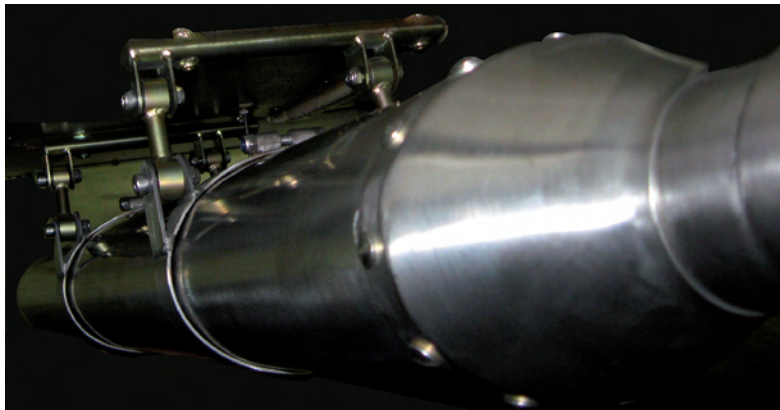
Primaries tubes

# Technical Characteristics

## 2 - The MUFFLER

The muffler works according to two principles :

- An expansion chamber of perforated sheeting ensures diffraction.
  - Sound proofing material is layered around the expansion chamber, to ensure noise absorption.
- Cockpit comfort is increased by around 15 %, notably due to elimination of frequencies in the highest ranges.





## Technical Characteristics

### 3 - Muffler brackets

- Because of limited space in the engine compartment, the muffler is attached under the cockpit.
- The exhaust flanges ensure that the exhaust gas collector is firmly fixed to the engine.
- Given the engine is mounted via silent blocks to the engine mount, a certain amount of play is normal, at cruise speed, for example, with relationship to the rest of the airframe. All these conditions require adequate construction and liaison between the collector and the muffler.
- A single swivel joint tube between the exhaust tube and the muffler takes care of all vertical and lateral displacement.
- Particular care is given, during the manufacturing process, to the sealing of the swivel joint, without impairing its mobility.



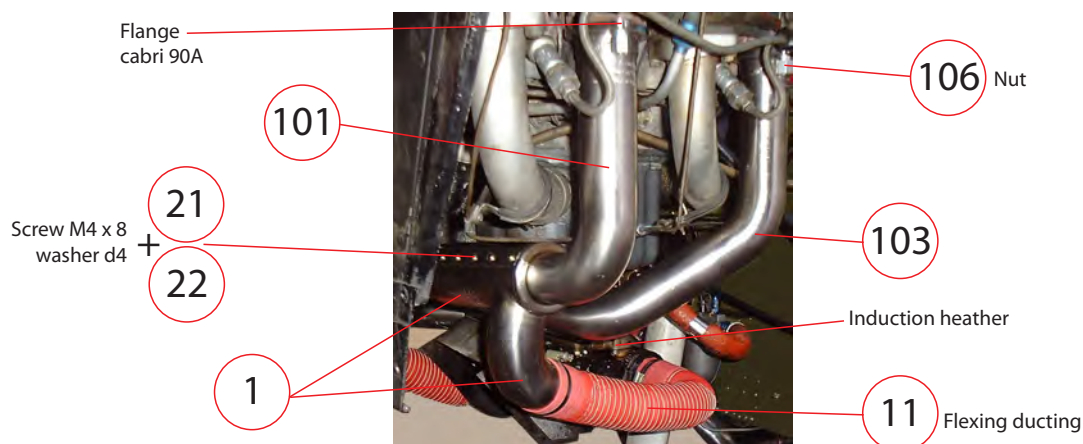
- Small vertical connecting rods connect the muffler's brackets to the cockpit. They absorb the muffler's longitudinal movements.
- The structural elements that hold the muffler are machined out of 15CDV6T, a material specially used in aerospace for machine-welded components. Surface-treated, they are protected against corrosion.
- To absorb vibrations, Paulstra-type swivel joints ensure the connection between the connecting rods and brackets under the cockpit.

This combination of mechanical elements allows a certain amount of movement between the collector and the muffler, diminishing mechanical stress, and augmenting the assembly's reliability.

