Ferrari

RECALL CAMPAIGN INSTRUCTIONS

USA
RECALL CAMPAIGN

REF. NO. 52
CRANKSHAFT REPLACEMENT

458 ITALIA
MODEL YEAR 2011 - 2012

CALIFORNIA
MODEL YEAR 2012

JUNE 2012

READ , INITIAL AND PASS ON »

Service Manager	Parts Manager	Service Writer	Technician					Warranty Clerk

Ferrari North America, Inc.

June 18, 2012

Dear Ferrari Dealer:

Ferrari S.p.A., the manufacturer of Ferrari automobiles, has determined that a defect which relates to motor vehicle safety exists in one Model Year 2011 and certain Model Year 2012 Ferrari California and Ferrari 458 Italia vehicles.

The defect involves a possible non-conformity in the final stages of machining of the crankshafts of one 2011 and certain 2012 Ferrari California and Ferrari 458 Italia vehicles. Because of this, there is a possibility of a crankshaft failure in the incorrectly machined area caused by thermal and dynamic stresses. This failure may cause engine seizure rendering the vehicle inoperable, possibly resulting in a crash.

The vehicles affected are as follows:

One Model Year 2011 Ferrari 458 Italia and certain Model Year 2012 Ferrari 458 Italia vehicles in the VIN range: ZFF67NFA3B0182199 to ZFF67NFA3C0183516 (Assembly number 100739 to Assembly number 101063) and certain Model Year 2012 Ferrari California vehicles in the VIN range: ZFF65LHA2C0182364 to ZFF65LJA0C0183765 (Assembly number 100961 to Assembly number 101487).

The corrective action will be performed free of charge to the customer. Ferrari is offering 3 options for the customer to choose for remedying this non-conformity: (1) installation of a new crankshaft and the relevant crankshaft bearings by the authorized Ferrari dealer; (2) removal and reinstallation of the engine by the authorized Ferrari dealer with the installation of the new crankshaft and the relevant crankshaft bearings performed by Ferrari North America; or (3) replacement by the authorized Ferrari dealer of the original engine with an engine provided by Ferrari North America.

By the time the customer receives his/her notification letter, the FNA Parts Department will have been supplied with the parts and necessary instructions to make the parts available to you. The recall booklet for the dealers will be made available soon after the parts are made available to FNA.

Best Regards,

Enzo Francesconi
Vice President of Aftersales

Ferrari North America, Inc.
250 Sylvan Avenue
Englewood Cliffs, NJ 07632
Tel 201 816 2600
Fax 201 816 2626

Ferrari North America, Inc.

June 18, 2012

«FIRST» «LAST»
«ADD1»
«ADD2»
«CITY», «ST» «ZIP»

NHTSA Recall 12V-211

Serial Number: «VIN» «ASSY»

Dear Ferrari Customer:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Ferrari S.p.A., the manufacturer of Ferrari automobiles, has decided that a defect which relates to motor vehicle safety exists in one Model Year 2011 and certain Model Year 2012 Ferrari California and Ferrari 458 Italia vehicles.

The defect involves a possible non-conformity in the final stages of machining of the crankshafts of one Model Year 2011 and certain Model Year 2012 Ferrari California and Ferrari 458 Italia vehicles. Because of this, there is a possibility of a crankshaft failure in the incorrectly machined area caused by thermal and dynamic stresses. This failure may cause engine seizure without warning, rendering the vehicle inoperable, possibly resulting in a crash.

The vehicles affected are as follows:

One Model Year 2011 Ferrari 458 Italia and certain Model Year 2012 Ferrari 458 Italia vehicles in the VIN range: XXXXXXXXXB0182199 to XXXXXXXXXC0183516 (Assembly number 100739 to Assembly number 101063) and certain Model Year 2012 Ferrari California vehicles in the VIN range: XXXXXXXXXC0182364 to XXXXXXXXXC0183765 (Assembly number 100961 to Assembly number 101487).

Ferrari is offering 3 options for remedying this machining error: (1) installation of a new crankshaft and the relevant crankshaft bearings by the authorized Ferrari dealer; (2) removal and reinstallation of the engine by the authorized Ferrari dealer with the installation of the new crankshaft and the relevant bearings performed at Ferrari North America; or (3) replacement by the authorized Ferrari dealer of the original engine with an engine provided by Ferrari North America. The choice of the repair options is up to you.

Ferrari North America, Inc.
250 Sylvan Avenue
Englewood Cliffs, NJ 07632
Tel 201 816 2600
Fax 201 816 2626

Because your vehicle is among those affected by the above condition, we ask you to contact any Authorized Ferrari Dealer immediately in order to arrange for an inspection of your automobile and to have the corrective action performed.

The corrective actions for the above-listed repair will be performed free of charge to you and will require varying amounts of time, depending on which repair option you choose.

By the time you receive this letter, the Authorized Ferrari Dealers will have been supplied with the parts and the instructions to perform the repair. If the Dealer fails or is unable to make the necessary repairs free of charge within a reasonable time, or if you have any problem obtaining the needed repair, you should inform the national headquarters of Ferrari North America, Inc. at:

Ferrari North America, Inc.
250 Sylvan Avenue
Englewood Cliffs, NJ 07632
(201) 816-2600 (National Technical Office)

If you believe that Ferrari has failed to remedy the defect described in this letter free of charge to you and within a reasonable time, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Ave, S.E., Washington, DC 20590; or call the toll-free Vehicle Safety Hotline at 1-888-327-4236 (TTY: 1-800-424-9153); or go to *http://www.safercar.gov*

You may be eligible to receive reimbursement for the cost you incurred if you already have obtained a remedy for a problem associated with the defect described in this letter. However, you still must have this corrective action performed, regardless of any previous repairs that may have been performed. Information about the reimbursement program for pre-notification repairs is provided in the enclosure to this letter.

Federal regulation requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten working days.

If you no longer own this vehicle or your address has changed, please complete the enclosed prepaid yellow card and return it to Ferrari North America, Inc.

We urge you to comply with this notice promptly and we apologize for any inconvenience this may cause you.

Best Regards,

Enzo Francesconi
Vice President of Aftersales

ENCLOSURE

Pre-Notification Reimbursement Program

You may be eligible for reimbursement if you previously incurred out-of-pocket costs for repairs or replacements associated with the replacement of the crankshaft and the relevant crankshaft bearings covered by this campaign number 52.

1. This reimbursement program applies to the vehicles listed below and in the attached letter:

- One Model Year 2011 Ferrari 458 Italia and certain Model Year 2012 Ferrari 458 Italia vehicles in the VIN range: XXXXXXXXXB0182199 to XXXXXXXXXC0183516 (Assembly number 100739 to Assembly number 101063) and certain Model Year 2012 Ferrari California vehicles in the VIN range: XXXXXXXXXC0182364 to XXXXXXXXXC0183765 (Assembly number 100961 to Assembly number 101487).

2. This reimbursement program applies to repairs or replacement of the crankshaft and the relevant crankshaft bearings.

3. This reimbursement program applies to repairs or replacement of the crankshaft and the relevant crankshaft bearings for the vehicles listed above, if such repair or replacement was made at any time up to ten days following the mailing of the attached notification letter.

4. This reimbursement program does not apply to repairs or replacements that were made within the period during which the original warranty would have provided for a free repair of the problem addressed by this recall, unless (i) a franchised dealer or authorized representative of Ferrari denied warranty coverage or (ii) the repair made under the warranty did not remedy the problem. Reimbursement also will not be provided if the pre-notification remedy was not of the same type as the recall remedy provided herein, did not address the defect that led to this recall, or was not reasonably necessary to correct the defect.

5. To obtain reimbursement for pre-notification remedies, you will need to provide a receipt, which may be an original or copy, identifying the equipment replaced; and, if the pre-notification remedy was obtained at a time when the vehicle was covered under the original warranty program, documentation indicating that the manufacturer's dealer or authorized facility either refused to remedy the problem addressed by the recall under the warranty or that the warranty repair did not correct the problem addressed by the recall. In addition, you will need to submit a written and signed claim for reimbursement that contains the information required in paragraph 6, below.

Continued on next page

ENCLOSURE

6. The claim for reimbursement should include the following information. (a) the name and address of the claimant; (b) identification of their vehicle's make, model, model year, and vehicle identification number; (c) identification of the Ferrari Campaign number (Campaign No.52) or identification of the recall by reference to NHTSA's recall number; and (d) identification of the owner or purchaser of the vehicle at the time that the pre-notification remedy was obtained.

7. If you have any questions about the reimbursement program or need help in making a claim for reimbursement, please write or call Ferrari North America, Inc., at the following address and telephone number:

Ferrari North America, Inc.
250 Sylvan Avenue
Englewood Cliffs, NJ 07632
(201) 816-2600

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari 458 Italia and Ferrari California

Replacement of the Engine Crankshaft

RECALL CAMPAIGN OVERVIEW

INTRODUCTION: Ferrari 458 Italia and Ferrari California

SUBJECT: Recall Campaign No. 52

VEHICLES: Ferrari 458 Italia, MY 2011 (see ModisCS for VINs' involved)
Ferrari 458 Italia, MY 2012 (see ModisCS for VINs' involved)
Ferrari California, MY 2012 (see ModisCS for VINs' involved)

The affected vehicles consist of one Model Year 2011 Ferrari 458 Italia and certain Model Year 2012 Ferrari 458 Italia vehicles in the VIN range: ZFF67NFA3B0182199 to ZFF67NFA3C0183516 (Assembly number 100739 to Assembly number 101063) and certain Model Year 2012 Ferrari California vehicles in the VIN range: ZFF65LHA2C0182364 to ZFF65LJA0C0183765 (Assembly number 100961 to Assembly number 101487).

CONDITION: Ferrari S.p.A has determined that due to a possible non-conformity in the final stages of machining of the crankshafts of the type F136 engine that there is a possibility of a crankshaft failure in the incorrectly machined zone caused by thermal and dynamic stresses. This failure may cause engine seizure rendering the vehicle inoperable, possibly resulting in a crash.

REMEDY: FNA will provide notice to all customers, warning them of this non-conformity and that their vehicle must be brought to their authorized Ferrari dealer to remedy the non-conformity by means of one of the three following options, the choice of which is to be made by the customer: (1) installation of a new crankshaft and the relevant crankshaft bearings by the authorized Ferrari dealer; (2) removal and reinstallation of the engine by the authorized Ferrari dealer with the installation of the new crankshaft and the relevant bearings performed by Ferrari North America; or (3) replacement by the authorized Ferrari dealer of the original engine with an engine provided by Ferrari North America.

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari 458 Italia and Ferrari California

RECALL CAMPAIGN OVERVIEW (cont.)

REPLACEMENT OF THE CRANKSHAFT

PARTS INVOLVED: The parts kits required for the replacement of the crankshaft are identified by the following part number:

- **Crankshaft Kit Part. no. 70002479** valid for vehicle **458 Italia**
- **Crankshaft Kit Part. no. 70002480** valid for vehicle **Ferrari California**

LABOR: Replacement of the crankshaft by the Authorized Dealer

458 Italia

› Campaign number..... **52**
› Cost code **24**
› Malfunction code **42.1.10.007**
› Problem code **01**
› Operation code **42.0.90.224.0**
› Time allowance ..... **35.00 Hours**

Ferrari California

› Campaign number..... **52**
› Cost code **24**
› Malfunction code **49.1.10.007**
› Problem code **01**
› Operation code **49.0.90.225.0**
› Time allowance ..... **30.00 Hours**

REIMBURSEMENT: Upon receipt of a warranty claim via ModisCS

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari 458 Italia and Ferrari California

RECALL CAMPAIGN OVERVIEW (cont.)

REPLACEMENT OF THE COMPLETE ENGINE

PARTS INVOLVED: The complete engine will be sent to you and will be coordinated by your ABM.

LABOR: Replacement of the complete engine by the Authorized Dealer

458 Italia

› Campaign number..... **52**
› Cost code **24**
› Malfunction code **42.1.10.007**
› Problem code **01**
› Operation code **42.1.00.003.0**
› Time allowance ..... **23.50 Hours**

Ferrari California

› Campaign number..... **52**
› Cost code **24**
› Malfunction code..... **49.1.10.007**
› Problem code **01**
› Operation code **49.1.00.003.0**
› Time allowance ..... **16.40 Hours**

REIMBURSEMENT: Upon receipt of a warranty claim via ModisCS

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari 458 Italia
Replacement of the Engine Crankshaft

TECHNICAL INSTRUCTIONS
TO REPLACE THE COMPLETE ENGINE

Remove the engine-gearbox assembly (as described in paragraph **B2.01 step 2** of the Workshop Manual for the 458 Italia).

Fit the engine-gearbox assembly (as described in paragraph **B2.02 step 1** of the Workshop Manual for the 458 Italia).

Connect the DEIS tester to the diagnostic socket of the vehicle (as described in paragraph **F2.10** of the 458 Italia Workshop Manual).

With the DEIS tester perform the **"30_SHORT TRIP Procedure tank seal"** cycle and the **"50_Check fuel pressure"** cycle.

Perform a visual inspection for oil and fluid leaks in the underbody and engine compartment.

Check the correctness and compliance of the pipe connections in the underbody and engine compartment.

Finally connect DEIS and perform a SCAN IN function. If any errors should arise open a ROL immediately and attach the relevant errors and parameters related to your issue.

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari California
Replacement of the Engine Crankshaft

TECHNICAL INSTRUCTIONS
TO REPLACE THE COMPLETE ENGINE

Remove the engine-gearbox assembly (as described in paragraph **B2.01 step 1** of the Workshop Manual for the California).

Fit the engine-gearbox assembly (as described in paragraph **B2.02 step 3** of the Workshop Manual for the California).

Connect the DEIS tester to the diagnostic socket of the vehicle (as described in paragraph **F2.10** of the California Workshop Manual).

With the DEIS tester perform the **"30_SHORT TRIP Procedure tank seal"** cycle and the **"50_Check fuel pressure"** cycle.

Perform a visual inspection for oil and fluid leaks in the underbody and engine compartment.

Check the correctness and compliance of the pipe connections in the underbody and engine compartment.

Finally connect DEIS and perform a SCAN IN function. If any errors should arise open a ROL immediately and attach the relevant errors and parameters related to your issue.

Ferrari North America, Inc.
Technical Department

U.S.A. RECALL CAMPAIGN NO. 52

Ferrari 458 Italia and Ferrari California
Replacement of the Engine Crankshaft

TECHNICAL INSTRUCTIONS
TO REPLACE THE CRANKSHAFT

Enclosed you will find the Technicial Instructions to replace the crankshaft on both the Ferrari 458 Italia and the Ferrari California.

Ferrari 458 Italia ..... Page 2 of this section
Ferrari California ..... Page 29 of this section

Technical Instruction for 458 Italia

To perform the operations the following **Crankshaft KIT Part number 70002479** is necessary, valid for vehicle **458 Italia**.

- IMPORTANT -

The following operation must be performed in a clean area suitable for the procedure itself, wearing professional disposable powderless nitrile gloves. Check the condition of the gloves used frequently and replace if excessively soiled or damaged.

- IMPORTANT -

At each step in the removal procedure, note the positions of screws, brackets, protective braids, sheaths and clamps to ensure correct, rapid reassembly.

- IMPORTANT -

For each removed component, collect the fasteners and washers in a separate container to maintain order during the procedure and to prevent the possibility of subsequent fastener installation errors.

- IMPORTANT -

During reassembly, replace all seals and gaskets for the components removed.

1A.1 Remove the engine-gearbox assembly (as described in paragraph **B2.01** step **2** of the Workshop Manual for the 458 Italia).

1A.2 Remove the cylinder head covers (as described in paragraph **B2.03** step **1** of the 458 Italia Workshop Manual).

1A.3 Remove the front crankcase cover (as described in paragraph **B2.03** step **2** of the 458 Italia Workshop Manual).

1A.4 Remove the spark plugs (as described in paragraph **A3.13** step **1** of the 458 Italia Workshop Manual).

1A.5 Remove the engine oil pump (as described in paragraph **B5.02** step **1** of the 458 Italia Workshop Manual).

1A.6 Remove the starter motor (as described in paragraph **F2.05** step **1** of the 458 Italia Workshop Manual).

1A.7 Remove the starter flywheel (as described in paragraph **C4.02** step **1** of the 458 Italia Workshop Manual).

1A.8 Select the trolley **AV 2621** – Fig. **1**.

1A.9 Select the crankcase support **AM 107064** and install on trolley **AV 2621** – Fig. **1**.

1A.10 Using suitable equipment for lifting the engine, position and fasten the engine on support **AM 107064** – Fig. **1**.

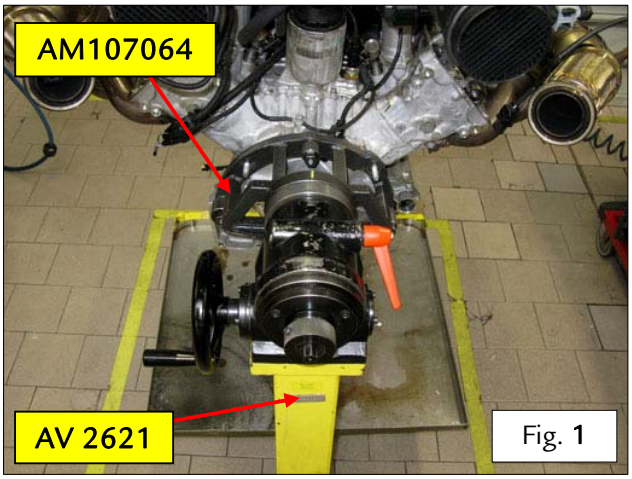
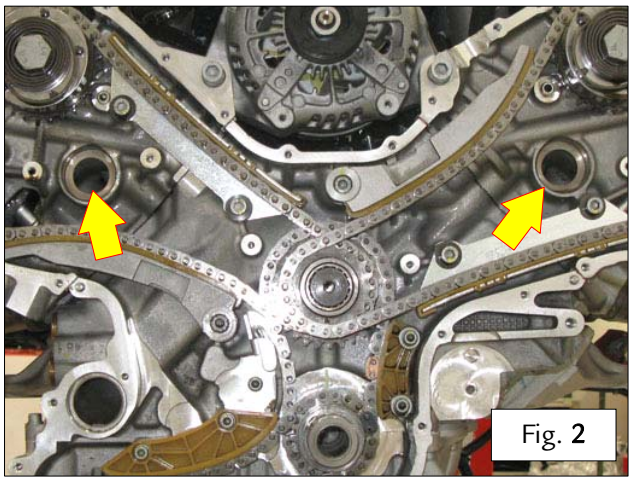


Fig. 1

1A.11 Gather and secure the cables and pipes together – Fig. **1**.

1A.12 Plug the indicated water ducts on the cylinder heads appropriately – Fig. **2**.


Fig. 2

1A.13 Before removing the timing system, it is necessary to take the cylinder **no. 1** to **TDC** during ignition. Then fit the dial gauge **(A)** in the tool and insert the assembly in the spark plug of the cylinder **no. 1** – Fig. **3**.

1A.14 Remove the dial gauge – Fig. **3**.

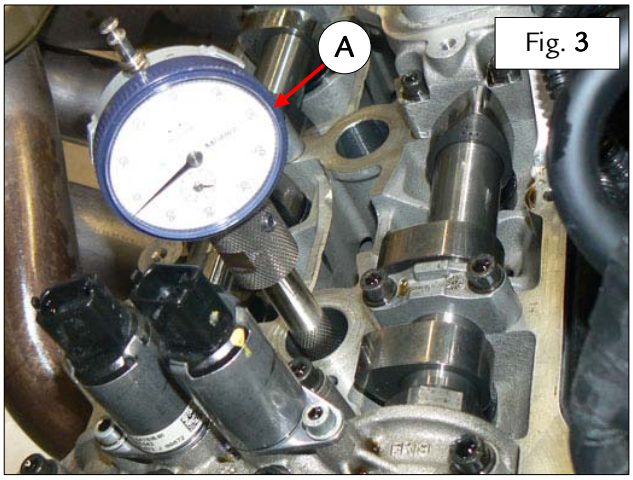
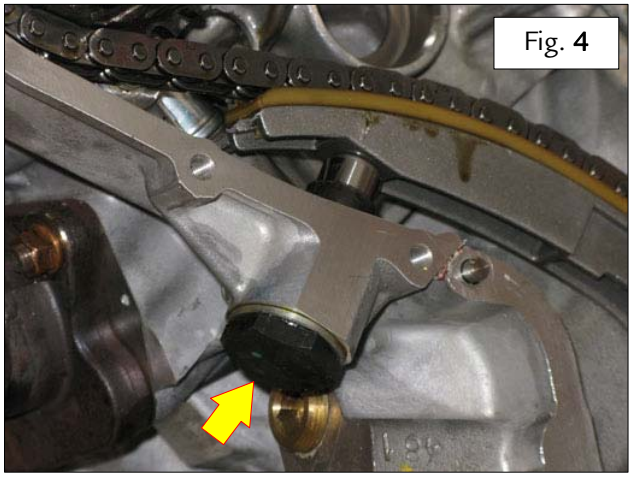


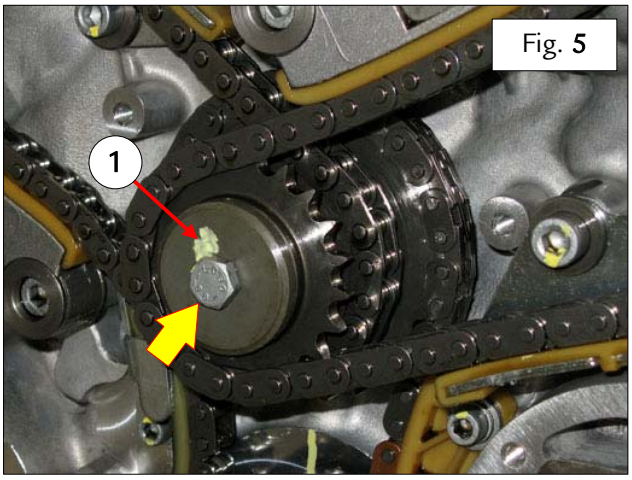
Fig. 3

1A.15 Undo the lower tensioner indicated – Fig. 4.

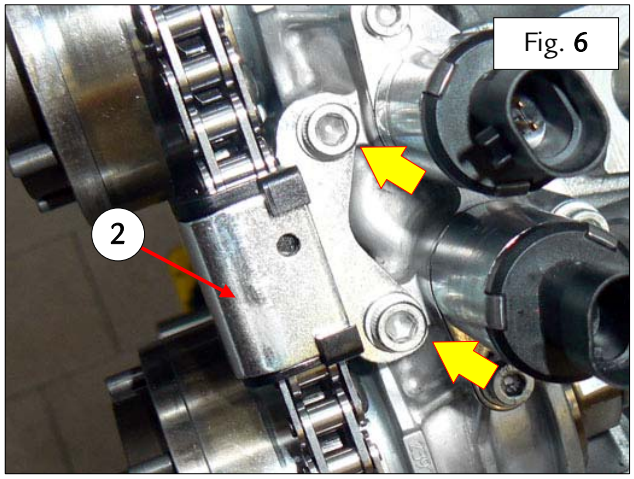


1A.16 Undo the indicated screw – Fig. 5.

1A.17 Remove the shoulder (1) – Fig. 5.



1A.18 UP TO ENGINE No. 175732, remove the fixed shoe (2), undoing the indicated screws – Fig. 6.



1A.19 Immobilise the camshafts with a retainer tool – Fig. 7.

1A.20 Remove the mobile shoe (3), undoing the respective screw indicated – Fig. 7.

1A.21 Loosen the indicated screw fastening the intake cam variable valve timing adjuster (4) – Fig. 7.

1A.22 Undo the indicated screw fastening the exhaust cam variable valve timing adjuster (5) – Fig. 7.

1A.23 Remove the exhaust cam variable valve timing adjuster (5), complete with chain (6), retrieving the respective diamond finish washer – Fig. 7.

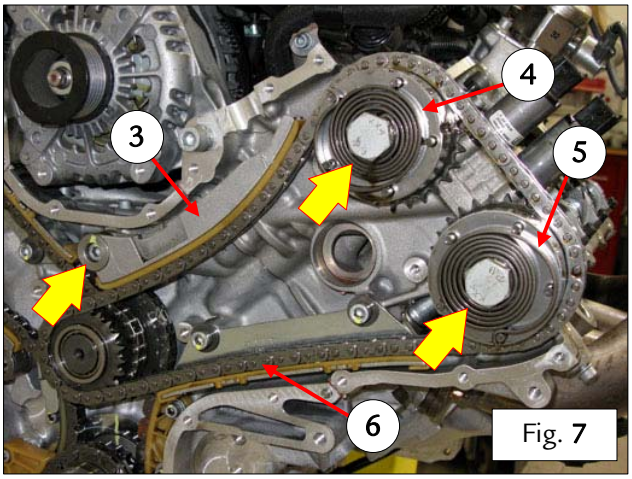


Fig. 7

1A.24 UP TO ENGINE No. 175732, remove the fixed shoe (7), undoing the indicated screws – Fig. 8.

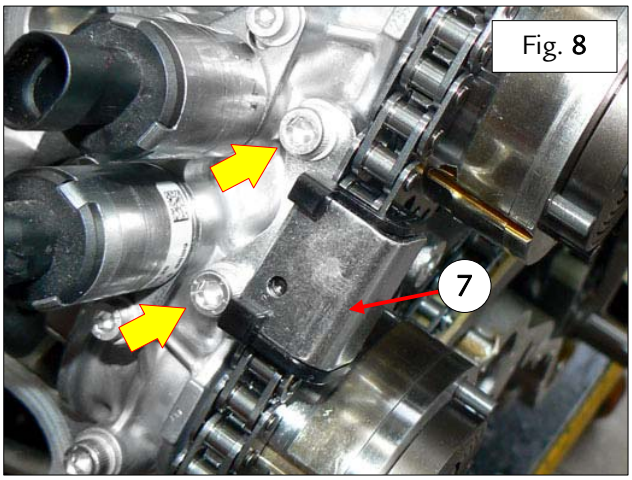


Fig. 8

1A.25 Immobilise the camshafts with a retainer tool – Fig. 9.

1A.26 Loosen the indicated screw fastening the intake cam variable valve timing adjuster (8) – Fig. 9.

1A.27 Undo the indicated screw fastening the exhaust cam variable valve timing adjuster (9) – Fig. 9.

1A.28 Remove the exhaust cam variable valve timing adjuster (9), complete with chain (10), retrieving the respective diamond finish washer – Fig. 9.

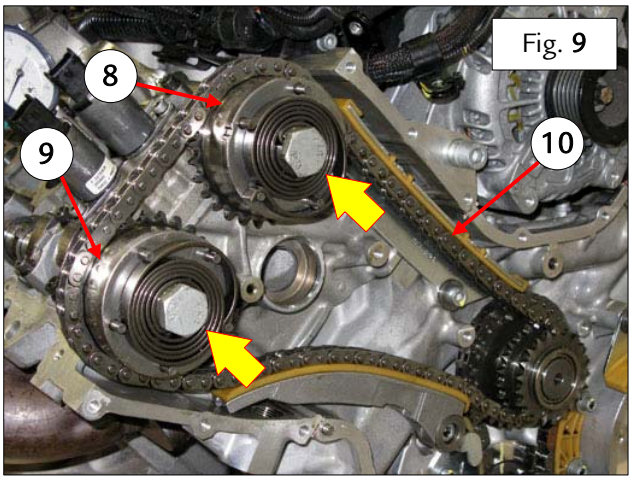


Fig. 9

1A.29 Remove the fixed shoe (11), undoing the respective screws indicated – Fig. 10.

