Ferrari North America
Technical Information

Date:	June 2017
Bulletin #:	2392
Campaign #:	
Supersedes:	
Section:	3

Model Type: 488 GTB/Spider
Model Year: All
Subject: **Procedures for repairing the DCT gearbox**

Please find enclosed the **Level 1 oil leak** repair procedures which may be performed on the DCT gearbox of **488 GTB** and **488 Spider** vehicles

- IMPORTANT -

ALWAYS open a ROL in the event of any problem related to oil leakage from the gearbox, attaching the photographs taken of the diagnostic module as described on page 25 of this document.

- IMPORTANT -

Prior to any procedure, appropriate self-certification must be sent to FNA to obtain authorization for the supply of the requested kit.

To do this, compile the form on page 29 of this TI in full.

This module must be sent together with the order request by e-mail to our Spare Parts Department

- IMPORTANT -

The S.T. Schedule for the model in question includes a specific table, viewable from the March 2017 update to the Technical Documentation, indicating the corresponding operation codes for the procedures performed, which are necessary to request reimbursement under warranty.

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Possible operations in relation to type of oil leak ("Level 1" procedures)

1. Replacing Corteco seal rings and differential flanges
2. Seal replacement on the differential cover
3. Replacing the ATF oil filter
4. Rear rubber cap replacement
5. Replacing Corteco seal ring on connector casing
6. Oil cap replacement
7. Replacing seal caps
8. E-DIFF pipe Replacement
9. Replacing air breather caps

The following tools and equipment are necessary to perform these procedures:

- Swivel-head base **Part. No. 95972621 (AV 2621)**
- Gearbox overhaul support **Part. No. 95977314 (AM 107314)**
- Lev. 1 gearbox overhaul tool kit **Part. No. 70002843**, consisting of:

- Gearbox presser tool **Part. No. 95978604 (AV 8604**)
- Lift bracket for central section of gearbox **Part. No. 95978605 (AV 8605)**
- Lift bracket for rear section of gearbox **Part No. 95978606 (AV 8606)**
- Gearbox housing alignment pin **Part. No. 95978607 (AV 8607)**
- Axle shaft oil seal installation punch **Part. No. 95978608 (AV 8608)**
- Drive shaft oil seal extractor tool **Part No. 95978609 (AV 8609**)
- Clutch side oil seal installation punch **Part. No. 95978610 (AV 8610**)
- External gearbox pressurising plugs **Part. No. 95978612 (AV 8612)**

The aforementioned tools must be ordered by you directly from our Spare Parts Department in the quantities needed.

The parts to be installed, in relation to the type of operation necessary, are as follows:

- SL1.1 GEARBOX OVERHAUL KIT_ TURBO **Part No. 70004640** Qty. 1
- SL1.4 GEARBOX OVERHAUL KIT **Part. No.** 70002806 Qty. 1
- SL1.6 GEARBOX OVERHAUL KIT **Part. No.** 70002808 Qty. 1

The following table indicates the kit part numbers necessary for the operations described, subdivided by model.

The following kits must be ordered by you directly from our Spare Parts Department in the quantities needed.

	488 GTB 488 Spider
1. Replacing Corteco seal rings and differential flanges	70002806
2. Seal replacement on the differential cover	70004640 70002808
3. Replacing the ATF oil filter	70004640
4. Rear rubber cap replacement	70004640
5. Replacing Corteco seal ring on connector casing	70004640
6. Oil cap replacement	70004640
7. Replacing seal caps	70004640
8. E-DIFF pipe replacement	70004640
9. Replacing air breather caps	70004640

Procedure

- IMPORTANT -

The utmost cleanliness must be maintained during ALL the following operations in this bulletin; always wear clean gloves, replacing them frequently as necessary, and use absorbent lint-free cloth and heptane to clean and degrease components.

- Whenever the removal of the DCT gearbox is required in the following operations, the specific tools must be used as indicated in the last Technical Information on this topic regarding the previous models.

1. Replacing Corteco seal rings and differential flanges

For the detailed operating procedure, see the last Technical Information on this topic, in the section relative to the 458 Italia.

2. Seal replacement on the differential cover

For the detailed operating procedure, see the last Technical Information on this topic, in the section relative to the 458 Italia.

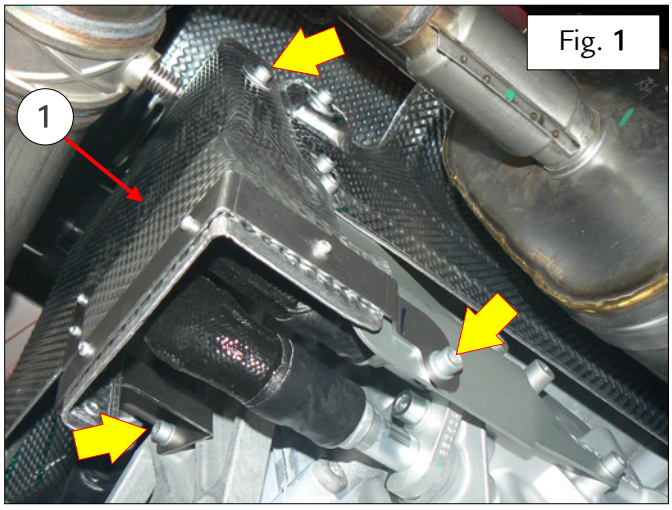
3. Replacing the ATF oil filter

NOTE THAT WHILE SOME OF THE FOLLOWING PHOTOGRAPHS WERE TAKEN WITH THE GEARBOX ON THE WORKBENCH, SOLELY TO ILLUSTRATE THE PROCEDURE MORE CLEARLY, THIS PROCEDURE MUST BE PERFORMED WITH THE GEARBOX IN THE VEHICLE.

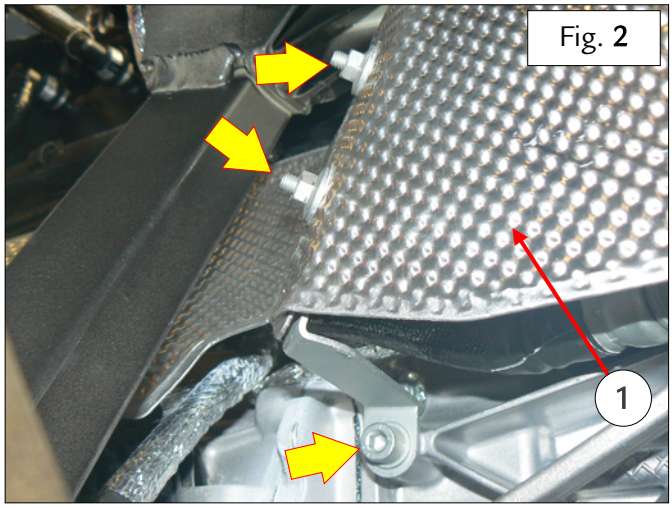
- Remove the LH rear wheel liner (as described in paragraph E3.05 of the Workshop Manual).
- Remove the rear diffuser and the rear flat undertray (as described in paragraph E3.12 of the Workshop Manual).

- Drain the F-3 ATF hydraulic fluid from the DCT clutch hydraulic system (as described in paragraph **C3.03** step of the Workshop Manual).

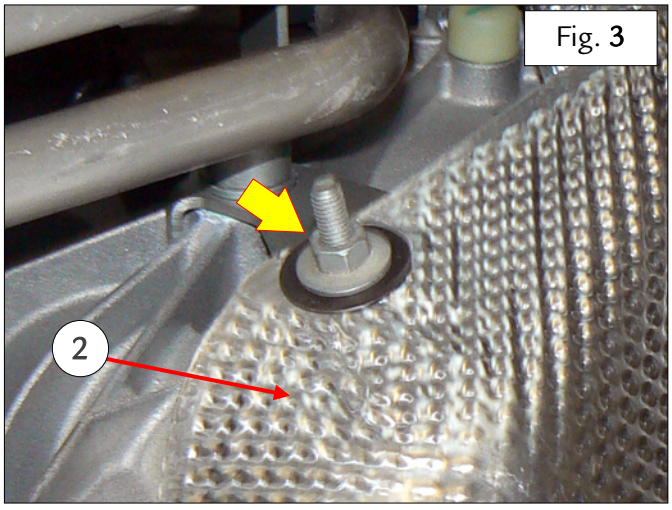
- Undo the indicated screws fastening the heat shield **(1)** – Fig. **1**.



- Undo the indicated screws and nuts fastening the heat shield **(1)** – Fig. **2**.
- Remove the heat shield **(1)** – Fig. **2**.



- Undo the indicated nut fastening the heat shield **(2)**, then remove the heat shield from the vehicle – Fig. **3**.



- Undo the indicated screw fastening the heat shield (2), then remove the heat shield from the vehicle – Fig. 4.

