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BIG BORE INSTRUCTIONS

CHANTLAND MFG

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750 KIT INSTALLATION INSTRUCTIONS

(Always keep these instruction sheets as they can be referred to later for specifications, service, and repair to the 750 Kit and engine.)

COMPONENTS FURNISHED IN EACH KIT:

() 1 - 750cc aluminum cylinder block with replaceable flanged sleeves. Cylinder bore is 3.000". The tolerance on this dimension usually varies from 2.999" to 3.001" depending on the actual finished size of each piston. Each piston is carefully fitted to each cylinder bore and is marked accordingly. DO NOT PAINT THE CYLINDER CASTING.

() 1 - Copper head gasket--annealed (softened) so the O-ring (if fitted) will seat into the gasket and provide a good seal. NOTE: The head gasket is the only special gasket necessary. Use Triumph gaskets in all other areas.

() 1 - 1/4" center head bolt (1/4 x 20 thread - use 7/16" wrench)

() 4 - Long inner head studs (up to 1970 models) 3/8 x 16 coarse thread.

() 4 - Short outer head studs (8 short studs if 1971--on) 3/8 x16 coarse thread.

() 1 - Tapered aluminum dowell plug to block off the oil pressure hole in the crankcase cylinder base surface.

() 1 - Reducer insert to reduce the original 5/16" center head bolt hole to 1/4".

() 1 - 1/4 x 1/2 washer for 1/4" center head bolt.

() 8 - 3/8 x 5/8 washers to fit under cylinder base nuts.

() 5 - Wrist pin clips (1 extra)

( ) 2 - 1/4 x 20 special pointed allen screws to secure the tappet blocks in the cylinder.

( ) 8 - Nuts for the cylinder head studs (3/8 x 28 threads - use 9/16 socket).

( ) 4 - Long coupling nuts for inner head bolts for 1971 and later models.

( ) 2 - Pistons of high silicone aluminum alloy with large valve pockets machined to a depth adequate for practically all high lift camshafts.

( ) 4 - Compression rings (usually cast iron with an upper inside ridge or bevel).

( ) 2 - Oil rings (cast iron or multi-piece depending on availability).

Please note that if your engine is 1971 or newer, the four inner head bolts have been changed. The original four bolts have a long head on them which is threaded inside so the rocker box bolts can be tightened down inside the bolt head. On these models the cylinder head is fully torqued down before the rocker boxes are installed. The 750cc Bolt Kit provided for 1971 and later models consists of eight short head studs with four long coupler nuts. These nuts take the place of the original bolt head and act as the coupler between the head stud and the rocker box bolt. If you do not have the correct bolts for the 1971 and later engine, contact the manufacturer immediately and they will be sent out at no-charge. DO NOT use four long bolts in place of the short inner bolts, as an effective bolt torque cannot be obtained and the rocker boxes will almost certainly become cracked and damaged from the improper installation! Also note that this head bolt arrangement has caused some tendency for the head gasket to leak caused from the loosening of the four inner head bolts on stock engines.

NOTE:

The manufacturer has taken extra precautions to insure that this product is of high quality workmanship and materials. If any flaw has been noticed or if there are any questions or complaints concerning the product or its installation, contact the manufacturer at once as this Kit is not refundable. DO NOT proceed when in doubt. This installation does not necessarily require a skilled and experienced mechanic with special tools. However, the job should not be undertaken without confidence and a good mechanical aptitude. If you do not feel qualified to install this Kit, make certain you trust it to a top-notch mechanic who knows Triumph engines--not just a "friend of a friend" or someone who professes to "know it all". Some signs of a good mechanic generally are

the way he makes certain all the parts are absolutely clean when he installs them, an orderly work area, thoroughness and pride in his work. Most shops charge from $40 to $70 to install this Kit--not including valve jobs, tune-ups, etc. Make certain the job is done right and the engine serviced properly afterwards. ONLY THEN IS YOUR WARRANTY VALID.

NOTE:

The sleeves in the 750 cylinder will fit into most 1962 and older crankcases. However, some of the very early engines will have to have the cases dismantled and a small amount of metal removed for sufficient clearance. Do not force the sleeves into the cases under any circumstances.

INSTRUCTIONS

1. Examine the coarse 3/8 x 16 thread on each head stud for burrs, etc. that may cause binding or tearing of the threads in the aluminum cylinder. Next, check the threads in the aluminum cylinder to make certain they are clean and free from any burrs or foreign material. Finally, take a screwdriver and screw each head stud down until it is seated at the bottom of the cylinder thread. Be certain each stud screws all the way in the cylinder thread effortlessly. Do this procedure before installing the cylinder on the engine. Check each stud for straightness by rolling it across a flat surface.

2. Remove rocker boxes, cylinder head, and cylinder. Make certain that the tappets do not fall out when you lift off the old cylinder. A piece of cardboard, etc. can be wedged between the top of each pair of tappets before the cylinder is removed. When removing the cylinder be extremely careful not to drop any dirt, carbon, or gasket pieces into the crankcase. Wash all parts and arrange neatly in an organized manner.

3. Before 1969 many 650 Triumph engines suffered from premature camshaft failure so check the camshaft lobes and tappet faces for ridges or flat spots. The exhaust camshaft and tappets normally show the most wear, which is caused from lifting the exhaust valve against extremely high pressure in the combustion chamber. It is normal if a very small line of wear is seen running crosswise on the center of the tappet faces. This line should be only faintly visible. If there is a definite flat spot the tappet must be replaced. Wipe the oil off the camshaft lobes and look closely for flat spots or ripples. If the slightest trace of wear is seen on the camshafts they should be replaced in order to avoid future erractic idle and possilbe engine damage. Once the camshafts have started to wear they will usually last only a few hundred miles.