1A.30 Remove the mobile shoe (12), undoing the respective screws indicated – Fig. 10.

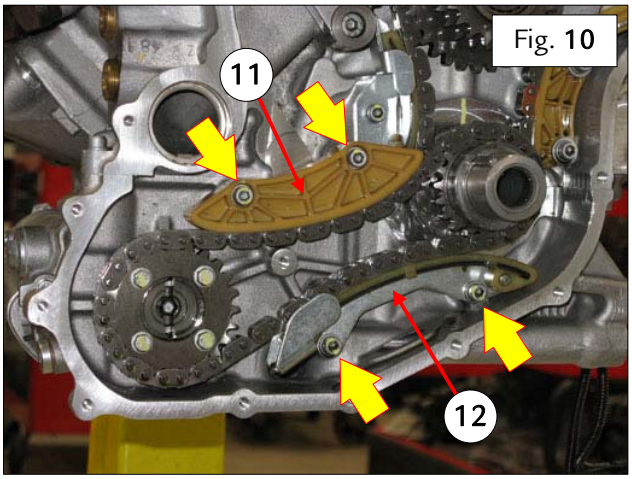


Fig. 10

1A.31 Undo the indicated screws fastening the pump drive gear wheel (13) – Fig. 11.

1A.32 Remove the pump drive gear wheel (13) complete with chain (14) – Fig. 11.

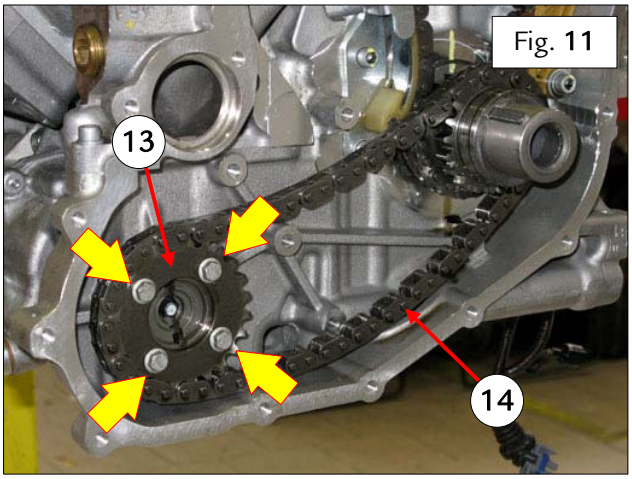


Fig. 11

1A.33 Remove the fixed shoe (15), undoing the respective screws indicated – Fig. 12.

1A.34 Remove the mobile shoe (16), undoing the respective screws indicated – Fig. 12.

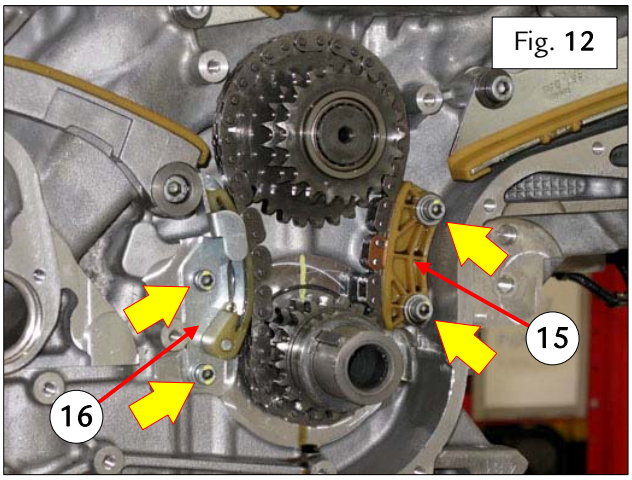


Fig. 12

1A.35 Simultaneously, remove the gear wheel (17) from the idler spindle and the gear wheel (18) from the crankshaft, complete with the chain (19) – Fig. 13.

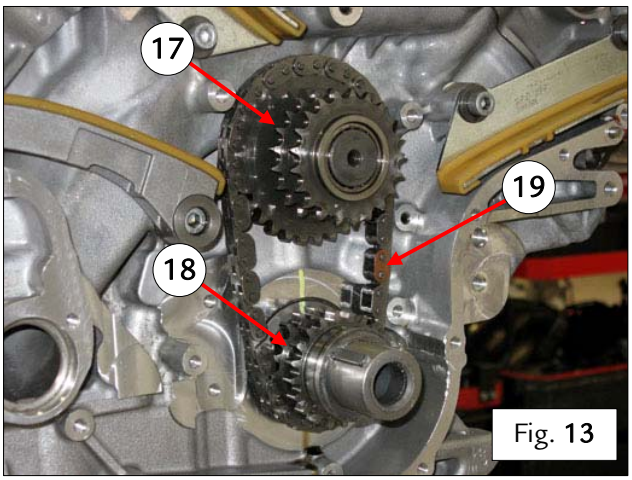


Fig. 13

1A.36 Using trolley AV 2621, turn the engine over to allow access to the lower crankcase shell fasteners – Fig. 14.

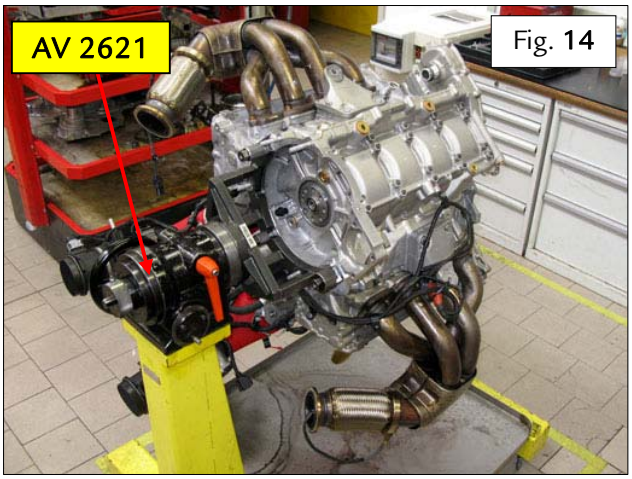
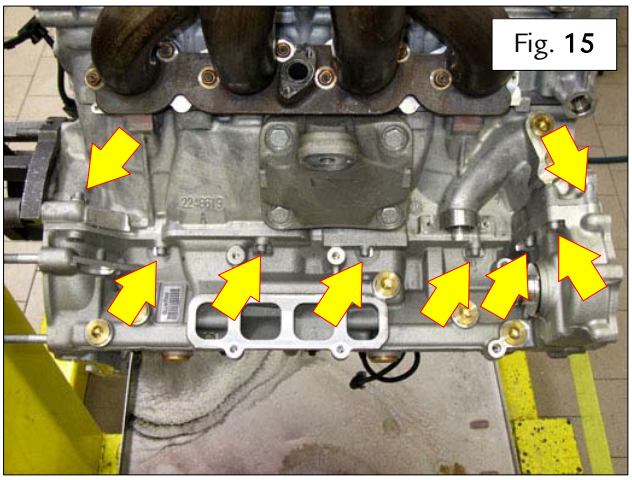


Fig. 14

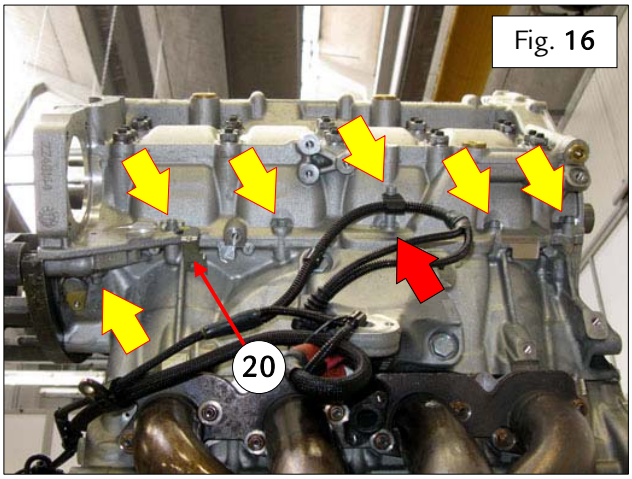
1A.37 Undo the indicated screws – Fig. 15.



1A.38 Undo the indicated screws – Fig. 16.

1A.39 Remove the bracket (20) – Fig. 16.

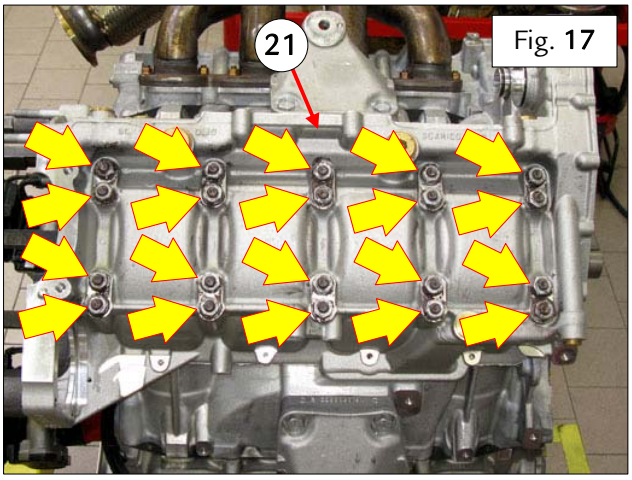
1A.40 Undo the stud indicated by the red arrow – Fig. 16.



1A.41 Undo the indicated nuts – Fig. 17.

1A.42 Remove the lower crankcase shell (21), easing carefully off the relative stud bolts – Fig. 17.

1A.43 Retrieve the half-bearings and the shims from the lower crankcase shell – Fig. 17.



1A.44 Turn the crankshaft to allow access to all the indicated screws fastening the big end caps (22) – Fig. 18.

1A.45 Note the number of the respective cylinder on each big end cap (22) – Fig. 18.

1A.46 Remove all the big end caps (22), undoing the indicated screws – Fig. 18.

1A.47 Retrieve the half-bearings from the connecting rods and from the big end caps – Fig. 18.

1A.48 Remove the crankshaft (23) – Fig. 18.

1A.49 Retrieve the half-bearings and the shims from the crankcase – Fig. 18.

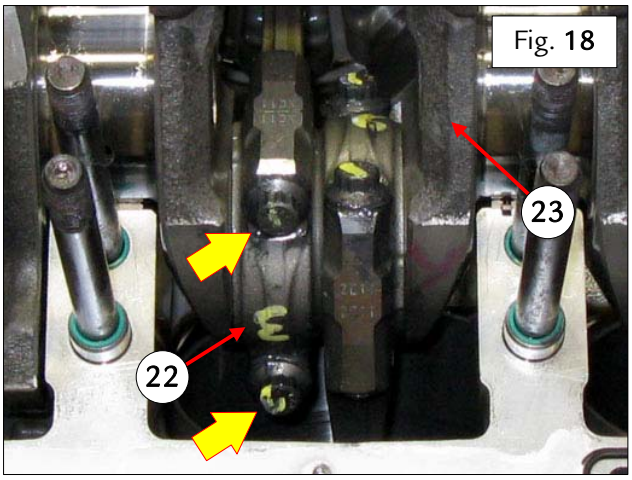
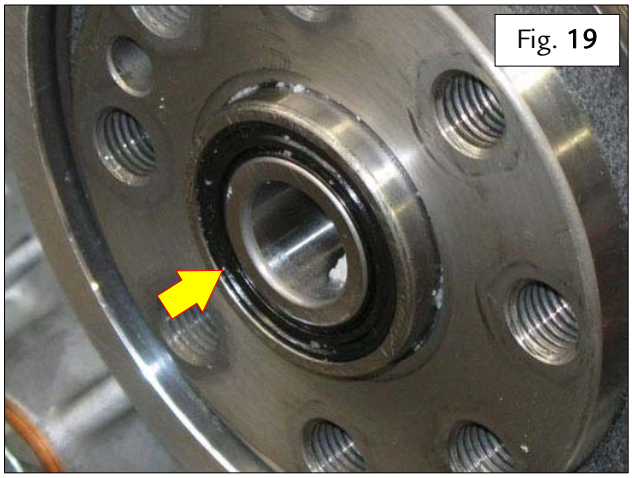


Fig. 18

1A.50 Replace the crankshaft, the connecting rod half-bearings and the upper and lower crankshaft half-bearings.

1A.51 Insert the bearing in the relative flywheel side seat of the new crankshaft – Fig. 19.


Fig. 19

- IMPORTANT -

During reassembly, replace all seals and gaskets for the components removed.

- IMPORTANT -

Thoroughly clean the seats for the connecting rod half-bearings and the crankcase half-bearings on the respective components.

1A.52 Fit the new upper half-bearings (24) in the respective seats on the crankcase – Fig. 20.

1A.53 Lubricate the new upper half-bearings (24) with SHELL HELIX ULTRA 5W/40 engine oil – Fig. 20.

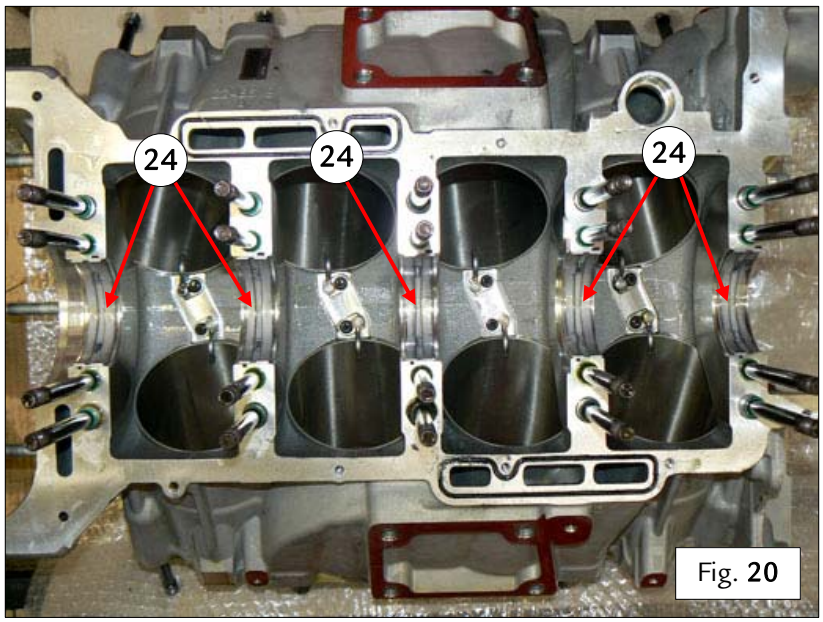


Fig. 20

1A.54 Apply a small quantity of MOLYKOTE BR2 on the crankcase to hold the upper shims (25) in place during assembly – Fig. 21.

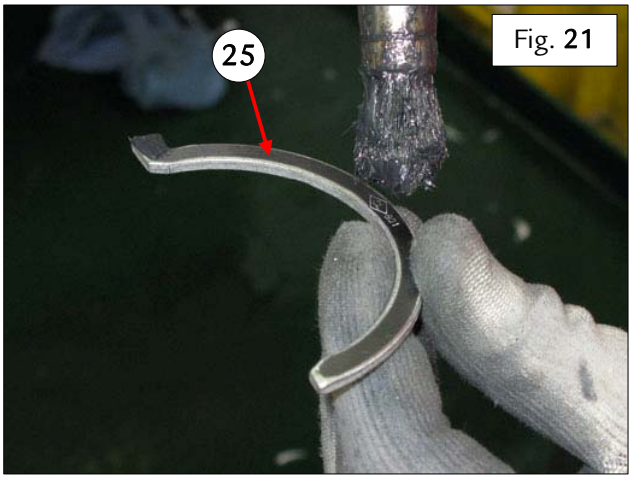


Fig. 21

1A.55 Fit the upper shims (25) in the respective seats on the crankcase – Fig. 22.

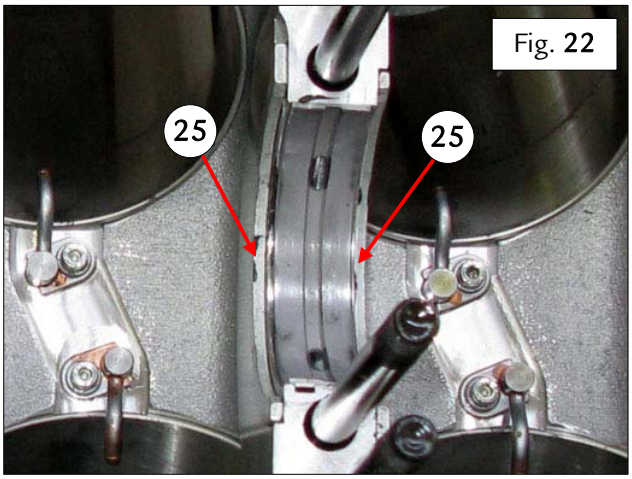


Fig. 22

1A.56 Fit the new lower half-bearings (26) in the respective seats on the lower crankcase shell – Fig. 23.

N.B.: **Mount an upper bearing with groove in the third main support (only for Lead Free engines).**

1A.57 Lubricate the new lower half-bearings (26) with SHELL HELIX ULTRA 5W/40 engine oil – Fig. 23.

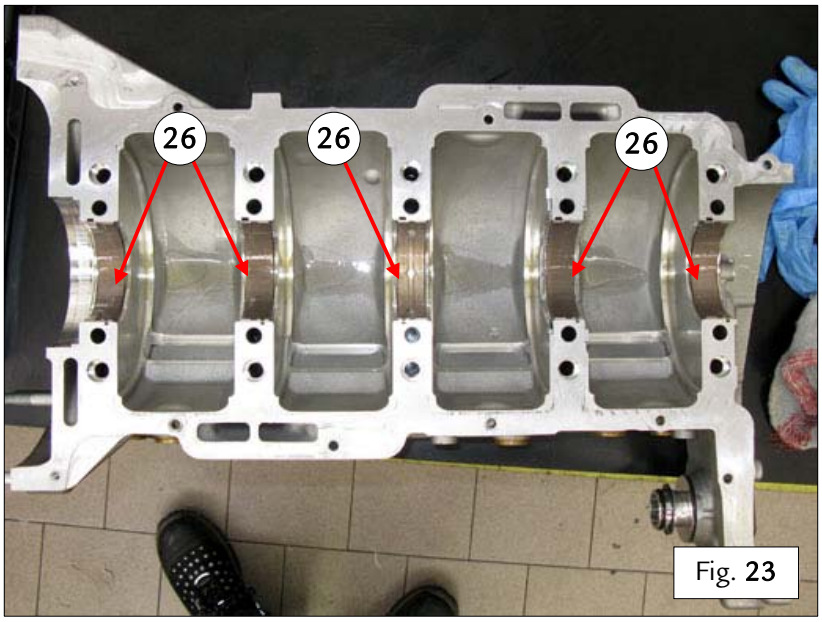


Fig. 23

1A.58 Apply a small quantity of MOLYKOTE BR2 to hold the lower shims (27) in place during assembly – Fig. 24.

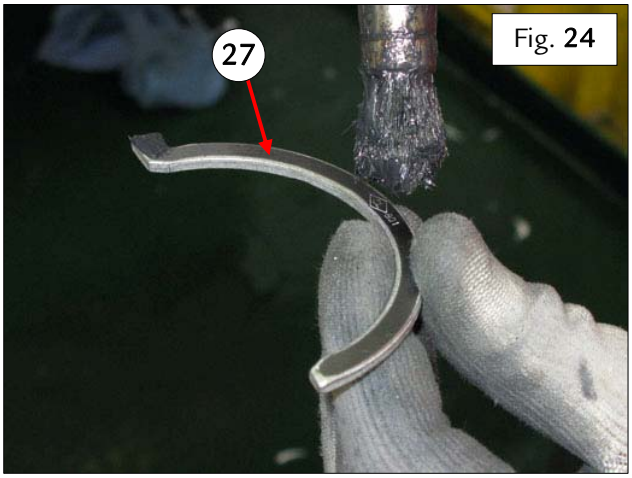


Fig. 24

1A.59 Fit the lower shims (27) in the respective seats on the lower crankcase shell – Fig. 25.

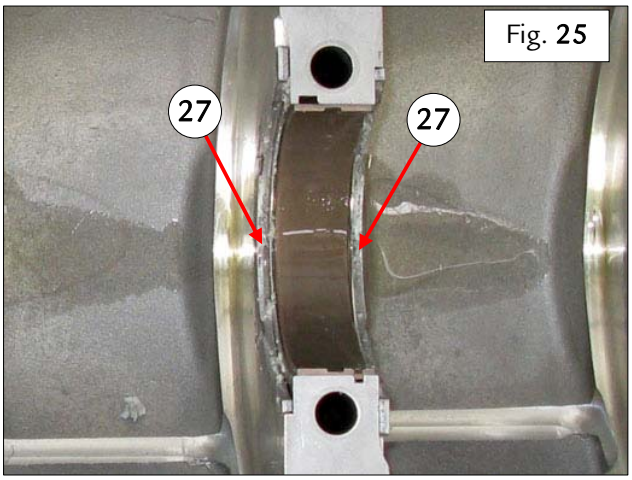


Fig. 25

1A.60 Fit the new half-bearings (28) on the connecting rods – Fig. 26.

1A.61 Lubricate the new half-bearings (28) with SHELL HELIX ULTRA 5W/40 engine oil – Fig. 26.

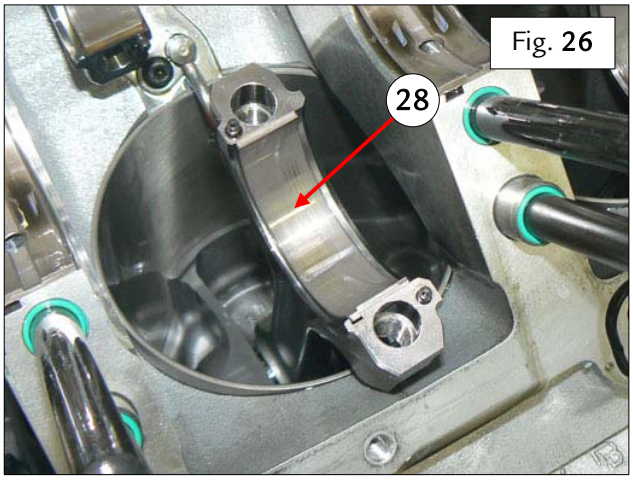


Fig. 26

1A.62 Fit the crankshaft, **working with the utmost care not to knock the shims out of place**.

1A.63 Fit the new half-bearings (30) on the big end caps – Fig. 27.

1A.64 Lubricate the new half-bearings (30) with SHELL HELIX ULTRA 5W/40 engine oil – Fig. 27.

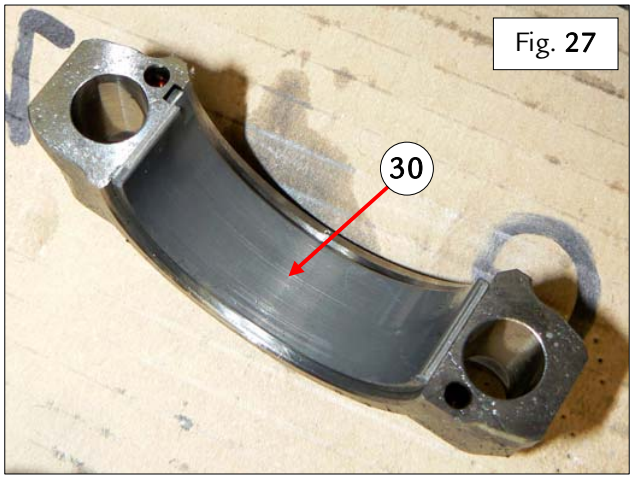
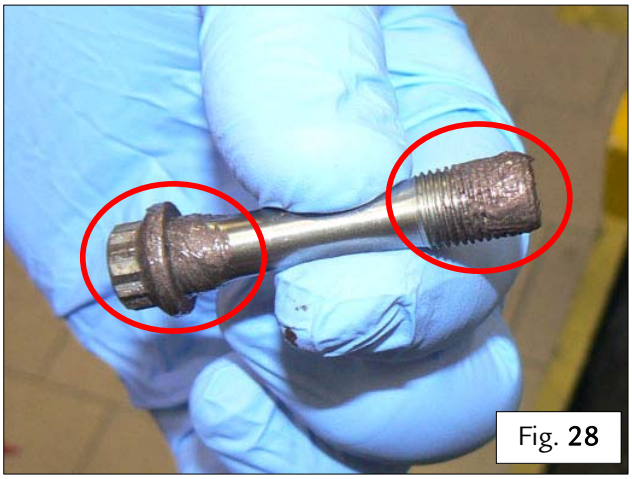


Fig. 27

1A.65 Check that the threads on the indicated screws fastening the big end caps are in good condition – Fig. 28.

1A.66 Apply **CASTROL OPTIMOL PASTE PL (PLB07)** lubricant to the undersides of the heads and the threads of the screws fastening the big end caps – Fig. 28.


Fig. 28

1A.67 Check that the mating surfaces between the connecting rod shanks and the respective big end caps are in good condition – Fig. 29.

1A.68 Lubricate the crankshaft (23) at the interface points with the big end caps (22) with **SHELL HELIX ULTRA 5W/40** engine oil – Fig. 29.

1A.69 Matching the parts correctly using the references noted during removal, fit the big end caps (22), partially tightening the respective screws indicated – Fig. 29.

1A.70 Pre-tighten all the indicated screws fastening the big end caps (22) to a first pre-tightening torque of **20 Nm ± 1.5 Nm** – Fig. 29.

1A.71 Pre-tighten all the indicated screws fastening the big end caps (22) to a second pre-tightening torque of **30 Nm ± 1.5 Nm** – Fig. 29.

1A.72 Definitively tighten all the indicated screws fastening the big end caps (22), applying an angle of **78° ± 1°** – Fig. 29.

1A.73 Check that the resulting tightening torque is **80 Nm ± 15 Nm** – Fig. 29.

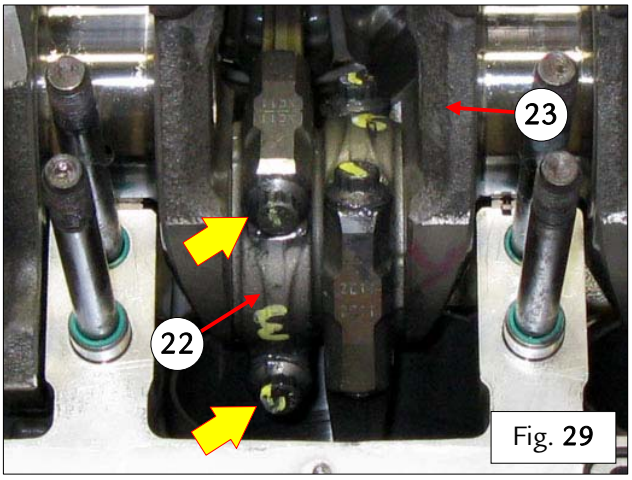


Fig. 29

1A.74 After fastening the connecting rod caps check the endfloat of the connecting rods with the thickness gauges: the value should be between **0.200÷0.339 mm**.

