

# Rover Engines

## 1971-72 ROVER 3500S 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
1968-72	215	3528	① 1-Bbl.	184@5200	226@3000	10.5-1	3.5	88.9	2.8	71.12
	215	3528	① 1-Bbl.	.....	.....	8.5-1	3.5	88.9	2.8	71.12

① — Two 1-Barrel Carburetors.

### ENGINE IDENTIFICATION

Stamped on engine block just to rear of left cylinder bank. 43000001A is 10.5-1 compression ratio. 43200001A is 8.5-1 compression ratio.

### ENGINE REMOVAL

- 1) Disconnect battery and remove hood.
- 2) Drain radiator and engine block. Both sides of block must be drained.
- 3) Remove power steering hose clip from oil pan. Remove both hoses from power steering pump and drain.
- 4) Drain oil pan.
- 5) Remove front exhaust pipe.
- 6) Disconnect the following items:
  - Propeller shaft.
  - Speedometer from rear of transmission.
  - Wires from starter solenoid, release from cable cleat.
  - Starter cable.
  - Wires from inhibitor switch on left-hand side of automatic transmission.
  - Ground lead from engine to chassis.
  - Rods from gear selector lever.
- 7) Remove nuts, washers and alignment plates from underside of front engine mounts.
- 8) Loosen, but do not remove nuts and bolts attaching engine/transmission rear mount to underside of chassis.
- 9) Remove air cleaner.
- 10) Disconnect heater hoses from rear of engine.
- 11) Disconnect throttle linkage from nylon coupling at rear of engine. Withdraw link rod from coupling below heater box.
- 12) Disconnect following electrical leads:
  - Leads from alternator.
  - High tension lead and point lead from ignition coil.
  - Water temperature transmitter lead.
  - Lead from oil pressure transmitter.
- 13) Release wiring harness from clip on alternator.
- 14) Disconnect brake servo pipe from intake manifold.
- 15) Disconnect spill return pipe from left-hand carburetor.
- 16) Disconnect fuel inlet line from fuel filter, and plug line to prevent fuel leakage.
- 17) Remove radiator.
- 18) Remove fan.
- 19) Release fuel line and spill return line from engine.
- 20) Remove nuts, cup washers, rubber bushing and guide washer from both ends of engine tie rod and remove rod.
- 21) Disconnect steering pump hose clip next to distributor and move hose aside.
- 22) Disconnect hoses from engine to charcoal canisters. Disconnect right-hand canister and move aside.
- 23) Remove engine oil filter.
- 24) Remove power steering pump, leaving drive belt on crankshaft pulley.
- 25) Attach lifting sling to engine. Jack up rear of vehicle approximately three feet to assist engine removal.
- 26) Support rear of transmission and remove nuts and bolts attaching rear mount. Then lower transmission until supported by engine sling.
- 27) Remove engine by lifting and drawing forward a little at a time.

### Transmission to engine removal

- 1) Disconnect downshift cable at carburetor.
- 2) Release transmission oil lines from engine.
- 3) Remove bell housing cover plate. *NOTE — Torque converter should be replaced in its original position. Mark flexible drive plate and torque converter before removal.*
- 4) Remove four torque converter bolts through cover plate opening.
- 5) Remove eight bell housing bolts and withdraw torque converter and transmission. *NOTE — Care should be taken not to spill oil if torque converter and transmission become separated.*

### INTAKE MANIFOLD REMOVAL

**Removal** — 1) Drain radiator and engine block.

- 2) Remove air cleaner.
- 3) Remove carburetors.
- 4) Disconnect vacuum lines between intake manifold, vacuum retard switch and distributor. Remove vacuum retard switch.
- 5) Release fuel line from clip at rear right-hand air cleaner bracket.
- 6) Release fuel spill return line from clip at left-hand air cleaner bracket.

