

1971-73 TRIUMPH STAG V8

GENERAL SPECIFICATIONS										
Year	Displ.		Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore		Stroke	
	Cu. ins.	cc					in.	mm	in.	mm
1971-73	182.9	2997	2x2-Bbl.	145@5500	170@3500	8.8-1 ①	3.385	86	2.539	64.5

① — Compression ratio is 7.75-1 in 1972-73.

ENGINE IDENTIFICATION

Engine identification number is stamped in machined pad on left cylinder head between No. six and eight exhaust ports.

LD27HE

- 1st & 2nd Digits — Model Range.
 3rd & 4th Digits — Sequence Number.
 5th & 6th Digits — "HE" — High Compression, "LE" — Low Compression.

ENGINE REMOVAL

NOTE — Manufacturer recommends to remove engine and transmission as a unit in an area equipped with a pit. If a pit is not available, extra high safety stands must be used.

- 1) Remove hood and disconnect battery. Drain cooling system, including plugs in both sides of cylinder block and remove radiator. Remove center bolt from fan pulley and remove fan and clutch.
- 2) Disconnect power steering pump lines to steering gear and drain system. Disconnect all electrical connections to engine. Disconnect electrical connections to transmission at junction block at left side of firewall.
- 3) Disconnect fuel line from filter. Disconnect accelerator and choke cable from carburetors. Disconnect heater hoses at firewall and remove windshield washer reservoir bottle.
- 4) Raise front of vehicle approximately 18" by positioning safety stands behind front wheels. Drain engine and transmission. If vehicle is equipped with auto. trans., remove dipstick tube to drain transmission.
- 5) Remove oil filter, front exhaust pipes and mufflers. If vehicle is equipped with auto. trans., disconnect shift linkage and oil cooler lines at transmission and cooler.
- 6) If vehicle is equipped with man. trans., remove slave cylinder and gear shift lever. On all models, disconnect speedometer cable.
- 7) Raise rear of vehicle, disconnect and remove drive shaft. Plug rear of transmission and lower vehicle. Place a jack under transmission and raise to release weight.
- 8) Attach a sling to lifting eyes at front of engine and connect to a hoist. Remove front engine mounting bolts and transmission crossmember bolts.
- 9) Raise front of engine until oil pan clears crossmember. Pull engine forward while lowering rear of transmission until both can be pulled up and out of vehicle.
- 10) To install engine and transmission, reverse removal procedure. Tighten all bolts and nuts to specifications.

INTAKE MANIFOLD REMOVAL

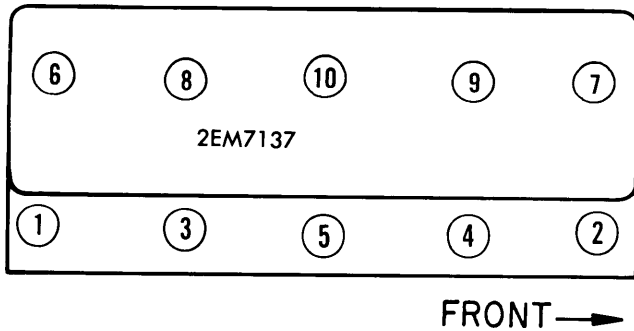
- 1) Drain cooling system and disconnect accelerator and choke cables at carburetors. Disconnect auto. trans. kickdown cable (if equipped).

- 2) Disconnect fuel line at filter and engine breather from right side camshaft cover. Disconnect vacuum line from carburetor and remove distributor cap.
- 3) Disconnect brake servo from manifold and top hose at thermostat housing. Disconnect by-pass line and coil leads.
- 4) Remove center nut and washer securing carburetor pedestal to manifold and remove assembly with air cleaner. Remove coil to gain access to manifold bolts.
- 5) Remove thermostat housing and thermostat. Remove manifold retaining bolts and remove manifold.
- 6) To install, loosen cylinder head bolts on one side. **CAUTION — Cylinder head bolts must be loosened on one side or warpage of intake manifold could occur during tightening.**
- 7) Make sure mating surfaces are clean. Install manifold and tighten bolts to tight cylinder head first, then to loose cylinder head.
- 8) With intake manifold tightened to specification, tighten loose cylinder head to specification. To install remaining components, reverse removal procedure.