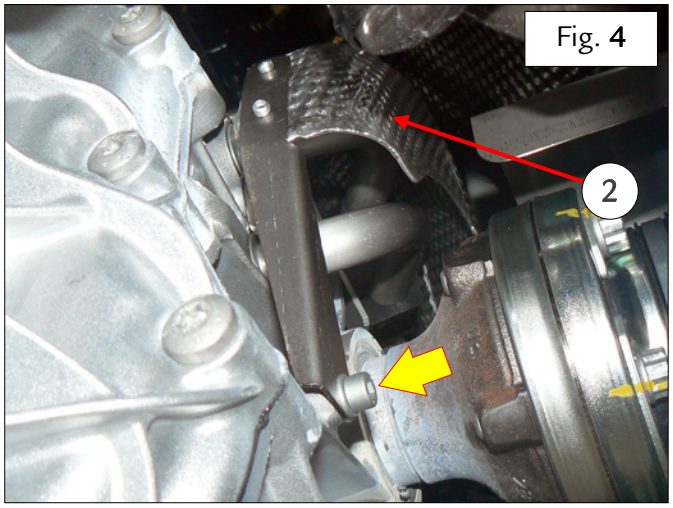


Fig. 4

- Undo the indicated screw on the retainer block (3) – Fig. 5.

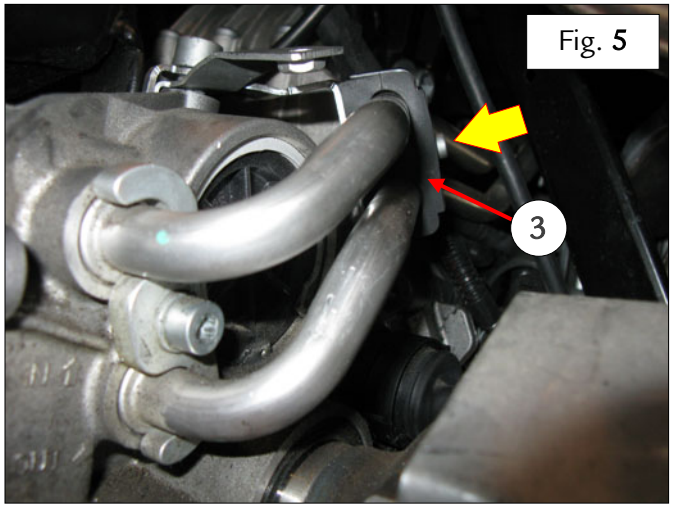


Fig. 5

- Remove the LH axle shaft heat shield (4), undoing the three screws indicated – Fig. 6.

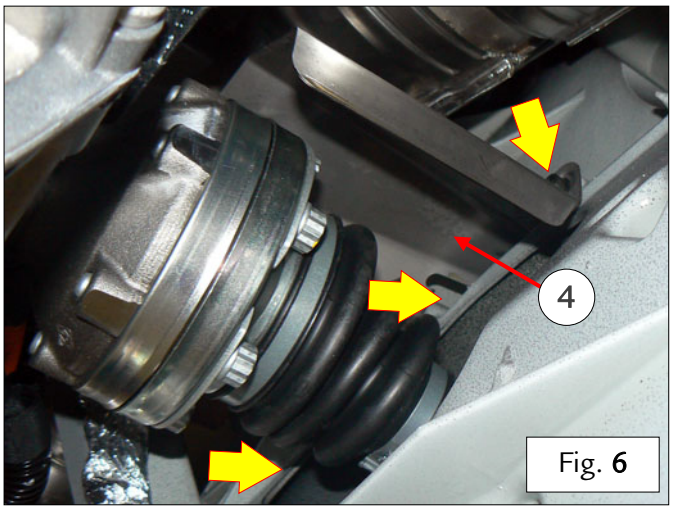


Fig. 6

- Thoroughly clean the area surrounding the fastening points of the clutch hydraulic system pipes with a suitable degreaser that does not leave residue – Fig. 7.
- Place a suitable container underneath to collect the clutch hydraulic system fluid – Fig. 7.
- Undo the indicated screw then remove the fork (5) – Fig. 7.
- Disconnect the clutch hydraulic system fluid pipes (6) from the gearbox and plug immediately – Fig. 7.
- Plug the ports on the gearbox – Fig. 7.

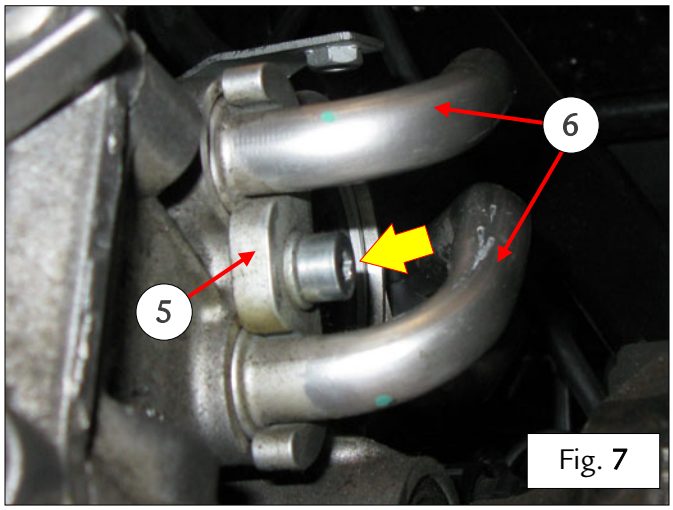


Fig. 7

- Thoroughly clean the area surrounding the fastening points of the clutch hydraulic system pipes with a suitable degreaser that does not leave residue – Fig. 8.
- Place a suitable container underneath to collect the clutch hydraulic system fluid – Fig. 8.
- Undo the indicated screw then remove the fork (5) – Fig. 8.
- Disconnect the clutch hydraulic system fluid pipes (6) from the single oil heat exchanger and plug immediately – Fig. 8.
- Remove the hydraulic clutch system oil pipes (6) – Fig. 8.
- Plug the ports on the heat exchanger – Fig. 7.

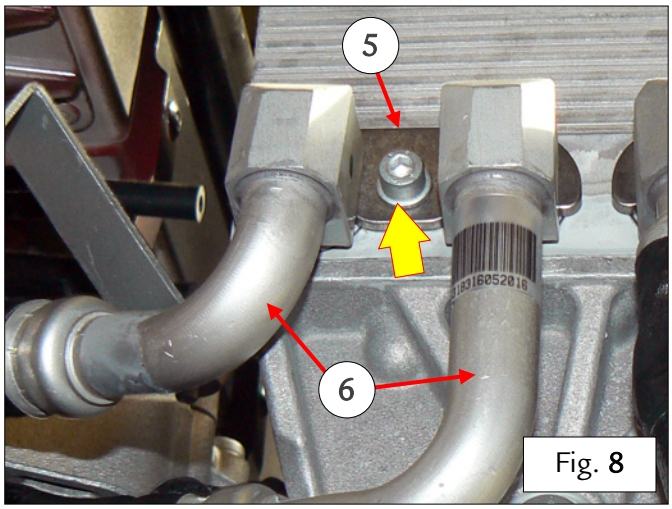


Fig. 8

- Remove the circlip (7) on the ATF filter (8) – Fig. 9.

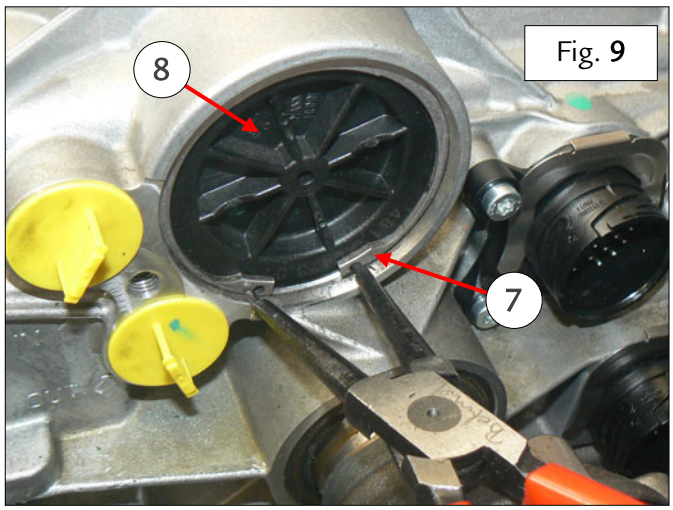


Fig. 9

- Fasten an extractor tool (9) to the oil filter(8) – Fig. 10.
- Remove the oil filter (8) and replace – Fig. 10

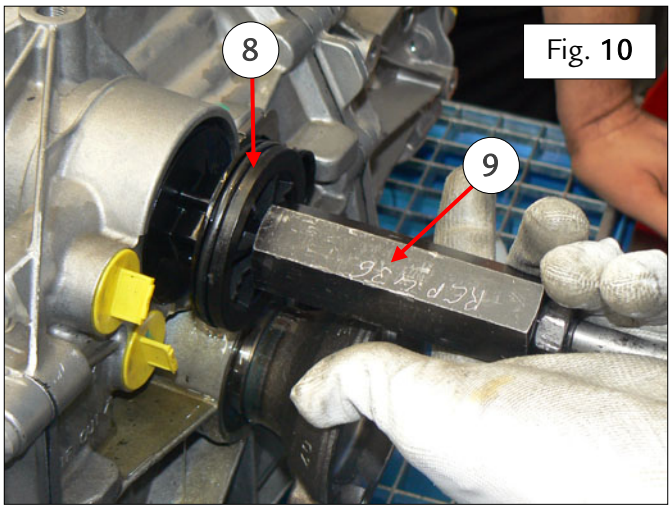


Fig. 10

- Before fitting the new oil filter (8), ensure that the two O-rings are installed correctly in the indicated positions – Fig. 11.