## 1971-72 ROVER 3500S V8 (Cont.)

- 7) Remove engine breather filter.
- 8) Disconnect throttle linkage at nylon coupling.
- 9) Disconnect downshift cable and bracket from intake manifold and cylinder head.
- 10) Remove the following six hoses:
  - Radiator top hose.
  - Water pump to intake manifold.
  - Water pump to heater return line.
  - Heater to heater inlet line.
  - Heater to heater return line.
  - Pressure relief line, radiator to intake manifold.
- 11) Remove water temperature transmitter lead.
- 12) Disconnect brake servo vacuum pipe connection at manifold.
- 13) Remove spark plug leads and plastic retainers on rocker cover together with distributor cap.
- 14) Remove 12 bolts attaching intake manifold to cylinder heads. Lift manifold off rearwards to clear hose from water pump.
- 15) Make sure there is no water lying on top of manifold gasket. Remove gasket clamps and lift off gasket, now remove rubber gasket seals.

**Installation** – 1) Using new seals, apply silicon grease to both sides of seals and fit them in position ensuring that ends of seals are fitted into notches formed between cylinder head and block.

2) Apply suitable sealing compound on four corners of cylinder head, intake manifold gasket and intake manifold, around water passage joints.

3) Place intake manifold gasket in position with the word "FRONT" towards front of engine and open bolt hole toward right-hand side.

4) Fit gasket clamps, but do not tighten fully.

5) Position manifold and connect water hoses.

6) Check gasket position. Install all bolts into cylinder heads using thread lubricant. The two longer bolts are installed in front and brackets for throttle return springs are located on third bolt from rear.

7) Tighten all bolts a little at a time, alternating sides. Torque all bolts to specifications. Now tighten clamp bolts to specifications.

8) Tighten all water hose clamps. Reverse removal procedure for remaining components.

### CYLINDER HEAD REMOVAL

**Removal** – 1) Drain radiator and block.

2) Remove air cleaners and carburetors.

3) Remove intake manifold.

4) Release spark plug leads from plastic retainers on rocker cover. Disconnect engine breather pipe on left-hand side. Remove screw attaching cable clamp and dipstick tube clamp.

5) Remove four screws attaching rocker covers to heads.

6) Unscrew four bolts attaching rocker shaft assembly and lift off assembly complete with baffle and bolts. *NOTE* – When removing rocker shaft only, take care to ensure that push rods are not lifted as hydraulic tappets may be dislodged.

7) Remove exhaust pipe from manifold.

### Left-hand cylinder head

8) Remove heat shield. Remove exhaust manifold bolts and disconnect automatic choke pipe at manifold. Remove exhaust manifold.

9) Disconnect tie rod from front of cylinder head and remove dipstick.

### Right-hand Cylinder head

10) Release transmission breather tube. Remove heat chamber from exhaust manifold.

11) Remove alternator.

12) Loosen head bolts evenly and remove head.

13) If both heads are removed, mark them so they may be returned to their original positions.

**Installation** – 1) Fit a new gasket with word "TOP" upwards. Do not use any kind of sealing compound as gasket is treated with a sealing lacquer.

2) Position head on cylinder block.

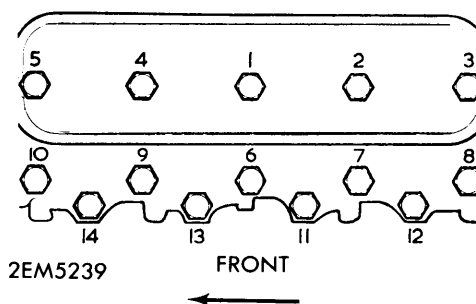
3) With a suitable thread lubricant, coat threads and install bolts in their proper places.

### Bolt Lengths

Bolts 1, 2 and 4 are 3 15/16" long.

Bolts 3, 5, 6, 7, 8, 9 and 10 are 2 3/4" long.

Bolts 11, 12, 13 and 14 are 2 9/32" long.



### CYLINDER HEAD TIGHTENING SEQUENCE

4) Tighten bolts a little at a time until specifications are reached. Do not over torque head bolts or cylinder may be distorted.

5) Reverse removal procedures for remaining components.

# Rover Engines

## 1971-72 ROVER 3500S V8 (Cont.)

VALVES							
Engine & Valve	Head Diam.	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Lift
3500S Int.	1.495-1.505"	45°	46°	.063"	.3402-.3412" <sup>①</sup>	.001-.003" <sup>③</sup>	.39"
					.3407-.3417" <sup>②</sup>	.0005-.0025" <sup>④</sup>	
Exh.	1.3075-1.3175"	45°	46°	.063"	.3397-.3407" <sup>①</sup>	.0015-.0035" <sup>③</sup>	.39"
					.3402-.3412" <sup>②</sup>	.002-.004" <sup>④</sup>	

- ① — Measured at head of valve.
- ② — Measured at stem of valve.
- ③ — Measured at top of guide.
- ④ — Measured at bottom of guide.

