Triumph 4 Cylinder Head Fitting Guide

Description: Triumph 4 Cylinder Head

Applications: TR2-4A

Part Numbers:

Description	Iron	Alloy
Cylinder head, plain	511695X	511695AX
Cylinder head, standard bare	511695	511695A
Cylinder head, standard assembled	514748	514748A
Cylinder head, Stage II	TT1112N	TT1112NA
Cylinder head, Stage III	TT1113N	TT1113NA
Cylinder head, Stage IV	TT1124N	TT1124NA

General Information

The new cylinder head is designed to resemble as closely as possible the original late TR4-4A version, working to the original drawings. It is recommended that as much hardware as possible to be changed at the time of installation to ensure to fit to be as good as possible and subsequent reliability be guaranteed.

Whatever the specification of the head, the block must be properly prepared:-

Thoroughly clean the top face of the block and liners. It is recommended that the studs be removed and inspected for wasting, distortion or thread damage. Nuts should screw freely down the fine thread area. We highly recommend replacing all the hardware as a matter of course to ensure reliability. Clean out the groove in the course thread. Lightly grease the coarse thread and screw these fully into place. **DO NOT TIGHTEN OR TORQUE THESE STUDS INTO THE BLOCK.**

The liner protrusion should be checked. 0.004” to 0.006” is recommended. A steel straight edge and feeler gauges will suffice. Anything less than 0.003” protrusion will probably fail sooner rather than later, possibly damaging the new head. The liners are sealed at their bases with figure of 8 gaskets. If one liner is 'low' the gaskets may be halved to obtain the correct heights. Originally these gaskets were copper and 0.018" thick. Gaskets are available in a range of materials & thicknesses, see Parts & Consumables list below. Triumph originally specified Wellseal as the correct sealant - this is still available (Part No: 600569A). Wellseal ultimately sets hard and doesn't break off into loose fragments (possibly blocking oil or waterways). The head gasket should slide down the studs without distorting around the stud apertures, and this should be checked.

So we now have a clean block with liners protruding correctly, 10 healthy studs fitted and a gasket that will slide nicely into place. The question of what to put on a gasket to assist the sealing now arises. Triumph recommended Wellseal. Grease seems to work equally well with a standard copper/asbestos gasket (Part No: 205481), but we recommend only Wellseal be used with steel shim gaskets. Some users prefer Blue Hylomar, and the spray type is particularly good if the instructions are followed.
If the whole engine has been rebuilt a dummy fitment should take place to fully seat the liners. A used head gasket could be utilised for this. No gasket cement of any type should be used for this process but it is recommended that both faces of the gasket be lightly greased. The head should be torqued down in stages to at least 60 ft/lbs (but not more than 70ft/lbs, if an alloy head is being fitted). Remove the cylinder head. Re-check the liner protrusion: it should be 004"-006".

Having chosen the sealing assistant, coat the gasket as recommended ensuring there is no excess around the oil feed hole to the rear. Slide the gasket into place. Align the head and gently slide this also into place. For standard engines it is recommended the standard gasket (Part No: 205481) is used. For modified engines, steel shim gasket 202775 should be used (copes with up to 89mm bores without modification).

Fit the 10 hardened steel washers (Part No: WA112081) this slightly oversized version is particularly crucial when fitted to an alloy head, but are equally recommended with iron heads and original ones. Under no circumstance use soft or damaged washers as these will spoil the locating faces on the top of the head and may cause uneven pull down torque.

Having lightly oiled their threads screw the 10 head nuts (Part No: 110962) into place and torque them down using the torque stages recommended below and in accordance with the sequence reproduced from the workshop manual below, tightening gradually. See the Nut Tightening Sequence diagram on page 3.

A good idea at this stage is to connect the engine up to the cooling system, which will mean fitting the thermostat housing and fill the system with coolant and leave overnight. Removal of the sump drain plug should reveal presence of any leaks, although not where from. Assuming there are no leaks, continue with the build. Check the thermostat housing for corrosion, particularly around its lower edge and replace if necessary. Fit all the studs, manifold and rocker etc, to the head discarding any damaged or ill-fitting ones, ensuring they screw in cleanly and straight.

Fit the rocker gear, and adjust rocker clearances as recommended for the cam fitted. Instead of using nut and washer (Part No: GHF202 and GHF333) use special nut (Part No: CAM4545) which provides a clean hard face to the pedestal. Don't forget to check that the pushrods are straight before installing (roll on a flat surface).