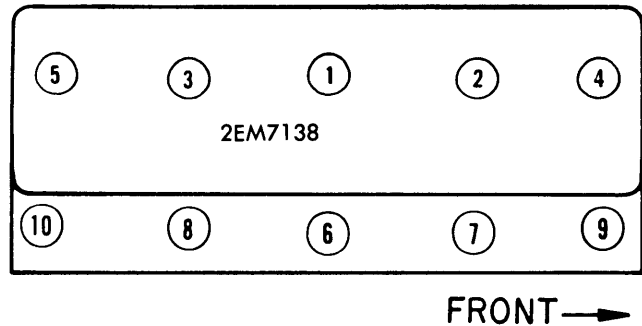
CYLINDER HEAD REMOVAL

- 1) Drain cooling system and disconnect battery. Disconnect choke and accelerator cable from carburetors. Disconnect auto. trans. kickdown cable (if equipped).
- 2) Disconnect windshield washer reservoir and fuel line from filter. Disconnect breather tube from right side camshaft cover and vacuum advance line from carburetor.
- 3) Remove distributor cap and disconnect temperature sending unit connection. Disconnect heater hose from left cylinder head and brake servo from manifold.
- 4) Remove center nut and washer securing carburetor pedestal to manifold and remove assembly with air cleaner. Disconnect auto. trans. dipstick tube from cylinder head (if equipped).
- 5) Remove both camshaft covers and turn engine until line in camshaft gear flange aligns with groove in camshaft bearing cap.
- 6) Bend over lock tabs and loosen top bolts securing camshaft gear to flange, rotate engine and remove lower bolts securing gear to flange. Turn engine and realign marks as previously outlined.
- 7) Remove upper bolt and lock plate. Using nuts from camshaft bearing mounts, secure camshaft gear and chain to support brackets on both sides.
- 8) From under vehicle, remove oil filter and disconnect both exhaust pipes from manifolds. Remove engine dipstick, power steering pump bolts and move power steering pump to side.
- 9) Move coil to gain access to intake manifold bolts and remove intake manifold. Remove cylinder head bolts in sequence shown in illustration and remove cylinder heads.

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CYLINDER HEAD BOLT LOOSENING SEQUENCE



CYLINDER HEAD BOLT TIGHTENING SEQUENCE

10) To install cylinder heads, make sure all mating surfaces are clean. Install two alignment studs in bolt holes seven and eight (see tightening sequence illustration).

11) Install left hand cylinder head gasket and cylinder head. Tighten cylinder head bolts, after removing studs, to specification in sequence shown in illustration.

12) Install intake manifold gasket on left side cylinder head and install intake manifold and tighten bolts to specification.

Install right cylinder head using same procedure as used on left but do not tighten cylinder head bolts.

13) Install right side intake manifold gasket and tighten intake manifold bolts to specification. Tighten right side cylinder head bolts to specification in sequence shown in illustration.

14) Install camshaft sprocket on camshaft flange, making sure marks are still aligned. To install remaining components, reverse removal procedure.

VALVES							
Engine & Valve	Head Diam. In. (mm)	Face Angle	Seat Angle	Seat Width In. (mm)	Stem Diameter In. (mm)	Stem Clearance In. (mm)	Valve Lift In. (mm)
All Int.	1.44 (36.58)	44.5°	44.5°	.....	.3107-.3112 (7.89-7.90)	.0008-.0010 (.02-.03)	.....
Exh.	1.28 (32.51)	44.5°	44.5°	.....	.3100-.3105 (7.87-7.89)	.0016-.0018 (.04-.05)	.....

VALVES ARRANGEMENT

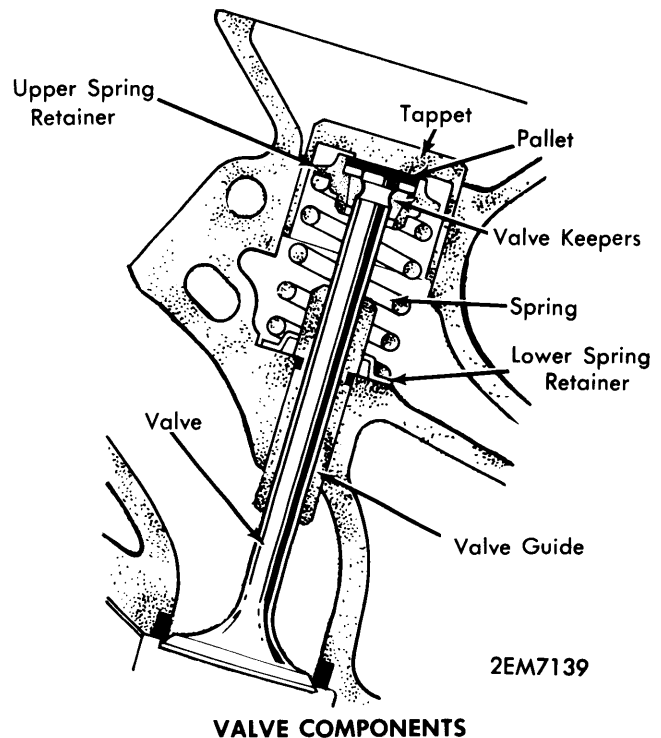
E-I-I-E-E-I-I-E (front to rear, both banks).