The crankcases have to be split to perform this operation. If the camshafts are worn, they should be replaced with 1969 or newer camshafts as they are treated with an electro-chemical process that hardens the lobe surface making them extremely wear resistant. These camshafts can be identified by a dull black or grey finish. This is a major operation and should be done only by a skilled mechanic. Always use new tappets with new camshafts.

4. Check rod bearings, upper wrist pin bushings, and wrist pins for wear. REPLACE IF WORN. Recheck for ease of wrist pin fit if new wrist pin bushings have been pressed in the rods. Carbon build-up inside old wrist pin bushings can cause a tight pin fit.

5. Plug oil hole to exhaust tappets. 1966 and newer models have at the right front side of the crankcase cylinder base surface, an oil pressure hole that must be plugged. This oil feed hole was added to increase the oil supply to the exhaust tappets and camshaft in hopes that it would eliminate the camshaft problems then being experienced. However, the cmashaft problems were not lessened and it was found that the metal being used in the camshafts was not standing up against the increased pressure in the newer engines caused from longer cam durations, higher compression ratios, etc. As mentioned earlier, the problem was solved in 1969 with the introduction of a new metal alloy and hardening process. None of the manufacturers of 750 Kits provide for this oil hole as it is not considered necessary. This has been proven in many Triumph racing engines. Except for some of the very early 1966 engines there is a metal dowell pressed in the oil hole that is to be plugged. This dowell has to be removed. Place a nail or the chuck end of a drill bit inside the dowell, then with a Vice-Grip or pliers grip the dowell and remove with a twisting motion. The nail or drill bit will keep the dowell from collapsing or breaking off while it is being removed. Clean the oil from the hole with laquer thinner, etc. Coat the tapered aluminum plug with "Loctite" and place the small end into the hole. With a flat bottomed punch or drift, drive the plug down until it is even or slightly below the cylinder base gasket surface. Be careful that the plug does not protrude above the surface. Remove all burrs so the base gasket will seal properly. If for some reason this hole seeps oil after the engine is running, the hole can be plugged again by taking off the timing gear cover where a special plug can be installed inside the crankcase. Take great care if this operation is necessary.

6. Remove old pistons and clean base gasket surface. When

removing the old pistons and wrist pins, be careful not to put too much side pressure on the connecting rods. Clean rods and place a rag, etc. around them to avoid damaging them. Nicked or battered connecting rods are prone to breakage. NOTE: the rod is usually weakened if the top area is extremely blackened from excess heat.

7. Remove lower crankcase oil drain plug and flush out crankcase with gasoline, solvent or fuel oil. An ordinary spark plug wrench fits most crankcase drain plugs.

8. Replace drain plug and pour a cup of clean #50 oil down around the crankshaft mainbearings.

9. Install new base gasket. Do not use the thin paper-type gaskets as they tend to leak. Use the heavier type grey colored Triumph gasket or a suitable replacement. Gasket cement is not necessary, but if you prefer to use it apply only a thin coat on the gasket. The Triumph oil pump is very susceptible to failure from picking up any pieces of dirt, metal, loose and excessive gasket cement, etc. Cleanliness cannot be stressed enough so BE CAREFUL. Oil the camshaft lobes.

10. Check the old wristpins for wear. Buy new ones if there is the slightest trace of wear or heat discoloration. NOTE: 1967 engines used longer wristpins. They must be replaced with 1966 and earlier or 1968 and later pins.

11. Oil wristpins and connecting rod bushings.

12. Heat pistons until they can just be held in the hands. The pistons can be heated on a stove, oven, hot water, etc. Oil wristpin bores and install pistons on the connecting rods. Be careful not to "spring" the clip so it will lose its tension. If the pistons are supplied with the "Spiral-Loc" type clips these must be installed with one end first and wound into the hole and groove. These clips can be difficult when installing and removing so take extra care when these are used. If difficulty is experienced when driving in the wristpin, check for burrs, etc., in the piston wristpin bores. DO NOT force the wristpins into the pistons as damage can be caused to both the rods and pistons. Each rod and piston should be cushioned with the hand when installing the wristpins. Double check that all the wristpin clips are securely in place. NOTE: Damage caused from loose clips is not covered in the warranty.

13. Check that the pistons have sufficient side clearance in the cylinder bores. Do this before installing the pistons rings. Lower the cylinder over the pistons (minus rings) until it rests evenly on the gasket surface. If the cylinder will

not go completely into the cases, check the two small inner crankcase screws just below the crankcase cylinder base surface. Sometimes they have loosened from vibration and the large 750 sleeve will strike them, causing the cylinder to bind. The cylinder should be tightened down at least on two opposite corners to be sure it is seated squarely on the crankcase. Each piston must have clearance in the cylinder bore. This can be checked by pushing the dome of the piston from side to side. Each piston should easily "slap" back and forth against the opposite sides of the cylinder bore. If the piston can only be moved slightly or is tight against one side of the bore, remove the cylinder and reverse the piston 180° and recheck the clearance. This procedure will normally provide the proper clearance. It has been found that in many Triumph engines the connecting rods do not center properly in the cylinder bores, causing improper piston side clearance. Some pistons furnished in this 750 Kit may be cast, and since the rod-end clearance between the piston inner wristpin bosses is also "cast in", there is normally a small amount of additional clearance on one side than the other. If after reversing the piston, there is still not enough side clearance, then remove the piston and slightly file or grind the side of the inner wristpin boss until the proper clearance is provided. This operation is rarely necessary. Remove burrs.