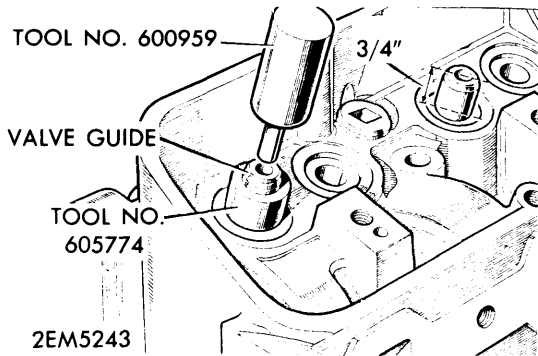
### VALVE ARRANGEMENT

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

### VALVE GUIDES

Replace guides if stem clearances are beyond specifications.

- 1) Drive out old guide using suitable drift.
- 2) Lubricate new guide and install from top of head, using suitable tool (Rover Part No. 600959) and spacer (Rover Part No. 605774). The tool is designed to insert valve guide to its proper height of 3/4" above step surrounding valve guide boss. *NOTE — Replacement guides have .001" larger OD to maintain a good press fit in aluminum head.*



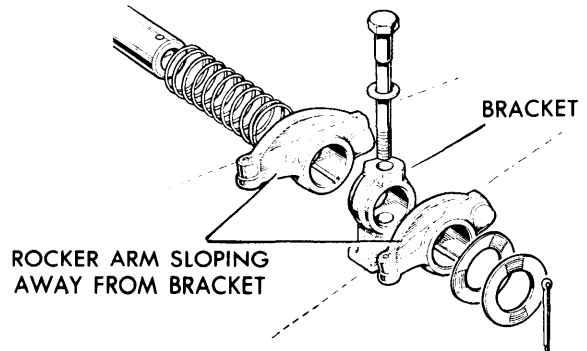
2EM5243  
**INSTALLING VALVE GUIDE**

### ROCKER ARM ASSEMBLY OVERHAUL

**Removal** — 1) Lift off rocker cover and gasket by removing four attaching screws.

2) Unscrew four bolts attaching rocker shaft assembly. Lift off rocker assembly complete with baffle and bolts. Use care to separate push rods from rocker assembly, so hydraulic lifters do not become dislodged from cylinder block.

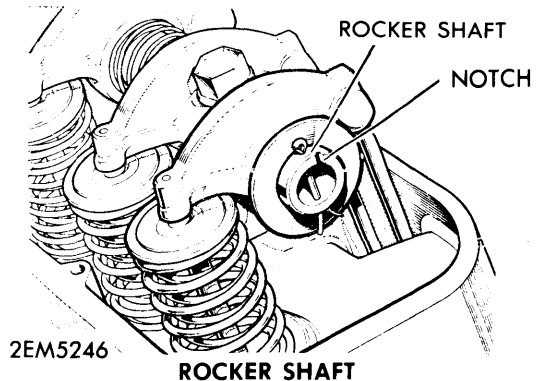
**Installation** — 1) Install cotter pin on one end of rocker shaft. Place flat washer and spring washer on first, then reinstall rocker arms, springs and brackets. Two types of rocker arms are used and they must be positioned so valve ends slope away from brackets (See Illustration).



**LOCATION OF ROCKER ARMS**

2) Compress springs, rockers and bracket so spring washer, plain washer and cotter pin may be reinstalled.

3) Install bolts through brackets and shaft so that notch on end of rocker shaft is pointing upwards and to rear on left-hand side and toward front on right-hand side (See Illustration).