1A.75 Install the strip **(34)** on the flywheel side crankshaft – Fig. **30**

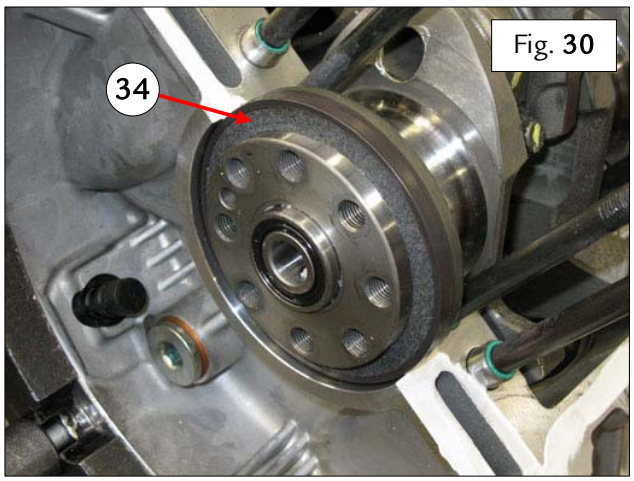


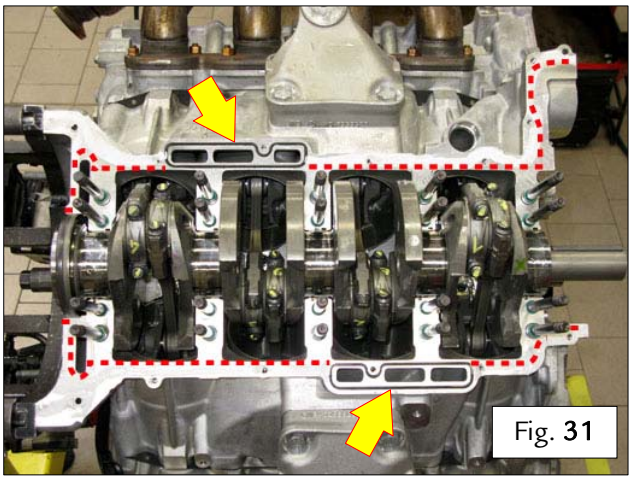
Fig. **30**

1A.76 Using a cloth moistened with heptane and compressed air, thoroughly clean all the mating surfaces on the crankcase and lower crankcase shell.

1A.77 Using a cloth moistened with heptane and compressed air, thoroughly clean all the nuts and respective washers for fastening the lower crankcase shell.

1A.78 Apply **CAF 4** paste to the crankcase as indicated by the dotted lines to form an uninterrupted bead of sealant of uniform thickness – Fig. **31**.

1A.79 Ensure the positioning of the two strips indicated – Fig. **31**.


Fig. **31**

1A.80 **Within 10 minutes** of applying **CAF 4** paste, carefully fit the lower crankcase shell **(21)** on the crankcase, inserting it on the respective stud bolts with care – Fig. **32**.

1A.81 Fit the indicated washers, with the machined sides turned to face the lower crankcase shell **(21)** – Fig. **32**.

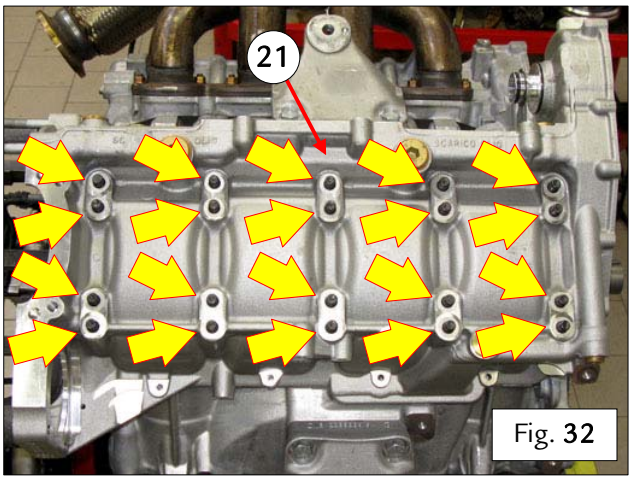
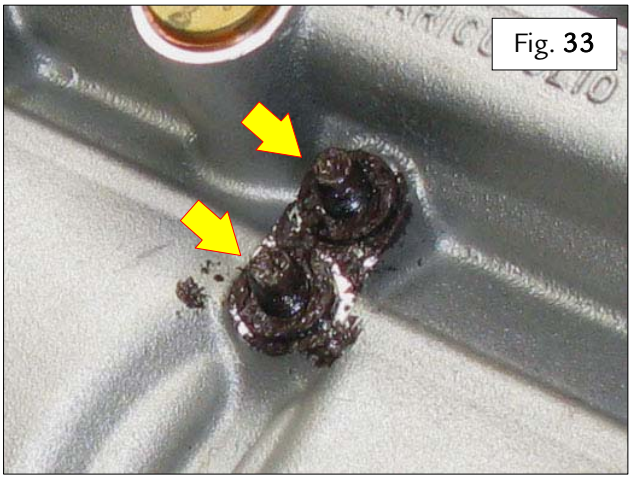


Fig. 32

1A.82 Apply **MOLYKOTE 1000** grease to the upper surface of all the indicated washers and to the threads of all the stud bolts indicated – Fig. **33**.

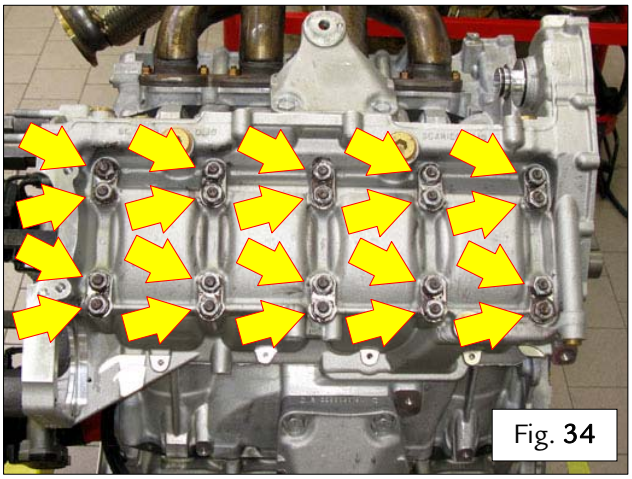

Fig. 33

- IMPORTANT -

Tighten the nuts fastening the lower crankcase shell following the sequence indicated in Fig. 35 precisely.

1A.83 Pre-tighten the indicated nuts in the sequence given below, to a torque of **10 Nm class A** – Fig. **34**.

1A.84 Following the sequence given below, definitively tighten the internal nuts indicated, applying an angle of **165° ± 1°**, and check that the resulting tightening torque is **70 Nm ± 10 Nm** – Fig. **34**.


Fig. **34**

1A.85 Following the sequence given below, definitively tighten the external nuts indicated, applying an angle of **130° ± 1°**, and check that the resulting tightening torque is **60 Nm ± 10 Nm** – Fig. **34**.

1A.86 Carry out the tightening procedures described above following the indications given in the photo aside precisely – Fig. **35**.

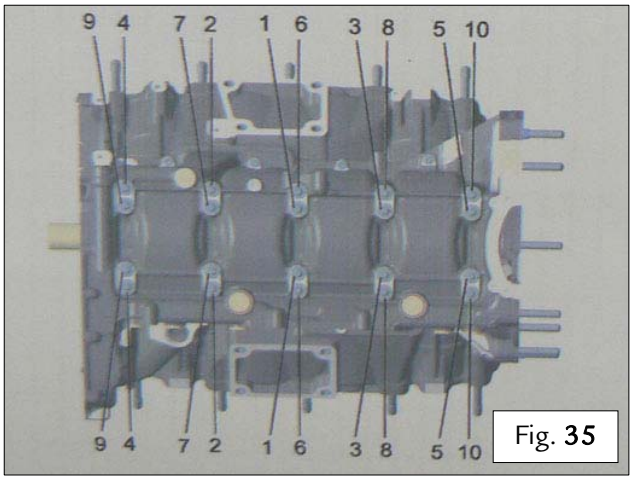


Fig. **35**

1A.87 Definitively tighten the stud indicated by the red arrow to a torque of **10 Nm** class B – Fig. **36**.

1A.88 Definitively tighten the indicated screws to a torque of **10 Nm** class B, fitting the bracket **(20)** and the wiring harness – Fig. **36**.

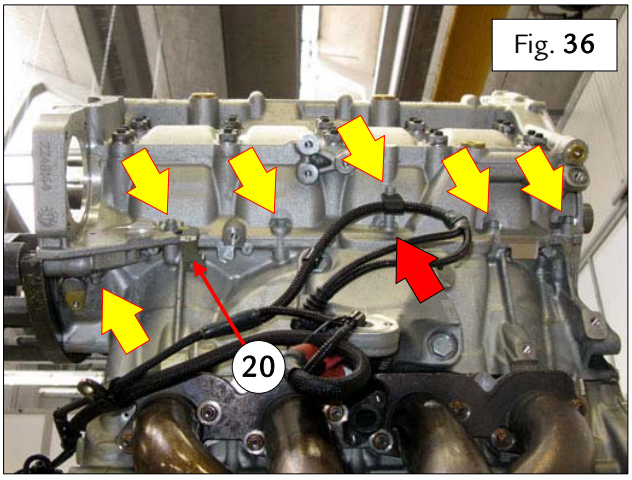
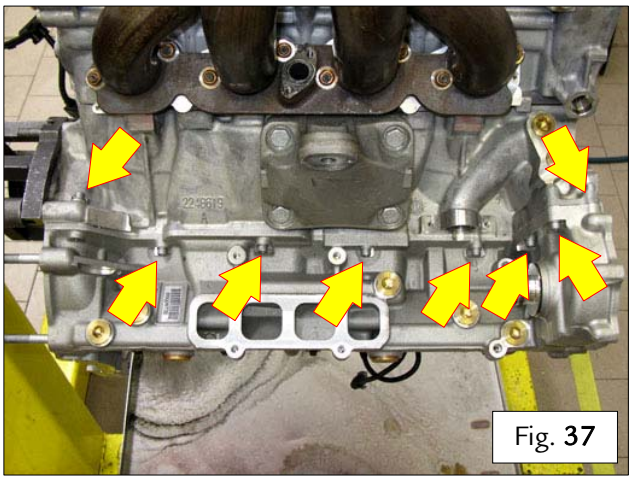


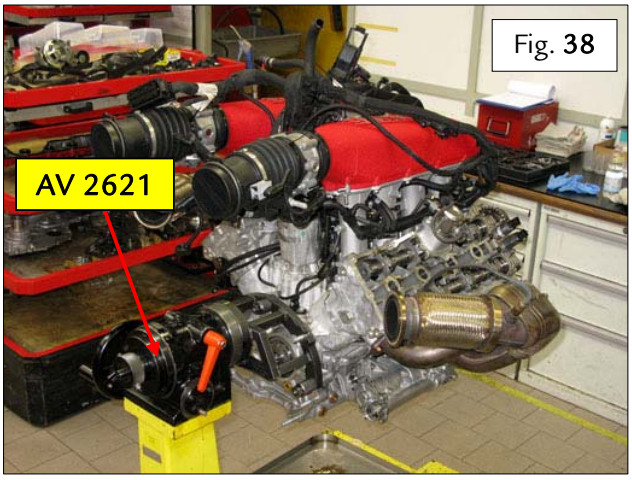
Fig. **36**

1A.89 Tighten the indicated screws to a torque of **10 Nm** class B – Fig. **37**.

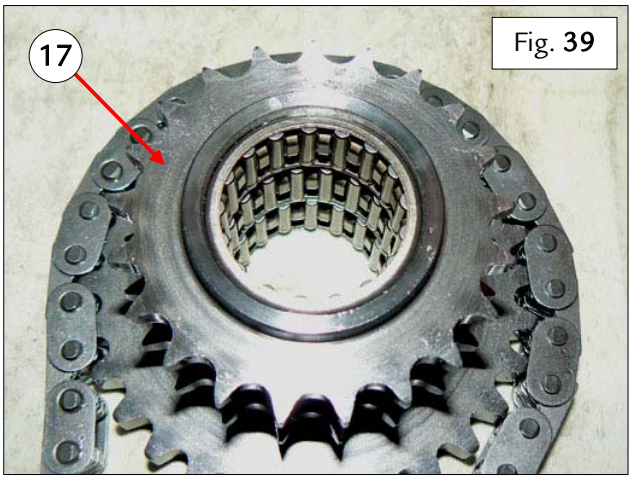


1A.90 Check the endfloat of the crankshaft: the value should be between **0.12÷0.24 mm**.

1A.91 Using trolley **AV 2621**, turn the engine over in order to refit the timing system components – Fig. **38**.



1A.92 Check that the roller bearings are installed correctly in the gear wheel **(17)** – Fig. **39**.



1A.93 Simultaneously, refit the gear wheel (17) on the idler spindle and the gear wheel (18) on the crankshaft, complete with the chain (19) – Fig. 40.

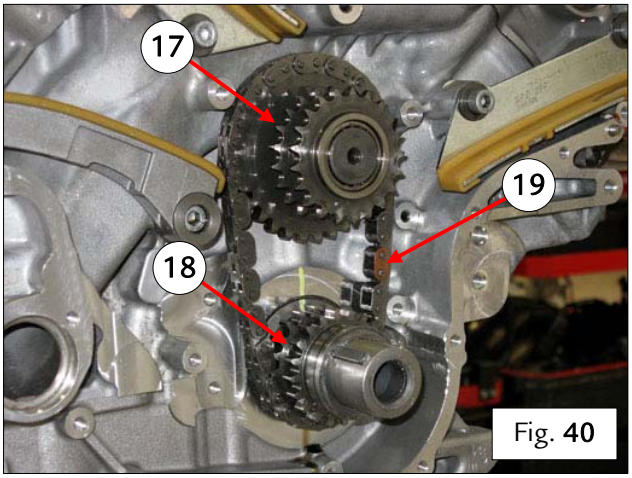


Fig. 40

1A.94 Refit the mobile shoe (15), tightening the respective screws indicated to a torque of 10 Nm class B – Fig. 41.

1A.95 Refit the fixed shoe (16), tightening the respective screws indicated to a torque of 10 Nm class B – Fig. 41.

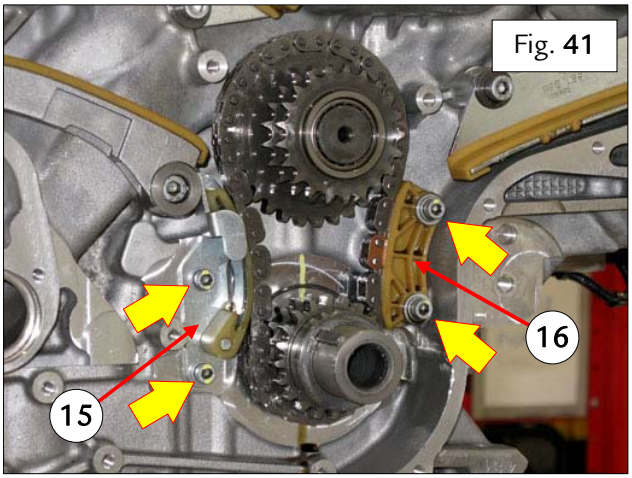


Fig. 41

1A.96 Refit the pump drive gear wheel (13) complete with chain (14) – Fig. 42.

1A.97 Definitively tighten the indicated screws fastening the pump drive gear wheel (13) to a torque of 10 Nm class B – Fig. 42.

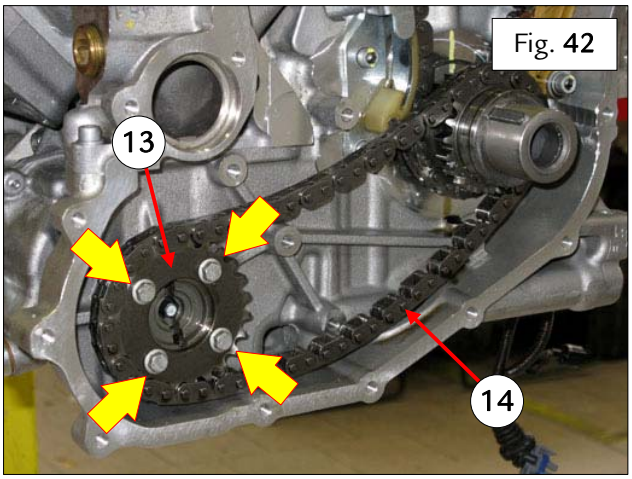


Fig. 42

1A.98 Refit the mobile shoe (12), tightening the respective screws indicated to a torque of **10 Nm** class B – Fig. **43**.

1A.99 Refit the fixed shoe (11), tightening the respective screws indicated to a torque of **10 Nm** class B – Fig. **43**.

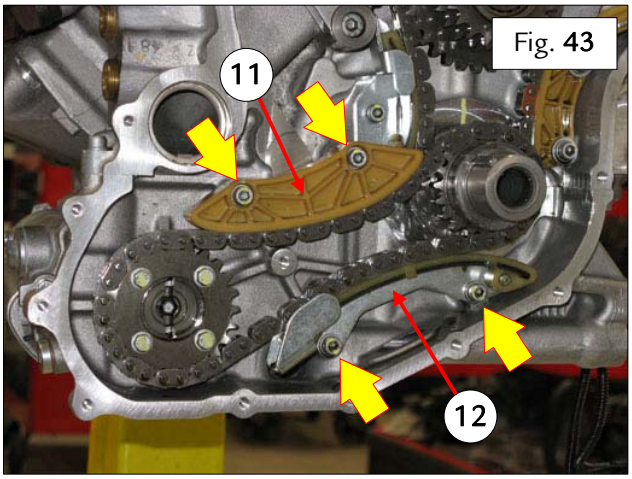


Fig. 43

1A.100 Before refitting the timing system, it is necessary to take the cylinder **no. 1** to **TDC** during ignition. Then mount the dial gauge (A) in the tool and insert the assembly in the spark plug of the cylinder **no. 1** – Fig. **44**.

1A.101 Remove the dial gauge – Fig. **44**.

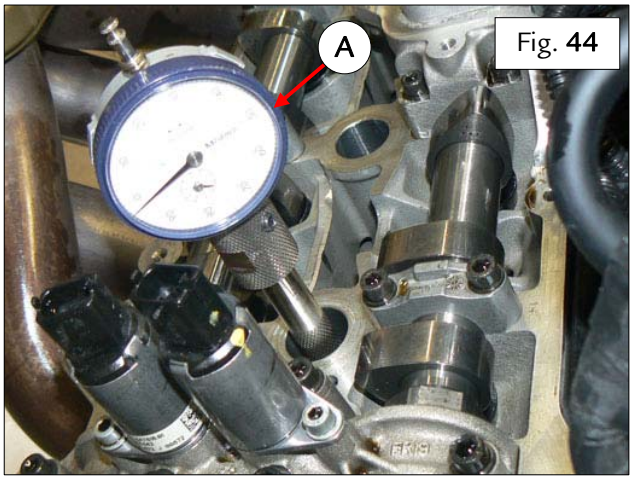


Fig. 44

1A.102 Immobilise the camshafts with a retainer tool – Fig. **45**.

1A.103 Refit the exhaust cam variable valve timing adjuster (9), complete with chain (10), installing the respective diamond finish washer – Fig. **45**.

N.B.: the exhaust cam variable valve timing adjusters are distinguished by the red dot positioned on their rear side.

1A.104 Partially tighten the indicated screw fastening the exhaust cam variable valve timing adjuster (9) – Fig. **45**.

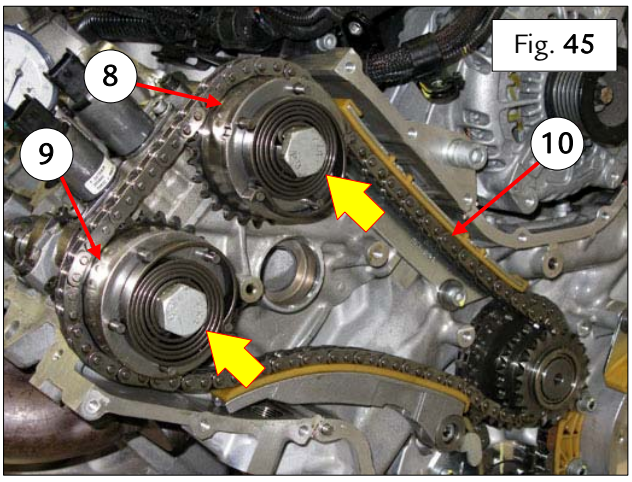


Fig. 45

1A.105 Partially tighten the indicated screw fastening the intake cam variable valve timing adjuster (8) – Fig. 45.

1A.106 UP TO ENGINE No. 175732, refit the fixed shoe (7), tightening the indicated screws – Fig. 46.

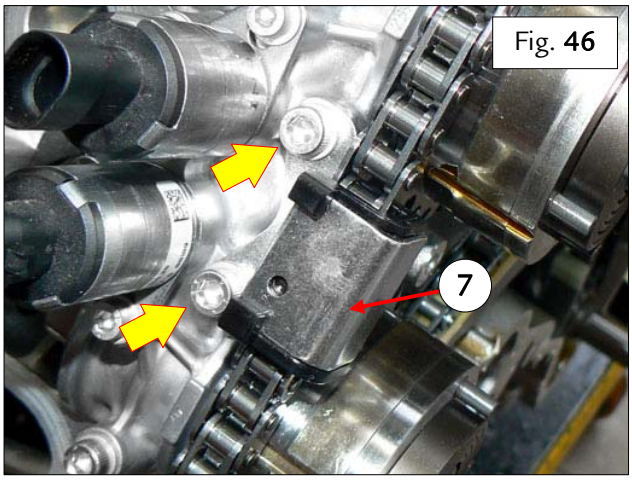


Fig. 46

1A.107 Immobilise the camshafts with a retainer tool – Fig. 47.

1A.108 Refit the exhaust cam variable valve timing adjuster (5), complete with chain (6), installing the respective diamond finish washer – Fig. 47.

N.B.: the exhaust cam variable valve timing adjusters are distinguished by the red dot positioned on their rear side.

1A.109 Partially tighten the indicated screw fastening the exhaust cam variable valve timing adjuster (5) – Fig. 47.

1A.110 Partially tighten the indicated screw fastening the intake cam variable valve timing adjuster (4) – Fig. 47.

1A.111 Refit the mobile shoe (3), tightening the respective screw indicated – Fig. 47.

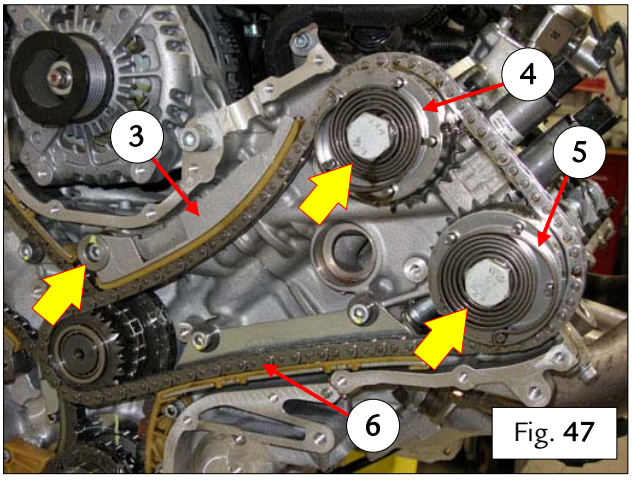


Fig. 47

1A.112 **UP TO ENGINE No. 175732**, refit the fixed shoe **(2)**, tightening the indicated screws – Fig. **48**.

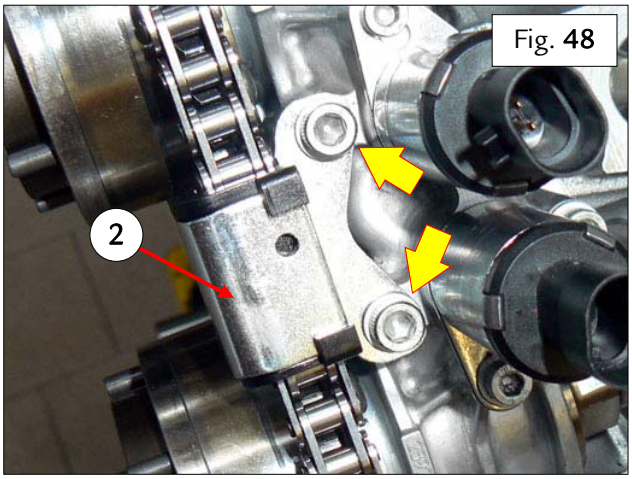


Fig. **48**

1A.113 Refit the shoulder **(1)** – Fig. **49**.

1A.114 Definitively tighten the indicated screw to a torque of **25 Nm** class B – Fig. **49**.

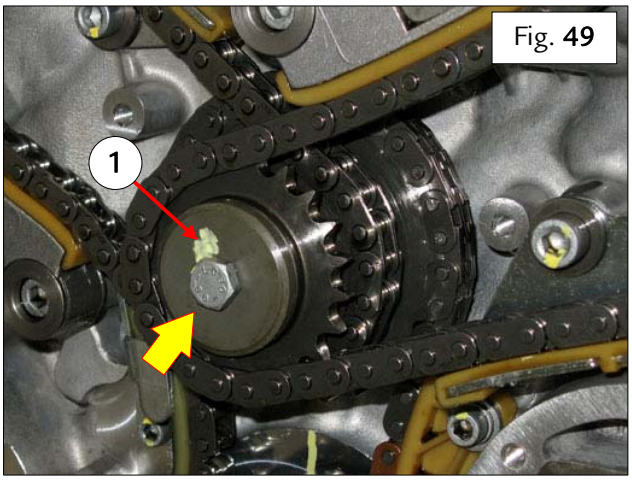
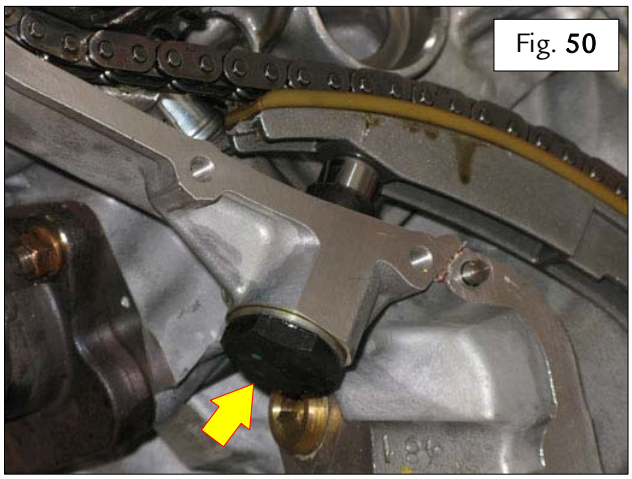


Fig. **49**

1A.115 Definitively tighten the lower tensioner to a torque of **40 Nm** class B – Fig. **50**.