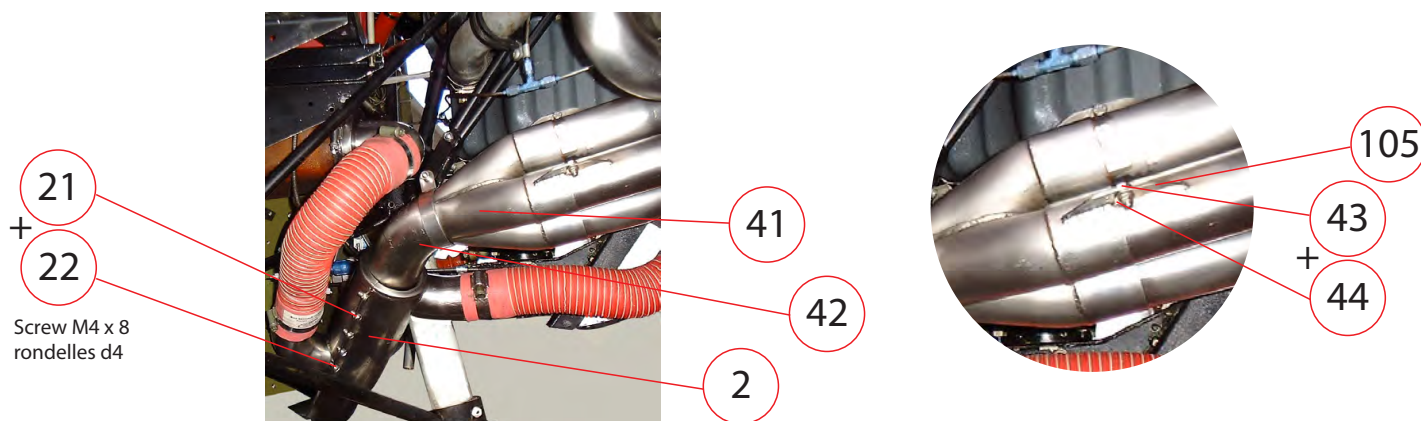


## CESSNA 152 MUFFLER ASSEMBLY INSTRUCTIONS

- 1 - Remove top and bottom cowlings.
- 2 - Remove original exhaust.
- 3 - Keep the existing 4 cylinder gaskets.
- 4 - Disassemble the original carburettor heat and cabin flexible ducting.
- 5 - Disassemble pilot and co-pilot seats, and remove cockpit carpeting covering access panel under the seats.
- 6 - Pre-mount carburettor heat (photo1) on the front left primary tube (photo101) indexing it with the bracket welded on the primary tube.
  - Insert the 11 M4 x 8 Poêlier (photo (21) and washers D4 (photo(22). Tighten all the screws.



- 7 - Pre-mount the cabin heart (photo (2) on the 4 in 1 exhaust tube (photo4) with the largest elbow facing 4 in 1 side.
  - Position the 18 M4 x 8 Poelier (photo (21) screws and et D4 (photo (22) washers.
- 8 - Assemble the 4 primary tubes (photo (101) to (photo (104) without forgetting the exhaust gaskets.
  - Position but do not tighten the 8 aviation nuts (photo (106).
- 9 - Insert the 4 in 1 (photo (41) onto the primary tubes according to the numbers engraved on the primary tubes' brackets (photo (105) : the numbers must face each other. Position the TH M5 x10 mm (photo (43) screws and the Simmonds M5 (photo(44) locking nuts.





10 - Fully tighten the locking nuts (photo (44)).

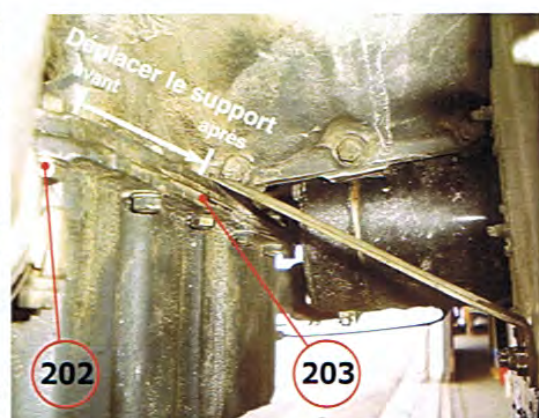
- Block the 8 aviation nuts (photo (106)) on the flanges of the primary tubes.