**ROCKER SHAFT**

## 1971-72 ROVER 3500S V8 (Cont.)

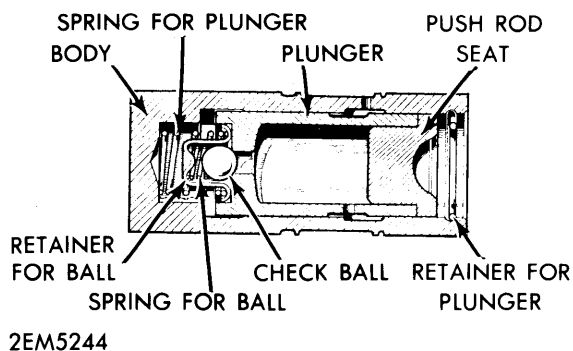
4) Install rocker shaft assemblies engaging push rods correctly. Baffle plates are installed at front on left-hand side and at rear on right-hand side. Pull bolts down evenly and torque to specifications.

5) Reinstall rocker cover and gasket.

### HYDRAULIC LIFTER SERVICE

**Removal** – 1) Remove intake manifold as previously instructed. Remove push rods.

2) Lift out lifters and retain in proper order for reassembly. *NOTE – If tappet can not be withdrawn from top its base has been mushroomed slightly. Camshaft must be removed and lifter withdrawn from below.*



2EM5244  
**HYDRAULIC TAPPET**

**Overhaul** – 1) Inspect inner and outer surfaces for wear, blow holes or scoring.

2) Inspect cam contact surface on lower end of tappet. A proper operating tappet will show a circular wear pattern. If other patterns appear replace tappet. Tappet must be free to rotate in cylinder block.

3) Inspect push-rods and tappet push-rod seats for roughness. Replace if necessary.

4) Improper hydraulic lifter operation may result if valve stem has been raised by grinding or installation of a new valve seat by more than .050". Normal height of stem above spring seat is 1.825".

VALVE SPRINGS			
Engine	Free Length	PRESSURE (LBS.)	
		Valve Closed	Valve Open
3500S Outer	.....	39-45@ 1.6"	.....
Inner	.....	21.5-26.5 @ 1.63"	.....

PISTONS, PINS, RINGS						
Engine	PISTONS	PINS		RINGS		
	Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
3500S	.0005-.0011"	.0001-.0003"	Press Fit	Comp. Oil	.017-.022" .015-.055"	.003-.005" .....

### OIL PAN REMOVAL

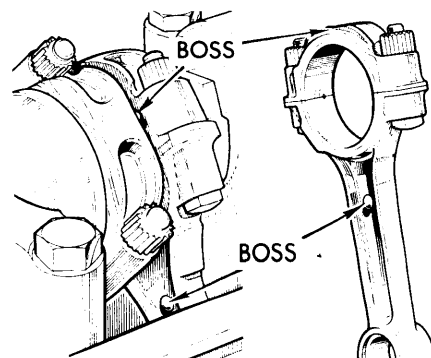
Oil pan may be removed with engine in vehicle.

- 1) Remove torque converter cover plate to gain access to pan bolts.
- 2) Drain oil and remove oil pan bolts.
- 3) Release oil cooler pipes on right-hand side of pan.
- 4) To reinstall, reverse removal procedures, apply sealing compound to joint face where timing cover and block meet.

### PISTON & ROD INSTALLATION

When reinstalling piston and rods, match piston to rod and replace in same bore as it came from. Check that grade letter on piston and block match. Make sure that connecting rod bosses are mated and rods in left-hand bank face to rear and right-hand bank face to front of engine (See Illustration).

When all rods are correctly installed oil holes in connecting rods will face toward camshaft. Torque rod nuts to specifications. Check rods for side play (See Specifications).



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**CONNECTING ROD IDENTIFICATION**

## 1971-72 ROVER 3500S V8 (Cont.)

### PISTON PIN REPLACEMENT

Piston pins are a press fit in connecting rod. A suitable press and tools will be required to replace piston pins.

### FITTING PISTONS

Measure cylinder bore at 90° to piston pin approximately 2 in. from the top. Measure piston at 90° to piston pin 1/4 in. below ring groove. Cylinder block and piston should be at same temperature to avoid measurement errors. Pistons are available in standard graded sizes and non-graded oversizes. Oversizes are .010" and .020" only.