— 14. Remove the cylinder and check the piston rings for proper end gap. Place each ring squarely in the cylinder bore and check that there is no less than .005" end gap on each ring. If not, carefully file additional end gap and remove burrs. Cast iron cylinders normally use more than .005", but due to the additional barrel expansion of an aluminum cylinder, .005" can safely be used. When the piston rings are installed on the piston, be certain the inside bevel or ridge on the compression rings are installed to the top. Each ring end gap ~~should be rotated approximately 120° apart so a minimum of~~ compression and combustion pressure is lost. NOTE: Due to availability, some Kits may be provided with one-piece cast iron or multi-piece "rail type" oil rings. If the Kit is provided with multi-piece rings, there are two different types of inner expanders used, also due to availability. These are the regular spring expander type and the peripheral expander type. Extreme caution must be taken when installing the peripheral type so the expander ends do not overlap. The peripheral expander is unique in that its ends must butt up against one another in order for it to produce tension against the cylinder wall. If the ends overlap, great difficulty is experienced when installing the pistons in the cylinder bores. This causes the oil ring to stick out on one side where the ends have overlapped each other, causing serious binding in the cylinder bore. It is normal for multi-piece oil rings to create more cylinder wall pressure than the plain cast iron oil ring. If an abnormal amount of stiffness is experienced

when rotating the engine, the oil ring expander ends should be rechecked. While installing the two rails and one spacer ring over the peripheral expander, it is very easy for the expander ends to overlap by accident; so be extremely careful. The end gap with multi-piece oil rings is normally greater than .005. Never file or grind the ends of the expander. Also, check the area where the oil ring groove comes very close to the wristpin bores for burrs, etc., in the groove. This causes a tight oil ring fit. Sometimes when installing the wristpins, a burr is raised up into the oil ring groove. Check that the oil ring fits freely in the groove in that area. If the ring is tight, remove the burr by lightly scraping with a knife, etc.

15. Remove tappet blocks from old cylinder. First, remove the tappet block locating screws. Place the old cylinder upside down on a rag or soft piece of wood and drive out the tappet blocks. The special Triumph tool should be used for this as the tappet blocks are made of cast iron and can be easily broken or damaged. If possible, your Triumph dealer should remove and install the tappet blocks for you. Give the dealer these instructions so he can be aware of the special precautions when installing the tappet blocks in this alloy cylinder. If a Triumph tappet block tool is not available, a soft metal drift of brass or aluminum, etc., can be used. After the tappet blocks are removed, carefully file off all sharp burrs and clean thoroughly.

16. Install the tappet blocks in the aluminum cylinder. First, check for burrs, etc, in the tappet block bores in the new cylinder. Coat each tappet block and tappet block bore with oil, (don't use "Loctite"). On 1966 and later engines, the oil feed hole to the exhaust tappets has already been plugged. (An operation you just performed.) However, oil can still be pumped into the exhaust tappets through the small oil hole in the exhaust tappet face surface. This can cause an external oil leak at the tappet block locating screw. The oil trapped between the tappet face and camshaft lobe is forced back up into the tappet stem through the hole in the tappet face. Instead of the oil originally being pumped from the crankcase through a drillway in the cylinder block to the exhaust tappet block and tappets, it is being pumped in the reverse direction by the tappet and camshaft lobe action. The oil is then forced out the hole in the side of the tappet stem into a hole inside the tappet block stem bore. Then it circulates in the groove machined around the tappet block body. The locating screw hole that is drilled into the tappet block at a 90° angle to the tappet stem bores is directly in the oil groove around the tappet block. Since the pointed locating screws, furnished with the Kit, don't have a head on them like the original screws, oil can be forced from the groove in the

tappet block out around the threads in the locating screw causing an external oil leak. Use only the locating screws furnished with the Kit as they have a different thread and the pointed end is designed to seat into the tappet block providing extra insurance that the block doesn't rotate. This possible oil leak can be eliminated simply by reversing the tappet blocks-- that is by putting the exhaust tappet block in the intake side and vice-versa. Before driving in the blocks, make certain the cylinder is supported evenly on the base gasket surface with two soft blocks of wood. This will keep the cylinder sleeves from being damaged. Make certain that each tappet block is started perfectly straight into the cylinder with the tappet stem bores parallel to the cylinder bores. NOTE: The tappet block interference fit in the new aluminum cylinder is tighter than the old cast iron cylinder, causing more difficulty in driving down the tappet blocks. As the expansion rate of an aluminum cylinder is greater than a cast iron one, the tappet bores are purposely machined .001 smaller to insure the tappet blocks do not loosen when the engine has heated up. If the tappet block seems to drive in too easily, check the size with a micrometer. The minimum size of the tappet block diameter should be no less than .9995. Occasionally a tappet block will be a little undersized. If so, do not install it as loose blocks are not covered in the warranty. To ease the installation, the cylinder can be evenly heated in an oven to 200°. CAUTION--If you heat the cylinder, use no more than 200° as the temper can be removed from the casting and the sleeves loosened by exceeding that limit. When the tappet block is seated completely down in the cylinder, double check that the tappet stem bores are parallel with the cylinder bores. This can be accurately checked by placing both tappets halfway down in the tappet block. Next, take one of the engine pushrods and lay it squarely against the side of tne tappet stems, in line with the cylinder sleeves. If the blocks are in correctly, each end of the pushrod will be the same distance from the outer edge of each cylinder sleeve. If the tappet blocks are not straight, the camshaft and valve timing is altered, plus unnecessay wear is caused on the camshaft lobes and tappets. If the block is not straight and you have the proper tappet block tool, drive it about halfway back out. Before driving it back in, determine in which direction the block must be twisted to line up and then as you redrive it back down, twist the Triumph tool in that direction. The shock of the hammer on the tappet block tool will allow you to slightly move the block in the direction you are twisting. Recheck for straightness. NOTE: Do not rely entirely on the alignment of the holes in the cylinder casting and tappet block, as the alignment hole is nte tappet block is not always square with the tappet stem bores. Clean away any metal shavings, burrs, etc. Clean the oil out of the alignment hole in the