VALVE GUIDE SERVICING

1) With cylinder head removed and disassembled, pull guide from cylinder head toward camshaft side of head with a suitable puller (S60A-8).

2) Pull new guide into head from combustion chamber side of head with a suitable guide installing tool (S60A-2). Ream guides with a .3125" reamer.

VALVE SPRINGS			
Engine	Free Length In. (mm)	PRESSURE (LBS.) Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
All	1.60 (40.64)	24.1 (10.93)



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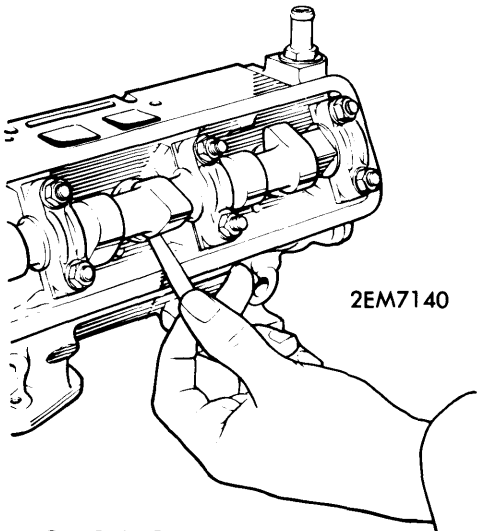
VALVE SPRING REMOVAL

- 1) With cylinder head removed as previously outlined, remove camshaft bearing cap bolts evenly until valve spring pressure is released and remove camshaft.
- 2) Remove valve tappets and pallets and compress valve spring with a suitable tool (S352). With spring compressed, remove valve keepers, upper spring retainers, springs, valves and spring seats.
- 3) To assemble valve train components, reverse disassembly procedure. Install valve spring with tight coil end toward cylinder head.

VALVE CLEARANCE ADJUSTMENT

NOTE — Valve clearance can be checked or adjusted with cylinder head removed or installed.

- 1) Remove air cleaner and elbows, distributor cover and disconnect spark plug wires. Remove camshaft cover.



CHECKING VALVE CLEARANCE

- 2) Check clearance of valves by inserting a feeler gauge between heel of camshaft and tappet. Record clearance of any valves not to specification.

Valve Clearance Specifications

Application	In. (mm)
Intake Valves .....	.006-.008 (.15-.20)
Exhaust Valves .....	.016-.018 (.40-.46)

- 3) To adjust valve clearance, bend over lock tabs on camshaft sprocket bolts. Rotate sprocket as required to loosen both bolts. Remove last bolt when mark in camshaft flange is aligned with groove in bearing cap.

- 4) Using a nut from bearing cap, secure camshaft sprocket and chain to support bracket. Remove bearing cap nuts, caps and remove camshaft.

- 5) Remove tappets and pallets for valves that did not have specified clearance. Tappets must be installed on same valve, mark or position accordingly.

- 6) Using a micrometer, measure and record thickness of each pallet. Find difference between recorded clearance and specified clearance.

- 7) Add or subtract difference to original pallet, depending on whether recorded clearance is more or less than that specified. Total is required size of new pallet.

- 8) Pallets are available in sizes ranging from .070-.114" in increments of .001". Install appropriate size pallet, tappets and camshafts. Tighten camshaft bearing bolts to specification.

- 9) Install camshaft sprocket, making sure marks are still aligned and tighten sprocket bolts. Install camshaft cover. Use same procedure to check or adjust valves for other side. To install remaining components, reverse removal procedure.

PISTONS, PINS, RINGS						
Engine	PISTONS	PINS		RINGS		
	Clearance In. (mm)	Piston Fit In. (mm)	Rod Fit In. (mm)	Rings	End Gap In. (mm)	Side Clearance In. (mm)
All	.0025-.0045 (.06-.11)	.0001-.0006 (.002-.01)	.0001-.0006 (.002-.01)	No. 1	.013-.018 (.33-.46)	.0015-.0035 (.04-.08)
				No. 2	.010-.015 (.25-.38)	.0015-.0060 (.04-.15)
				No. 3	① .015-.055 ② (.38-1.4)	..... .....

① — Gap shown is for spacers, spring ends butt together.

OIL PAN REMOVAL

- 1) Drain engine oil. Remove exhaust pipe from left side. Disconnect stabilizer bar links from stabilizer. Raise vehicle and place safety stands behind front wheels.
- 2) Disconnect strut rods from lower control arms and disconnect control arms from crossmember. Disconnect steering gear from crossmember.