Fig. **50**

1A.116 Position the flange (31) with its strip (32) then partially tighten the hydraulic tensioner (33) – Fig. 51.

1A.117 Tighten the indicated screws to a torque of 10 Nm class B – Fig. 51

1A.118 Tighten the upper hydraulic tensioner to a torque of 40 Nm class B – Fig. 51

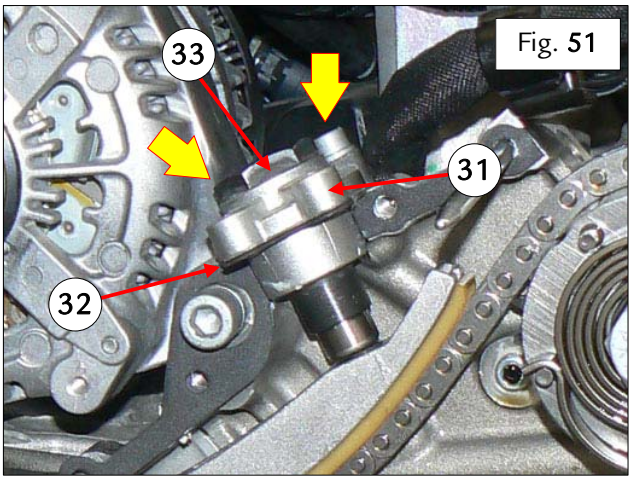
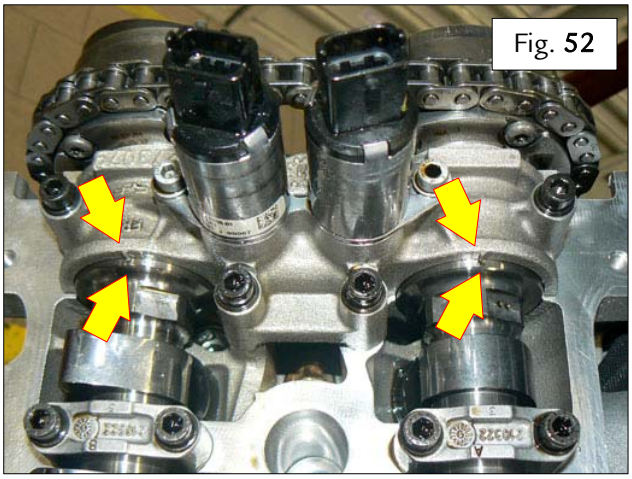


Fig. 51

1A.119 Loosen the fastener screws of the adjusters then align the reference notches on the shafts and on the front caps – Fig. 52.

1A.120 Temporarily tighten the screws of the adjusters – Fig. 52.


Fig. 52

1A.121 Fit the dial gauge (A)in the tool, insert the assembly in the spark plug hole of cylinder **no. 1** and identify ignition **TDC** – Fig. **53**.

1A.122 Maintaining as perpendicular a position as possible relative to the tappet, place the finger of the dial gauge against the upper surface of the bucket tappet of one of the intake valves of cylinder **no. 1**, measure the valve lift and reset the dial gauge **(B)** at **TDC**. In this condition, the bucket tappets can rotate freely in their seats – Fig. **53**.

1A.123 Rotate the crankshaft clockwise by **360°** to approach the valve overlap phase, and check that the dial gauge **(B)** still indicates zero before the camshaft begins to open the valves – Fig. **53**.

1A.124 Rotate the crankshaft until the dial gauge **(A)** indicates **TDC**. In this condition, the dial gauges **(A)** and **(B)** must indicate zero – Fig. **53**.

1A.125 Rotate the crankshaft clockwise until dial gauge **(A)** indicates a value of **4.81 mm** (corresponding to **25°** after **TDC**) – Fig. **53**.

1A.126 Dial gauge **(B)** should now indicate a value of **0.60 mm ± 0.08 mm** – Fig. **53**.

1A.127 Adjust the camshaft with a wrench applied to the specific seat to obtain the correct values – Fig. **53**.

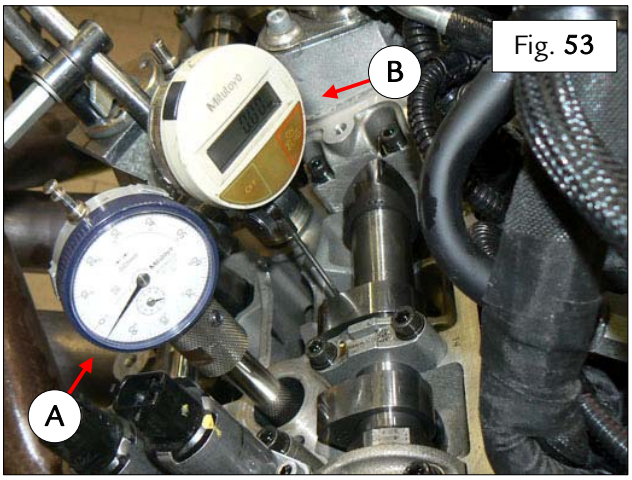


Fig. 53

1A.128 Immobilise the intake camshaft with a retainer tool – Fig. **54**.

1A.129 Apply **SHELL HELIX ULTRA 5W/40** engine oil to the intake cam variable valve timing adjuster **(8)**, on the contact surface with the respective fastener screw – Fig. **54**.

1A.130 Pre-tighten the indicated screw fastening the intake cam variable valve timing adjuster **(8)** to a torque of **50 Nm** class A – Fig. **54**.

1A.131 Definitively tighten the indicated screw fastening the intake cam variable valve timing adjuster **(8)**, applying an angle of **70°**, and check that the resulting torque is **100÷140 Nm** – Fig. **54**.

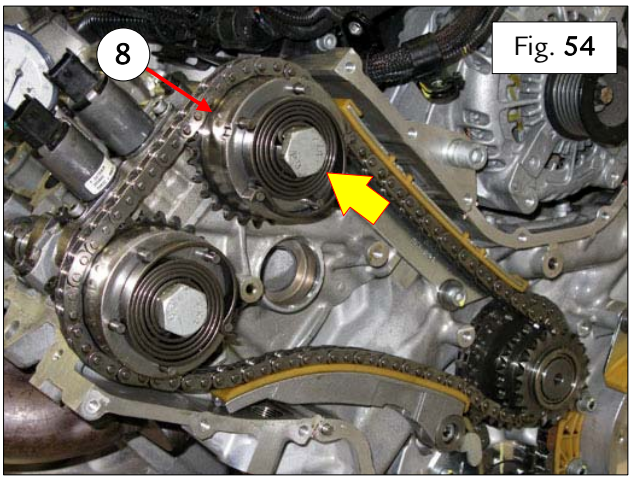


Fig. **54**

1A.132 With dial gauge **(A)** still inserted in the spark plug hole of cylinder **no. 1**, identify **TDC** – Fig. **55**.

1A.133 Place the dial gauge **(B)** on the exhaust side of cylinder **no. 1**, with the finger against the upper surface of the bucket tappet of one of the exhaust valves – Fig. **55**.

1A.134 Starting from **TDC**, rotate the crankshaft first anticlockwise to move the piston by **5 mm**, then clockwise to move the piston by **3.24 mm**, to finish with the piston **1.76 mm** from the original position (corresponding to **15° before TDC**) – Fig. **55**.

1A.135 Reset the valve lift measurement dial gauge **(B)** – Fig. **55**.

1A.136 Rotate the crankshaft clockwise to close the exhaust valve completely – Fig. **55**.

1A.137 Dial gauge **(B)** should now indicate a value of **0.60 mm ± 0.08 mm** – Fig. **55**.

1A.138 Adjust the camshaft with a wrench applied to the specific seat to obtain the correct values – Fig. **55**.

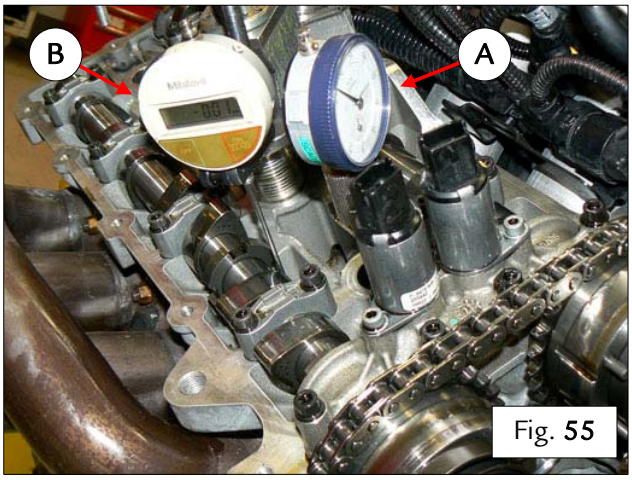


Fig. **55**

1A.139 Immobilise the exhaust camshaft with a retainer tool – Fig. **56**.

1A.140 Apply **SHELL HELIX ULTRA 5W/40** engine oil to the exhaust cam variable valve timing adjuster **(9)**, on the contact surface with the respective fastener screw – Fig. **56**.

1A.141 Pre-tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(9)** to a torque of **50 Nm** class A – Fig. **56**.

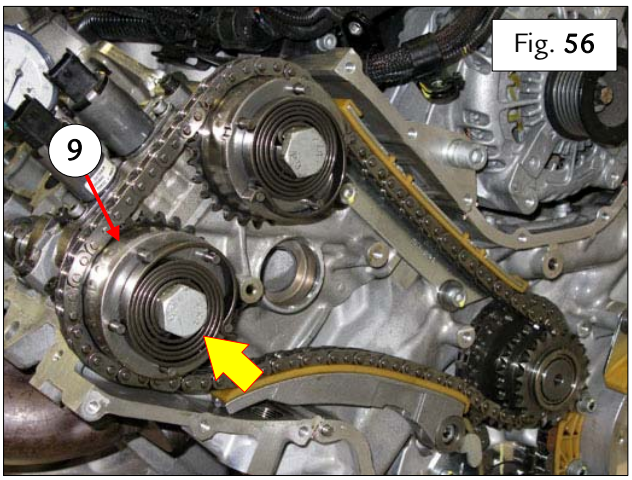
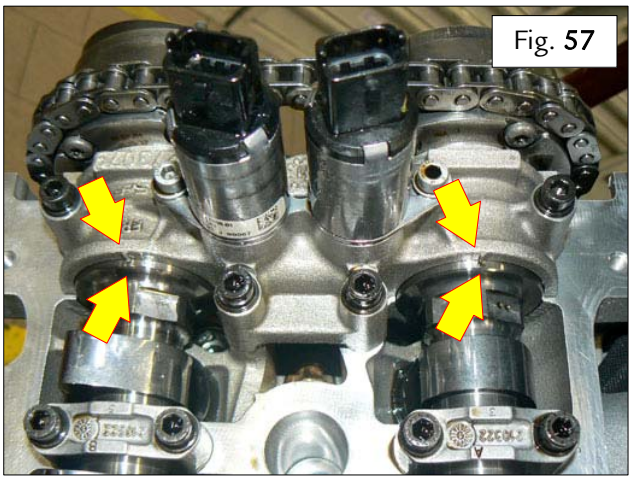


Fig. **56**

1A.142 Definitively tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(9)**, applying an angle of **70°**, and check that the resulting torque is **100 - 140 Nm** – Fig. **56**.

1A.143 Check that the indicated reference marks on the camshafts and on the respective front caps are approximately aligned – Fig. **57**.


Fig. **57**

1A.144 Repeat the timing adjustment procedure described above for the opposite cylinder bank.

1A.145 Perform a few crankshaft turns and recheck the timing values.

1A.146 Remove the dial gauges.

1A.147 Remove the plugs fitted previously – Fig. 58.

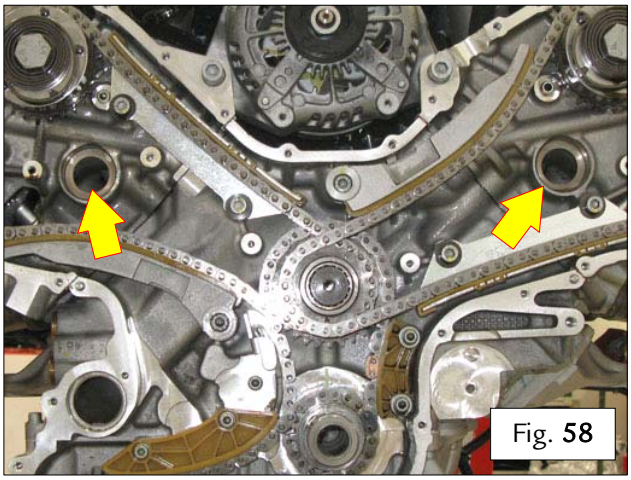


Fig. 58

1A.148 Refit the starter flywheel (as described in paragraph C4.02 step 2 of the 458 Italia Workshop manual).

1A.149 Refit the starter motor (as described in paragraph F2.05 step 2 of the 458 Italia Workshop Manual).

1A.150 Refit the engine oil pump (as described in paragraph B5.02 step 2 of the 458 Italia Workshop Manual).

1A.151 Refit the spark plugs (as described in paragraph A3.13 step 1 of the 458 Italia Workshop Manual)

1A.152 Refit the front crankcase cover (as described in paragraph B2.05 step 1 of the 458 Italia Workshop Manual).

1A.153 Refit the cylinder head covers (as described in paragraph B2.05 step 2 of the 458 Italia Workshop Manual).

1A.154 Refit the engine-gearbox assembly (as described in paragraph B2.02 step 1 of the Workshop Manual for the 458 Spider).

1A.155 Connect the DEIS tester to the diagnostic socket of the vehicle (as described in paragraph F2.10 of the 458 Italia Workshop Manual)

1A.156 With the DEIS tester perform the "30_SHORT TRIP Procedure check tank seal" cycle and the "50_Check fuel pressure" cycle.

1A.157 Perform a visual inspection for oil and fluid leaks in the underbody and engine compartment.

1A.158 Check the correctness and compliance of the pipe connections in the underbody and engine compartment.

Technical Instruction for Ferrari California

To perform the operations the **following Crankshaft KIT Part number 70002480** is necessary, valid for vehicle **Ferrari California**

- IMPORTANT -

The following operation must be performed in a clean area suitable for the procedure itself, wearing professional disposable powderless nitrile gloves. Check the condition of the gloves used frequently and replace if excessively soiled or damaged.

- IMPORTANT -

At each step in the removal procedure, note the positions of screws, brackets, protective braids, sheaths and clamps to ensure correct, rapid reassembly.

- IMPORTANT -

For each removed component, collect the fasteners and washers in a separate container to maintain order during the procedure and to prevent the possibility of subsequent fastener installation errors.

- IMPORTANT -

During reassembly, replace all seals and gaskets for the components removed.

2B.1 Remove the engine-gearbox assembly (as described in paragraph **B2.01** step **1** of the Workshop Manual).

2B.2 Remove the intake manifold (as described in paragraph **B4.04** step **1** of the Workshop Manual).

2B.3 Remove the cylinder head covers (as described in paragraph **B2.03** step **1** of the Workshop Manual). **N.B.**: With the engine on the bench it is not necessary to remove the GDI high pressure pumps.

2B.4 Remove the spark plugs (as described in paragraph **A3.13** step **1** of the Workshop Manual).

2B.5 Remove both catalytic converters (as described in paragraph **B7.03** step **1** of the Workshop Manual)

2B.6 Remove the transmission housing (as described in paragraph **C4.03** step **1** of the Workshop Manual).

2B.7 Remove the flywheel (as described in paragraph **C4.04** step **1** of the Workshop Manual).

2B.8 Remove the water pump drive belt (as described in paragraph **A3.12** step **3** of the Workshop Manual).

2B.9 Remove the auxiliary utilities drive belt (as described in paragraph **A3.12** step **5** of the Workshop Manual).

2B.10 Remove the engine oil sump (as described in paragraph **B2.03** step **2** of the Workshop Manual).

2B.11 Remove the engine oil pump (as described in paragraph **B5.02** step **1** of the Workshop Manual).

2B.12 Remove the starter motor (as described in paragraph **F2.05** step **1** of the Workshop Manual).

2B.13 Remove the A.C. compressor (as described in paragraph **F5.03** step **1** of the Workshop Manual).

2B.14 Remove the power steering pump (as described in paragraph **D5.03** step **1** of the Workshop Manual).

2B.15 Select the trolley **AV 2621** – Fig. **1**.

2B.16 Select the crankcase support **AM 107064** and install on trolley **AV 2621** – Fig. **1**.

2B.17 Using suitable equipment for lifting the engine, position and fasten the engine on support **AM 107064** – Fig. **1**.

2B.18 Gather and secure the cables and pipes together – Fig. **1**.

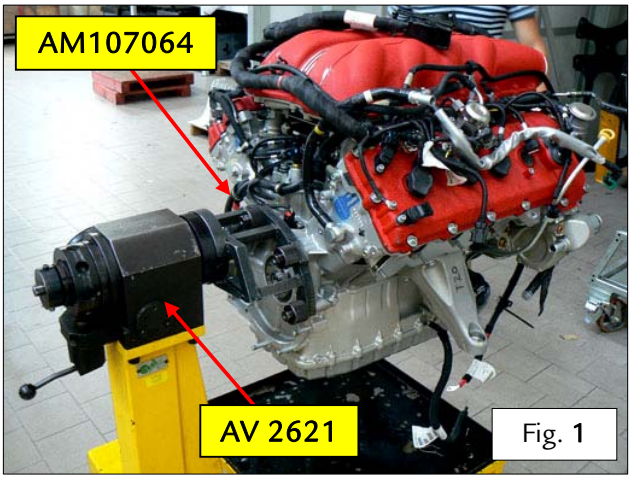


Fig. 1

2B.19 Disconnect the pipe **(1)** from the secondary air valve, by removing the indicated collar – Fig. **2**.

2B.20 Disconnect the pipe **(2)** from the secondary air valve – Fig. **2**.

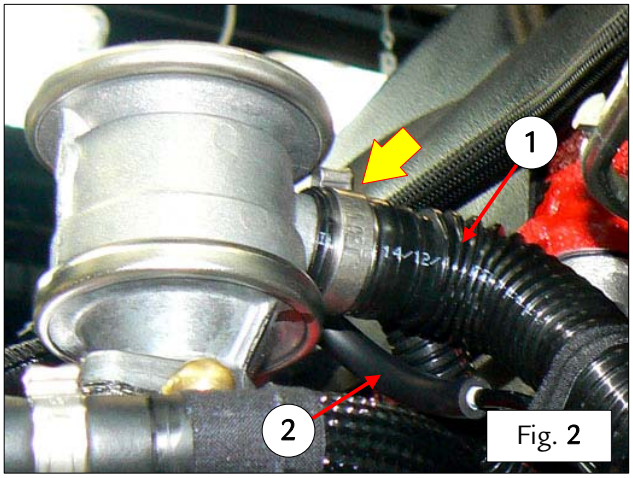


Fig. 2

2B.21 Disconnect the pipe **(3)** from the secondary air valve, by removing the indicated collar – Fig. **3**.

2B.22 Disconnect the pipe **(4)** from the secondary air valve – Fig. **3**.

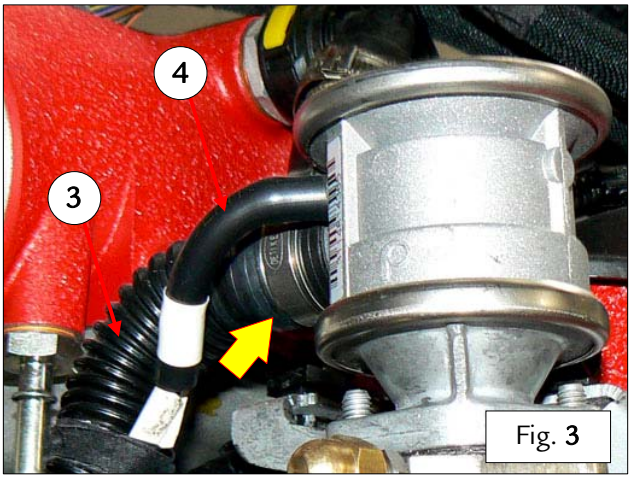


Fig. 3

2B.23 Detach and open the indicated clips – Fig. **4**.

2B.24 Remove the secondary air pipe assembly **(5)** – Fig. **4**.

2B.25 Disconnect the connector **(6)** – Fig. **4**.

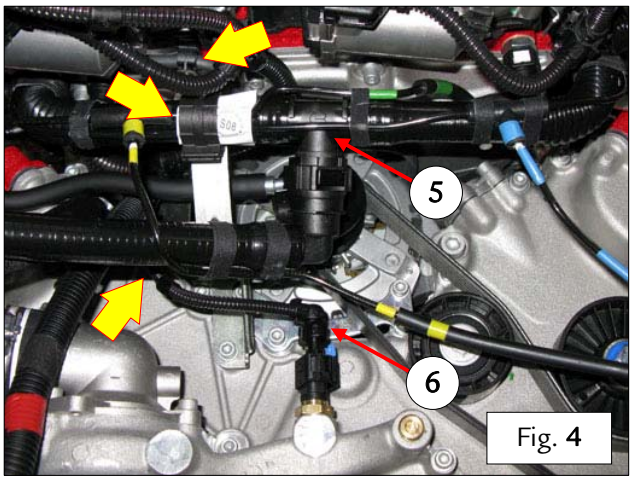


Fig. 4

2B.26 Remove the bracket (7) by undoing the respective indicated screw – Fig. 5.

2B.27 Remove the bracket (8), undoing the respective indicated screws – Fig. 5.

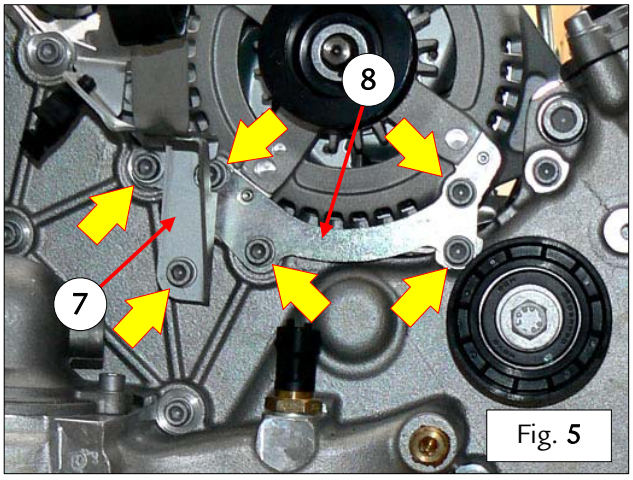


Fig. 5

2B.28 Before removing the timing system, it is necessary to take the cylinder no. 1 to TDC during ignition. Then mount the dial gauge (A) in the tool and insert the assembly in the spark plug of the cylinder no. 1 – Fig. 6.

2B.29 Remove the dial gauge – Fig. 6.

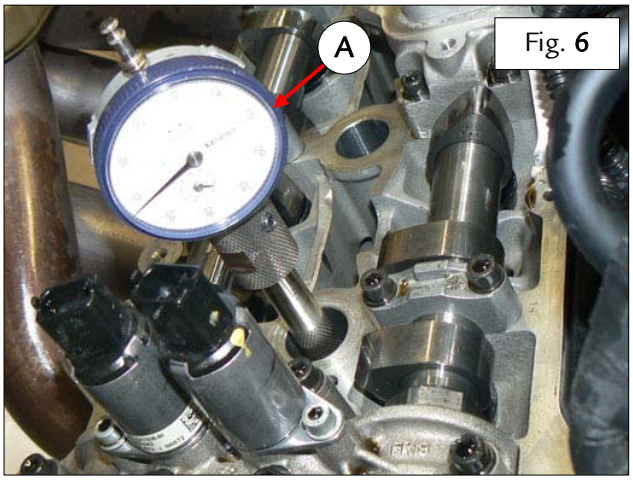


Fig. 6

2B.30 Loosen the screws (9) – Fig. 7.

2B.31 Undo the indicated screws (10) – Fig. 7.

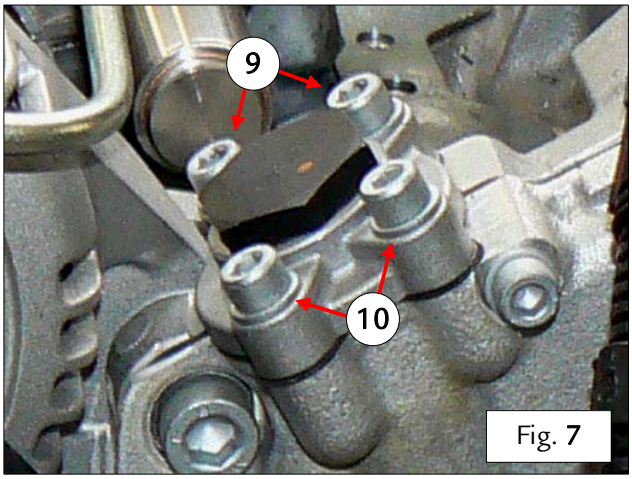


Fig. 7

2B.32 Remove the belt tensioner **(11)** by undoing the indicated screw – Fig. **8**.

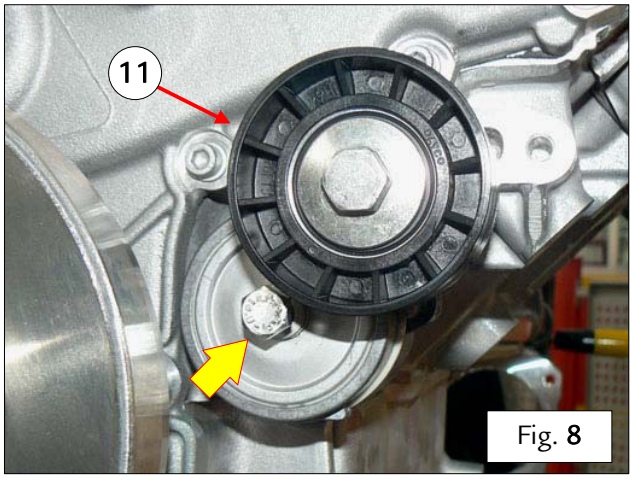


Fig. **8**

2B.33 Immobilise the rotation of the crankshaft.

2B.34 Remove the torsion damper **(12)** by undoing the indicated screw – Fig. **9**.