11 - Position the Cerflex collars (photo (14)) on the carburettor heat flexible ducting of 410 mm (photo (11)), cabin heat entry flexible ducting of 410 mm (photo (12)) and exit flexible ducting of 340mm (photo (13)). Do not tighten.

12 - Position one end of the carburettor heat flexible ducting (photo (11)) on the hot air entry tube of the carburettor heat box and the other end on the exit of the carburettor heat box (photo(1) on the primary (101) tube. Check that the flexibly ducting is in position and tighten the Cerflex d50 collars.

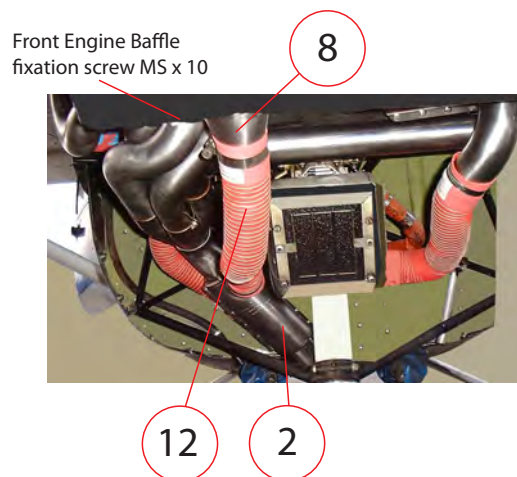
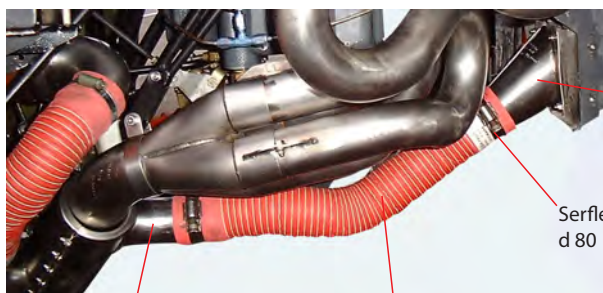
13 - Bend the aluminum baffle at the front of the engine inwards.

- Attach the bracket to the sump at position 203 instead of 202
- Attach the bracket to the front baffle at position 201 instead of 200. Drill the baffle if need to be to attain position 201.



14 - Centre the cold air entry cone on the right side of the front engine baffle (photo (8)), on the right inside of the cold air intake and facing downward.

- Drill d5 mm holes in the aluminum baffle to secure the cone with TH M5 x10 mm screws (81), washers (82) M5 nylstop bolts.





15 - Insert one end of cabin heat the flexible (photo (12) on the cold air inlet cone (photo (8), and the other end on the cabin heat inlet (photo(2).

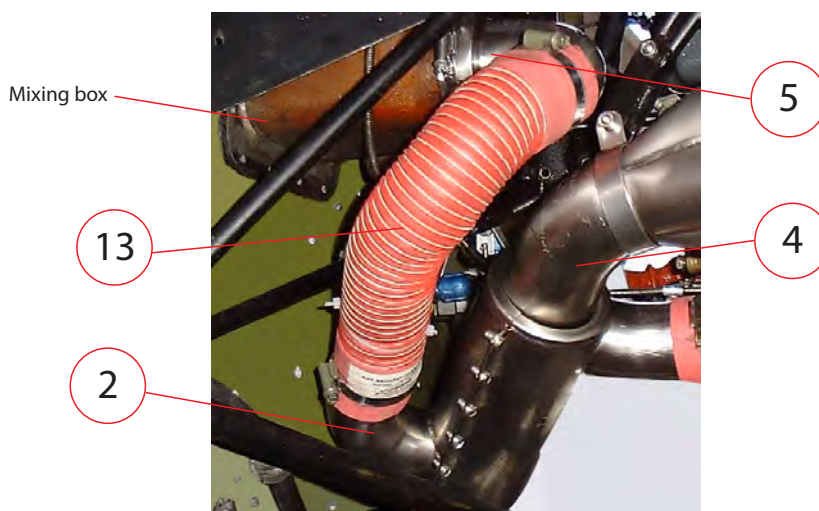
- Ensure that the ducting is correctly installed and is not in contact with any of the primary tubes.
- Tighten the Cerflex collars.

16 - Position the hot air intake elbow (photo (5) on the mixing box on the firewall and secure with a Cerflex collars d80.