- 3) Remove brake line retaining clips and brake lines from crossmember. Remove crossmember retaining bolts and remove crossmember. Remove oil pan.

- 4) To install, make sure mating surfaces are clean and install new gasket. Install oil pan and tighten bolts to specification. Install crossmember with chamfered plates fitted to inside.

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5) To install remaining components, reverse removal procedure. Do not tighten strut rods or lower control arms completely until weight of vehicle is on front wheels. Tighten all bolts and nuts to specification.

PISTON & ROD ASSEMBLY

- 1) Remove cylinder heads and oil pan as previously outlined. Rotate crankshaft until rod and piston being removed is at bottom of stroke and remove nuts and rod cap.
- 2) Push piston and rod assembly up and out through top of cylinder. Install rod cap on rod making sure that caps are not interchanged with other caps.
- 3) To install, make sure cylinder and piston are thoroughly clean. Space ring gaps evenly on non-thrust side of piston. Compress rings with a suitable compressor (38U3).
- 4) Push piston into cylinder, making sure notch in top of piston is toward front of engine. Push piston in completely making sure bearing is properly seated against crankshaft.

2) Inspect bushing in connecting rod and piston pin for wear and replace as necessary. Press bushing from connecting rod, press in new one and fit to new piston pin.

3) To assemble pistons and connecting rods for left side, position piston on rod so that when notch on top of piston is facing forward, chamfered side of rod is facing rear of engine. Oil and install pin and circlips.

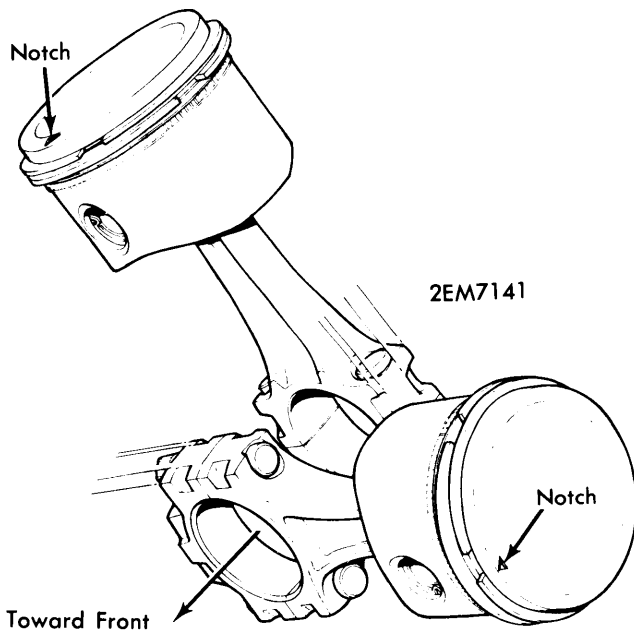
4) To assemble pistons and connecting rods for right side, position piston on rod so that when notch on top of piston is facing forward, chamfered side of rod is facing front of engine. Oil and install pin and circlips.

FITTING PISTONS

1) Pistons are manufactured in two size classes and cylinder bores are machined to size accordingly. Piston class code is stamped in top of piston. Class of cylinder bore is stamped in cylinder head mating surface of cylinder block.

Piston Specifications

Application	Piston Size In. (mm)	Bore Size In. (mm)
Class F	3.3828-3.3833 (85.92-85.93)	3.3853-3.3858 (85.99-86.00)
Class G	3.3834-3.3839 (85.94-85.95)	3.3859-3.3864 (86.00-86.01)

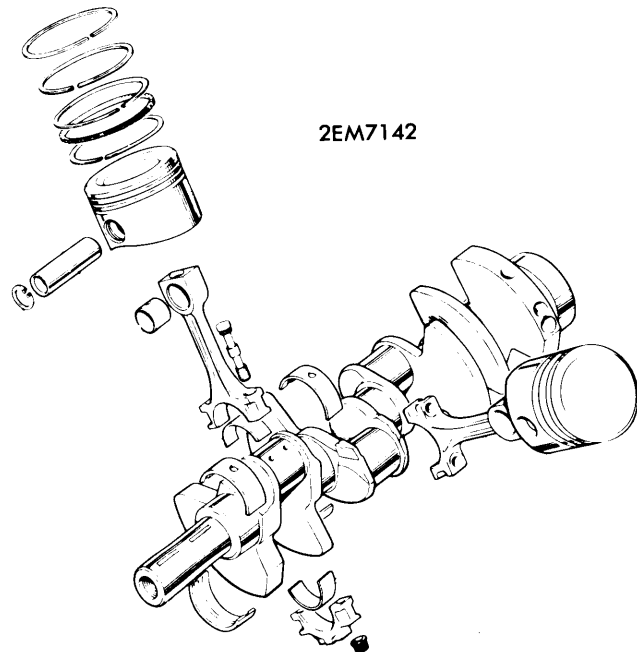


PISTON & ROD ASSEMBLY INSTALLATION DIRECTION

5) Install rod cap making sure bearing is properly seated. Tighten nuts to specification. Install oil pan and cylinder heads as previously outlined.