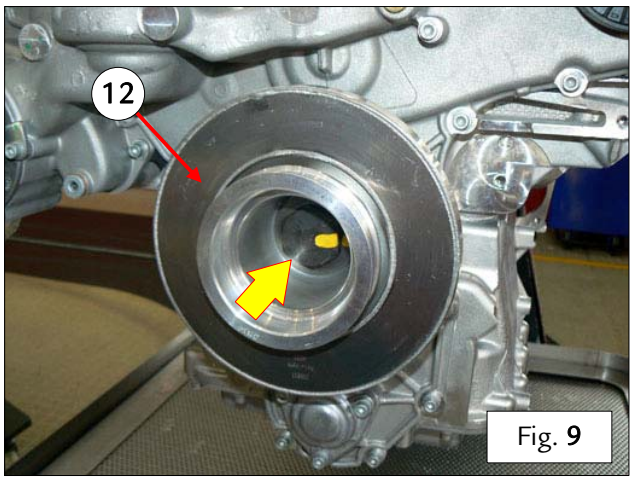
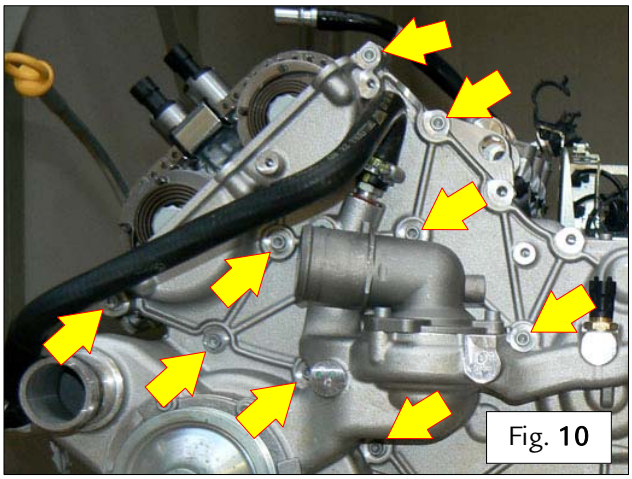


Fig. **9**

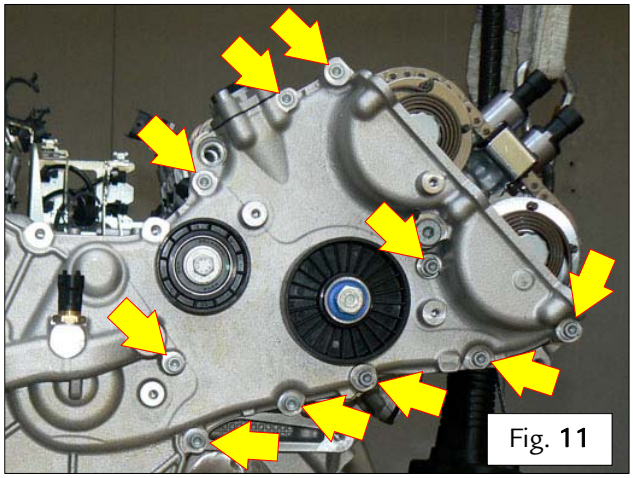
2B.35 Note the position of the indicated screws.

2B.36 Undo the indicated screws – Fig. **10**.


Fig. **10**

2B.37 Note the position of the indicated screws.

2B.38 Undo the indicated screws – Fig. 11.


Fig. 11

2B.39 Note the position of the indicated screws.

2B.40 Undo the screws marked by red arrows and remove the cover (16) – Fig. 12.

2B.41 Undo the indicated screws – Fig. 12.

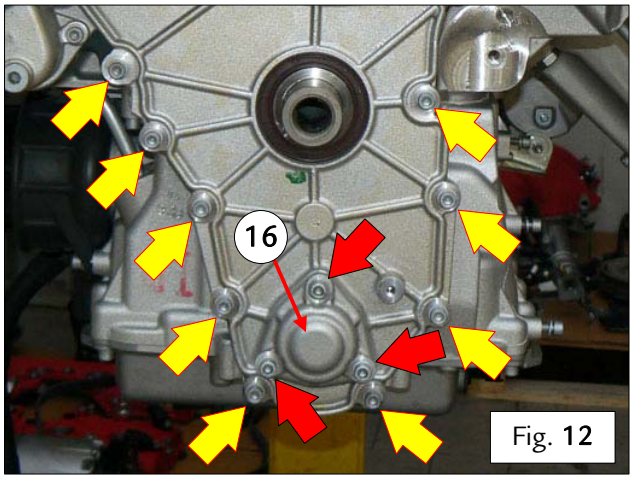


Fig. 12

2B.42 Prise off and carefully remove the front cover.

2B.43 Remove the strip (13) – Fig. 13.

2B.44 Remove the strip (14) – Fig. 13.

2B.45 Remove the strip (15) – Fig. 13.

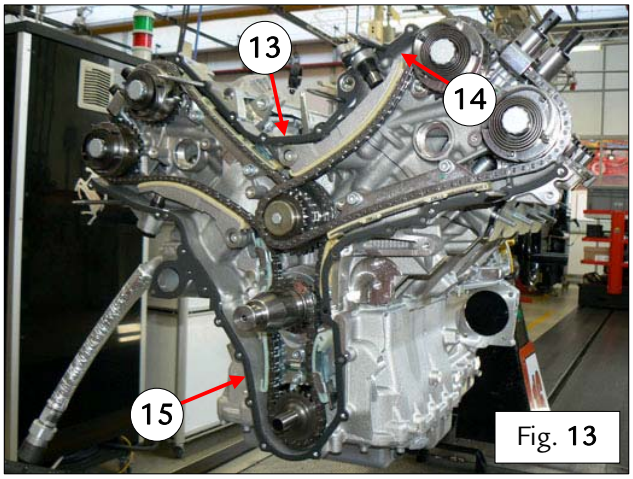
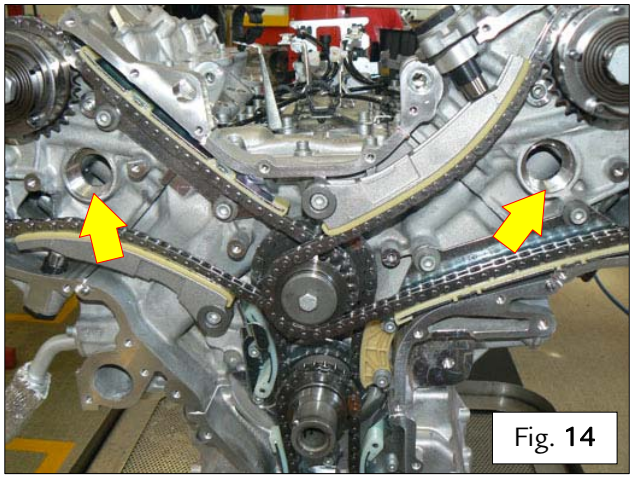


Fig. 13

2B.46 Plug the indicated water ducts on the cylinder heads appropriately – Fig. **14**.


Fig. **14**

2B.47 Unfasten the engine service cable **(17)** by undoing the indicated screw – Fig. **15**.

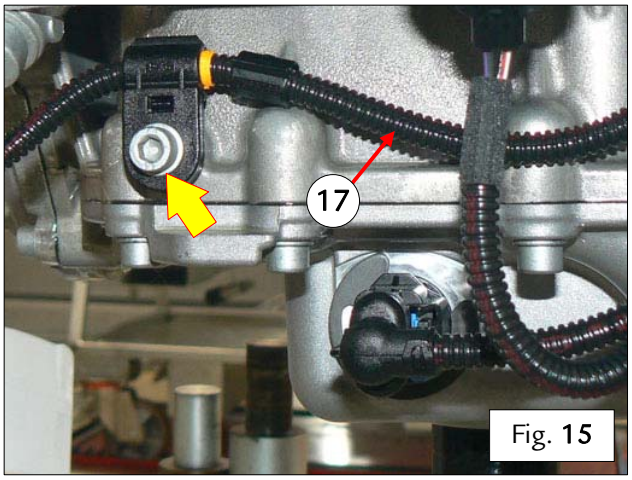


Fig. **15**

2B.48 Unfasten the engine service cable **(17)** by undoing the indicated screws – Fig. **16**.

2B.49 Gather the engine service cable in the flywheel side – Fig. **16**.

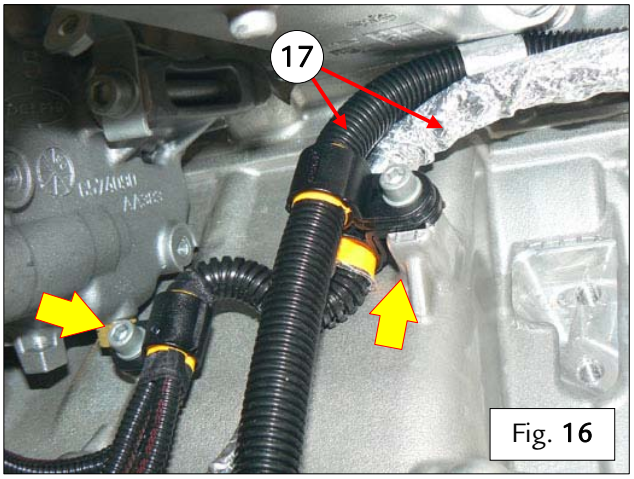


Fig. **16**

2B.50 Remove the engine oil level rod **(18)** by removing the indicated snap ring – Fig. **17**

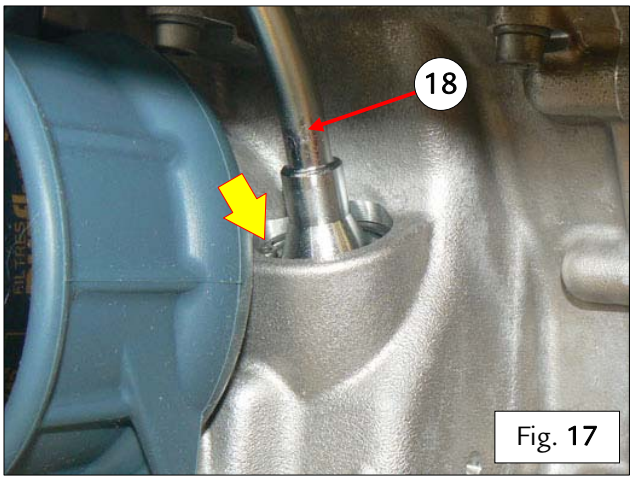


Fig. **17**

2B.51 Loosen the upper tensioner **(19)** – Fig. **18**.

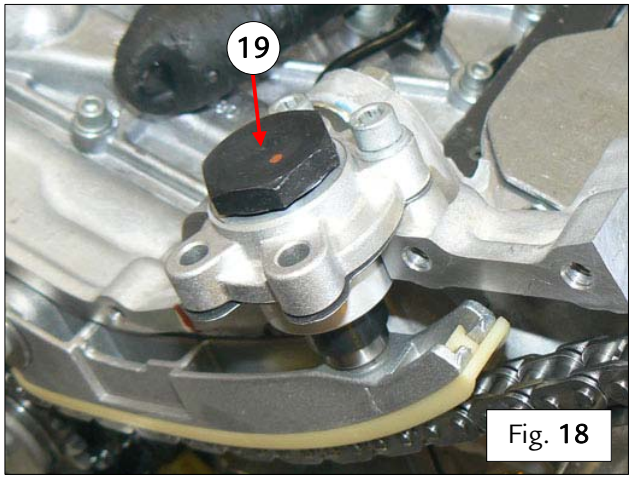


Fig. **18**

2B.52 Loosen the lower tensioner **(20)** – Fig. **19**.

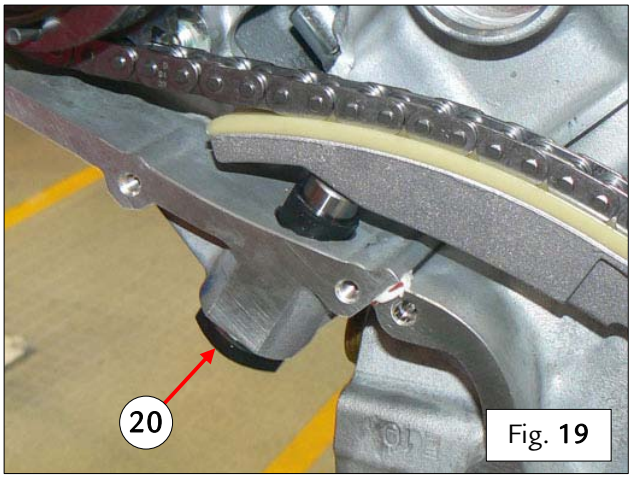


Fig. **19**

2B.53 **UP TO ENGINE No. 166072**, remove the fixed shoe **(21)**, undoing the indicated screws – Fig. **20**.

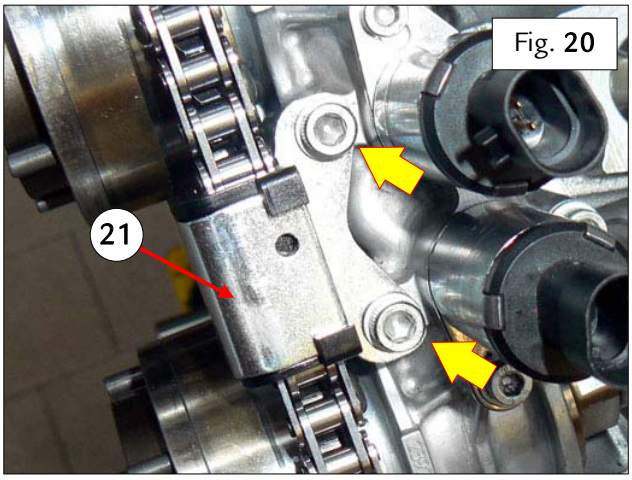


Fig. **20**

2B.54 Immobilise the camshafts with a retainer tool – Fig. **21**.

2B.55 Remove the mobile shoe **(22)**, undoing the respective screw indicated – Fig. **21**.

2B.56 Loosen the indicated screw fastening the intake cam variable valve timing adjuster **(23)** – Fig. **21**.

2B.57 Undo the indicated screw fastening the exhaust cam variable valve timing adjuster **(24)** – Fig. **21**.

2B.58 Remove the exhaust cam variable valve timing adjuster **(24)**, complete with chain **(25)**, retrieving the respective diamond finish washer – Fig. **21**.

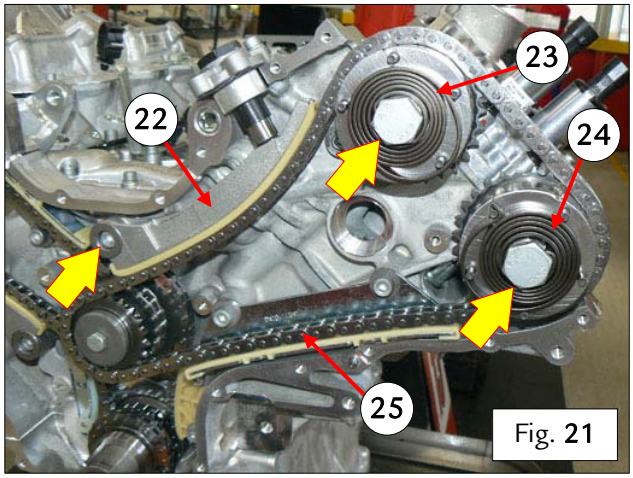


Fig. **21**

2B.59 **UP TO ENGINE No. 166072**, remove the fixed shoe **(26)**, undoing the indicated screws – Fig. **22**.

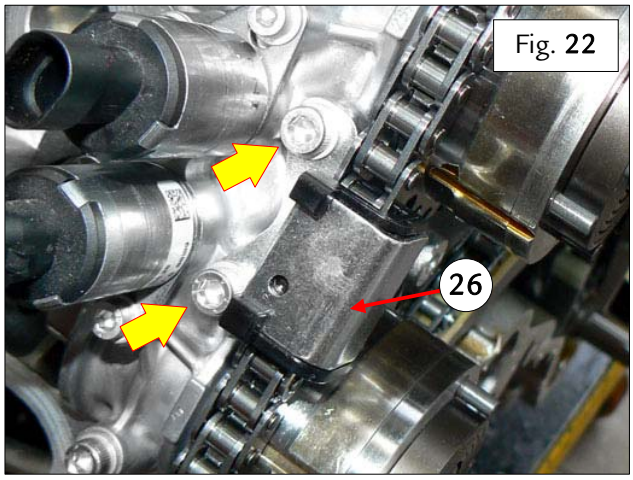


Fig. **22**

2B.60 Immobilise the camshafts with a retainer tool – Fig. **23**.

2B.61 Loosen the indicated screw fastening the intake cam variable valve timing adjuster **(27)** – Fig. **23**.

2B.62 Undo the indicated screw fastening the exhaust cam variable valve timing adjuster **(28)** – Fig. **23**.

2B.63 Remove the exhaust cam variable valve timing adjuster **(28)**, complete with chain **(29)**, retrieving the respective diamond finish washer – Fig. **23**.

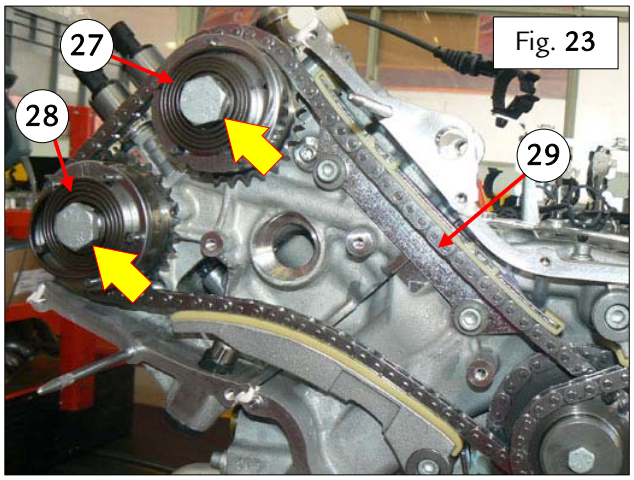


Fig. 23

2B.64 Undo the indicated screw – Fig. **24**.

2B.65 Remove the shoulder **(30)** – Fig. **24**.

2B.66 Remove the mobile shoe **(31)**, undoing the respective screws indicated – Fig. **24**

2B.67 Remove the fixed shoe **(32)**, undoing the respective screws indicated – Fig. **24**

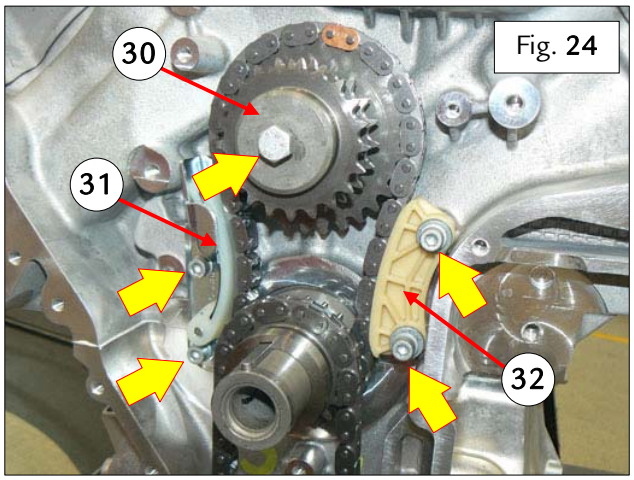


Fig. 24

2B.68 Remove the fixed shoe **(33)**, undoing the respective screws indicated – Fig. **25**.

2B.69 Remove the mobile shoe **(34)**, undoing the respective screws indicated – Fig. **25**

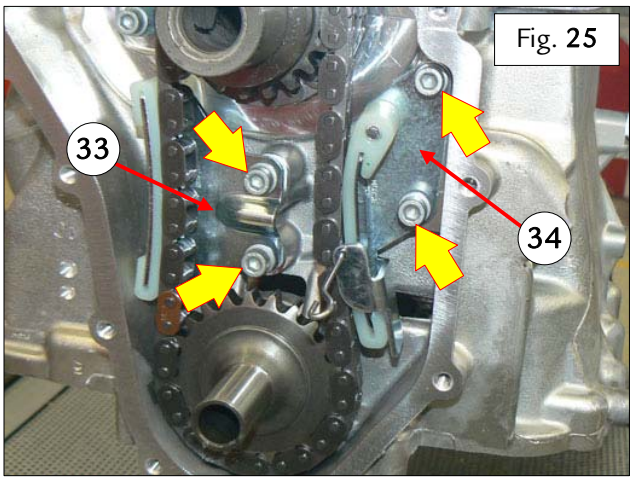
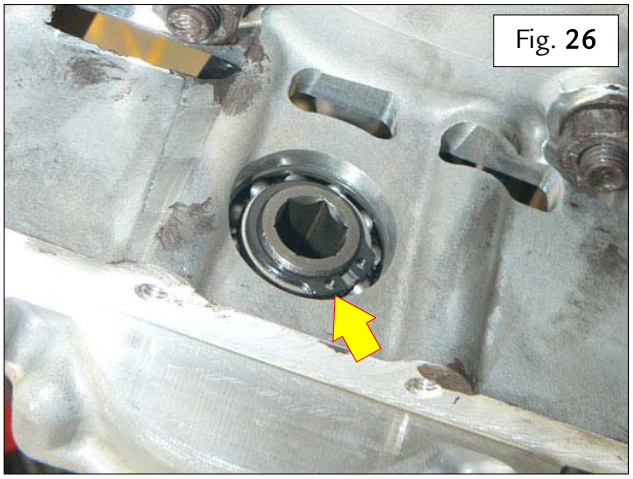
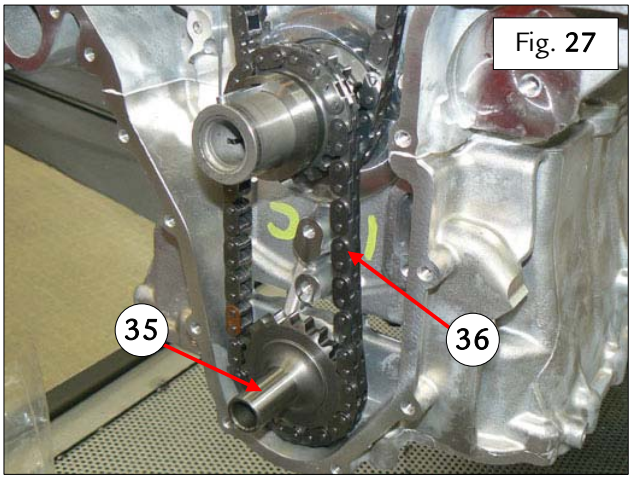


Fig. 25

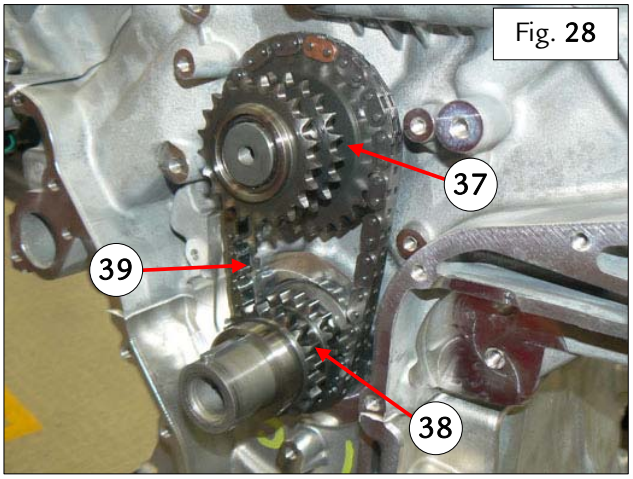
2B.70 Remove the indicated snap ring on the drive gear of the oil pump – Fig. **26**.



2B.71 Pull out the drive gear **(35)** of the oil pump complete with chain **(36)** – Fig. **27**.



2B.72 Simultaneously, remove the gear wheel **(37)** from the idler spindle and the gear wheel **(38)** from the crankshaft, complete with the chain **(39)** – Fig. **28**.



2B.73 Undo the indicated screws, retrieving the brackets **(40)** – Fig. **29**.

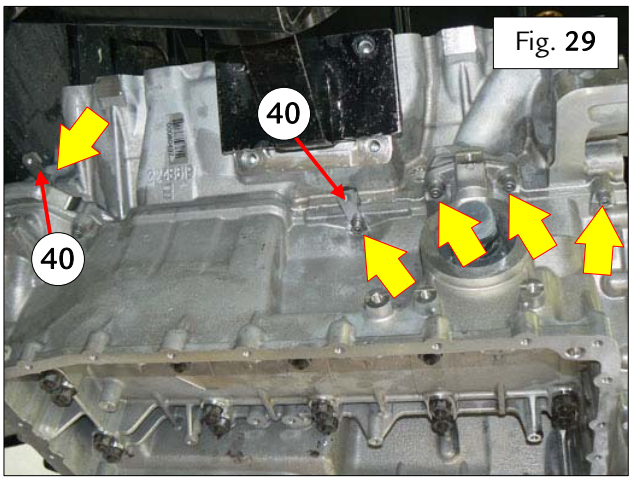
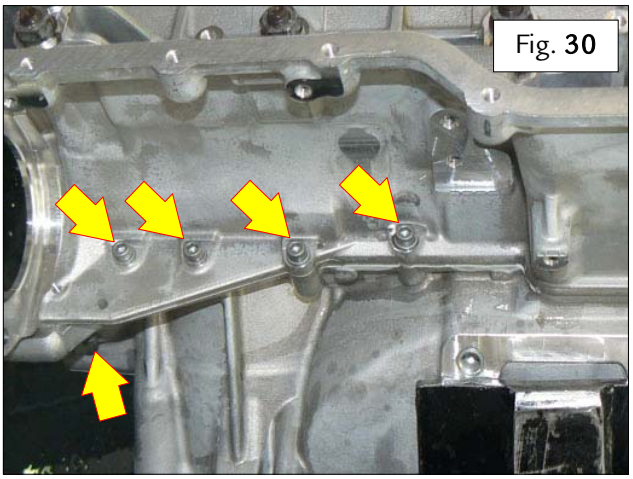
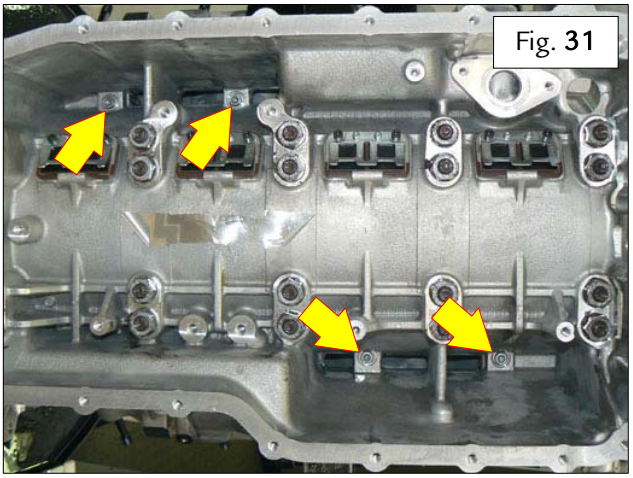


Fig. 29

2B.74 Undo the indicated screws – Fig. **30**.


Fig. 30

2B.75 Undo the indicated screws – Fig. **31**.


Fig. 31

2B.76 Unscrew the torques of the indicated nuts, retrieving the respective washers – Fig. **32**.

2B.77 Remove the lower crankcase shell **(41)**, easing carefully off the relative stud bolts – Fig. **32**.

2B.78 Retrieve the half-bearings and the shims from the lower crankcase shell – Fig. **32**.