cylinder with laquer thinner, etc. Use "Loctite" on the alignment screw and firmly tighten with an allen wrench. Oil the tappets and replace in their original position. Wedge cardboard, etc., between the top of the stems to prevent them from falling into the crankcase.

17. Install cylinder over pistons. Recheck the position of the piston ring end gaps. Oil the rings and piston skirts. A ring compresser should be used to avoid breaking the piston rings. If one is not available, a pair of ordinary hose clamps will work. The pistons should be supported at the bottom of the skirts so they cannot move around when installing the cylinder. A pair of long bolts or piece of wood can be placed across the crankcase base surface to support the pistons. To avoid damage, someone should help you steady the cylinder and pistons.

18. Tighten down cylinder. Engines up to 1967 use two types of 3/8 Whitworth base nuts. The four large nuts use a 5/16 Whitworth size wrench and the four small ones use a 1/4 Whitworth. Only eight of the small nuts can be used so obtain four more of these from your Triumph dealer. Due to the large bore of the 750 cylinder, the wrench clearance over the base nuts is greatly reduced, making it necessary to use only the small type nuts. Use only box end wrenches to tighten these base nuts. The box end of the wrench will normally have to be ground thin for clearance over the nut. Late 1967 and newer engines use twelve point 3/8 nuts with American size thread. Grind a 1/2" box end American size wrench for clearance. Place the 3/8 x 5/8 washers under the base nuts. Firmly tighten the eight base nuts using uniform pressure. Don't forget to remove the wedge between the tappets.

19. Dismantle the springs and valves from the cylinder head and decarbonize completely. Check the valve stems and guides for wear and galling. Check to see if any of the four 1/4" outer rocker box bolt threads are stripped. "Heli-coil" if necessary. The valve guide clearance is very critical and if the engine has many miles on it chances are the valve guides are worn out. Whenever new guides are installed, the valves and seats MUST be reground to keep them concentric with one another. Make certain when installing the new valve guides that they go in tight. It is quite common to find loose valve guides, so correct by installing oversize guides. The importance of a good valve and guide job cannot be stressed enough. Replace valve springs when in doubt. WARNING! Do not use heavy duty or racing valve springs with stock camshafts as they almost always cause camshaft failure. If high lift camshafts are used, make sure there is sufficient clearance between the top of the valve guide and the bottom of the valve spring retaining collar when the valve is fully opened. Use the

appropriate springs with special cams. Check the cylinder head gasket surface to be sure it is flat and true. If there is a black path of carbon across the center bolt area, this means the head gasket had been leaking between the two cylinders and must be resurfaced. If the surface has only small nicks and minor signs of leakage, then the head can be trued by lapping it across a piece of medium sandpaper laid on a flat and level piece of glass or metal. If the head is surfaced in a machine shop, the fly cutter being used must be wide enough to cover the gasket surface completely during each cut. Remove only enough metal to provide a level surface. Do not remove more metal for the purpose of increasing the compression ratio. Before reassembling the head, bolt it on the cylinder to check that the pistons do not strike the edge of the combustion chamber. This rarely happens but at times the combustion chamber has been found to overlap the cylinder bore on one side more than the other causing the base of the piston dome to strike the radius of the combustion chamber edge. This can be checked by rotating the engine with the head bolted down without the head gasket. It is not necessary to install the valves, pushrods, etc. This should be checked regardless if the head has been resurfaced or not. Press a thin piece of clay around the base of the piston dome and rotate the engine a few times. Remove the head and check that there is at least .040" clearance to allow for rod stretch, etc. If the clearance is less than .040", carefully file or sand the edge of the combustion chamber until the proper clearance is provided. Wash all parts. Oil valves, stems, and guides and reassemble. If "high lift" camshafts are used, the valve to piston clearance should also be checked.

20. Install head gasket on cylinder. Gasket sealer is not necessary, but if you prefer, use only a neat thin coat of special head gasket sealer.

21. Install cylinder head and pushrod tubes. Engines to 1968 use different thickness O-rings to adjust the seal on the pushrod tube ends. With the head resting on the pushrod tubes, adjust with various thickness O-rings, until the gap between the head and the head gasket is approximately 1/16". This will provide the proper O-ring compression to insure and oil tight seal. Too little pressure will cause the O-ring to leak. Too much pressure can distort the cylinder head, plus crushing the O-rings causing them to burst and leak. Rotate the pushrod tubes until the pushrod alignment holes are aligned and parallel with the tappets. 1969 and later engines have redesigned pushrod tubes. It is not necessary to adjust the O-ring pressure on these models. However, these require that the O-rings are in perfect condition. Check for critical tears and nicks in the O-rings, especially the O-ring inside the bottom of the pushrod tube. It is a good idea to install a thin white O-ring