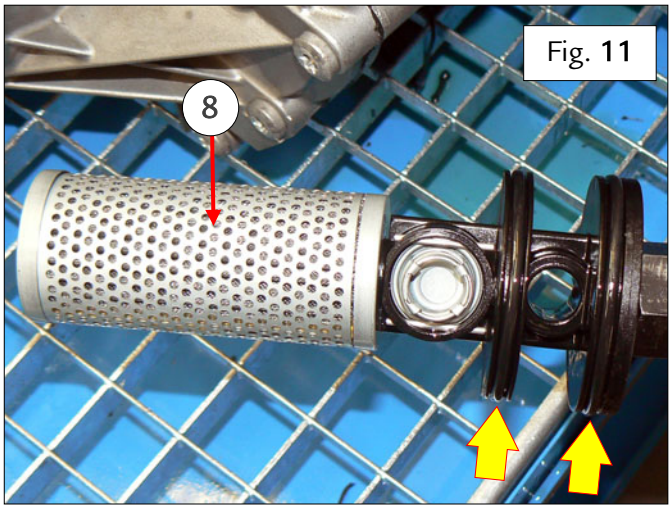


Fig. 11

- Fit the new oil filter (8) manually in the relative seat, with the indicated spring facing downwards (Fig. 12) and aligned with the groove indicated in Fig. 13.

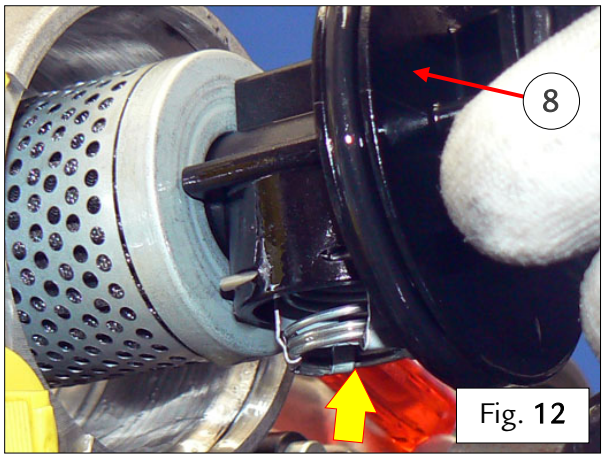


Fig. 12

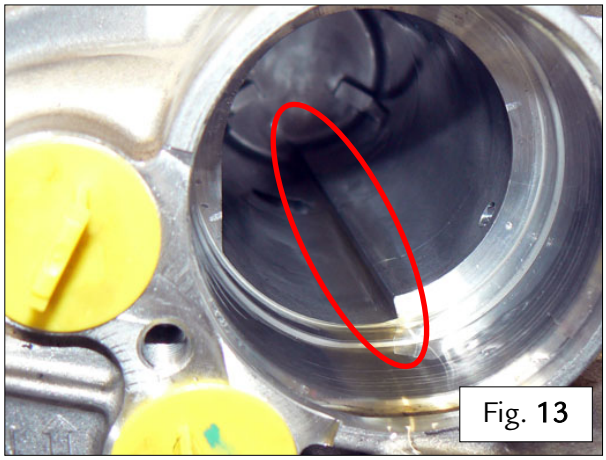


Fig. 13

- Keeping the oil filter (8) in the position described above, insert fully into its seat – Fig. 14.

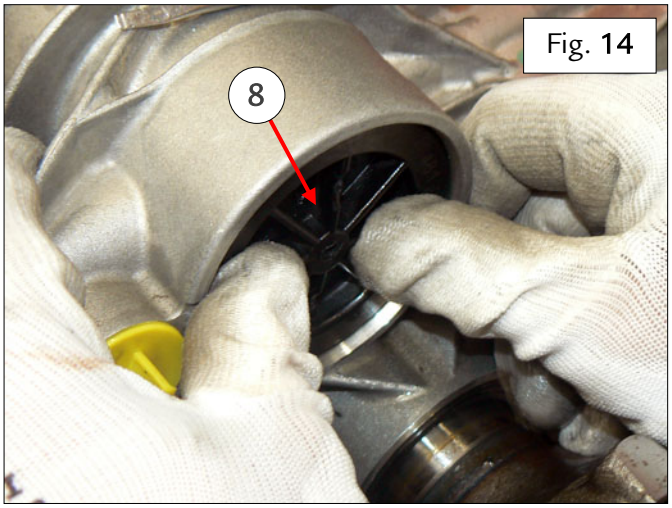


Fig. 14

- Fit the new circlip (7) to fasten the oil filter (8) – Fig. 15.

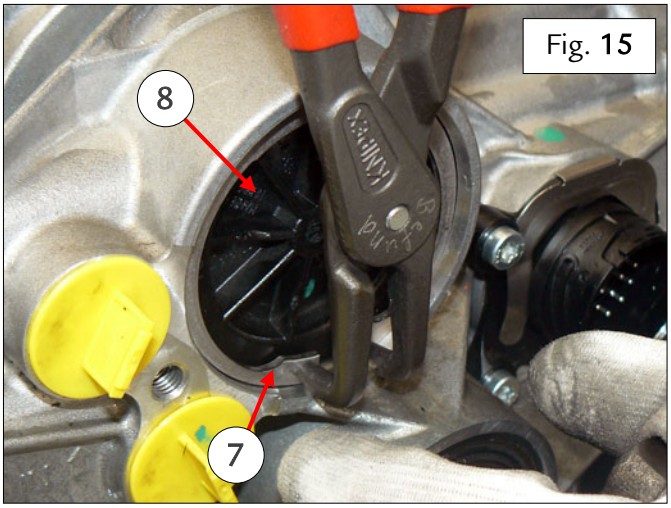


Fig. 15

- Remove the plugs fitted previously on the heat exchanger and on the gearbox – Fig. 16.
- Thoroughly clean the area surrounding the fastening points of the clutch hydraulic system pipes on the heat exchanger and on the gearbox with a suitable degreaser that does not leave residue – Fig. 16.
- Replace the seals on the pipes (6) on both sides, lubricating them with the specified clutch system oil – Fig. 16.
- Connect the pipes (6) to the heat exchanger and to the gearbox – Fig. 16.
- Fit the fork (5) – Fig. 16.
- Tighten the indicated screw – Fig. 16.

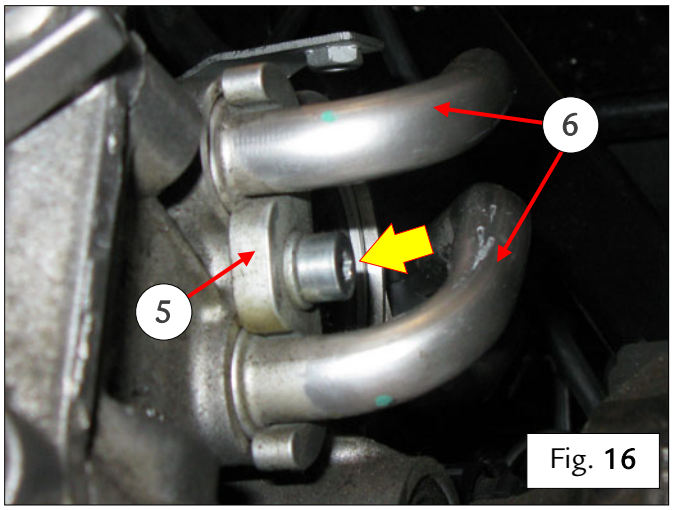


Fig. 16

- Fit the fork (5) – Fig. 17.
- Tighten the indicated screw – Fig. 17.

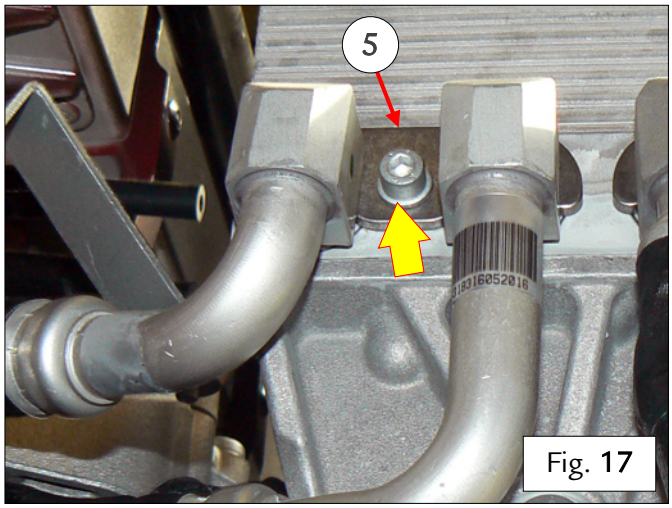


Fig. 17

- Tighten the indicated screw on the retainer block (3) – Fig. 18.

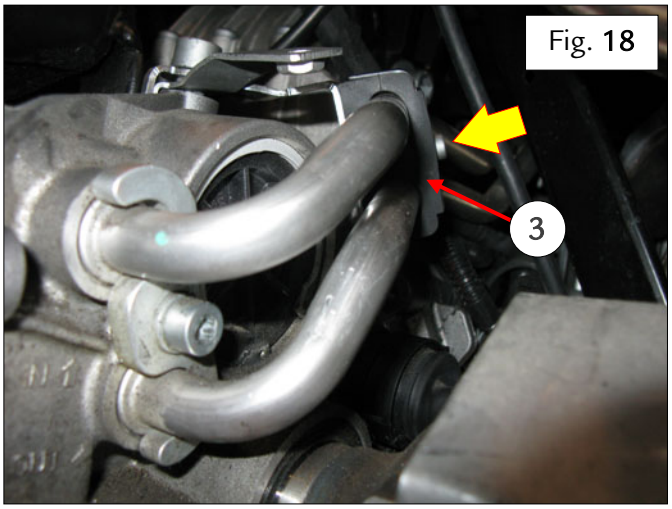


Fig. 18

- Tighten the indicated screw to a torque of 20 Nm class A – Fig. 19.