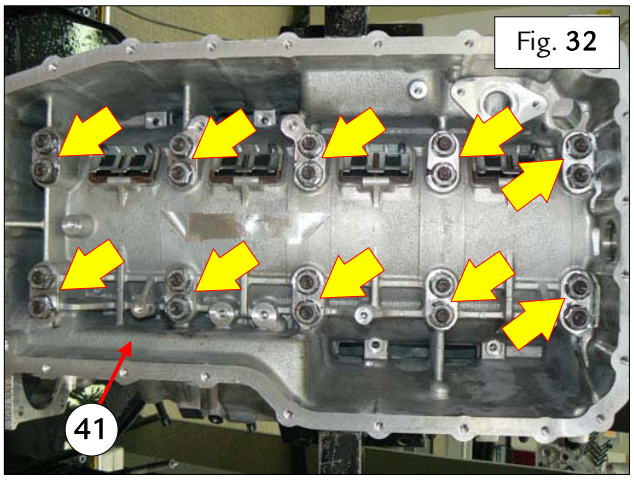


Fig. 32

2B.79 Turn the crankshaft to allow access to all the indicated screws fastening the big end caps **(42)** – Fig. **33**.

2B.80 Note the number of the respective cylinder on each big end cap **(42)** – Fig. **33**.

2B.81 Remove all the big end caps **(42)**, undoing the indicated screws – Fig. **33**.

2B.82 Remove the crankshaft **(43)** – Fig. **33**.

2B.83 Retrieve the half-bearings from the connecting rods and from the big end caps – Fig. **33**.

2B.84 Retrieve the half-bearings and the shims from the crankcase – Fig. **33**.

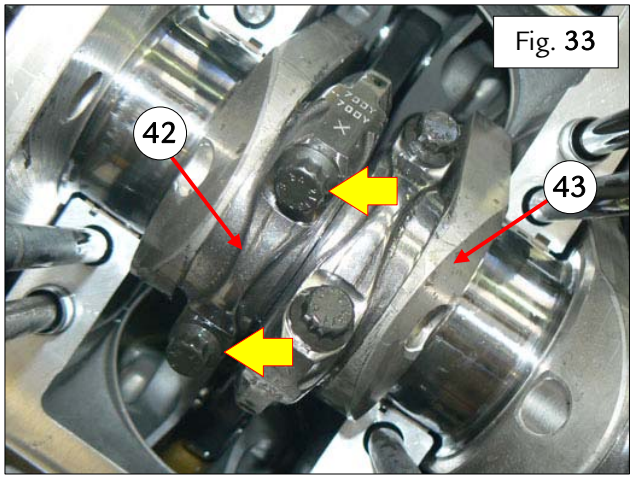


Fig. 33

2B.85 Replace the crankshaft, the connecting rod half-bearings and the upper and lower crankshaft half-bearings.

- IMPORTANT -

During reassembly, replace all seals and gaskets for the components removed.

- IMPORTANT -

Thoroughly clean the seats for the connecting rod half-bearings and the crankcase half-bearings on the respective components.

2B.86 Fit the new upper half-bearings **(44)** in the respective seats on the crankcase as shown below – Fig. **34**.

2B.87 Lubricate the new upper half-bearings **(44)** with **SHELL HELIX ULTRA 5W/40** engine oil – Fig. **34**.

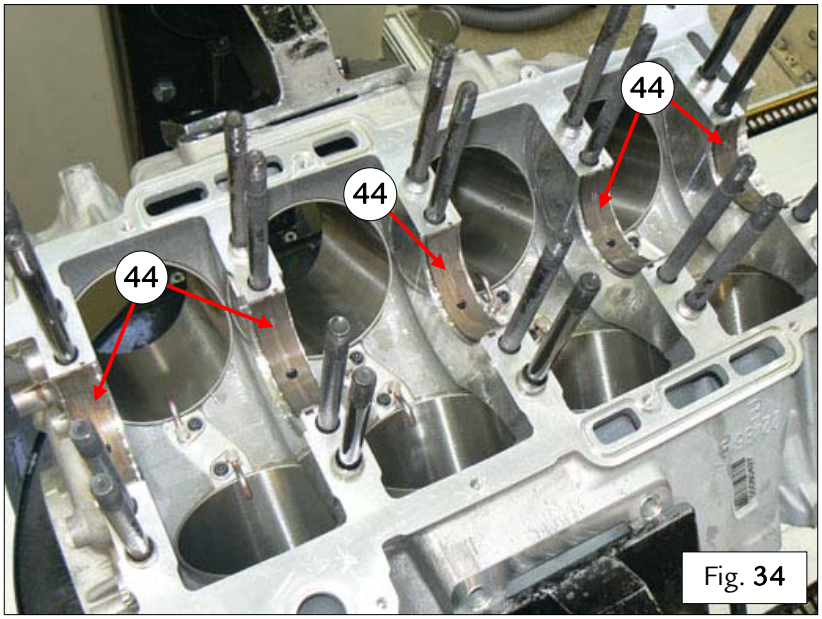


Fig. **34**

2B.88 Apply a small quantity of **MOLYKOTE BR2** on the crankcase to hold the upper shims **(45)** in place during assembly – Fig. **35**.

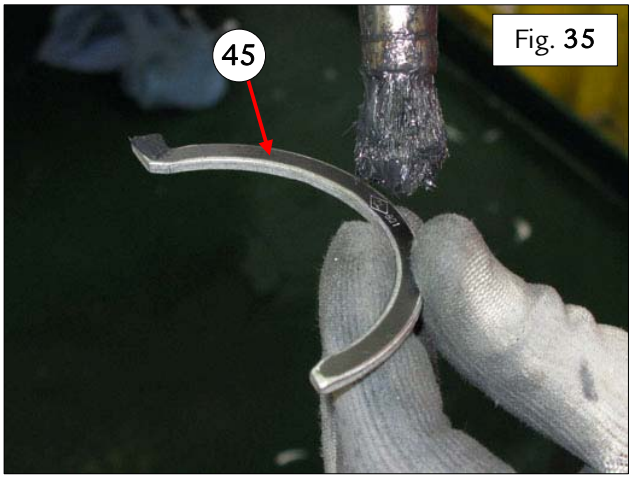


Fig. **35**

2B.89 Fit the upper shims **(45)** in the respective seats on the crankcase – Fig. **36**.

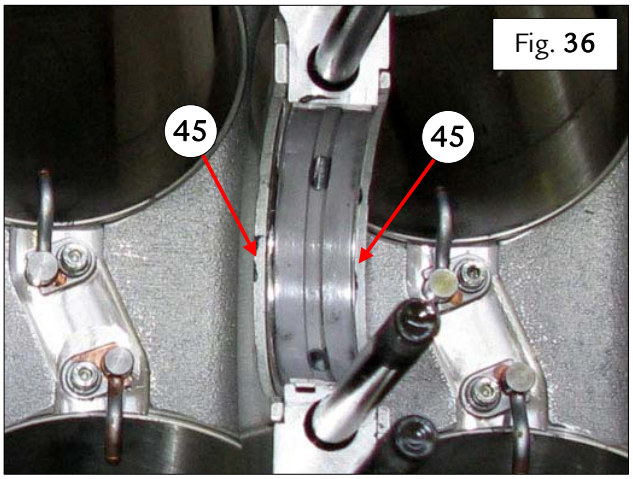


Fig. **36**

2B.90 Fit the new lower half-bearings (46) in the respective seats on the lower crankcase shell – Fig. 37.

2B.91 Lubricate the new lower half-bearings (46) with SHELL HELIX ULTRA 5W/40 engine oil – Fig. 37.

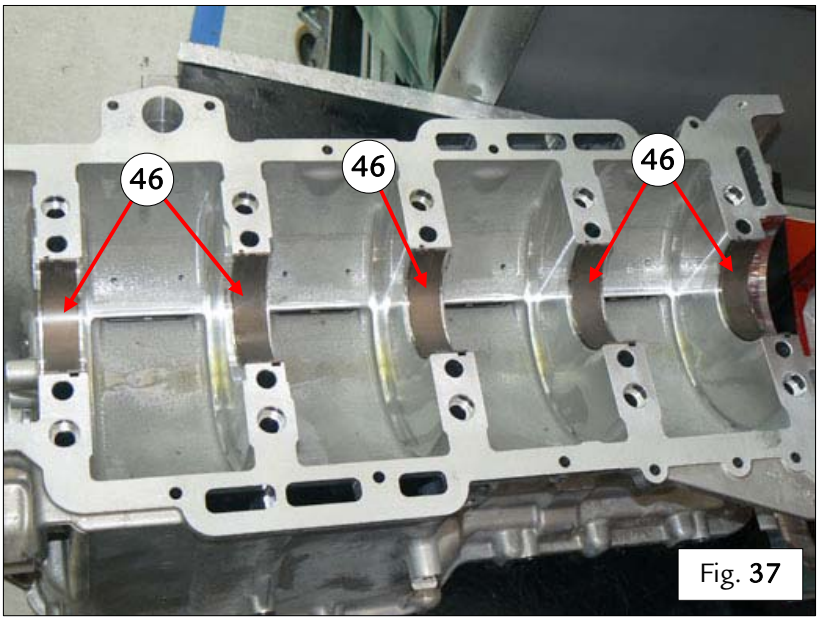


Fig. 37

2B.92 Apply a small quantity of MOLYKOTE BR2 to hold the lower shims (47) in place during assembly – Fig. 38.

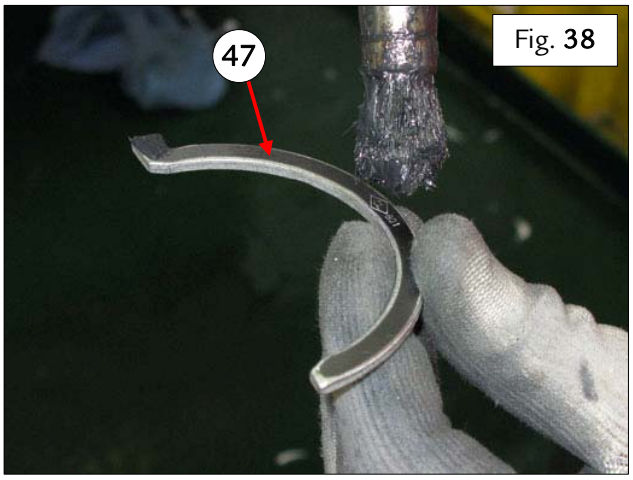


Fig. 38

2B.93 Fit the lower shims **(47)** in the respective seats on the lower crankcase shell – Fig. **39**.

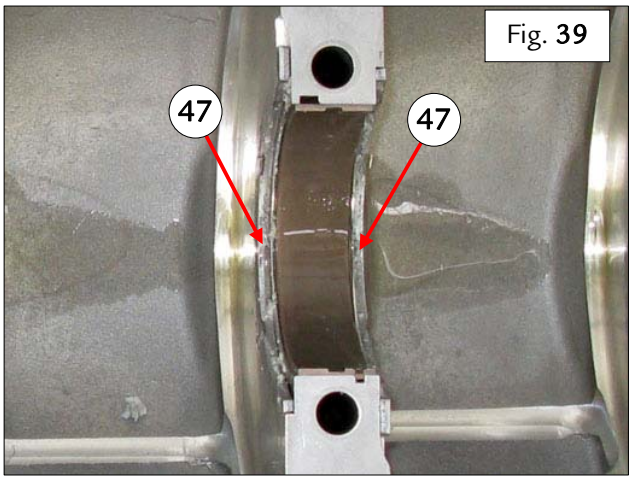


Fig. **39**

2B.94 Fit the new half-bearings **(48)** on the connecting rods – Fig. **40**.

2B.95 Lubricate the new half-bearings **(48)** with **SHELL HELIX ULTRA 5W/40** engine oil – Fig. **40**.

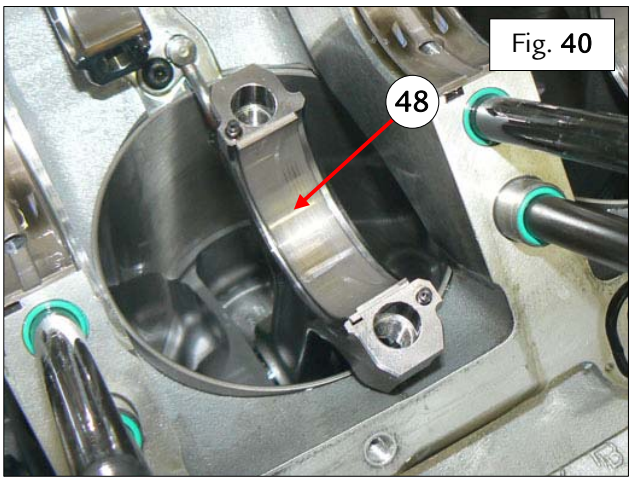


Fig. **40**

2B.96 Fit the crankshaft, working with the utmost care not to knock the shims out of place on the crankcase.

2B.97 Fit the new half-bearings **(49)** on the big end caps – Fig. **41**.

2B.98 Lubricate the new half-bearings **(49)** with **SHELL HELIX ULTRA 5W/40** engine oil – Fig. **41**.

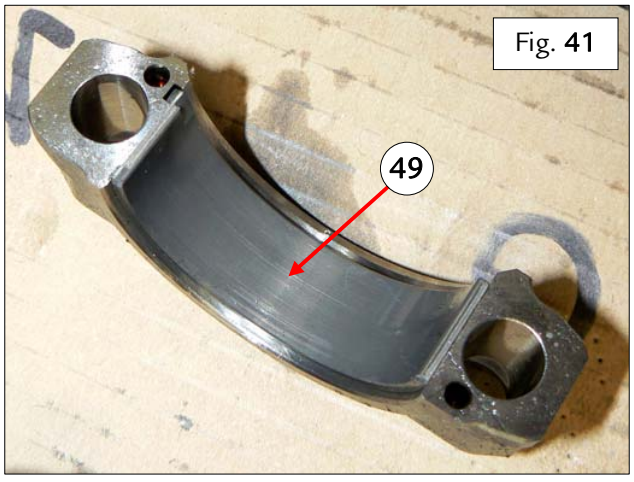


Fig. **41**

2B.99 Check that the mating surfaces between the connecting rod shanks and the respective big end caps are clean and in good condition – Fig. **42**.

2B.100 Lubricate the crankshaft **(43)** at the interface points with the big end caps **(42)** with **SHELL HELIX ULTRA 5W/40** engine oil – Fig. **42**.

2B.101 Matching the parts correctly using the references noted during removal, fit the big end caps **(42)**, partially tightening the respective screws indicated – Fig. **42**.

2B.102 Pre-tighten all the indicated screws fastening the big end caps **(42)** to a first pre-tightening torque of **20 Nm ± 1.5 Nm** – Fig. **42**.

2B.103 Pre-tighten all the indicated screws fastening the big end caps **(42)** to a second pre-tightening torque of **30 Nm ± 1.5 Nm** – Fig. **42**.

2B.104 Definitively tighten all the indicated screws fastening the big end caps **(42)**, applying an angle of **58° ± 1°** – Fig. **42**.

2B.105 Check that the resulting tightening torque is **70 Nm ± 15 Nm** – Fig. **42**.

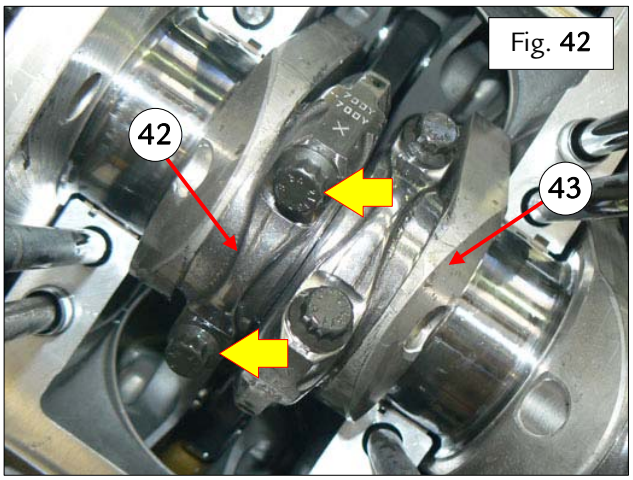


Fig. **42**

2B.106 After fastening the connecting rod caps check the endfloat of the connecting rods with the thickness gauges: the value should be between **0.200÷0.339 mm**.

2B.107 Install the strip **(34)** on the flywheel side crankshaft – Fig. **43**.

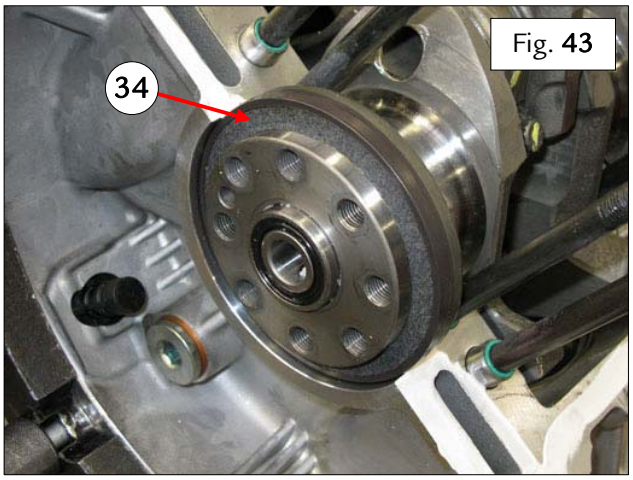


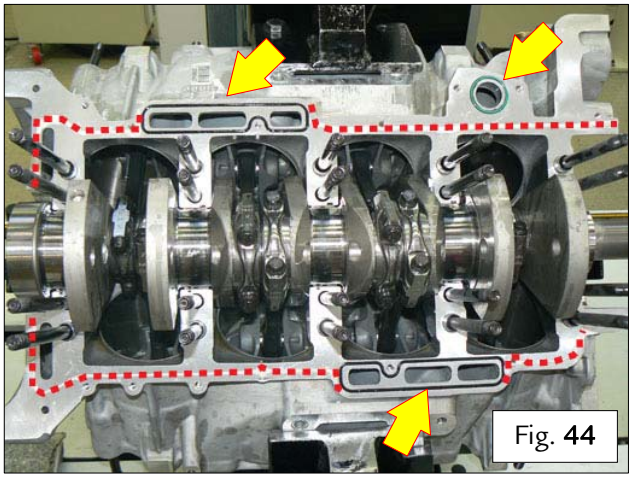
Fig. **43**

2B.108 Using a cloth moistened with heptane and compressed air, thoroughly clean all the mating surfaces on the crankcase and lower crankcase shell.

2B.109 Using a cloth moistened with heptane and compressed air, thoroughly clean all the nuts and respective washers for fastening the lower crankcase shell.

2B.110 Apply **CAF 4** paste to the crankcase as indicated by the dotted lines to form an uninterrupted bead of sealant of uniform thickness – Fig. **44**.

2B.111 Ensure the positioning of the three strips indicated – Fig. **44**.


Fig. **44**

2B.112 **Within 10 minutes** of applying **CAF 4** paste, carefully fit the lower crankcase shell **(41)** on the crankcase, inserting it on the respective stud bolts with care – Fig. **45**.

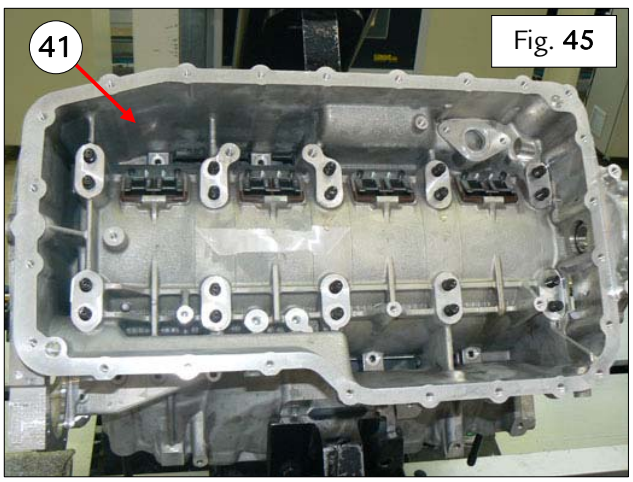


Fig. **45**

2B.113 Fit the indicated washers on the stud bolts, with the machined sides turned to face the lower crankcase shell **(41)** – Fig. **46**.

2B.114 Apply **MOLYKOTE 1000** grease to the upper surface of all the indicated washers and to the threads of all the stud bolts indicated – Fig. **46**.

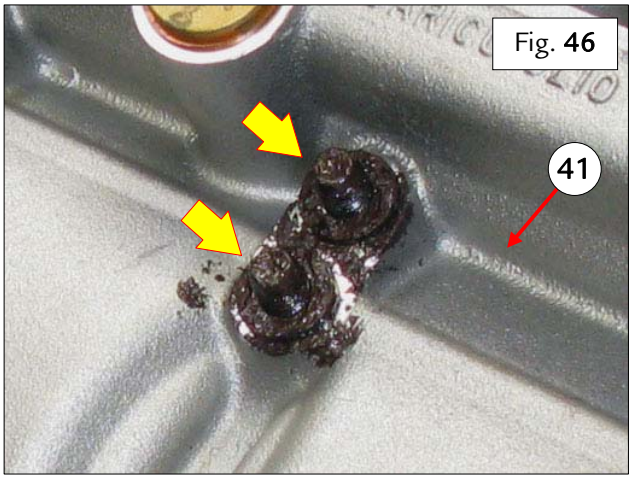


Fig. **46**

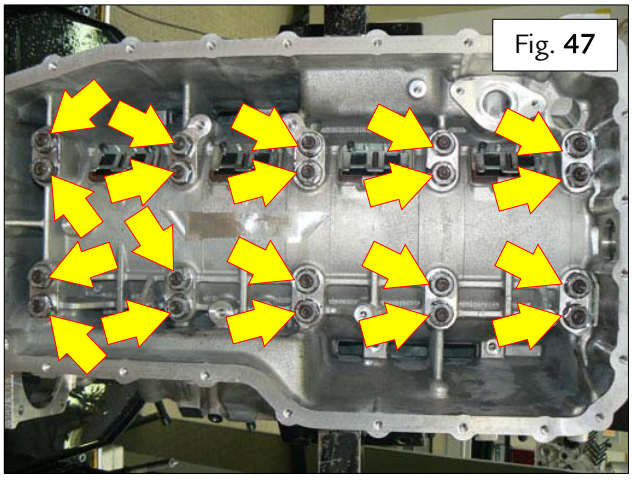
- IMPORTANT -

Tighten the nuts fastening the lower crankcase shell following the sequence indicated in Fig. 48 precisely.

2B.115 Pre-tighten the indicated nuts in the sequence given below, to a torque of **15 Nm** class A – Fig. **47**.

2B.116 Following the sequence given below, definitively tighten the internal nuts indicated, applying an angle of **135° ± 1°**, and check that the resulting tightening torque is **61.5 Nm ± 15 Nm** – Fig. **47**.

2B.117 Following the sequence given below, definitively tighten the external nuts indicated, applying an angle of **105° ± 1°**, and check that the resulting tightening torque is **57 Nm ± 19.5 Nm** – Fig. **47**.


Fig. **47**

2B.118 Carry out the tightening procedures described above following the indications given in the photo aside precisely – Fig. **48**.

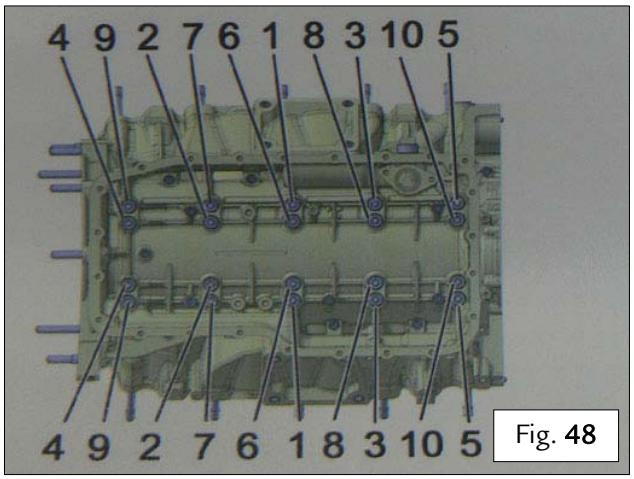
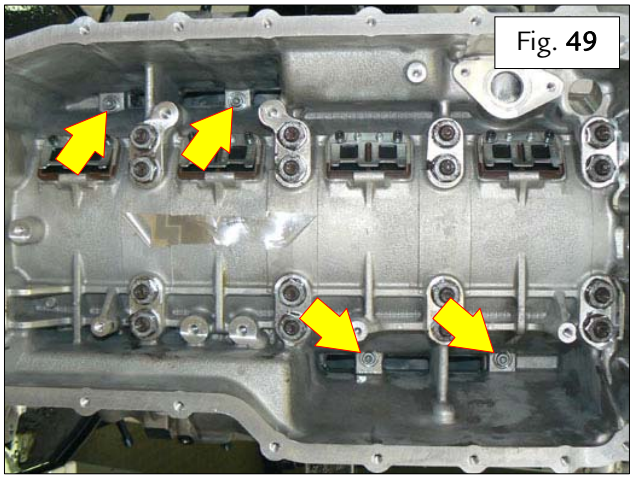


Fig. **48**

2B.119 Tighten the indicated screws to a torque of **10 Nm** class B – Fig. **49**.


Fig. **49**

2B.120 Tighten the indicated screws to a torque of **10 Nm** class B, after fitting the brackets **(40)** with the nut facing up – Fig. **50**.

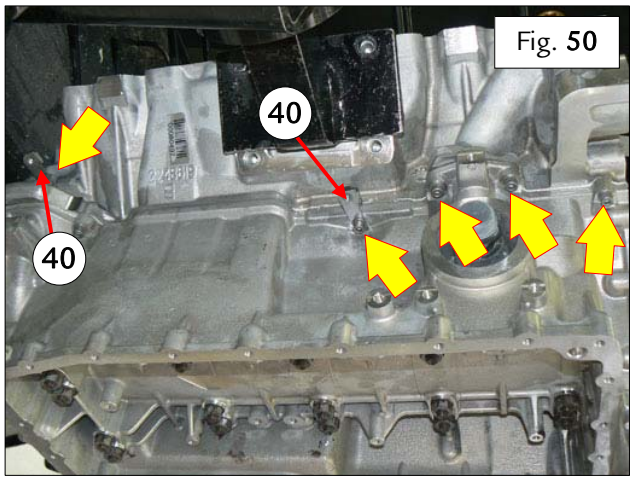
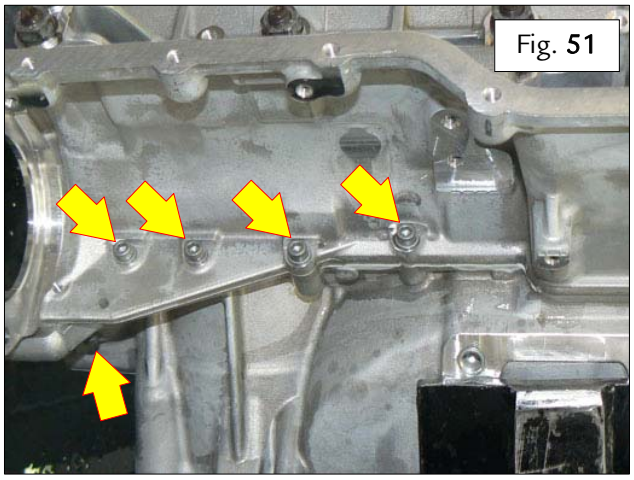


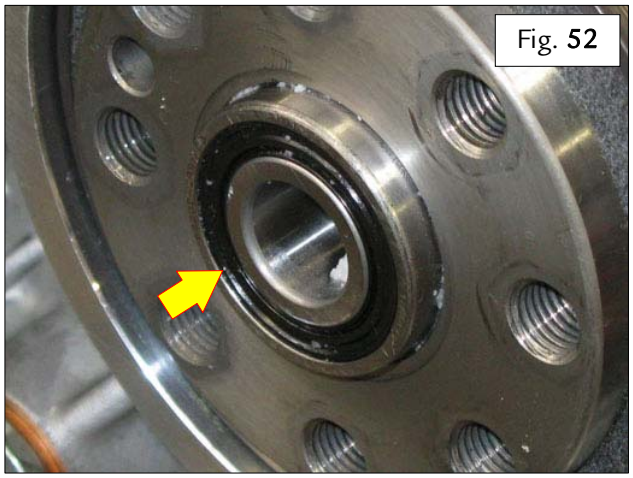
Fig. **50**

2B.121 Tighten the indicated screws to a torque of **10 Nm** class B – Fig. **51**.