PISTON PIN REPLACEMENT

1) Remove piston and connecting rod as previously outlined. Remove circlips from piston and push piston pin out. Separate piston from connecting rod.



PISTON & ROD ASSEMBLY COMPONENTS

2) If cylinder bore is worn excessively, cylinder must be bored for next oversize piston. Pistons are available .020" oversize. Piston and bore class size does not pertain to oversize pistons.

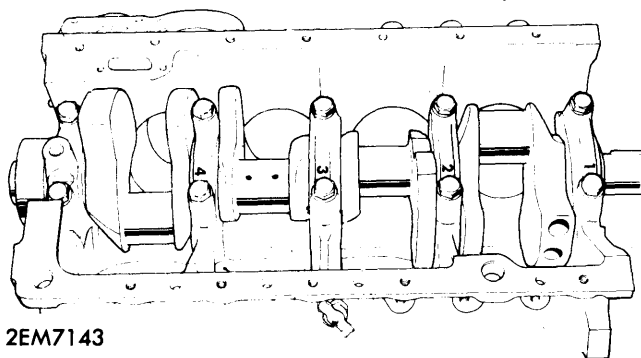
Triumph Engines

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CRANKSHAFT MAIN & CONNECTING ROD BEARINGS							
Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam. In. (mm)	Clearance In. (mm)	Thrust Bearing	Crankshaft End Play In. (mm)	Journal Diam. In. (mm)	Clearance In. (mm)	Side Play In. (mm)
All	2.1260-2.1265 (54.00-54.01)	.002 (.05)	Center	.003-.011 (.08-.28)	1.7500-1.7505 (44.45-44.46)	.0018 (.04)	.015-.024 (.38-.60)

MAIN & CONNECTING ROD BEARING SERVICE

- 1) With crankshaft removed, thoroughly clean and inspect. Blow out oil passages with compressed air. Check main and connecting rod bearing clearance. If clearance is excessive, crankshaft must be reground.
- 2) Main and connecting rod bearings are available in .010, .020 and .030" undersize. Crankshaft should not be ground more than .030" undersize.
- 3) Lightly oil bearings before installing. Main bearing caps are numbered and must be installed with numbers matching and on same side as corresponding numbers in cylinder block.

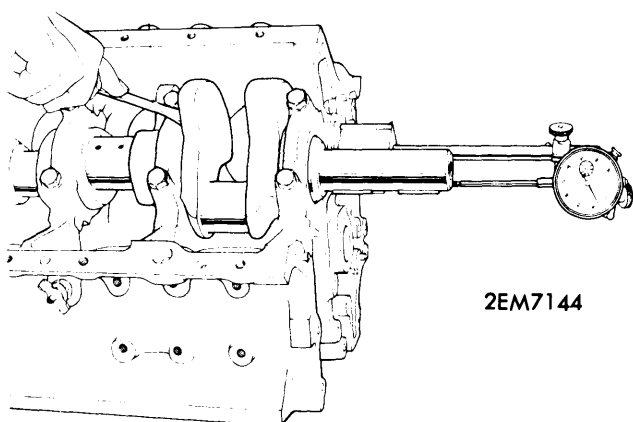


2EM7143
MAIN BEARING CAP MARKINGS

- 4) Tighten bolts to specification and check crankshaft endplay. See *Thrust Bearing Alignment*. Check crankshaft for freedom of rotation.

THRUST BEARING ALIGNMENT

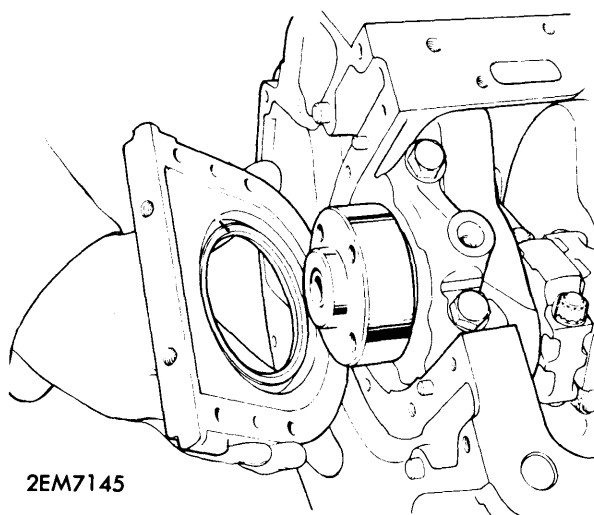
Attach a dial indicator to front of engine and measure back and forth movement of crankshaft. If endplay is not to specification, thrust bearing of appropriate size must be installed in center main bearing.