### Graded Standard Pistons

### Oversize

Z.....	0-.0003"
A.....	.0003-.0006"
B.....	.0006-.0009"
C.....	.0009-.0012"
D.....	.0012-.0015"

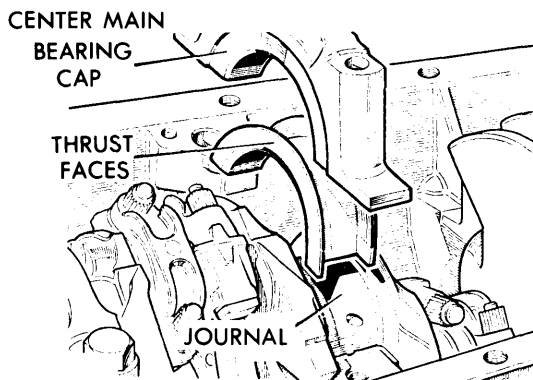
Piston and block are marked with grade letter of piston fitted. When boring cylinders crankshaft and main bearings must be in place to prevent block from being distorted.

Check end-gap and side clearance of compression rings. Oil ring does not require checking. When installing compression, the word "TOP" must face upwards. Chrome compression ring goes in top groove of piston.

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS							
Engine	MAIN BEARINGS			CONNECTING ROD BEARINGS			
	Journal Diam.	Clearance	Thrust Bearing	Crankshaft Endplay	Journal Diam.	Clearance	Sideplay
3500S	2.2992- 2.2997"	.0009- .0024"	No. 3 .....	.004- .008"	2.0000- 2.0005"	.0006- .0022"	.006- .014"

### REPLACEMENT BEARINGS

Main bearings are available in .010", .020", .030", and .040" undersizes. In the case of center main bearing which controls crankshaft end play, thrust faces follow undersizes as follows: Standard, .010", .010" and .020" undersizes.



CENTER MAIN BEARING

### MAIN BEARINGS

Measure crankshaft journals, they should not have more than .003" clearance. While checking run-out at each journal, note relation of maximum eccentricity on each journal. Maximum on all journals should come at same angular location. If they do not come at nearly the same location, crankshaft may well have a bend in it and should be replaced. Maximum out of round is .0015". Grind crankshaft to next undersize if necessary. Using the Plastigage method, check bearing clearance. If clearance is more than .003" bearing should be replaced. Bearing half with oil groove and hole must be fitted to engine block.

### CONNECTING RODS

Inspect connecting rod bearings for wear. Measure crankshaft journal for run-out. Use the Plastigage method to check rod bearing clearance. If clearance exceeds .003" replace rod bearings. Remove cap and peel off Plastigage, reinstall bearing cap and torque nuts to specifications.

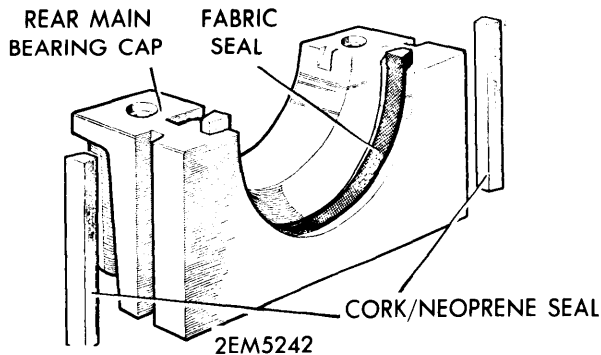
### THRUST BEARING ALIGNMENT

Crankshaft end play is controlled by the center main bearing. Thrust faces of the bearing, as undersize bearings are installed, increase in thickness. Therefore crankshaft thrust faces must be grounded to give proper clearances. See (REPLACEMENT BEARINGS) for thrust face oversizes.

### REAR MAIN BEARING OIL SEAL

Two types of seals are used at rear main bearing. A braided fabric seal is used around the crankshaft and a cork/neoprene is used along sides of bearing cap (See Illustration). With crankshaft removed, replace old seals. Press fabric seal into groove to rear of oil collecting groove. Using a hammer handle or smooth dowel, rub seal down until it protrudes not more than 1/16" above groove. Cut ends of seal flush with parting surface. Insert cork/neoprene seal into side groove of bearing cap, allowing it to protrude slightly above crankshaft side of cap. Coat oil seal faces with engine oil. Install rear bearing cap and torque to specifications. Push end of cork/neoprene seal up into groove, using a blunt instrument, until it is flush with block face. Do not cut seal ends.

