

SERVICE BULLETIN No

10-14

DATE: 9/8/86

**SUBJECT: Cylinder Head Tightening on F105C Engines (3200-8 cylinder)**  
**VEHICLES: 328 GTB/S, 3.2 Mondial and 3.2 Mondial Cabriolet**

### INTRODUCTION

The new 3200-8 cylinder engines, installed on 328 GTB/GTS and Mondial 3200/Cabriolet is equipped with new studs (p.n. 126647), washers (p.n. 126648) and nuts (p.n.126646), for fitting and tightening of cylinder heads. They are torqued following a special procedure in order to ensure a uniform and constant load which does not vary in consequence of the settling down of the cylinder head gasket and engine life. There is no longer any need to re-torque during the scheduled maintenance.

### INITIAL INSTALLATION AT FACTORY

The original fitting, on the new engine, is performed by Ferrari by means of a special computerized, dynamometric wrench (SPS Technologies, model SENSOR I) performed in two steps:

- 1 : Pre-torque (snug) of each nut up to 55Nm (40 Ftlbs), following the same sequence specified for the 308 engine.
- 2 : Always in sequence, slight unscrewing followed by final tightening up to the "elasticity limit" of each stud. The reached elasticity limit is monitored and warned by the wrench itself, which calculates it as gradient of torque against degree of rotation (system: JCS-TEL).

### MAINTENANCE

It is not necessary to re-torque the cylinder heads for the entire engine life. However, for our knowledge and research we ask you to perform a rough checking of the head nuts torque, at least on the first cars, while performing valve clearances checking (every 15,000 miles) in the following way; with a standard torque wrench, ACCURATELY CALIBRATED AT 70 Nm (52 Ftlbs), try to tighten each head nut and CHECK IT DOES NOT ROTATE.

In case one or more nuts prove to be not tight, you shall unscrew and re-tighten following the procedure described in the next section (see ENGINE OVERHAULING).



**ENGINE OVERHAULING**

In case of engine overhauling, or re-fitting of a cylinder head, for installation it would be theoretically necessary to use the special computerized wrench, type SENSOR I, by SPS Technologies, in order to exactly duplicate the initial tightening performed by the Ferrari Factory.

However, an acceptable result can be achieved with the following tools:

- Standard torque wrench (1/2")
- Ferrari special socket (AV 1393) for 4 valve engine
- Angle check wrench (like, for instance, USAG No. 830 - 1/2" drive)

Utilizing the following procedure:

- 1 - Lubricate with graphite grease the thread of the studs and the contact surfaces of both washers and nuts.
- 2 - Following the sequence specified by the manual, torque each nut to exactly 45 Nm (33 Ftlbs) paying attention to have the Ferrari special socket AV 1393 at 90° with the handle of the torque wrench.
- 3 - Then, always in sequence, tighten each nut of additional 120 degrees by using a normal wrench, combined with the angle check wrench and Ferrari special socket AV 1393.

For the above last step, since the position of the nut does not allow a 120° rotation in one operation only, you shall perform the following:

- Connect the angle check wrench (for instance USAG 830 - 1/2") between the Ferrari socket AV 1393 and the handle.
- Connect an iron plate to the engine, in order to locate the magnet on top of it.
- Manually bring to "zero" the dial on the angle check wrench.
- Tighten the nut as far as possible and read the angle you have reached.
- Pull up and reposition the wrench, then manually bring the dial in the position previously reached
- Tighten the nut further and read the new total angle reached.
- Repeat the above operations a few times (3+4) until a total angle of 120° has been reached.

Note: The USAG angle Check Wrench (Ferrari Part Number 900000830) will be automatically shipped from the Ferrari NA Spare Parts Dept., Cypress, CA to your dealership. Dealer cost - \$36.27. Additional units are available through the Ferrari NA Spare Parts Department following normal ordering procedures.