2EM7144
CHECKING CRANKSHAFT ENDPLAY

REAR MAIN BEARING OIL SEAL SERVICE

- 1) Transmission and clutch or automatic transmission and torque converter must be removed to gain access to rear main bearing oil seal.
- 2) Remove bolts securing oil pan to seal mount and remove seal mount retaining bolts. Remove seal mount and pry seal from mount.
- 3) Clean seal mount and cylinder block mating surfaces. Install new seal in mount making sure seal is flush with seal mount. Install mount with a new gasket.
- 4) Tighten bolts to specifications and install remaining components.



2EM7145
REAR MAIN BEARING OIL SEAL INSTALLATION

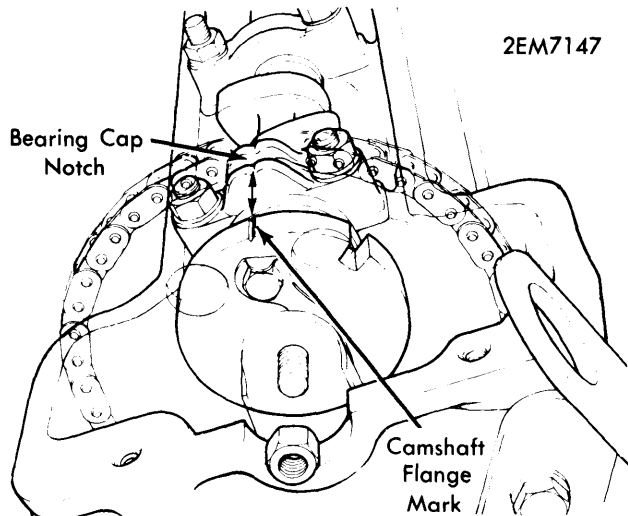
ENGINE FRONT COVER AND OIL SEAL

- 1) Disconnect battery and remove hood. Drain cooling system and remove radiator and hoses. Remove fan and clutch unit. Disconnect power steering pump from mount, remove belt and position to side.
- 2) Remove alternator and belt. Remove crankshaft pulleys. Remove bolts securing front cover to oil pan and loosen remaining pump bolts and allow pump to drop 1/4".
- 3) Remove bolt securing front cover to cylinder block and cylinder heads and remove front cover. Clean cover and cylinder block mating surfaces.
- 4) Install cover using pieces of steel plate to guide cover under cylinder head. This will prevent damage to cover, heads or gaskets. Use the new gasket when installing cover.
- 5) Install all cover mounting bolts. To install remaining components...

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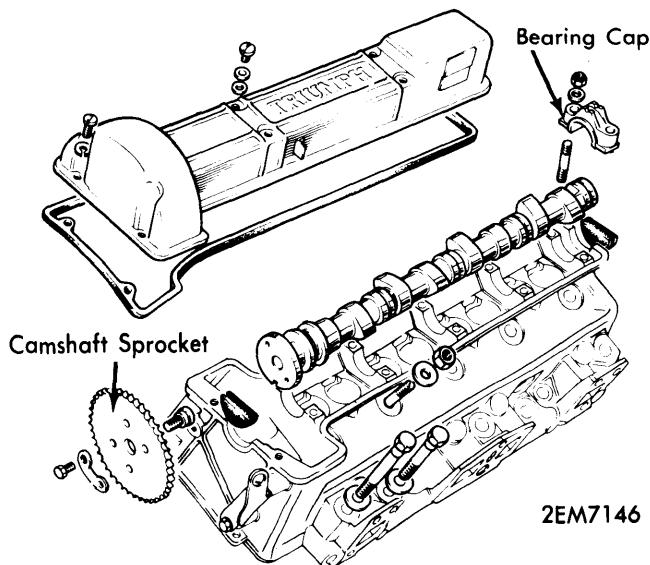
CAMSHAFT REMOVAL

- 1) Remove air cleaner and elbows from carburetor. Remove camshaft covers. Rotate engine until lines on camshaft flanges are aligned with grooves in camshaft bearing mount.
- 2) Bend over lock tab on upper sprocket retaining bolt. Rotate engine until lower sprocket bolt can be removed. Rotate engine until marks are aligned as previously outlined.