## 1971-72 ROVER 3500S V8 (Cont.)



**REAR MAIN BEARING SEALS**

### ENGINE FRONT COVER

- 1) Drain coolant from radiator and both sides of engine block. Remove radiator.
- 2) Remove fan and pulley.
- 3) Loosen alternator and remove fan belt. Remove alternator adjusting bolt between bracket and front cover and move alternator to one side.
- 4) Loosen timing pointer bolts and move pointer to one side.
- 5) Disconnect hoses from power steering pump and drain fluid.
- 6) Remove power steering pump and drive belt.
- 7) Remove pump mounting bracket.
- 8) Disconnect water hoses from pump to intake manifold and pump to heater return pipe.
- 9) Disconnect distributor vacuum line and distributor cap. Unclip leads on left-hand rocker cover and push cap to one side. Disconnect distributor low tension lead, oil pressure transmitter and oil pressure warning light switch leads.
- 10) Lock engine and loosen bolt attaching vibration damper, rotate engine until No.1 piston is at TDC on firing stroke. Mark distributor body in relation to center line of rotor arm. If distributor is to be removed, mark body and timing cover for reassembly.
- 11) Remove bolt and washer from end of crankshaft and slide off vibration damper and pulley.
- 12) Remove all bolts attaching front cover, including two bolts which attach oil pan. Remove front cover.
- 13) Reverse removal procedures for reinstallation.

### ENGINE FRONT COVER OIL SEAL

- 1) With engine front cover removed, see (ENGINE FRONT COVER), drive out front oil seal and oil thrower toward rear of cover.
- 2) Coil new packing into new oil thrower. Carefully drive assembly into front cover. Make sure ends of packing are facing upwards. Stake seal and oil thrower in place using a small chisel.

- 3) Size packing by rotating a hammer handle around packing until vibration damper can be inserted.

### CAMSHAFT & BEARING REPLACEMENT

With front cover and timing chains removed, carefully withdraw camshaft. Camshaft bearings are not replaceable, therefore use care when handling camshaft. Inspect camshaft for excessive wear, replace if necessary. Reinstall camshaft and reassembly engine.

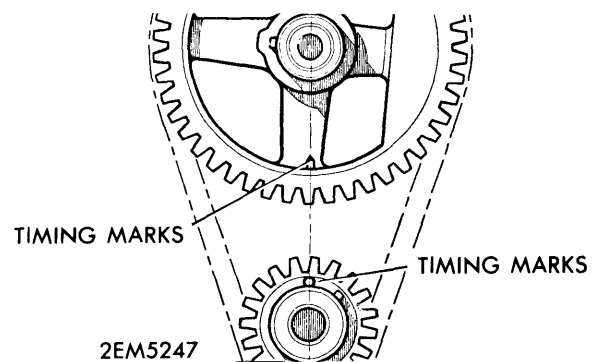
### CAMSHAFT CHAIN REPLACEMENT

- 1) With timing cover removed as previously instructed, slide camshaft and crankshaft chainwheels off with chain attached.
- 2) If engine or camshaft have not been disturbed, slide chainwheels and chain back onto shafts with timing marks properly aligned. See (VALVE TIMING).

VALVE TIMING				
Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
3500S	30°	75°	68°	37°

### VALVE TIMING

- 1) Rotate crankshaft so that No. 1 piston is at TDC.



**TIMING MARKS**

- 2) Install camshaft chainwheel and rotate until camshaft mark is in six o'clock position. Remove camshaft chainwheel without moving camshaft.
- 3) Locate chainwheels to chain so two marks are aligned. Slide chainwheels and chain onto camshaft and crankshaft. Check that timing marks are properly aligned.
- 4) Reinstall front cover. The distributor rotor arm should be positioned approximately 30° before final position mark on distributor body to compensate for rotation as cover is pushed into place.

# Rover Engines

## 1971-72 ROVER 3500S V8 (Cont.)

### ENGINE OILING

#### ENGINE OILING SYSTEM

A gear type oil pump takes oil from oil pan through a strainer. From the pump, oil is forced through a replaceable filter. After leaving the filter, oil flows to an oil gallery where by secondary passages crankshaft main bearings are supplied with oil. From openings in main bearing journals oil travels through passages in crankshaft to connecting rod journals. From another secondary passage camshaft bearings and rocker arm shafts are fed. Oil passes from holes in rocker shafts through rocker arms and down push rods to hydraulic lifters.