(old, flat type) under the bottom of each pushrod tube. Take great care to insure there is no chance of pushrod tube leakage. Oil that may leak is blown by the wind around the cylinder and engine causing a messy appearance. The engine heat will bake on the oil and grime resulting in future problems such as overheating. When the head is installed on the cylinder for final assembly, check that the O-rings have not been pinched or dislocated, especially the top O-rings. Screw in the four outer head studs. Install the center head bolt reducer sleeve in the cylinder head. Install the 1/4" x 1/2" washer under the 1/4 x 20 center head bolt provided. Use the thick washers from the old head bolts and place over the 3/8" head studs. Use only the "high nuts" provided for these studs. Lightly tighten the center head bolt and the four outer studs until the head is seated on the head gasket. Recheck the O-rings and pushrod tube alignment. (If the engine is 1971 or newer install the four center studs with the long coupler nuts using the washers from the original inner head bolts. On these engines the head is fully torqued down before the rocker boxes are installed.) Check rocker boxes and cylinder head rocker box gasket surfaces for nicks. Install rocker box gaskets. Gasket cement is not necessary but if you prefer apply sparingly. Oil the cup ends of the pushrods and lower into the pushrod tubes until the tappets are engaged. The oil creates a suction when the tappet stem meets the pushrod.

22. Install rocker boxes. Remove the rocker box tappet covers. (The rocker arm shaft O-ring should be replaced to avoid a messy leak in this area.) Take extra care and oil rocker arms and shafts). With your thumbs, hold the adjuster end of each rocker arm against the top of the rocker box. Tilt each rocker box backwards and slowly lower while engaging the pushrods. Be absolutely certain the pushrods are engaged. Screw down the four long center head studs. Install the thick washers from the old head bolts under the "high nuts."

23. Torque head studs. Working from the center head bolt torque the head stud nuts evenly, 5 pounds at a time, until the 1/4" center bolt is torqued 8 to 10 pounds and the 3/8" head studs 22 pounds. DO NOT EXCEED THAT LIMIT. Install the remaining miscellaneous nuts and bolts, etc. On models before 1971, it is only necessary to install one pair of the head mounts to the frame, usually the front pair. Sometimes the outer edge of the head stud end of the "torque stay" must be ground off so it doesn't rub against the gas tank. A metallic hum and vibration is noticed in the gas tank if the mount rests against the tank. This is usually caused because the thicker "high nuts" on the center head studs bring the "torque stays" up higher against the gas tank. You will notice that the "torque stay" does not rest squarely on top of the high nut. This is caused because the thicker "high nut" creates a dif-

ferent angle in relation to the frame mounting hole. To correct this, simply bend down the end of the "torque stay" with the 3/8" head stud hole in it, until it rests evenly on top of the "high nut."

24. For stock camshafts, set the tappets to .002 on the intakes and .004 on the exhaust. Firmly tighten the adjuster nuts. Follow the camshaft manufacturer's specifications for all other camshafts. NOTE: If a tappet adjuster has to screwed down an abnormal amount, check to see if the pushrod has become disengaged from the rocker arm.

25. Install medium cold spark plugs such as Champion N3, N.G.K. - B8E, K.L.G.-F.E. 100, or equivalent.

26. Most engines will require from one to three sizes larger main jets. NOTE: Amal concentric carbs use a much smaller main jet than the Mono-Block type. For most applications the stock carbs work fine. Make certain that 1968 and 1969 concentric carbs have the new style needle jet and jet needle installed. Check carb slides for wear and galling.

27. Set ignition timing at precisely 38° at full advance. Check to be sure the advance mechanism works freely and is not worn on the pivot. Replace if it is not in perfect condition. Lightly lubricate. NOTE: On 1968 and newer ignition points, remove molding burrs on the rubbing block.

28. Drain and flush oil tank. Fill with # 20-50 detergent oil.

29. Start engine and immediately check to see if the oil is circulating back to the oil tank. If the complete engine has just been overhauled, double check to make certain the oil lines are hooked up correctly.

30. After the first 100 miles reset the tappets and retorque the head bolts and base nuts. Check the tappet block alignment screws.

31. Adjust carb settings, jets, and the proper heat range of spark plugs until the spark plugs show a medium brown color at all R.P.M. ranges.

32. Always keep a close watch on the cylinder base nuts for tightness.

33. Do not exceed 4,500 R.P.M.'s for the first 500 miles.

SERVICE TIPS AND PRECAUTIONS

An engines' worst enemies are heat caused from an "out of tune" engine, dirty oil, and operation without proper air cleaners.

1. Keep timing set at 38° full advance.
2. Always keep the advance mechanism lubricated and in good working order.
3. Change oil every 500 miles. Use # 20-50 detergent. Clean oil is cheap insurance.
4. If the motorcycle is operated in high temperatures or on long trips, the installation of a good oil cooler is suggested.
5. Keeps carbs adjusted and syncronized at all times.
6. Always use an air cleaner for street and highway use, and always make certain it is clean.
7. Adjust tappets the first 100 miles after installation and every 500 miles thereafter.
8. Two heat ranges of spark plugs should be used. A medium range for normal operation and a colder range for trips or highway use.
9. If "pinging" or "knocking" develops when starting out or accelerating, install a colder set of plugs and recheck the ignition timing. Too much advance will cause "detonation" and "knocking".
10. Do not paint the cylinder as this only retards heat dissipation--even if you paint it black. The only way a benefit in cooling can be gained from a black finish is when it is applied with a superior bonding technique.
11. Stay away from exotic equipment unless an all out racing engine is desired.
12. Don't be alarmed if the upper end of the engine emits a small increase in mechanical noise after the 750 installation. This is normal and is caused from the property that aluminum has in transmitting and amplifying sound.
13. Do not attempt to drill holes in the pistons or modify and lighten them in any way.
14. Do not hone the cylinder sleeves for additional piston clearance. The aluminum cylinder requires less piston clearance

than a cast iron cylinder because of the increase in cylinder bore expansion when the aluminum cylinder reaches operating temperature. The clearance for 9.5:1 c.r. compression pistons designed for road and street should be .003 to .004 at the bottom of the skirt. 10.5:1 c.r. pistons should have .004 to .005 clearance.