ALIGNMENT OF CAMSHAFT TIMING MARKS

- 3) Remove upper sprocket bolt and using a nut from bearing mount, secure sprocket with chain to support bracket on both sides.
- 4) Remove camshaft bearing caps. Mark caps to ensure that they are installed in same position. Remove camshafts.
- 5) To install camshafts, reverse removal procedure. Make sure marks are aligned as previously outlined. Align marks by turning camshaft, do not rotate crankshaft or sprockets. To install remaining components, reverse removal procedure.



CAMSHAFT & COMPONENTS

VALVE TIMING				
Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
All	18°	58°	58°	18°

TIMING CHAIN REPLACEMENT

- 1) Remove front engine cover as previously outlined. Remove camshaft sprockets from camshafts, aligning marks as described in camshaft removal. See *Camshaft Removal*.
- 2) Remove bolts securing outer chain tensioner and distance piece to cylinder block. Remove outer chain guides, with support bracket and remove right camshaft sprocket and outer timing chain.
- 3) Follow same procedure to remove left side support bracket, sprocket and timing chain. Remove crankshaft gears if necessary. Remove keys and shims.
- 4) Install first crankshaft gear and align with intermediate shaft gear with a straight edge. Install shims behind crankshaft gear if necessary to align gears.
- 5) Remove gear when aligned correctly, install keys, appropriate shims and both crankshaft gears. Install left side straight chain guide. Temporarily install left side curved guide.
- 6) Install support bracket and using only one bolt and lock plate, install left side camshaft sprocket. Install timing chain on intermediate sprocket, crankshaft and camshaft sprockets. When installing chain, scribed line on intermediate sprocket should be horizontal, tilting slightly to bottom on left side. All slack in chain should be on chain tensioner side.
- 7) Position curved guide in location but do not tighten bolts. Install chain tensioner with restrictor plate, in fully retracted position.
- 8) Insert a .040" feeler gauge between tensioner body and tensioner shoe. Push down on curved guide, applying tension to chain and tighten guide and support bracket. Make sure upper hole in support bracket is centered on bolt in sprocket.
- 9) Install right side camshaft sprocket with one bolt and lock plate. Install timing chain on camshaft and crankshaft sprockets, making sure all slack is on chain tensioner side.
- 10) Install support bracket and chain guides, but do not tighten guides. Install chain tensioner and spacer making sure tensioner is in fully restricted position.
- 11) Insert a .040" feeler gauge between tensioner body and tensioner shoe. Push on chain guide, applying tension to chain and tighten guide and support bracket.
- 12) Install remaining camshaft sprocket bolts and tighten to specification. Bend over lock tabs to secure sprocket bolts. Check valve timing. See *Valve Timing*. Install front engine cover as previously outlined.

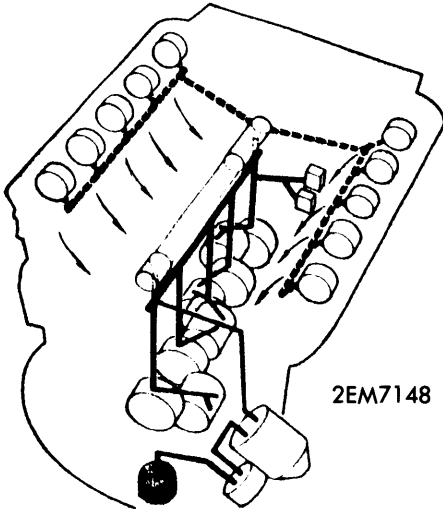
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VALVE TIMING

Remove camshaft covers and rotate engine until TDC mark on crankshaft pulley is aligned with TDC mark on scale. With TDC

marks aligned, line in camshaft sprocket flange should be aligned with groove in camshaft bearing cap. If marks are not aligned, timing chain is installed wrong and must be changed. See *Timing Chain Removal*.

ENGINE OILING



ENGINE OILING SYSTEM

ENGINE OILING SYSTEM

Full pressure oil system, utilizing a rotor type oil pump driven by intermediate shaft. A full-flow oil filter and a pressure regulator valve is also employed.

Crankcase Capacity – 4 Qts.

Oil Filter – Full-flow paper element type.

Normal Oil Pressure – 50-55 psi (3.4-3.9 kg/cm²) at normal operating temperature.

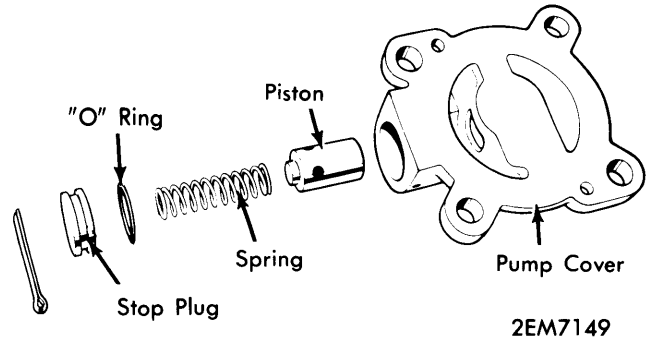
Pressure Regulator Valve – Valve and components are mounted in oil pump cover. Oil pump must be removed to remove or check pressure regulator valve. See *Oil Pump*.