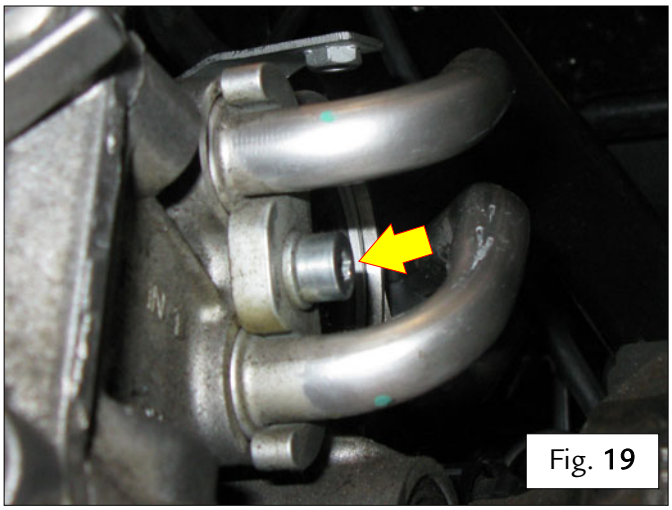


Fig. 19

- Tighten the indicated screw to a torque of **8 Nm** class **A** – Fig. **20**.

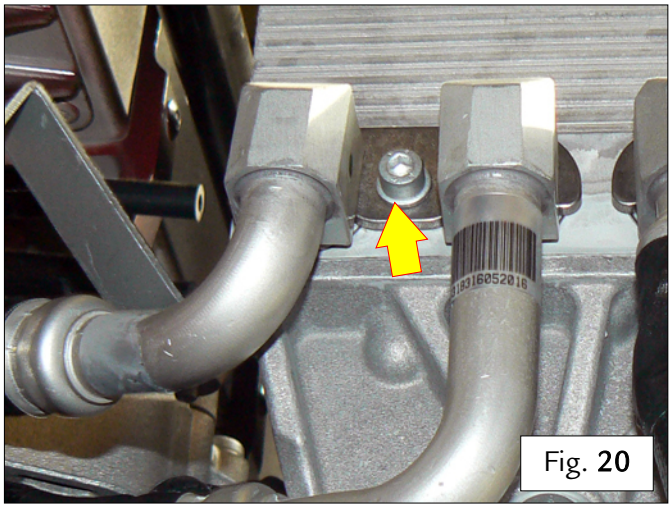


Fig. 20

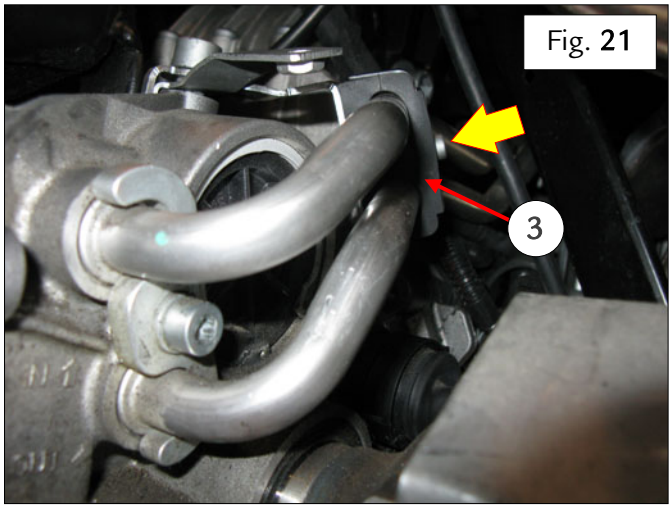


Fig. 21

- Tighten the indicated screw on the retainer block (3) to a torque of **8 Nm** class **B** – Fig. **21**.

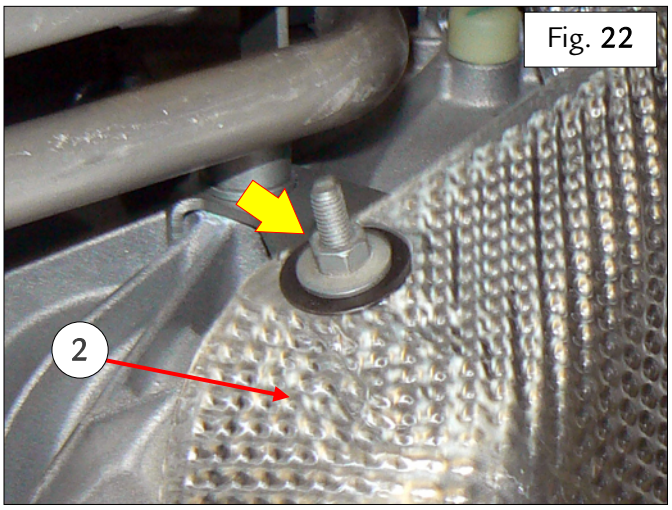


Fig. 22

- Fit the heat shield (2) in the relative seat – Fig. **22**.
- Tighten the indicated nut to a torque of 9 Nm class B - Fig. **22**.

- Tighten the indicated screw on the heat shield (2) to a torque of **9 Nm** class B – Fig. **23**.

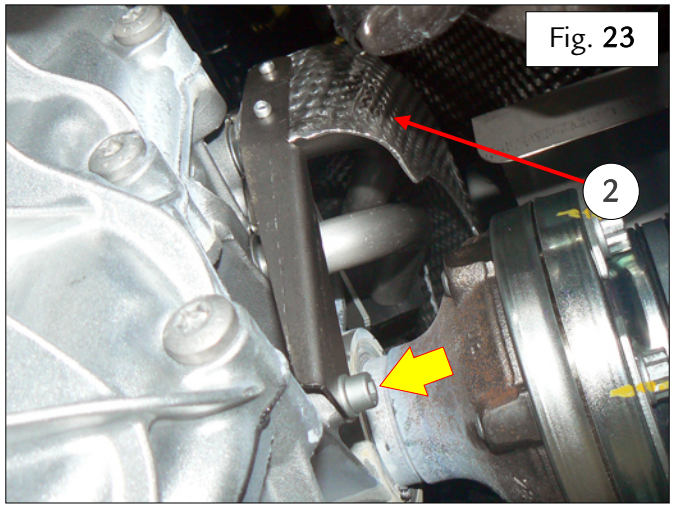


Fig. 23

- Fit the heat shield (1) in the relative seat – Fig. **24**.
- Tighten the screws indicated to the torque of **9 Nm** Class B – Fig.**24** .

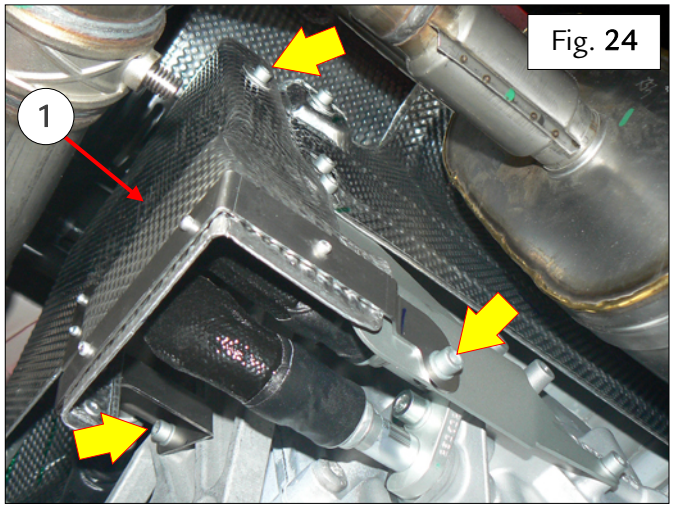


Fig. 24

- Tighten the indicated screw to a torque of **9 Nm** class B – Fig. **25**.
- Tighten the indicated nuts on the heat shield (1) to a torque of **9 Nm** class B – Fig. **25**.

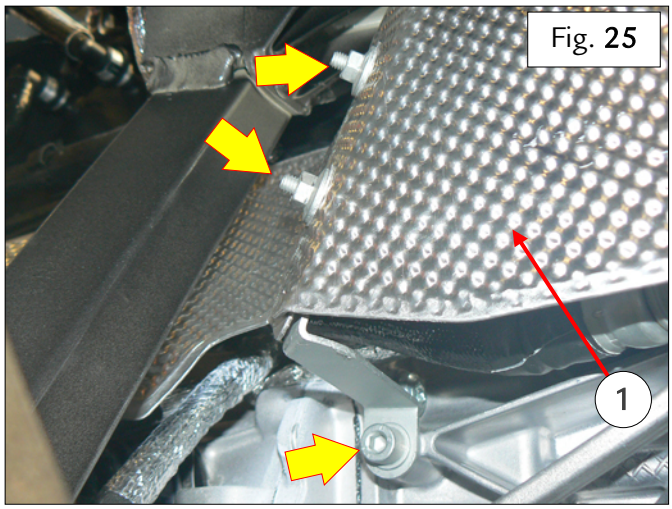


Fig. 25

- Fit the LH heat shield (4) protecting the axle shaft and fasten by tightening the three screws indicated to a torque of **9 Nm** class B – Fig. **26**.