15. Tappet settings that have become too tight will cause excessive heat resulting in burned valves, scored and collapsed pistons, etc.

16. It is normal if the engine crankcase breather emits a little more oil foam and mist after installation. This is caused from the increased crankcase pressure when the larger displacement pistons reach bottom dead center. However, if an abnormal amount of oil is blown from the breather, it is possible that there is a piston ring broken or a scored or holed piston. The oil pump can also cause this condition if the sump ball valve has dirt etc., lodged under it.

17. A slapping noise in the upper end usually means a scored or collapsed piston. If the engine is "out of tune," etc., a great deal of engine heat develops. The piston will usually score and seize in an engine with a cast iron cylinder. However, the hotter an aluminum cylinder gets, the larger the bore becomes from heat expansion. This makes it almost impossible to seize a piston. What usually happens is the piston skirt loses its strength and collapses from too much heat and starts "slapping" before it can seize to the cylinder wall. This can be a built-in safety factor as a seized piston can cause the connecting rods to break and lock up the engine and rear wheel.

18. For high performance applications, the manufacturer can supply Norris cams, A.R.D. magnetos, and many other high quality components. For details, questions, or problems, just call the manufacturer.

SERVICE, REPAIRS, AND REBUILDING OF THE 750 KIT

When the 750 Kit needs over size pistons and reboring, take these precautions:

1. Order the smallest over-size set of pistons over the present cylinder bore. First, measure the existing bore and determine if there is enough metal in the bore to provide for the next over-size pistons.

2. The copper sealing O-rings must be removed when boring the cylinder to provide for a flat surface 90° to the cylinder bore. The O-ring is ordinary .025" copper wire. It can be purchased at most hardware stores. The wire is peened in the groove, starting between the two outside head bolts. Use a thin pointed scratch awl, etc., to loosen one end of the wire and then simply pull until the rest comes out. When installing the wire, make certain the groove is clean and free from burrs. Start peening the wire in with a small hammer and cut off with a knife when you return to the place where the wire begins. Make sure the two ends fit closely together with no gap. Be careful not to nick the head gasket surface.

3. Pistons are available in .010, .020, .030, and .040 oversizes, the sleeves do get thin with the larger oversizes. Leave .001 for "finish honing" after the cylinder is bored. Use a precision hone with a fine grit of stones. For road and street use, provide .003 to .004 clearance. For racing, use .004 to .005 clearance. The temptation is to give the pistons more clearance as with cast iron cylinders, but don't because the cylinder is designed to use less clearance because of the aluminum barrell expansion.

4. The cylinder should be sent back to the manufacturer if it needs to be re-sleeved. This operation requires boring out the old sleeve until it is "paper thin," removing the sleeve, heating up the casting to install the new one, re-surfacing the head gasket surface, re-boring and machining a new O-ring groove.

5. If head bolt threads have been stripped in the cylinder, repair with "heli-coils". Two "heli-coils" should be installed in the bolt hole to insure sufficient thread depth.

EXTRACTING A BROKEN-HEAD STUD

If a head stud has been broken off and the equipment is not available to extract it, the cylinder should be sent back to the manufacturer. The only charge is the postage.

This procedure works best:

1. Center punch the broken stud to provide a starting place for the drill.

2. The head studs are very hard and a "Colbalt" or "Carbide" drill should be used. Drill down into the stud with the proper size drill until sufficient depth is provided for an "Easy Out." Be certain the extractor is firmly wedged in the stud before turning it out.

3. If difficulty is experienced in drilling or removing the stud, ask a machine shop where the nearest E.D.M. machine is located. This is an electrical discharge machine that is used to burn holes in broken off machinist taps, etc.

COST OF PARTS AND SERVICES
(Prices are subject to change without notice)

1.	Labor to install each sleeve	$25.00
2.	Sleeve	22.00 each
3.	Piston (.010, .020, .030, .040)	22.00 each
4.	Set of Rings (.010, .020, .030, .040)	10.00
5.	Head gasket	5.00
6.	Long head stud	1.50
7.	Short head stud	1.00
8.	Head stud nuts	.25
9.	Forged pistons	32.00 each

NOTE:

The manufacturer also repairs and services 750 Kits by other manufacturers such as Routt Kits, K.K. Kits, Morgo Kits, and the 750 Kit sold by Triumph Corporation. "Chantland" sleeves and pistons can be adapted to any of these kits. Kits will be repaired promptly and returned C.O.D. to the customer.

For information on BSA 750 Kits and larger Triumph Kits contact:

CHANTLAND CYCLE
242 Northdale Blvd.
Coon Rapids, Minnesota 55433
Phone: (612) 757-2584

TERMS OF WARRANTY

This warranty shall cover defects in materials and/or workmanship only. This warranty shall expire 30 days from purchase by the consumer or after 1,000 miles in normal service--whichever comes first. Components covered during this warranty will be replaced or repaired free of charge by the manufacturer. The manufacturer shall have the option of replacing or repairing the defective part in question, only after the part has been returned to the manufacturer for his inspection.