OIL PUMP

1) To remove oil pump, remove exhaust pipe from right side of engine and remove oil pump. If oil pump drive does not come out with oil pump, remove with a pair of long nose pliers.

2) Remove cover, inner and outer rotors from pump body. Remove cotter pin from cover and remove plug, spring and piston.

3) Thoroughly clean and inspect all components. Insert rotors in pump body. Place a straight edge across surface and measure endplay with a feeler gauge. Endplay should not exceed .004".

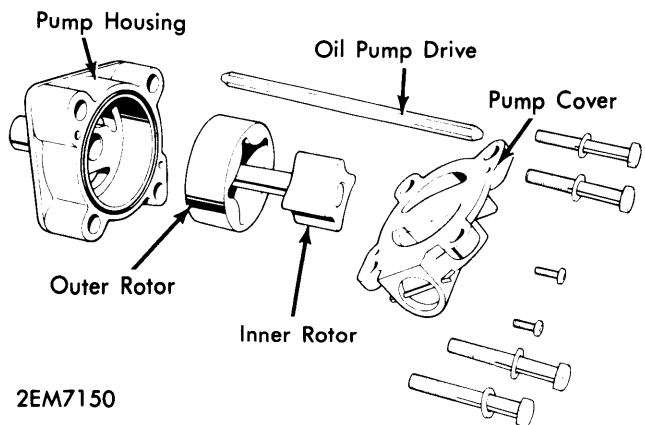


PRESSURE REGULATOR VALVE COMPONENTS

4) Measure clearance between inner and outer rotors with a feeler gauge. Replace rotors if clearance exceeds .010". Measure clearance between outer rotor and pump body. Replace rotor or pump body if clearance exceeds .008".

5) Check pressure regulator valve piston and bore in cover for wear or signs of scoring. Install a new "O" ring on pressure regulator valve plug and on pump body and cover mating surface.

6) Lubricate all components with oil. To assemble oil pump, reverse disassembly procedure. Reverse removal procedure to install oil pump and tighten bolts to specification.



OIL PUMP COMPONENTS

1971-73 TRIUMPH STAG V8 (Cont.)

ENGINE COOLING

WATER PUMP

- 1) Drain cooling system and remove intake manifold as previously outlined. Disconnect all hose connections at water pump.
- 2) Remove bolts securing water pump to cylinder block and remove water pump. Clean water pump and cylinder block mating surfaces.
- 3) Install water pump without gasket. Finger tighten all bolts evenly. Using a feeler gauge, adjust bolts around water pump until gap between water pump and cylinder block is even all the way around.
- 4) Noting gap obtained when bolts were turned to equalize gap, use gaskets as thick as gap plus .010-.025" thicker. Gaskets are available .010, .020 and .030" thick.
- 5) Remove water pump and install appropriate size gasket(s). Tighten bolts and install remaining components.

Thermostat — Three different thermostats are used. Markings on thermostat determine at what temperature thermostat starts to open and when it is fully open.

Thermostat Specifications

Thermostat Mark	Starts Opening	Fully Open
74°C	160-170°F (71-77°C)	185-191°F (85-88°C)
82°C	175-183°F (79-84°C)	200-204°F (93-96°C)
88°C	185-193°F (85-89°C)	210-216°F (99-102°C)

Cooling System Capacity — 9.25 qts.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Main Bearing	50-65 (6.9-9.0)
Connecting Rod	38-45 (5.2-6.2)
Cylinder Head	45-55 (6.2-7.6)
Camshaft Bearing	11-14 (1.5-1.9)
Camshaft Sprocket	7-9 (.9-1.20)
Intermediate Sprocket	30-37 (4.1-5.1)
Intake Manifold	16-20 (2.2-2.8)
Intermediate Shaft Lock Plate	16-20 (2.2-2.8)
Front Cover	16-20 (2.2-2.8)
Water Pump	11-14 (1.5-1.9)
Oil Pump	16-20 (2.2-2.8)
Oil Pan	16-20 (2.2-2.8)
Timing Chain	
Tensioner-to-Block	7-9 (.9-1.2)
Guides-to-Block	16-20 (2.2-2.8)
Flywheel-to-Crankshaft	38-45 (5.2-6.2)
Crankshaft Pulley	90-110 (12.5-15.2)