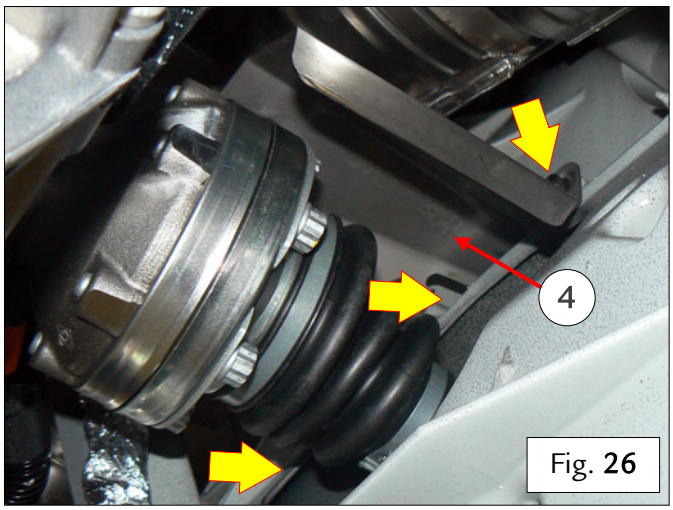


Fig. **26**

- Refill the DCT clutch hydraulic system with F-3 ATF hydraulic fluid (as described in paragraph **C3.03** of the Workshop Manual). **Note**: When refilling the oil and fluid and inspecting the relative levels, replace all the oil/fluid plugs and the relative seals removed during the procedures described herein.
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Refit the LH rear wheel liner as described in paragraph **E3.05** of the Workshop Manual).
- Refit the rear diffuser and the rear flat undertray (as described in paragraph **E3.12** of the Workshop Manual).
- Once the procedure is complete, test drive the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

4. Rear rubber cap replacement

NOTE THAT WHILE THE FOLLOWING PHOTOGRAPHS WERE TAKEN WITH THE GEARBOX ON THE WORKBENCH SOLELY TO ILLUSTRATE THE PROCEDURE CLEARLY. THIS PROCEDURE MUST BE PERFORMED WITH THE GEARBOX IN THE VEHICLE.

- Drain the GL5 gear oil from the gearbox with (as described in paragraph **C2.05** step of the Workshop Manual).

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- Drill the plug (1) – Fig. 1.
- Use the screwdriver to prise the rear rubber cap out of its seat (1) – Fig. 1.

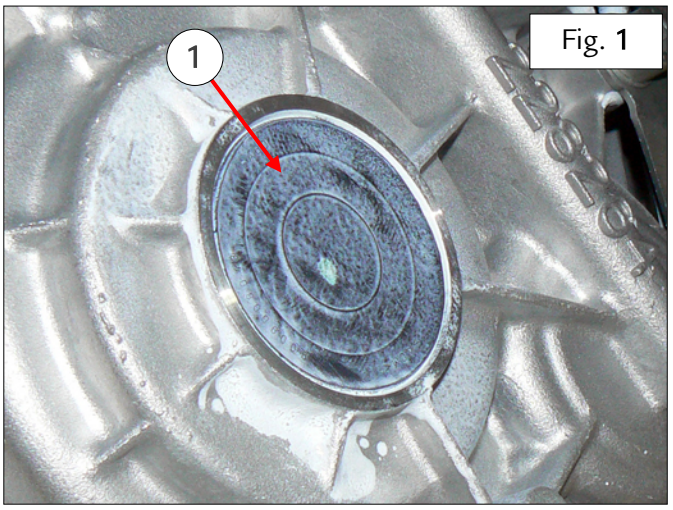


Fig. 1

- There are grooves in the seat (3) of the rear rubber cap used to improve the seal.
  Any residue from machining, a burr and/or dirt limit the seal of the cap with consequent oil leakage – Fig. 2.
- Using a suitable tool (3), scrape the circular surface (2) very gently to remove all debris/burr, taking particular care not to damage or scratch the surface itself – Fig. 2.

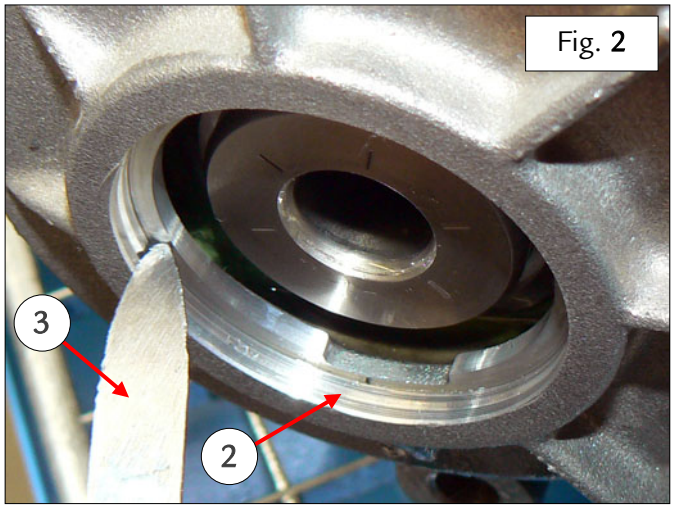


Fig. 2

- Fit a new rear rubber plug (1) in the relative seat – Fig. 3.
- Push the plug into its seat so that it is recessed by 1.15±0.3 mm relative to surrounding edge – Fig. 3.
- Check that the rear rubber cap is installed correctly (1) – Fig. 3.

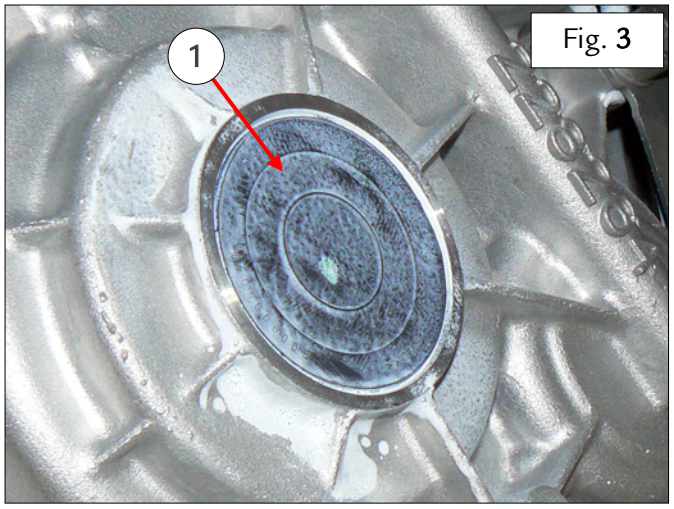


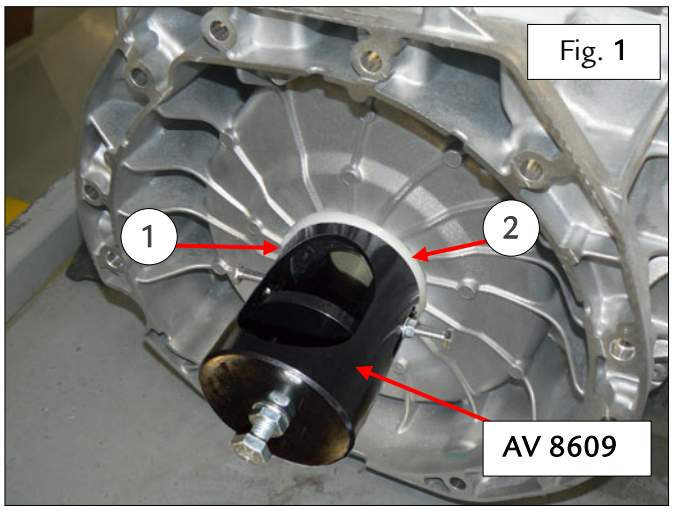
Fig. 3

- Fill the gearbox with 75W-90 GL5 gear oil (as described in paragraph **C2.05** of the Workshop Manual). **Note**: When refilling the oil and fluid and inspecting the relative levels, replace all the oil/fluid plugs and the relative seals removed during the procedures described herein.
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

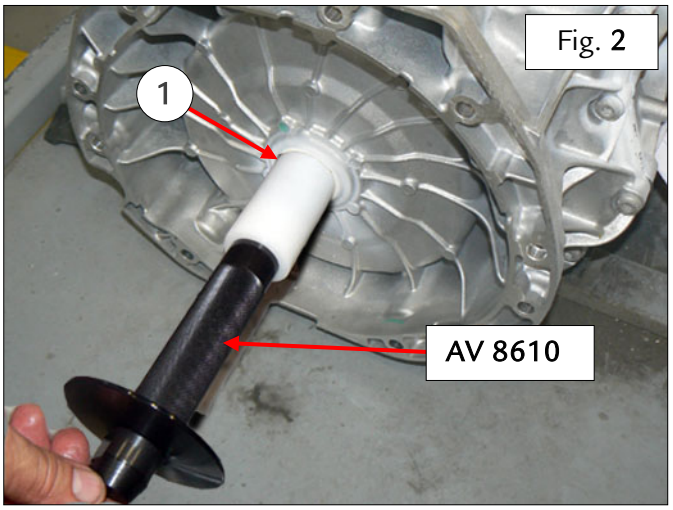
5. Replacing Corteco seal ring on connector casing

- Remove the complete DCT gearbox from the vehicle (as described in paragraph **C2.02** of the Workshop Manual).