THIS WARRANTY DOES NOT COVER OR PROVIDE LIABILITY FOR THE FOLLOWING:

1. Postage to and from the manufacturer.

2. Any component of this product when used for the purpose of racing or competitive events.

3. The cylinder pistons, piston rings, and sleeves when the cylinder is painted or applied with any other finish to the original "as cast" condition of the cylinder barrel.

4. Any claims when any component of the product has been modified or altered in any way.

5. Any abnormal wear or damage caused from lack of proper care and service such as the following:
   a. Operating engine without aircleaners.
   b. Operating engine with dirty aircleaners.
   c. Operating engine with inferior or insufficient oil.
   d. Operating engine with dirty oil.
   e. Operating engine in abnormally high temperatures such as desert riding.
   f. Use of 10.5:1 c.r. pistons for road and street use.

6. Damage, failure, excessive wear, caused from abuse, improper installation or excessive heat caused from an out-of-tune engine such as the following:
   a. Seized pistons.
   b. Pistons with burned through or collapsed domes.
   c. Pistons with collapsed, scored, or cracked skirts.
   d. Cracked, warped, or broken sleeves or pistons, caused from excessive engine heat or too much piston skirt to cylinder wall clearance.
   e. Blown or leaking head gasket.
   f. Leaking engine seals or gaskets.
   g. Loose or missing wrist pin clips.
   h. Broken or seized piston rings or ring lands in the piston.

7. Stripped or damaged threads in the cylinder block or damage resulting from the same. Explanation: The threads provided in the cylinder are more than adequate and will not strip out under normal conditions. The type and depth of these threads meet or exceed the specifications set for a reliable installation in aluminum. Only abuse or over-torquing will cause their failure.

8. Any liability for the cost of any labor such as: special machine work, installation, repairs, etc. performed by other than the manufacturer.

9. Any liability for damaged or defective engine and transmission parts, etc., other than components of this Kit.

10. Damage caused from tappet blocks that have worked loose from faulty installation.

PLEASE NOTE

The object of these conditions is not to solely protect the manufacturer, but to emphasize the care and service a motorcycle engine requires. Most motorcycle engines are air cooled and depend on many precautions to eliminate their overheating. Most automobile engines have a thermostatically controlled water cooling system that regulates the engine temperature. This system works much more efficiently than the air cooling system on a motorcycle engine. The water cooling system can dissipate the heat away from even an out-of-tune or abused engine. However, the air cooled motorcycle engine relies heavily on the operator to adjust the engine and his riding habits to protect and avoid failure from excessive heat and abnormal conditions. Many trouble-free miles can be enjoyed only if you fulfill your obligation to protect your engine and your investment.

If any problems arise after the warranty expires that may need adjustment, feel free to contact the manufacturer. Every effort will be made to reach a fair and just compromise that is agreeable to both parties.

CHANTLAND MFG

Bob Chantland
242 Northdale Blvd.
Coon Rapids, Minnesota 55433
612-757-2584

CHANLAND 750

ALL 650cc TRIUMPH OWNERS!!!

Now you can have 750cc performance without sacrificing your engine's reliability. Installing this kit is absolutely the fastest and least expensive way to obtain a comparable, or higher, horsepower to weight ratio, than the newest super bikes. You can easily expect a 25% increase in torque and horsepower.

The amazing power torque increase that you will obtain will leave you completely surprised. Your engine will start easily, and still run smoothly.

This performance proven 750cc kit displaces a full 750cc, and bolts on instantly without any machining or modifications whatsoever. All special parts are furnished in each kit. The complete installation takes no more than 3 or 4 hours, and can be done by anyone with reasonable mechanical ability. No special tools are required and complete easy to follow directions are furnished. This kit is all American made and is fully guaranteed.

The following questions are those most frequently asked by persons interested in installing this kit.

(1) Will this be hard on the engine's lower end (bearing, rods, and crank)? NO! As long as the lower end is in good condition there will be no problems, as the 650cc Triumph lower end is more than strong enough for high performance use.

(2) Will it be necessary to rebalance the crankshaft with this kit? NO! There should be no appreciable difference in vibration, in some instances the engine is actually smoother.

(3) Will the engine run rough or overheat with this kit? NO! The engine will still run smoothly and actually run cooler, as the aluminum barrel dissipates heat faster than cast iron. However, for the average street and road bike the 9.5:1 pistons are recommended.

(4) Would it be a waste (performance wise) to install this kit on a single carb TR6 model? NO! Now single carb TR6 owners can make their engine really come alive with the advantage of their single carb to obtain maximum torque. The single carb TR6 will actually deliver more torque in the low to mid range R.P.M.'s than a twin carb set-up. Several late model TR6 owners after installing this kit as the only modification have turned consistently in the high 12 to low 13 second e.t. bracket at speeds of 100 m.p.h. +.

(5) Will this kit fit on any 650cc Triumph? YES! This kit will bolt right on any 1963 or newer 650cc engine, without any machine work, and will fit inside most pre-unit construction cases (1962 or older) without any machine work. However, if you wish to install this kit on a 1962 or older pre-unit engine you must use a 1963 or newer cylinder head.