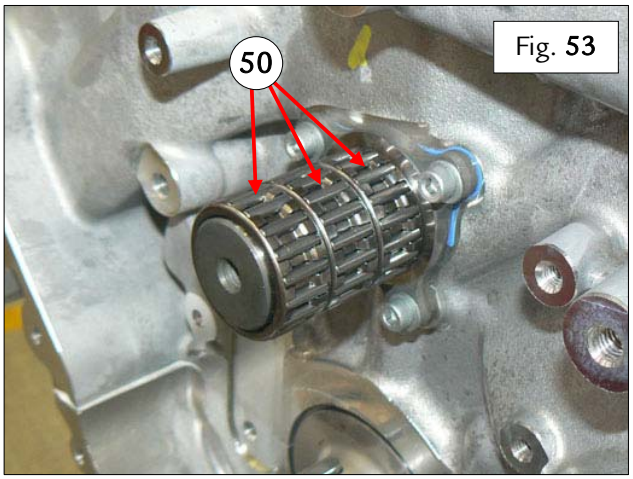


2B.122 Check the endfloat of the crankshaft: the value should be between **0.12÷0.24 mm**.

2B.123 Insert the bearing in the relative flywheel side seat of the new crankshaft – Fig. **52**.



2B.124 Ensure the positioning of the three bearings **(50)** – Fig. **53**.



2B.125 Simultaneously, insert the gear wheel **(37)** on the idler spindle and the gear wheel **(38)** on the crankshaft, complete with the chain **(39)** – Fig. **54**.

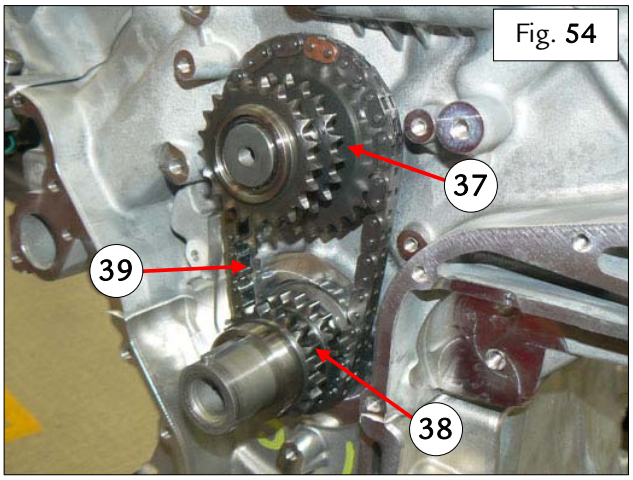


Fig. **54**

2B.126 Insert the drive gear **(35)** of the oil pump complete with chain **(36)** – Fig. **55**.

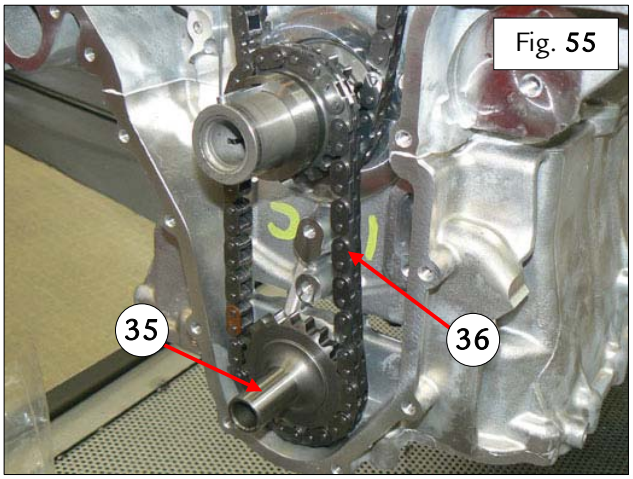
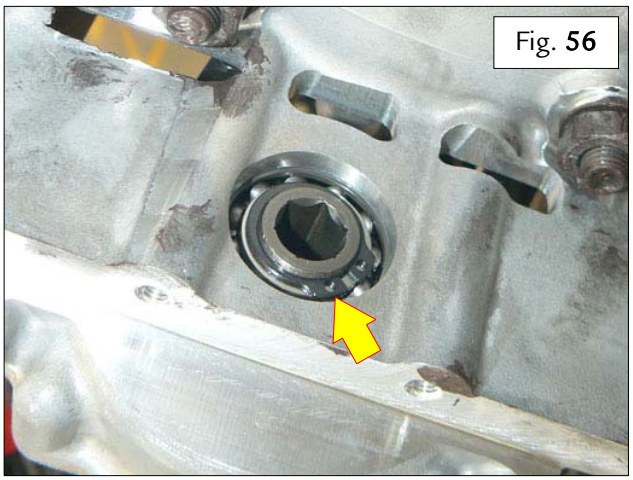


Fig. **55**

2B.127 Insert the indicated snap ring on the drive gear of the oil pump – Fig. **56**.


Fig. **56**

2B.128 Fit the fixed shoe **(33)**, tightening the respective screws indicated to a torque of **10 Nm** class B − Fig. **57**.

2B.129 Fit the mobile shoe **(34)**, tightening the respective screws indicated to a torque of **10 Nm** class B − Fig. **57**

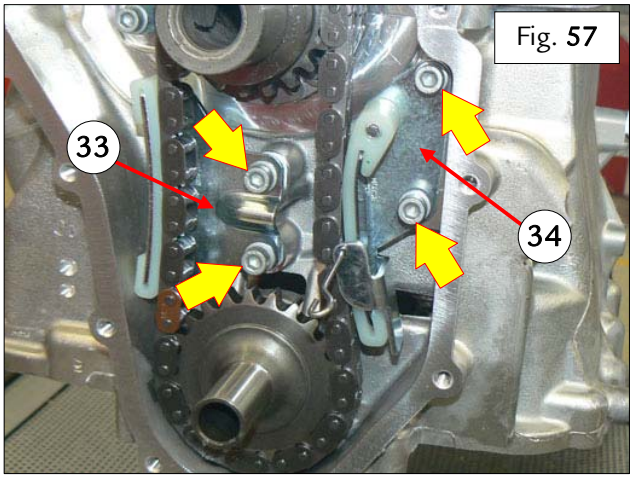


Fig. **57**

2B.130 Position the shoulder **(30)** then tighten the indicated screw to a torque of **25 Nm** class B − Fig. **58**

2B.131 Fit the mobile shoe **(31)**, tightening the respective screws indicated to a torque of **10 Nm** class B − Fig. **58**

2B.132 Fit the fixed shoe **(32)**, tightening the respective screws indicated to a torque of **10 Nm** class B − Fig. **58**

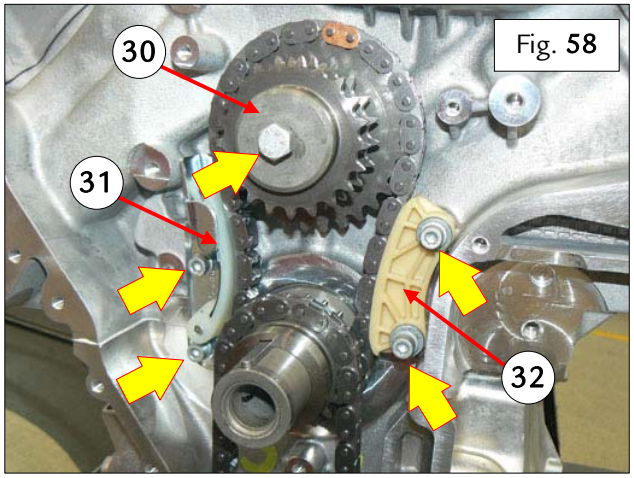


Fig. **58**

2B.133 Before refitting the timing system, it is necessary to take the cylinder **no. 1** to **TDC** during ignition. Then mount the dial gauge **(A)** in the tool and insert the assembly in the spark plug of the cylinder **no. 1** − Fig. **59**.

2B.134 Remove the dial gauge − Fig. **59**.

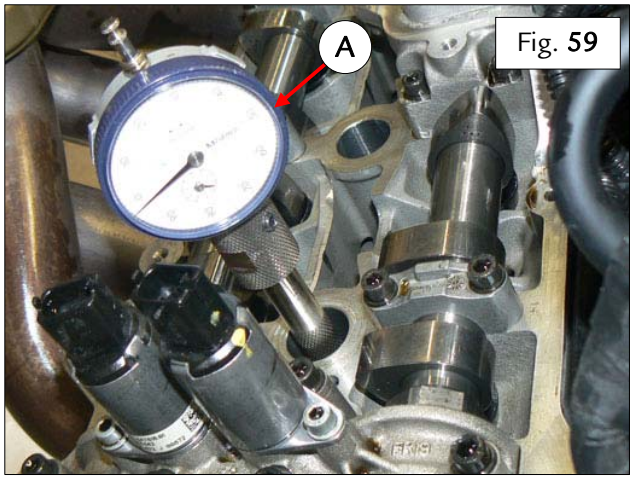


Fig. **59**

2B.135 Immobilise the camshafts with a retainer tool – Fig. **60**.

2B.136 Refit the exhaust cam variable valve timing adjuster **(28)**, complete with chain **(29)**, installing the respective diamond finish washer – Fig. **60**.

N.B.: the exhaust cam variable valve timing adjusters are distinguished by the red dot positioned on their rear side.

2B.137 Partially tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(28)** – Fig. **60**.

2B.138 Partially tighten the indicated screw fastening the intake cam variable valve timing adjuster **(27)** – Fig. **60**.

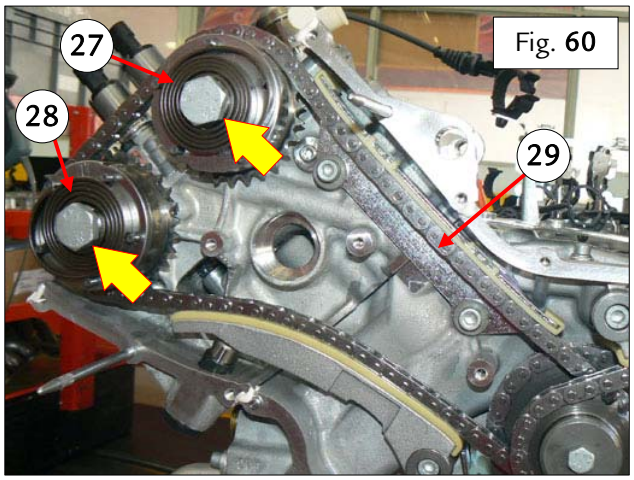


Fig. **60**

2B.139 **UP TO ENGINE No. 175732**, refit the fixed shoe **(26)**, tightening the indicated screws – Fig. **61**.

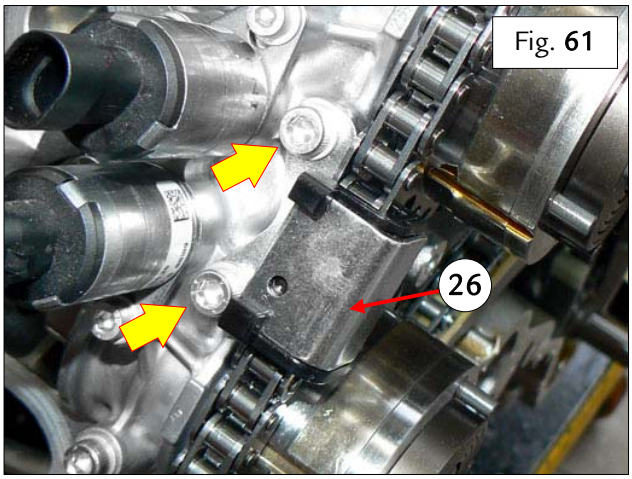


Fig. **61**

2B.140 Immobilise the camshafts with a retainer tool – Fig. **62**.

2B.141 Refit the exhaust cam variable valve timing adjuster **(24)**, complete with chain **(25)**, installing the respective diamond finish washer – Fig. **62**.

N.B.: the exhaust cam variable valve timing adjusters are distinguished by the red dot positioned on their rear side.

2B.142 Partially tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(24)** – Fig. **62**.

2B.143 Partially tighten the indicated screw fastening the intake cam variable valve timing adjuster **(23)** – Fig. **62**.

2B.144 Refit the mobile shoe **(22)**, tightening the respective screw indicated – Fig. **62**.

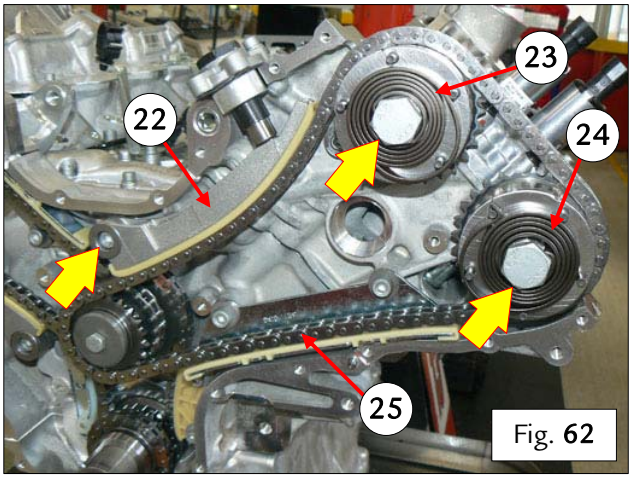


Fig. **62**

2B.145 **UP TO ENGINE No. 175732**, refit the fixed shoe **(21)**, tightening the indicated screws – Fig. **63**.

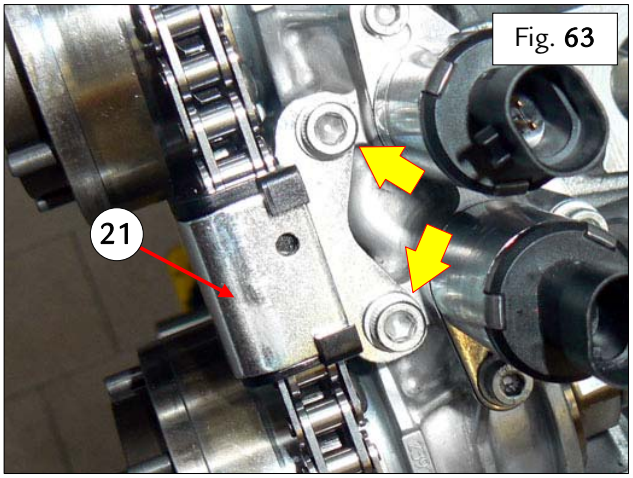


Fig. **63**

2B.146 Tighten the indicated screws to a torque of **10 Nm** class B then tighten the upper tensioner **(19)** to a torque of **40 Nm** class B – Fig. **64**.

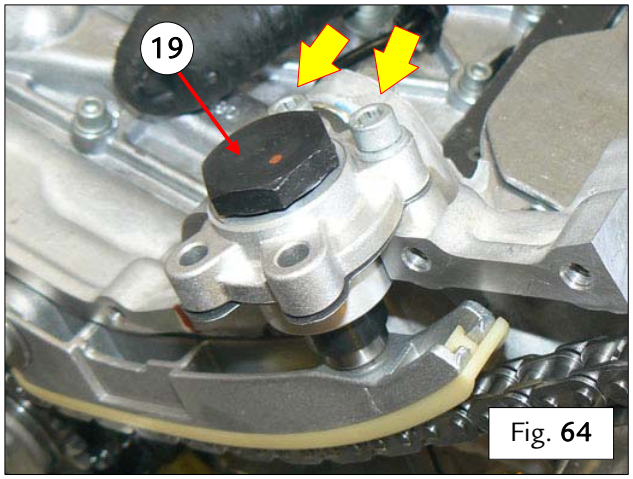


Fig. **64**

2B.147 Tighten the lower tensioner **(20)** to a torque of **40 Nm** class B – Fig. **65**.

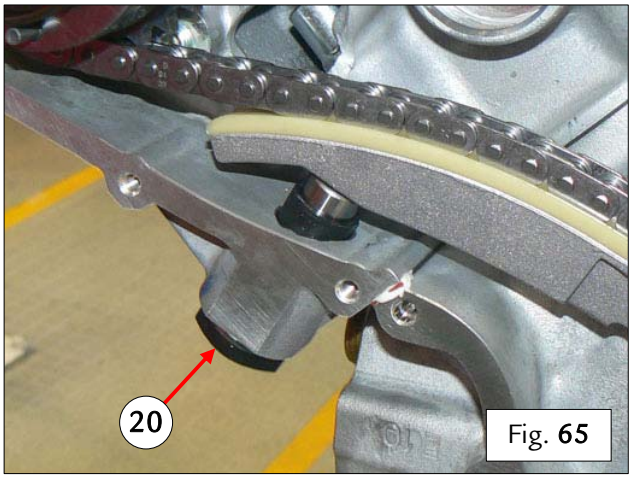
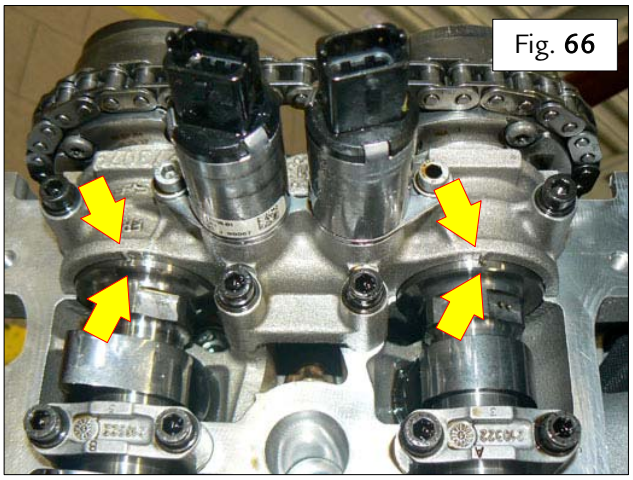


Fig. **65**

2B.148 Loosen the fastener screws of the adjusters then align the references on the shafts and on the front caps – Fig. **66**.

2B.149 Temporarily hand tighten the screws of the adjusters – Fig. **66**.


Fig. **66**

2B.150 Fit the dial gauge **(A)** in the tool, insert the assembly in the spark plug hole of cylinder **no. 1** and identify ignition **TDC** – Fig. **67**.

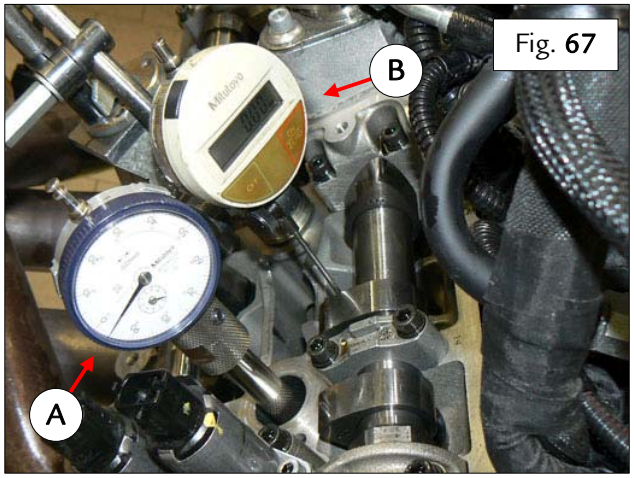


Fig. **67**

2B.151 Maintaining as perpendicular a position as possible relative to the tappet, place the finger of the dial gauge against the upper surface of the bucket tappet of one of the intake valves of cylinder **no. 1**, measure the valve lift and reset the dial gauge **(B)** at **TDC**. In this condition, the bucket tappets can rotate freely in their seats – Fig. **67**.

2B.152 Rotate the crankshaft clockwise by **360°** to approach the valve overlap phase, and check that the dial gauge **(B)** still indicates **zero** before the camshaft begins to open the valves – Fig. **67**.

2B.153 Rotate the crankshaft until the dial gauge **(A)** indicates **TDC.** In this condition, the dial gauges **(A)** and **(B)** must indicate **zero** – Fig. **67**.

2B.154 Rotate the crankshaft clockwise until dial gauge **(A)** indicates a value of **4.58 mm** (corresponding to **25°** after **TDC**) – Fig. **67**.

2B.155 Dial gauge **(B)** should now indicate a value of **0.70 mm ± 0.08 mm** – Fig. **67**.

2B.156 Adjust the camshaft with a wrench applied to the specific seat to obtain the correct values – Fig. **67**.

2B.157 Immobilise the intake camshaft with a retainer tool – Fig. **68**.

2B.158 Apply **SHELL HELIX ULTRA 5W/40** engine oil to the intake cam variable valve timing adjuster **(27)**, on the contact surface with the respective fastener screw – Fig. **68**.

2B.159 Pre-tighten the indicated screw fastening the intake cam variable valve timing adjuster **(27)** to a torque of **50 Nm** class A – Fig. **68**.

2B.160 Definitively tighten the indicated screw fastening the intake cam variable valve timing adjuster **(27)**, applying an angle of **70°**, and check that the resulting torque is **100 - 140 Nm** – Fig. **68**.

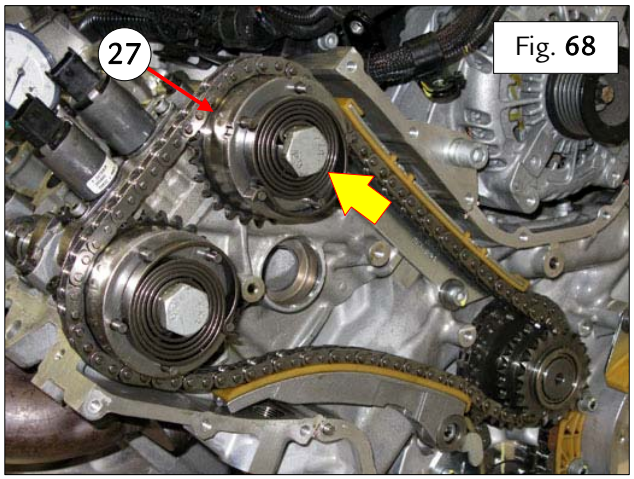


Fig. **68**

2B.161 With dial gauge **(A)** still inserted in the spark plug hole of cylinder **no. 1**, identify **TDC** – Fig. **69**.

2B.162 Place the dial gauge **(B)** on the exhaust side of cylinder **no. 1**, with the finger against the upper surface of the bucket tappet of one of the exhaust valves – Fig. **69**.

2B.163 Starting from **TDC**, rotate the crankshaft first anticlockwise to move the piston by **5 mm**, then clockwise to move the piston by **3.24 mm**, to finish with the piston **1.68 mm** from the original position (corresponding to **15°** before **TDC**) – Fig. **69**.

2B.164 Reset the valve lift measurement dial gauge **(B)** – Fig. **69**.

2B.165 Rotate the crankshaft clockwise to close the exhaust valve completely – Fig. **69**.

2B.166 Dial gauge **(B)** should now indicate a value of **0.60 mm ± 0.08 mm** – Fig. **69**.

2B.167 Adjust the camshaft with a wrench applied to the specific seat to obtain the correct values – Fig. **69**.

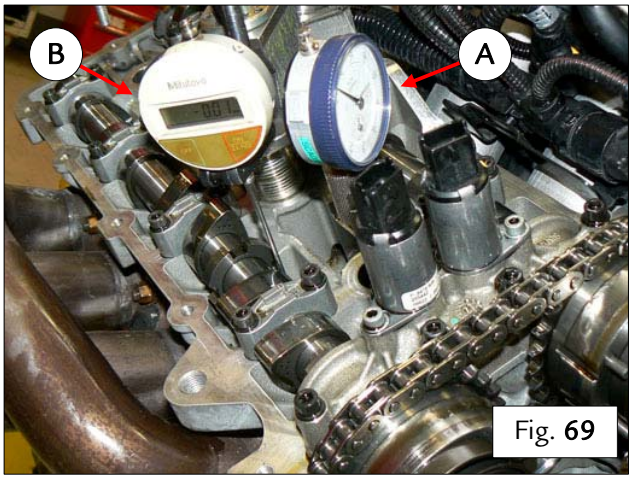


Fig. **69**

2B.168 Immobilise the exhaust camshaft with a retainer tool – Fig. **70**.

2B.169 Apply **SHELL HELIX ULTRA 5W/40** engine oil to the exhaust cam variable valve timing adjuster **(28)**, on the contact surface with the respective fastener screw – Fig. **70**.

2B.170 Pre-tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(28)** to a torque of **50 Nm** class A – Fig. **70**.

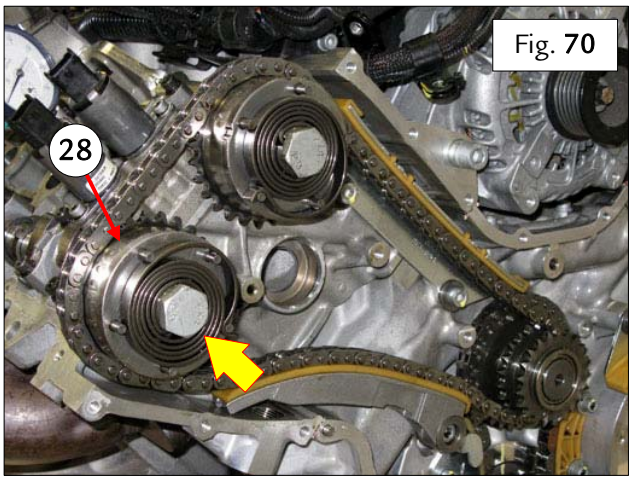
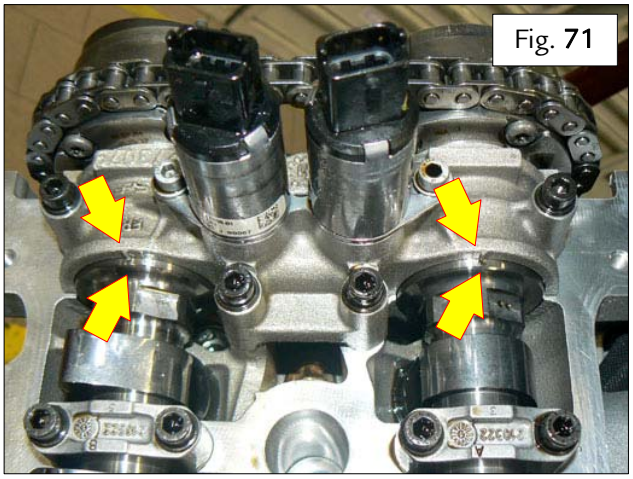


Fig. **70**

2B.171 Definitively tighten the indicated screw fastening the exhaust cam variable valve timing adjuster **(28)**, applying an angle of **70°**, and check that the resulting torque is **100 - 140 Nm** – Fig. **70**.