- Use the tool **AV 8609** (extractor and cylindrical ring **(2)**) to remove the Corteco seal ring **(1)** from its seat on the connector casing – Fig. **1**.



- Using the bushing **AV 8610** (**95978610**) and the relative ring, fit the new Corteco seal ring **(1)** in its relative seat, checking that it is installed correctly – Fig. **2**.



- Perform the **procedure for pressurizing the system** as described at the end of this document.
- Refit the complete DCT gearbox in the vehicle (as described in paragraph **C2.03** of the Workshop Manual). **Note**: When refilling with GL5 oil and ATF fluid and inspecting the relative levels, replace all the oil plugs and the relative seals removed during the procedures described in this bulletin.
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

6. Oil cap replacement

LOWER PLUGS

- Remove the rear flat undertray element (as described in paragraph **E3.12** of the Workshop Manual).
- If the ATF system plugs are replaced, drain the F-3 ATF hydraulic fluid from the DCT clutch hydraulic system (as described in paragraph **C3.03** step 1 of the Workshop Manual).
- If the GL5 system plugs are replaced, drain the 75W-90 GL5 gear oil (as described in paragraph **C2.05** step 1 of the Workshop Manual).

- Identify the relative plug from the five on the gearbox and remove – Fig. 1.

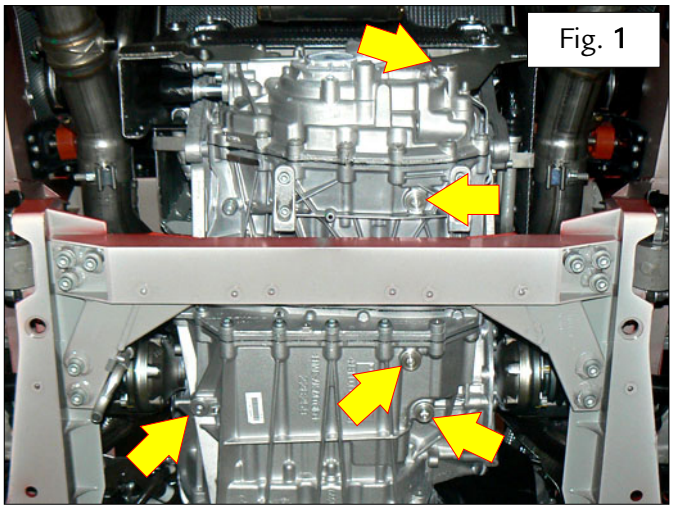


Fig. 1

- Make sure the seal (1) is installed on the new cap – Fig. 2.

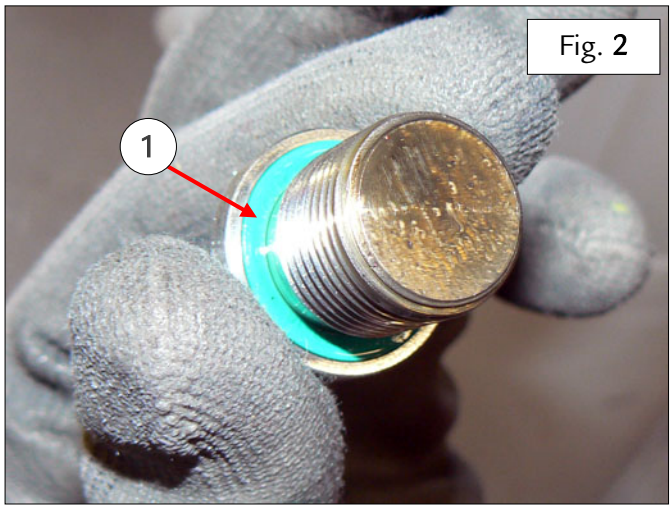


Fig. 2

- Fit the cap indicated in its seat on the gearbox and tighten it to a torque of **25 Nm** class **B** – Fig. 3.

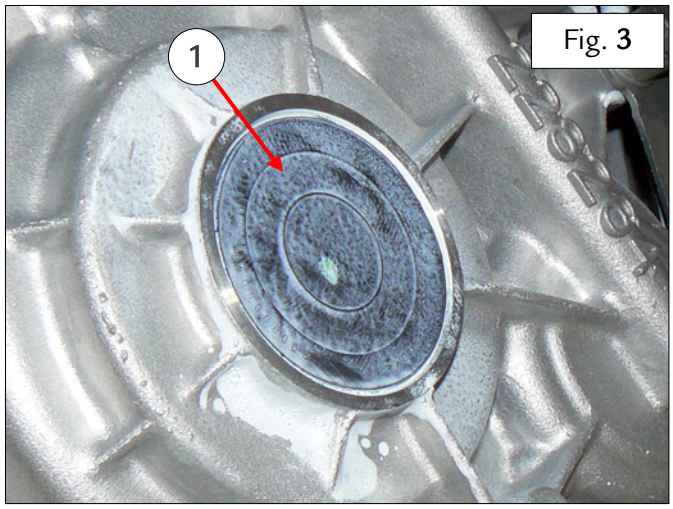


Fig. 3

- Refill the DCT clutch hydraulic system with F-3 ATF hydraulic fluid (as described in paragraph **C3.03** step 2 of the Workshop Manual).
- Fill the gearbox with 75W-90 GL5 gear oil (as described in paragraph **C2.05** step 2 of the Workshop Manual).
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Refit the rear flat undertray element (as described in paragraph **E3.12** of the Workshop Manual).
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

UPPER PLUG

- The engine compartment lid must be opened to access the plug.

- Remove the upper plug from the gearbox-differential casing – Fig. **4**.
- Fit the new plug, ensuring that it is fitted with the relative seal, and tighten to a torque of **25 Nm** class **B** – Fig. **4**.

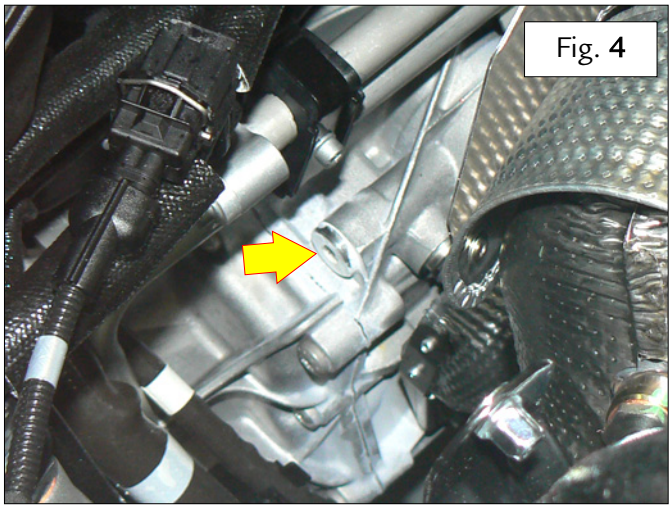


Fig. **4**

- **Mark the repaired gearbox for identification** as described at the end of this document.
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

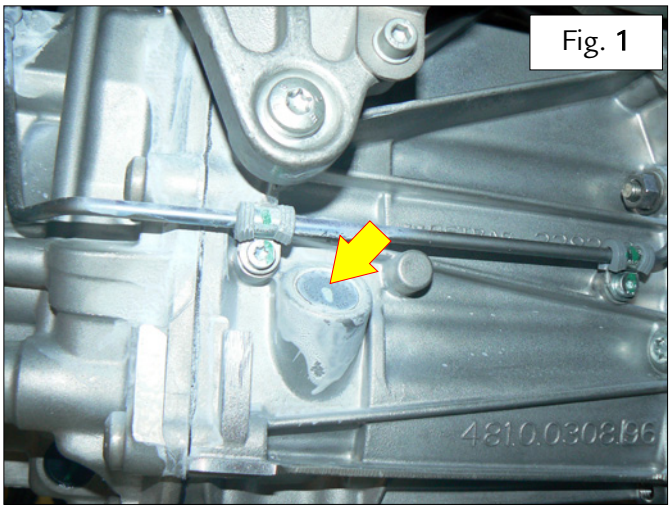
7. Replacing seal caps

Two seal plugs are installed on the gearbox: one on the right and one at the rear.

RIGHT HAND SEAL PLUG

- Drain the 75W-90 GL5 gear oil from the gearbox with (as described in paragraph **C2.05** step 1 of the Workshop Manual).
- Remove the E-DIFF pipe as indicated in step 8. Replacing the E-DIFF pipe.
- Remove the indicated plug and replace, ensuring that the new plug is securely fastened – Fig. 1.

  Note: the plug has no head and is the same diameter as the relative seat; fit the plug with caution to prevent it from falling into the casting.



- Refit the E-DIFF pipe as indicated in step 8. Replacing the E-DIFF pipe.
- Fill the gearbox with 75W-90 GL5 gear oil (as described in paragraph **C2.05** step 2 of the Workshop Manual). **Note**: When refilling the oil and fluid and inspecting the relative levels, replace all the oil/fluid plugs and the relative seals removed during the procedures described herein.
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

REAR SEAL PLUG

- Remove the rear diffuser (as described in paragraph **E3.12** of the Workshop Manual).
- Drain the 75W-90 GL5 gear oil from the gearbox with (as described in paragraph **C2.05** step 1 of the Workshop Manual).