- Position the elbow toward the exterior so that the flexible ducting from the carburettor heat (photo (2) can be attached with ease (photo (13).

17 - Position one end of the cabin heat flexible ducting (photo (13) at the end of the hot air intake elbow (photo (5), and the other end at the end of the cabin air heat (photo (2).

- Ensure that the ducting is correctly installed and is not in contact with any of the primary tubes.
- Tighten the Cerflex collars on the flexible ducting and the elbow on the mixing box.

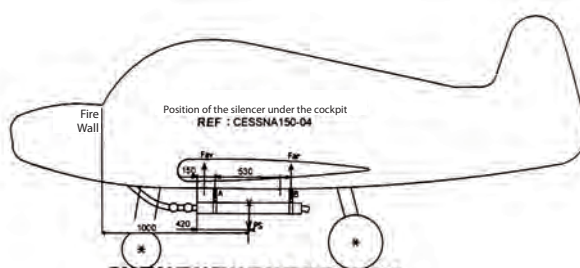
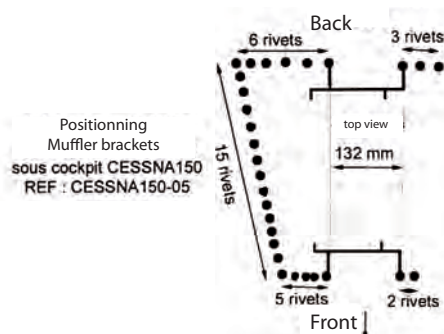


18 - Tighten all of the cabin heat M4 Poêlier (21) screws to fasten it on the 4/1exhaust tube(4).

19 - Ensure that no electrical cable or fuel line is in contact with any of the exhaust's "hot" element(s). If there is contact, or any risk of contact, separate such parts with clamps, or thermally insulate them.

20 - With a d4 mm drill remove the 4 rivets under cockpit, as per REF. CESSNA 152-05.

- Drill the 4 holes muffler bracket's support with a d6 mm drill as per REF: CESSNA 152-05.
- In case the distance between the holes the bracket holes (photo (31) and the previous rivets holes under the cockpit is too large: Replace one of the rivets under the cockpit by a d4 mm cutter head rivet.
- Drill through one of the original rivets for the first bracket hole
- Drill the second d6 mm using the bracket hole (photo (31)as a template.

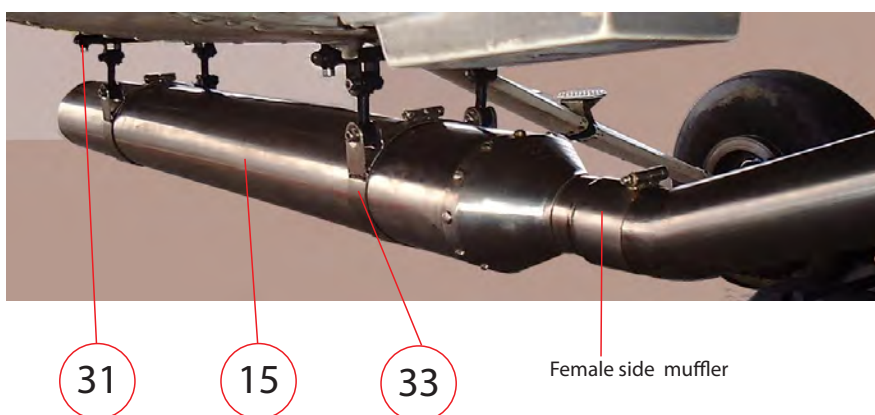


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21 - Position the front muffler bracket according to positioning as per REF.CESSNA 152-05

- Thread the 2 CHC M6x30mm screws into the Nylstop M6 bolts, and tighten.

22 - Position the muffler (photo (15)) in the supporting brackets (photo (33)) without tightening, so as to allow mobility for the rest of the installation.