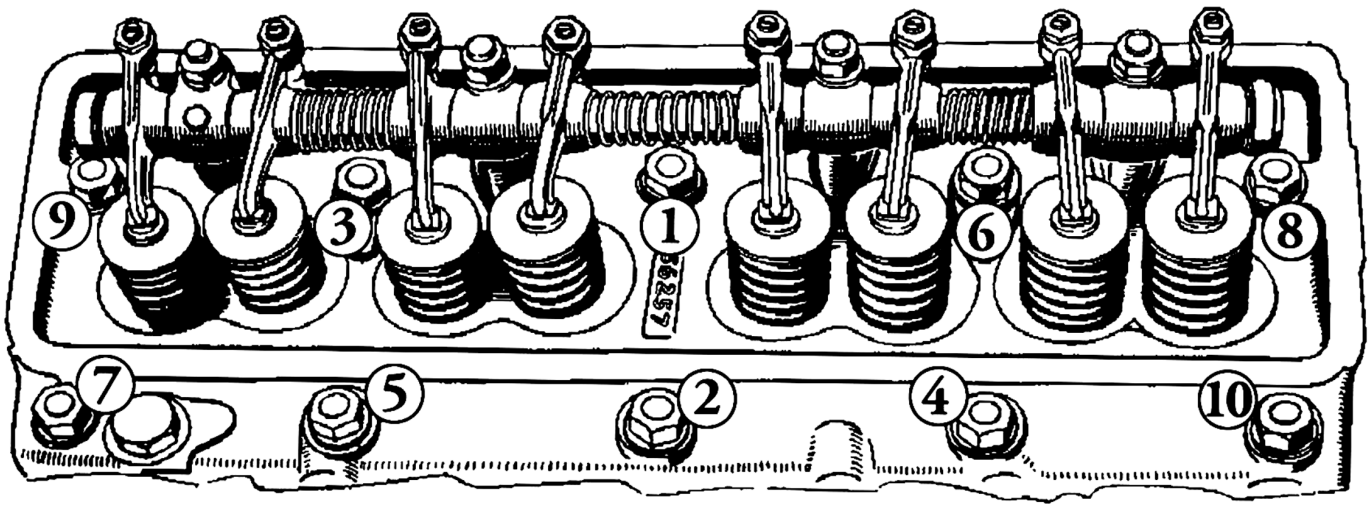
Try cementing the rocker cover gasket to the head holding it in place with weights while adhesive sets. This does act as very effective oil trap, which rarely leaks (from experience). It is not uncommon with a modified engine to require 2 gaskets, when the rocker lift demands it, with steel rocker covers.

Users of iron heads should replenish the cooling system using the correct antifreeze mixture. Users of an alloy head must run with 100% anti-freeze/summer coolant, which contains the correct inhibitors to prevent corrosion and electrolytic reaction.

Run the engine to temperature and check for leaks. After 10 hours maximum running, check the head torque as recommended and reset the rocker clearances.

Users of an alloy head on a standard engine should find little performance difference compared with a standard iron head in good condition. Users of more modified engines should find the superior cooling properties of the alloy advantageous and the more the engine is modified, the more the improvement that will be obtained.

Nut Tightening Sequence



Tightening Torques

Alloy Cylinder Heads - Up to 70ft/lbs! **NO MORE!**
Recommended torque stages:
1: 45ft/lbs 2: 60ft/lbs 3: 70ft/lbs **(MAX)**

Iron Cylinder Heads - Up to 95-105ft/lbs
Recommended torque stages:
1: 45ft/lbs 2: 75ft/lbs 3: 90ft/lbs 4: 105ft/lbs **(MAX)**

Rocker pedestal nut 3/8 UNF 9/16 AF	24-26ft/lbs
Manifold attachment 3/8 UNC 9/16 AF	22-24ft/lbs
Thermostat housing 5/16 UNC 1/2 AF	16-18ft/lbs

Hardware and Consumables

Cylinder head gasket set	GEG178	Steel washer, improved	WA112081
Conversion gasket (lower end)	GEG248	Improved rocker pedestal nut	CAM4545
Rocker cover gasket	GEG437	Thermostat housing	203781
Head gasket set (high port spec)	GEG178	Thermostat 74 degree	GTS102
Head gasket - copper/asbestos	205481	Penrite Running in oil 5lt	GGL9014X
Head gasket - steel	202775	Penrite Classic Light 20/60 oil 5lt	GGL9004X
Head gasket - copper	TT1136	Loctite (for manifold studs)	GEC2005
'Figure 8' gasket - steel 0.015"	112789	Multipurpose grease	CGL110
'Figure 8' gasket - copper 0.018"	112789C	Engine paint, black aerosol	CCCB1
'Figure 8' gasket - aluminium 0.021"	112789X	Water Wetter (cooling aid)	MM220-115
Head stud, washer & nut kit - ARP	TT1164	Redex 1shot	MRD1132
Big end bolt kit - ARP	TT1180K	Wellseal	600569A
Cylinder head nut	110962		

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