- Remove the indicated plug and replace, ensuring that the new plug is securely fastened – Fig. **2**.

  Note: the plug has no head and is the same diameter as the relative seat; fit the plug with caution to prevent it from falling into the casting.

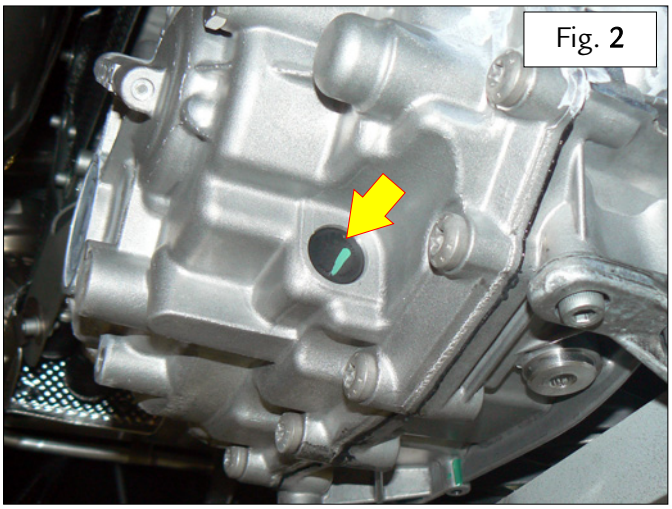


Fig. **2**

- Fill the gearbox with 75W-90 GL5 gear oil (as described in paragraph **C2.05** step 2 of the Workshop Manual). **Note**: When refilling the oil and fluid and inspecting the relative levels, replace all the oil/fluid plugs and the relative seals removed during the procedures described herein.
- **Mark the repaired gearbox for identification** as described at the end of this document.

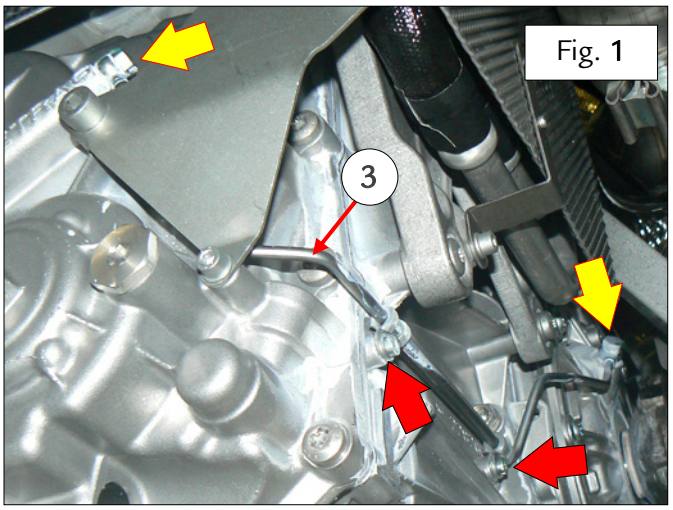
- Refit the rear diffuser (as described in paragraph **E3.12** of the Workshop Manual).
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

8. E-DIFF pipe replacement

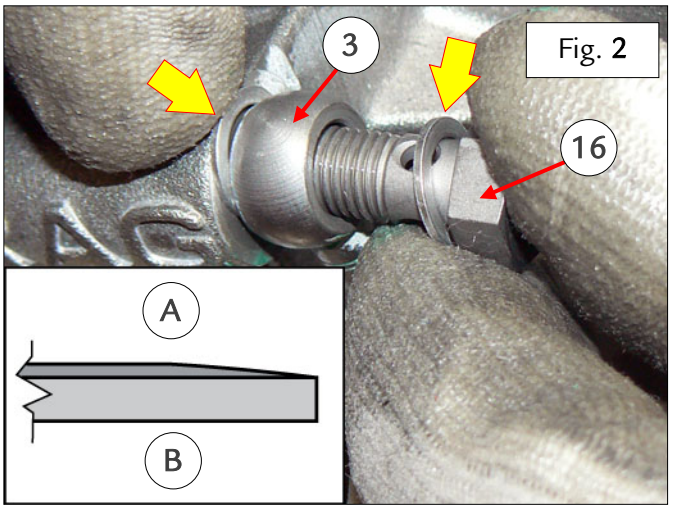
- IMPORTANT -

IT IS IMPORTANT that this operation be performed with the gearbox cold; wait at least 5-6 hours after the car is stopped. Do not tighten the E-DIFF pipe fittings with a hot gearbox or after a Test Drive.

- Drain the 75W-90 GL5 gear oil from the gearbox with (as described in paragraph **C2.05** step 1 of the Workshop Manual).



- Unscrew the fittings indicated by the yellow arrows then retrieve the seals – Fig. **1**.
- Undo the screws on the clamps indicated by the red arrows then remove the E-DIFF pipe **(3)** – Fig. **1**.
- Remove the E-DIFF pipe **(3)** from the vehicle, taking particular care not to bend or damage the pipe – Fig. **1**



- Fit the new E-DIFF pipe **(3)** in the relative seat on the gearbox, taking particular care not to bend or damage the pipe – Fig. **2**.
- Fit the two new seals as indicated, then hand-tighten the new union **(16)** – Fig. **2**.

  Note: The indicated seals have a bevelled edge on one side **(A)** and a right-angled edge on the other side **(B)**; **The side with the bevelled edge (A) MUST be the side in contact with the pipe (3).**
- Repeat the procedure on the other end of the E-DIFF pipe **(3)** – Fig. **2**.

Fit the clamps indicated by the red arrows on the E-DIFF pipe (3), then tighten the respective screws – Fig. 3.

- Tighten the fittings indicated by the yellow arrows to a torque of **8 Nm** – Fig. 3.

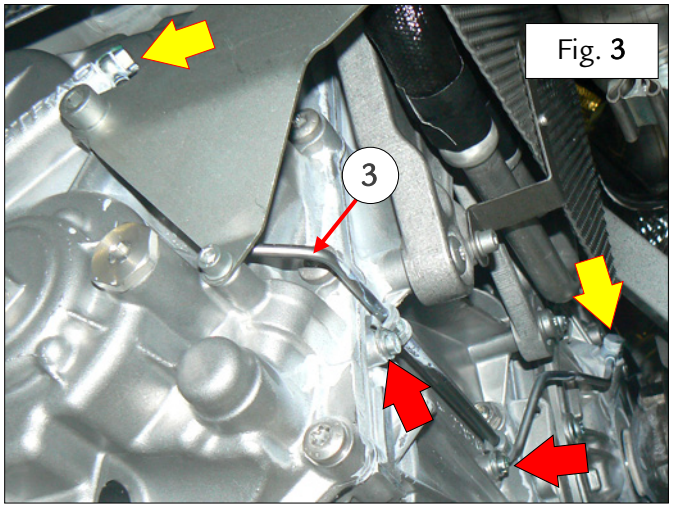


Fig. 3

- Fill the gearbox with 75W-90 GL5 gear oil (as described in paragraph **C2.05** step 2 of the Workshop Manual). **Note**: When refilling the oil and fluid and inspecting the relative levels, replace all the oil/fluid plugs and the relative seals removed during the procedures described herein.
- **Mark the repaired gearbox for identification** as described at the end of this document.
- Once the procedure is complete, **test drive** the vehicle for 10 Km, and check for leaks from the replaced components after returning to the workshop.

9. Replacing air breather caps

- The engine compartment lid must be opened to access the plugs.

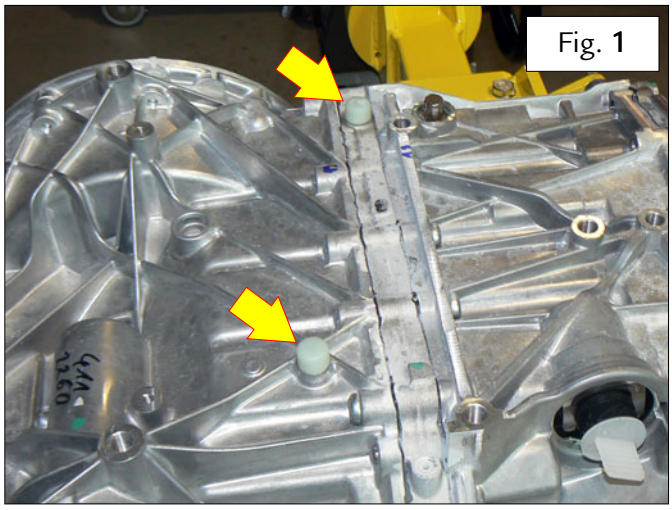


Fig. 1

- Remove the plugs from the relative breather orifices and replace – Fig. 1.
- When refitting the plugs, check that they are securely fastened – Fig. 1.

- **Mark the repaired gearbox for identification** as described at the end of this document.

System pressurization procedure

- Whenever the procedure to pressurise the gear oil system and AFT clutch hydraulic system is requested, follow the detailed operating procedure given in the last Technical Information on this topic.

Procedure for marking repaired gearbox

Whenever any of the operations described above are performed, the gearbox must be marked appropriately for identification, as described in the last Technical Information on this topic.