2B.172 Check that the indicated reference marks on the camshafts and on the respective front caps are approximately aligned – Fig. **71**.

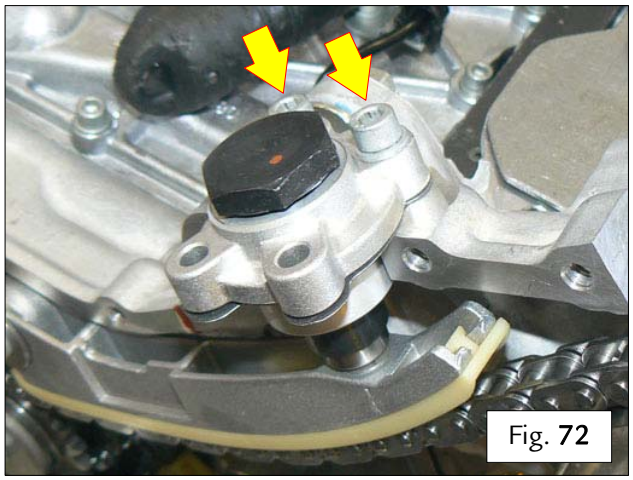

Fig. **71**

2B.173 Repeat the timing adjustment procedure described above for the opposite cylinder bank.

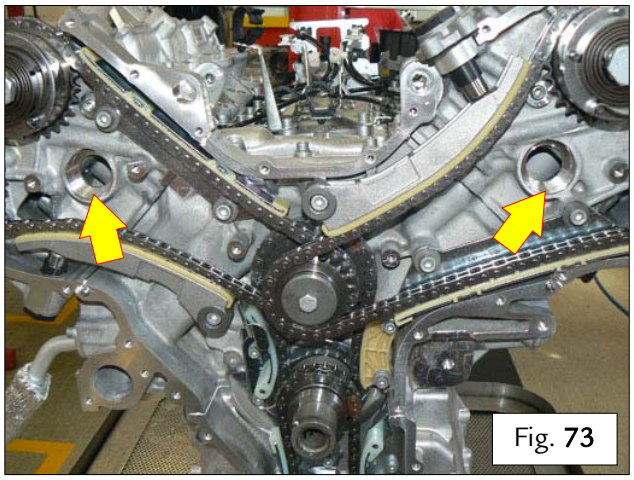
2B.174 Perform a few crankshaft turns and recheck the timing values.

2B.175 Remove the dial gauges.

2B.176 Loosen the indicated screws – Fig. **72**.


Fig. **72**

2B.177 Remove the caps previously mounted on the water ducts – Fig. **73**.


Fig. **73**

2B.178 Fasten the engine service cable (17) by partially tightening the indicated screws – Fig. **74**.

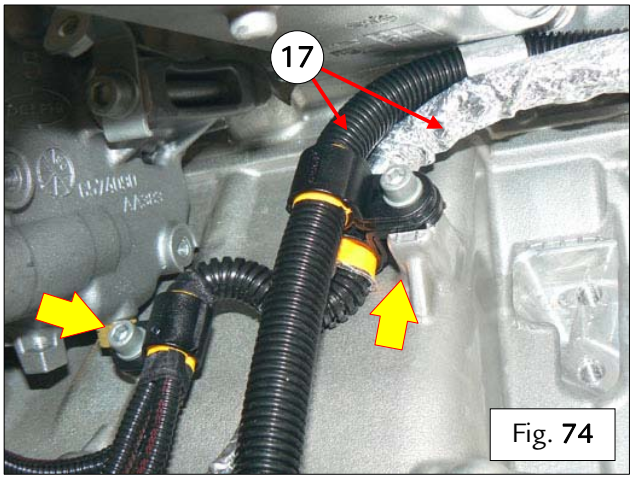


Fig. **74**

2B.179 Fasten the engine service cable **(17)** by partially tightening the indicated screw – Fig. **75**.

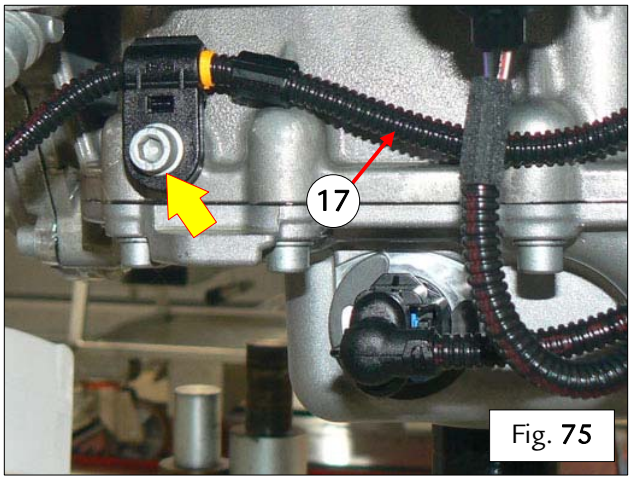


Fig. **75**

2B.180 Apply **SEGO** grease on the OR gasket and insert the engine oil dipstick **(18)** in its seat and then secure it with the indicated snap ring – Fig. **76**

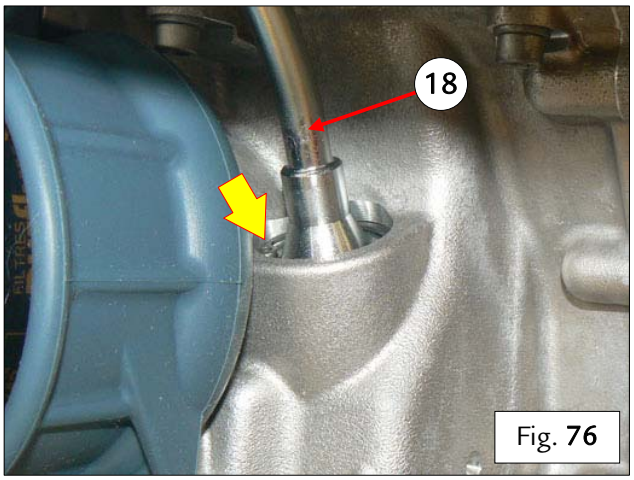


Fig. **76**

2B.181 Fit the centring pins **(51)** to fit the front cover – Fig. **77**.

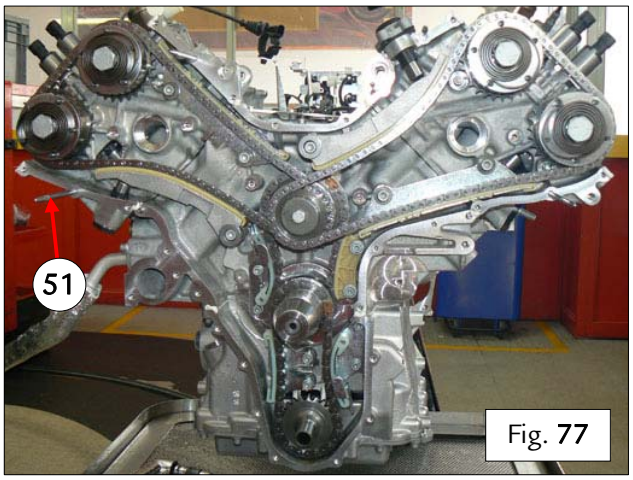
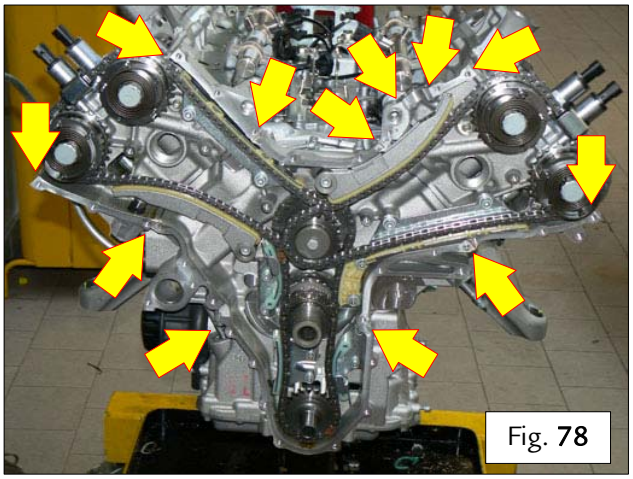


Fig. **77**

2B.182 Apply **CAF 4** paste at the points shown – Fig. **78**.


Fig. **78**

2B.183 Fit the strip **(13)** – Fig. **79**.

2B.184 Fit the strip **(14)** – Fig. **79**.

2B.185 Fit the strip **(15)** – Fig. **79**.

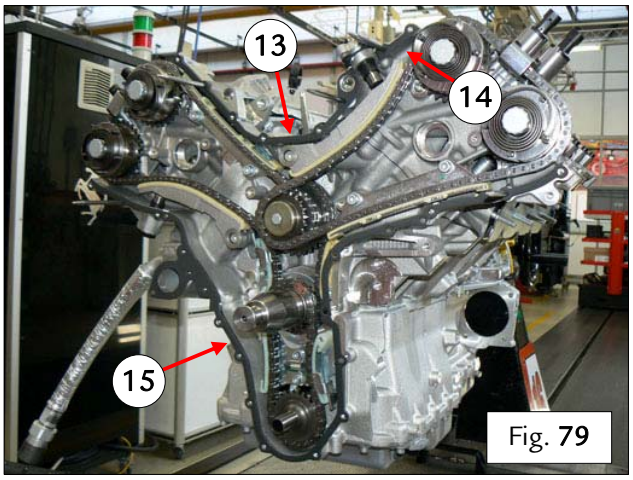
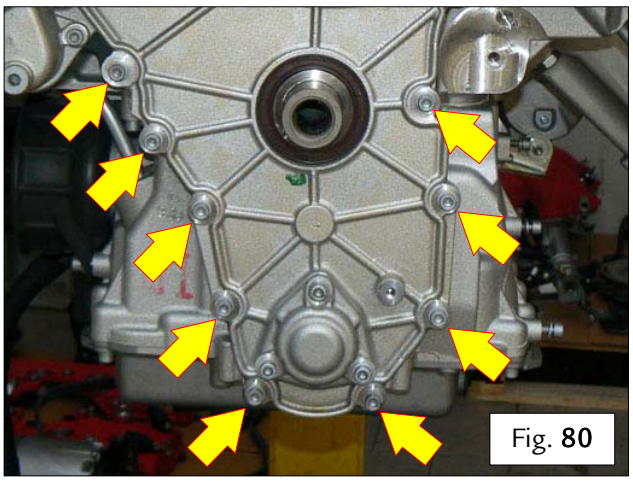


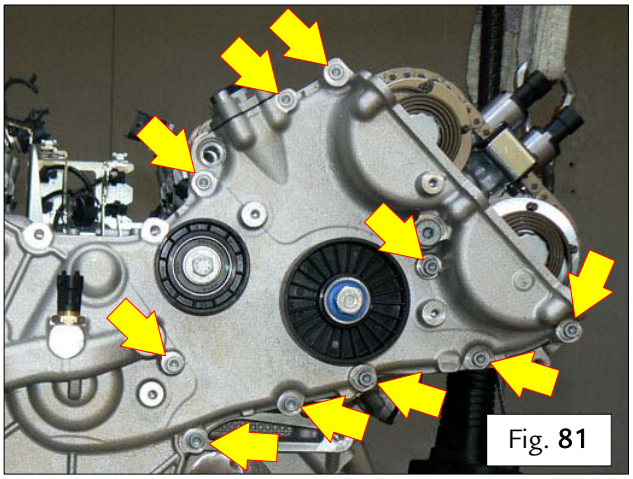
Fig. **79**

2B.186 Place the front cover in the relative centring pins.

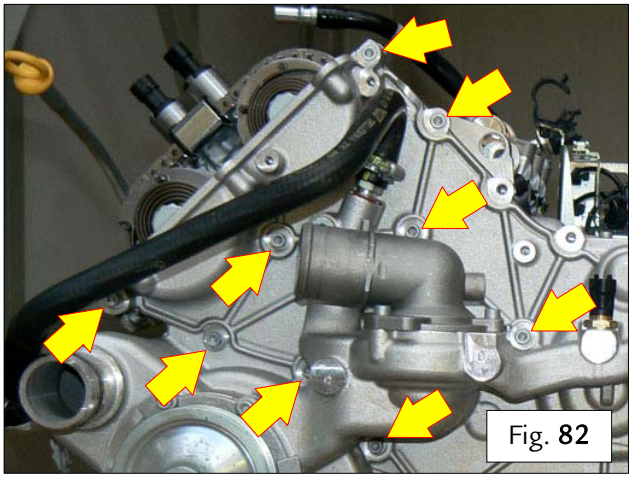
2B.187 Insert the screws shown in the respective positions – Fig. **80**.


Fig. **80**

2B.188 Insert the screws shown in the respective positions – Fig. **81**.


Fig. **81**

2B.189 Insert the screws shown in the respective positions – Fig. **82**.


Fig. **82**

2B.190 Fit the bracket **(8)** then insert the screws shown in the respective positions – Fig. **83**.

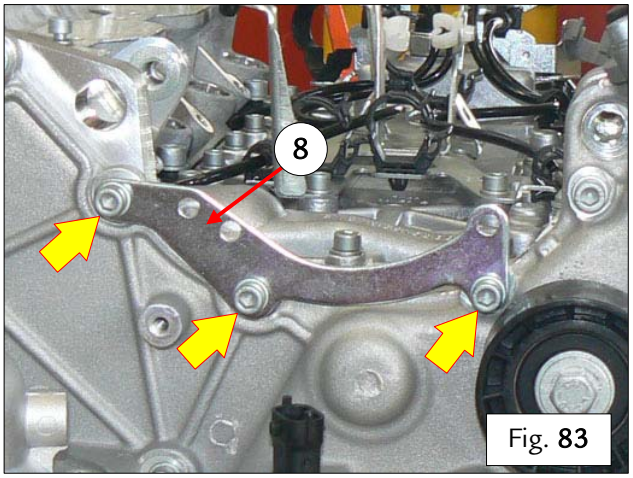


Fig. **83**

2B.191 Following the sequence shown, tighten the fastener screws of the front cover, applying a torque of **10 Nm** class B – Fig. **84**.

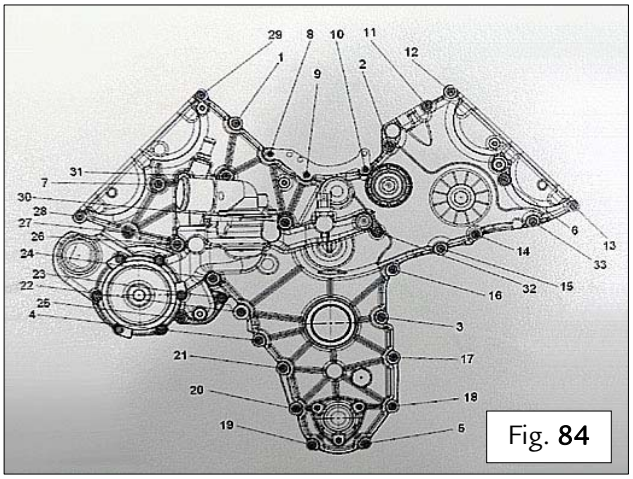


Fig. **84**

2B.192 Position the cover **(16)** and tighten the indicated screws to a torque of **10 Nm** class B – Fig. **85**.

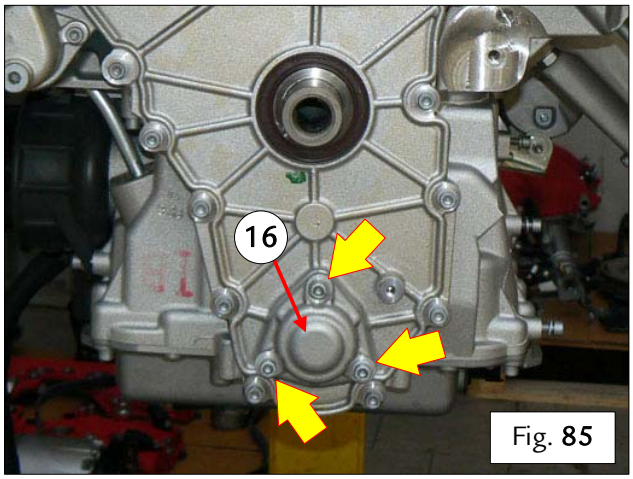


Fig. **85**

2B.193 Immobilise the rotation of the crankshaft.

2B.194 Apply **Loctite 242** on the threading of the indicated screw – Fig. **86**.

2B.195 Refit the torsion damper **(12)**, the respective washer and tighten the indicated screw to a torque of **450 Nm** class A – Fig. **86**.

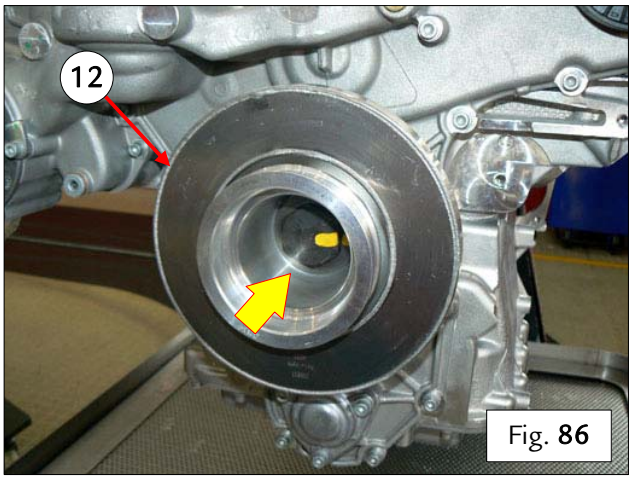


Fig. **86**

2B.196 Refit the belt tensioner **(11)** tightening the indicated screw to a torque of **25 Nm** class B – Fig. **87**.

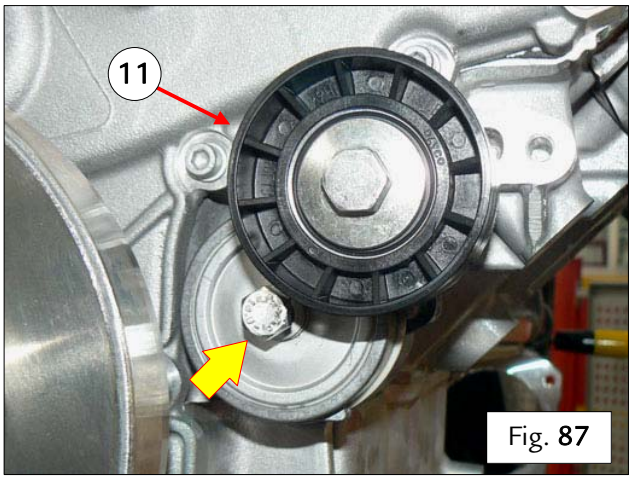


Fig. **87**

2B.197 Tighten the indicated screws **(9)** and **(10)** to a torque of **10 Nm** class B – Fig. **88**.

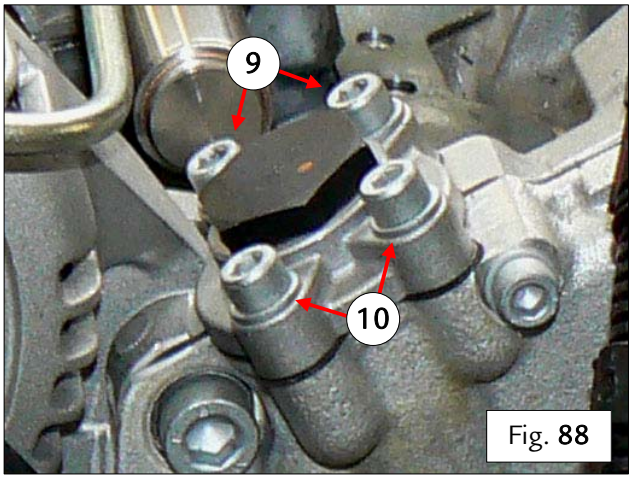


Fig. **88**

2B.198 Refit the bracket **(7)** tightening the respective indicated screw, applying a torque of **10 Nm** class B – Fig. **89**.

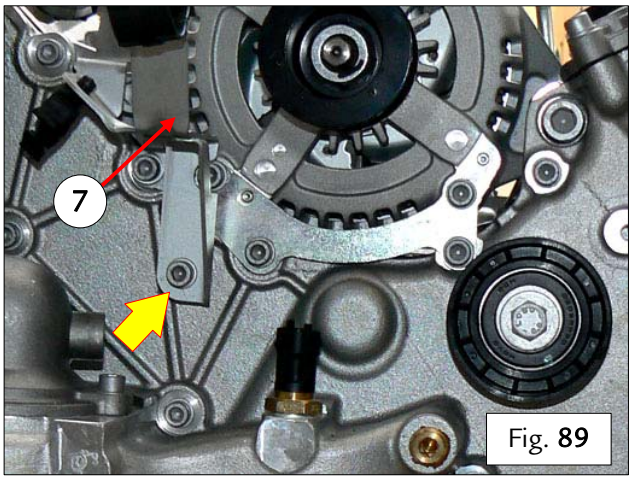


Fig. **89**

2B.199 Connect the connector **(6)** – Fig. **90**.

2B.200 Refit the secondary air pipe assembly **(5)** – Fig. **90**.

2B.201 Close and fasten the indicated clips – Fig. **90**.

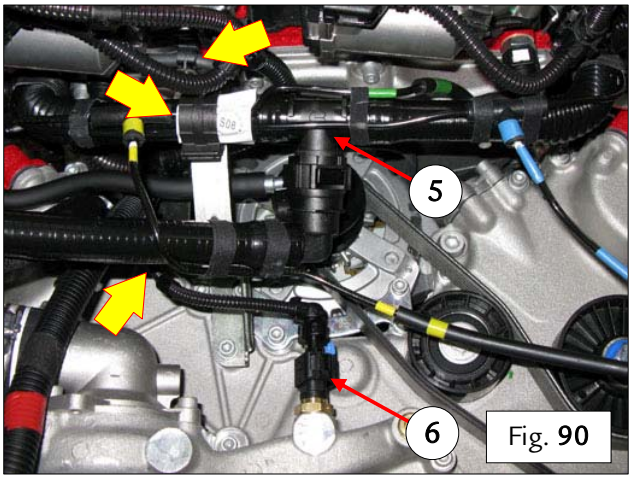


Fig. **90**

2B.202 Connect the pipe **(4)** from the secondary air valve – Fig. **91**.

2B.203 Connect the pipe **(3)** to the secondary air valve, replacing and tightening the indicated collar – Fig. **91**.

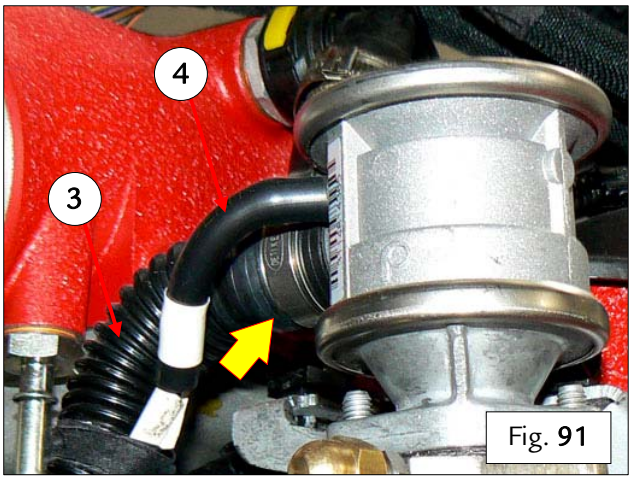


Fig. **91**

2B.204 Connect the pipe **(2)** to the secondary air valve – Fig. **92**.

2B.205 Connect the pipe **(1)** to the secondary air valve, replacing and tightening the indicated collar – Fig. **92**.

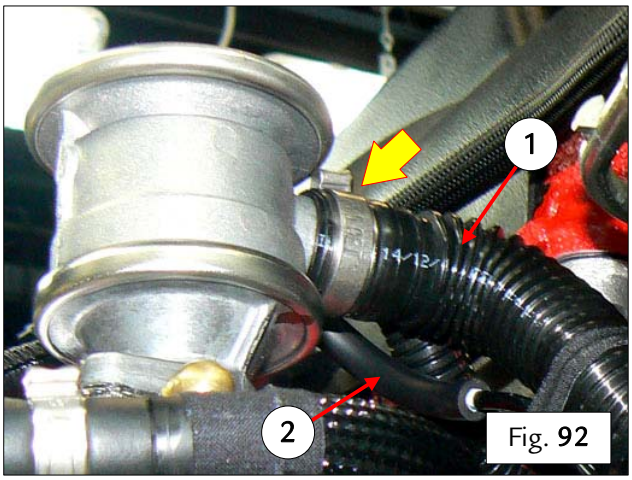


Fig. **92**

2B.206 Refit the power steering pump (as described in paragraph **D5.03** step **2** of the Workshop Manual).

2B.207 Refit the A.C. compressor (as described in paragraph **F5.03** step **2** of the Workshop Manual).

2B.208 Refit the starter motor (as described in paragraph **F2.05** step **2** of the Workshop Manual).

2B.209 Refit the engine oil pump (as described in paragraph **B5.02** step **2** of the Workshop Manual).

2B.210 Refit the engine oil sump (as described in paragraph **B2.05** step **1** of the Workshop Manual).

2B.211 Refit the auxiliary utilities drive belt (as described in paragraph **A3.12** step **6** of the Workshop Manual).

2B.212 Refit the water pump drive belt (as described in paragraph **A3.12** step **4** of the Workshop Manual).

2B.213 Refit the flywheel (as described in paragraph **C4.04** step **2** of the Workshop Manual).

2B.214 Refit the transmission housing (as described in paragraph **C4.03** step **2** of the Workshop Manual).

2B.215 Refit both catalytic converters (as described in paragraph **B7.03** step **2** of the Workshop Manual)

2B.216 Refit the spark plugs (as described in paragraph **A3.13** step **2** of the Workshop Manual).

2B.217 Refit the cylinder head covers (as described in paragraph **B2.05** step **2** of the Workshop Manual).

2B.218 Refit the intake manifold (as described in paragraph **B4.04** step **2** of the Workshop Manual).

2B.219 Refit the engine-gearbox assembly (as described in paragraph **B2.02** step **3** of the Workshop Manual).

2B.220 Connect the DEIS tester to the diagnostic socket of the vehicle (as described in paragraph **F2.10** of the 458 Italia Workshop Manual)

2B.221 With the DEIS tester perform the "**30_SHORT TRIP Procedure check tank seal**" cycle and the "**50_Check fuel pressure**" cycle.

2B.222 Perform a visual inspection for oil and fluid leaks in the underbody and engine compartment.

2B.223 Check the correctness and compliance of the pipe connections in the underbody and engine compartment.