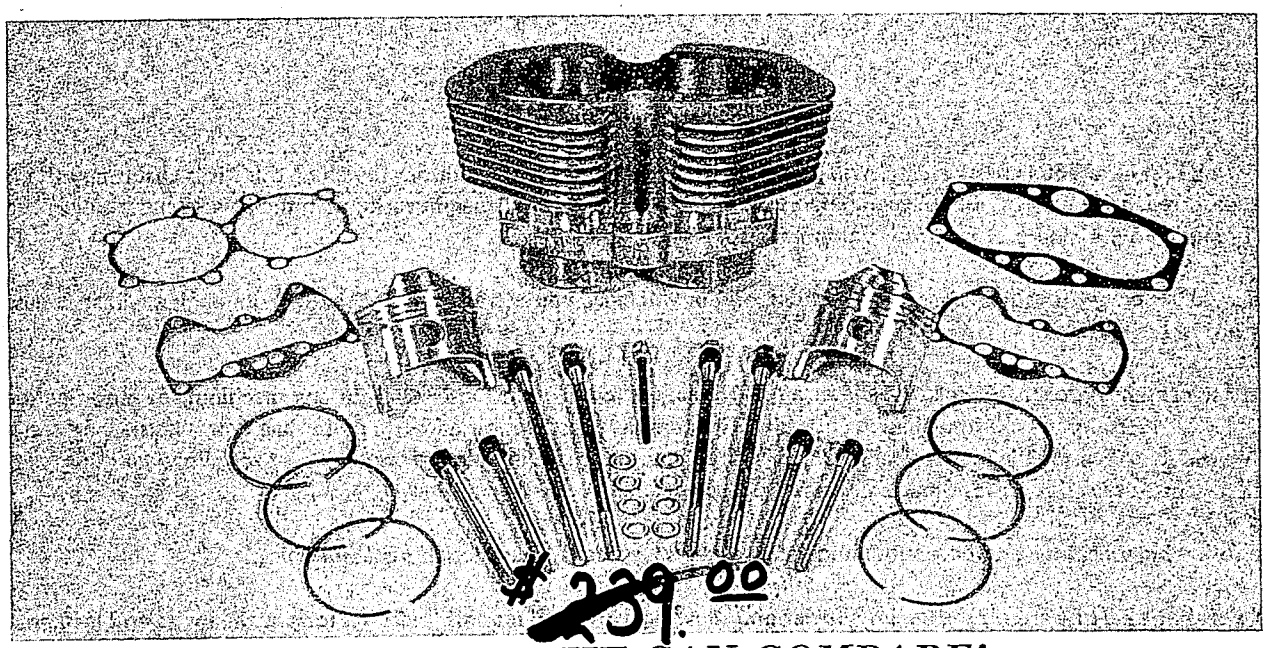
(6) Can this cylinder be rebored? YES! Oversize pistons and rings are immediately available, up to three oversizes.

(7) Are the valves in a Triumph head large enough for a 750cc kit? YES! As the later model 650cc Triumphs have larger valves than any other 750cc bike.

(8) Will it be necessary to use high performance camshafts with this kit for street use? NO! You will receive an amazing power increase by installing just the 750cc kit. But, if you would like to go a step further, you should install the Harmon and Collins #6 or #9 grind. With this terrific combination you can have a race bike in street trim. In most cases the stock carbs will work fine. Harmon & Collins, 5552 Alhambra Avenue, Los Angeles, California 90032.

For Street or Stri[redacted]

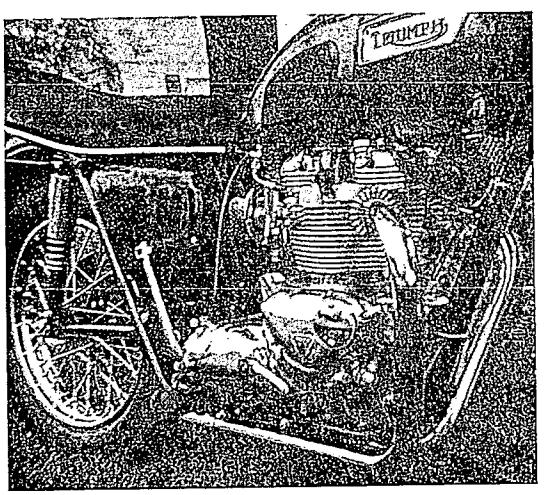
750cc Triumph Kit

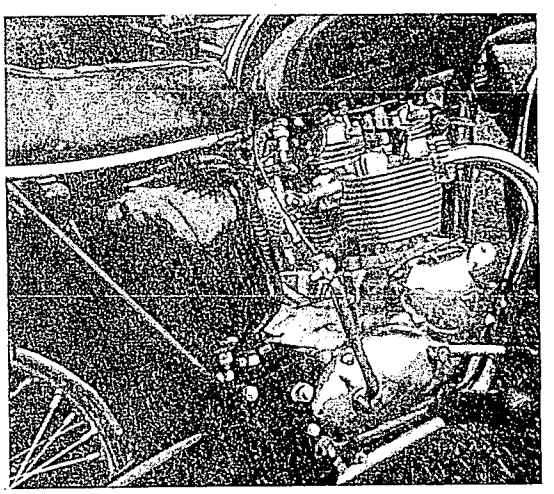


NO OTHER KIT CAN COMPARE!

TECHNICAL INFORMATION

Tempered 356 - T6 aircraft aluminum alloy cylinder is 7 lbs. lighter, yet stronger than cast iron cylinders • Polished fins match cylinder head - dissipates heat twice as fast • Box shaped inner body eliminates distortion • Roll extended threads, can't strip • Replaceable precision ground chrome - nickel alloy sleeves are extremely wear resistant • Only cylinder kit which features replaceable copper wire o-rings to insure a perfect seal on the head gasket surface • Cylinder head studs are manufactured from "stressproof" steel and are slotted for fast installation • 9.5:1 (road and street) or 10.5:1 (racing) pistons are manufactured from a low expansion, high silicone content aluminum alloy • Perfect circle rings are furnished and each piston is precision fitted to a 3.000" cylinder bore • Over sized pistons and rings are immediately available up to 3 oversizes.





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