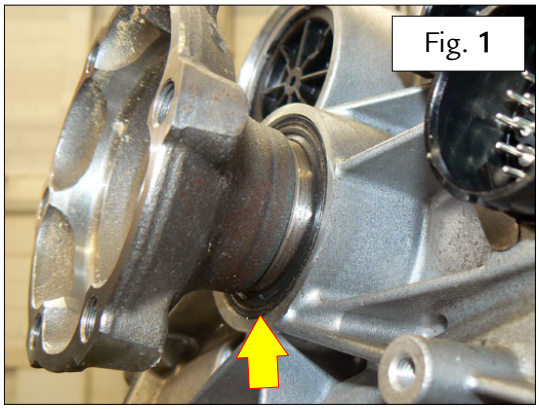
Thank you for your co-operation.

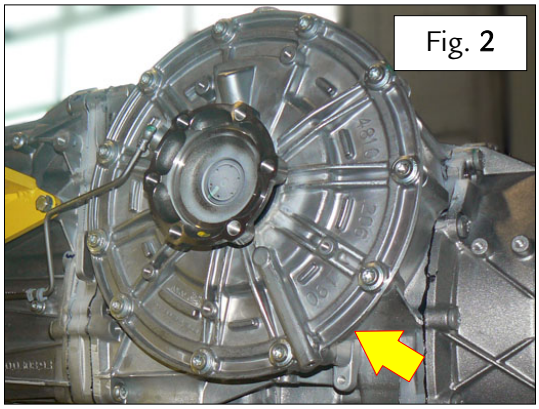
Form for "Level 1" diagnosis of DCT gearbox leaks

Model	Updated on
488 GTB 488 SPIDER	June 2017

As mentioned previously, when opening the ROL, photographs must be taken of the leak as described as follows and attached to the ROL:

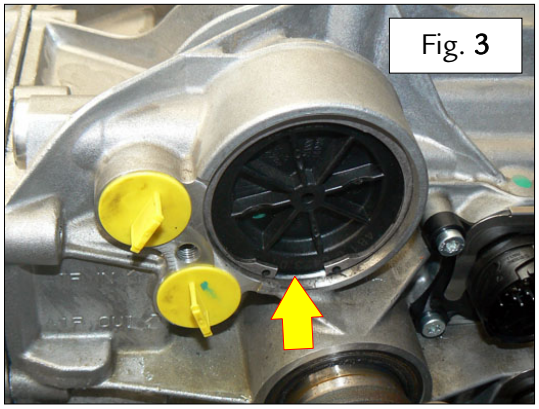
- A **PHOTO** of the leak on the gearbox and a **PHOTO** of the flat undertray, if fouled with oil;
- Clean the leak area thoroughly with heptane and lint-free clean cloths;
- Apply leak detection powder to the area of the gearbox where the leak was noted;
- Test drive the vehicle for 10 Km;
- Check for the leak again upon returning to the workshop. If the leak still exists, take another **PHOTO** of the leak.

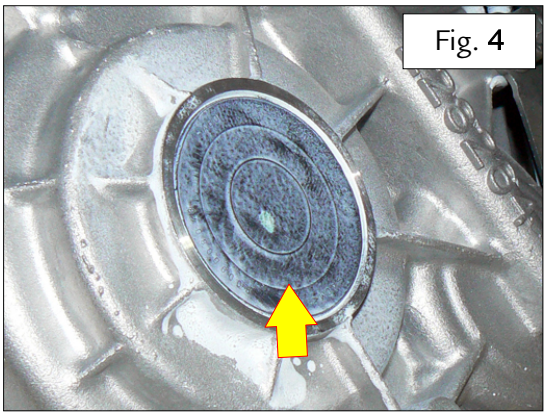
Oil leaks from Corteco seal rings/differential flanges		
Fault	**Procedure**	
Oil leaks from Corteco seal rings/differential flanges (Fig. 1)	**Perform procedure 1.** ➢ Replacing Corteco seal rings and differential flanges.	 Fig. 1

Oil leak from differential casing cover		
Fault	**Procedure**	
Oil leakage from differential cover (Fig. 2)	**Perform procedure 2.** ➢ Replace O-ring on differential cover.	 Fig. 2

Form for "Level 1" diagnosis of DCT gearbox leaks

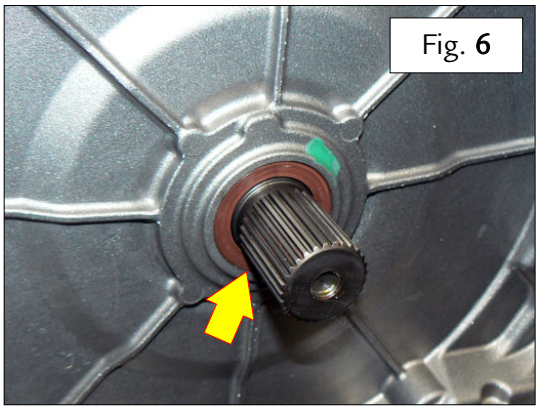
Model	Updated on
488 GTB 488 SPIDER	June 2017

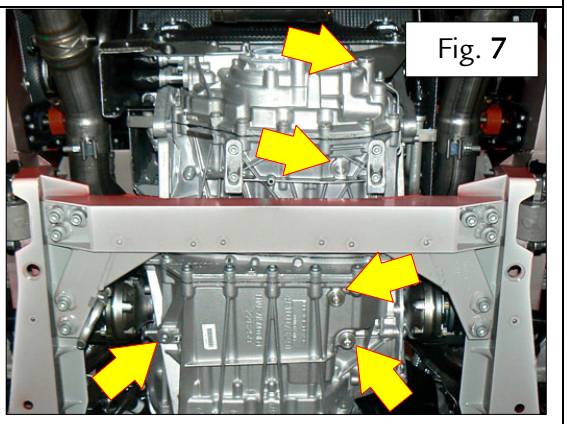
Fluid leak from ATF fluid filter		
Fault	**Procedure**	
Fluid leakage from ATF fluid filter (Fig. 3)	Perform procedure 3. ➢ Replace the ATF fluid filter.	 Fig. 3

Oil leak from rear plug		
Fault	**Procedure**	
Oil leakage from rear gearbox plug (Fig. 4)	Perform procedure 4. ➢ Replace rear plug.	 Fig. 4

Form for “Level 1” diagnosis of DCT gearbox leaks

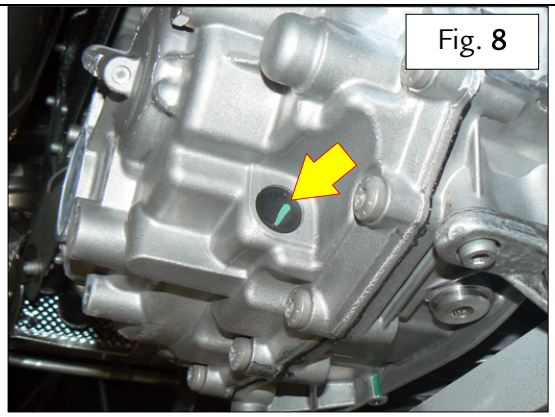
Model	Updated on
488 GTB 488 SPIDER	June 2017

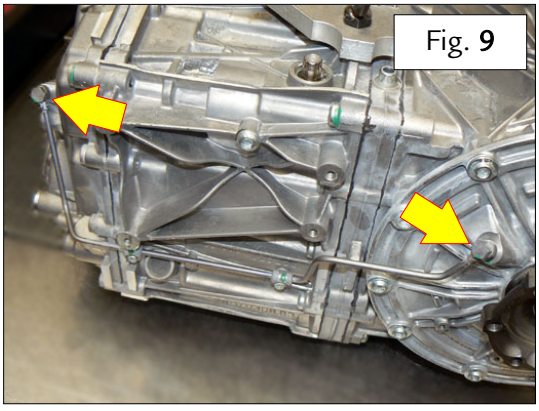
Oil leakage from front connector casing		
Fault	**Procedure**	
Oil leakage from Corteco seal ring on front connector casing (Fig. 6)	Perform procedure 6. ➢ Replacing Corteco seal ring.	 Fig. 6

Leakage from oil plugs on gearbox		
Fault	**Procedure**	
Oil leakage from gearbox oil plugs (Fig. 7)	Perform procedure 7. ➢ Replace the plug.	 Fig. 7

Form for "Level 1" diagnosis of DCT gearbox leaks

Model	Updated on
488 GTB 488 SPIDER	June 2017

Leakage from seal plugs		
Fault	**Procedure**	
Oil leakage from the two oil seal plugs (Fig. 8)	Perform procedure 8. ➢ Replace the seal plug.	 Fig. 8

Oil leakage from E-DIFF connectors/due to E-DIFF pipe failure		
Fault	**Procedure**	
Oil leakage from E-DIFF unions or failure of E-DIFF pipe (Fig. 9)	Perform procedure 9. ➢ Replace unions with relative seals and replace the E-DIFF pipe.	 Fig. 9

DCT Gearbox Repair_ “Level 1” Certificate

Model	Updated on
488 GTB 488 SPIDER	June 2017

VEHICLE FILE	
Date:	Chassis number:
Model:	Dealer:
Market:	Vehicle Km/mi:
Gearbox No.:	ROL No. (if available):
Warranty start date:	Warranty end date:
Prior procedures on DCT gearbox (date and type of procedure):	
DIAGNOSTIC FILE	
Fault (attach photo):	
JOB FILE	
Procedure performed (from operation list on page 2):	
Kit Part Nos. ordered:	

Task performed by (Dealer):

_____

_____

Technical Manager:

First name _____ Surname _____

(Print) (Print)

Company stamp

_____

Full signature

TI-2392