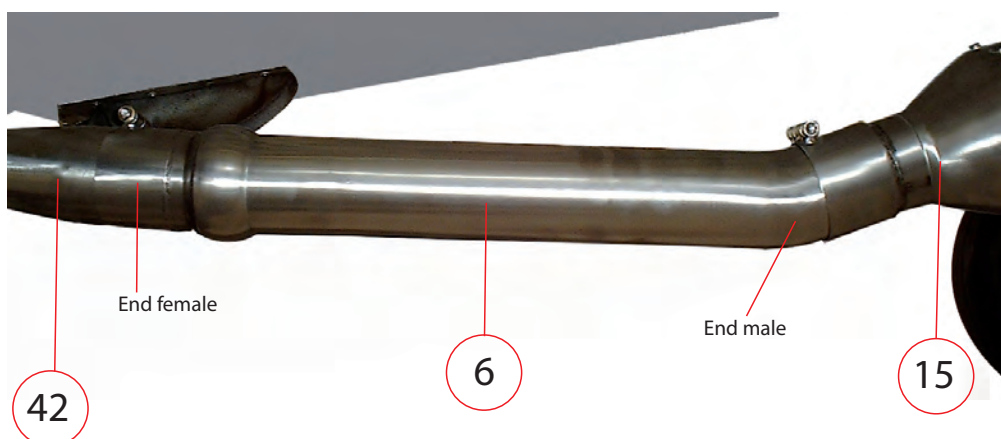
23 - Apply high temperature grease to all the joining points.

24 - Insert the female end of the single swivel joint tube (photo (6)) into the exit side of the 4 in 1 exhaust tube. (photo(42))

- Insert the other end male side of the single swivel joint tube (photo (6)) into the female side of the muffler (photo (15)) by longitudinally sliding the muffler forward so that all elements are perfectly joined and so that the connecting rods remain absolutely vertical in their brackets.

25 - Rotate the single swivel joint tube (photo (6)) on itself so that the swivel joint remains positioned in the most direct and non-constrained manner along a longitudinal axis.

- Tighten the CHC M6 screws and the Simmonds M6 nuts at each junction point.





- 26 - Tighten the 8 CHC M6 x35mm screws and the Simmonds M6 nuts of the muffler attachment/supports.
- 27 - Verify that each element is properly in place and correctly secured and tightened.
- 28 - Replace top and bottom cowlings and to perform a weighing of the aircraft.

**Atelier Chabord is liable from any liability resulting from installation not complying with this notice.**

## **Maintenance program**

**1** - Every 600 hours, remove the exhaust to replace the sound proofing material. The exhaust can be to send to :

**ATELIER CHABORD  
125, route de Bellegarde  
74330 EPAGNY**

At the factory, the exhaust will be entirely disassembled, inspected, and the sound proofing replaced as new.

Otherwise, order from Chabord, a sound proofing replacement kit. The replacement of this material shall be performed by a certified A & P.

**2** - During the exhaust disassembly (every 600 hours) the torque and mechanical wear of all Inox screws attaching the exhaust's brackets to the fuselage shall be controlled. Should any sign (even minute) of wear exist, the screw bearing such wear shall be immediately replaced.

**3** - During 50-hour inspections, visually control the following areas :

- connection between carburettor heat and the primary tubes
- "4 in1" clamps
- primary tubes

If any cracks are visually seen in the above-mentioned areas, or if any anomalies of any kind are noted on any part of the exhaust-muffler assembly, a report shall be filed in accordance with the part-follow-up form herein attached.

Maintenance program

Cessna 152 - F152 - FA152



## Product Follow-up form

This form is to be returned to Chabord manufacturing in case of any (even slight) anomalies of the Chabord exhaust-muffler assembly.

**ATELIER CHABORD**  
**125, route de Bellegarde**  
**74330 EPAGNY**

This form will provide useful return of experience on the product.

Thank you for your collaboration.

### GENERAL INFORMATION

Aircraft :	Owner :
Registration :	Date :
Part Number :	Hours in use since installation :
Problem noted in flight :	
Problem noted during an inspection : Pre flight : 50 hour : 100 hour annual	
Aéro club/FTO school :	Maintenance chief :
Person who found the problem :	
Tél. n° :	
Signature :	



## INFORMATIONS

### ATTENTION

**After installation of this product  
fill in the airplane manual that  
the STC N° 10043168 have been installed.**

For more information regarding manufacturing and installation  
of this product, to obtain an offer, you can contact

ATELIER CHABORD  
125, route de Bellegarde - 74330 EPAGNY  
Tél. +33 (0)4 50 22 14 02 - Fax. 00 33 4 50 22 00 83  
alain.chabord@wanadoo.fr