**Crankcase Capacity** — 5.4 qts. with filter.

**Oil Filter Replacement** — Every 5,000 miles.

**Normal Oil Pressure** — 30-40 psi @ 2400 RPM.

**Pressure Regulator Valve** — Non-adjustable.

#### OIL PUMP

**CAUTION** — Whenever a new oil filter is installed, it must be replaced with a minimum of delay. If filter is removed for more than a few minutes, oil pump may drain and must be primed before running engine.

**Removal** — 1) Remove oil filter.

2) Disconnect wire from pressure indicator switch and wire from oil pressure transmitter.

3) Remove bolts attaching oil pump cover assembly to front cover. Remove cover and slide out oil pump gears.

**Inspection** — 1) Clean gears and inspect for wear or scoring. Replace all worn gears.

2) Remove oil pressure relief valve. Inspect all parts for wear. If sides of spring are worn, replace spring.

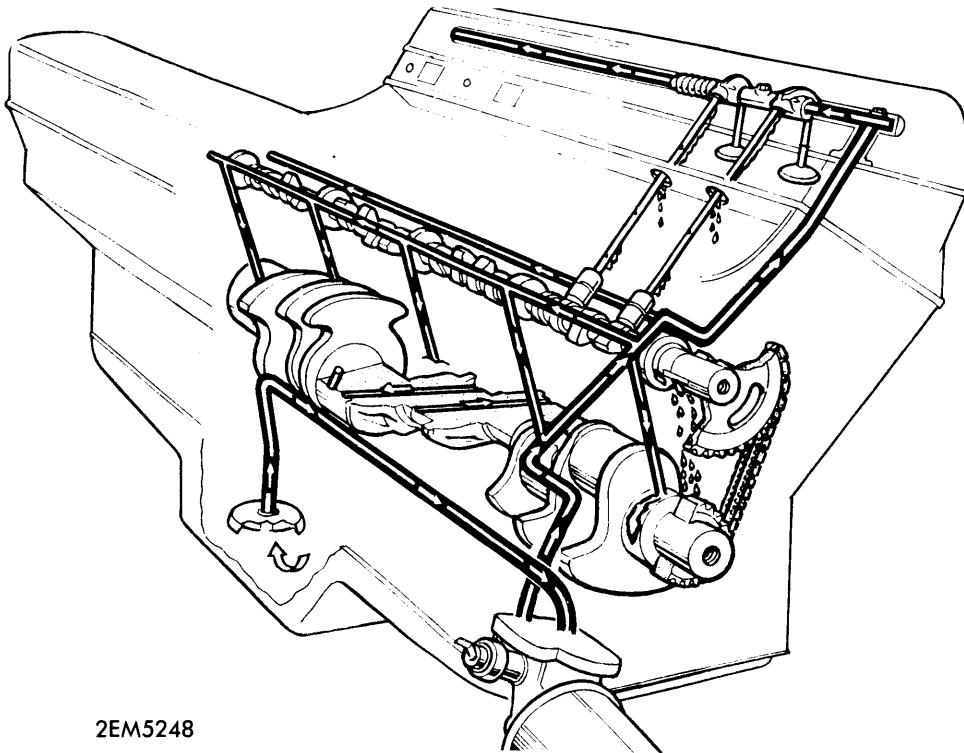
3) Check that valve in its bore is no more than an easy slide fit. If any play can be detected replace valve or cover.

4) Pry out oil filter by-pass valve. Check all parts for cracks, nicks or warping. Replace worn or damaged parts.

**Reassembly** — 1) Lubricate and install pressure relief valve assembly.

2) Install oil filter by-pass valve. Concave side of seat must face outward and outer rim must be pressed between .020-.040" below surface of surrounding casting.

3) Install oil pump gears and shaft into front cover.



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### LUBRICATION SYSTEM

## 1971-72 ROVER 3500S V8 (Cont.)

### ENGINE OILING (Cont.)

4) Place a straight edge across gear and measure clearance. Clearance should be .0018-.0058" (See Illustration).

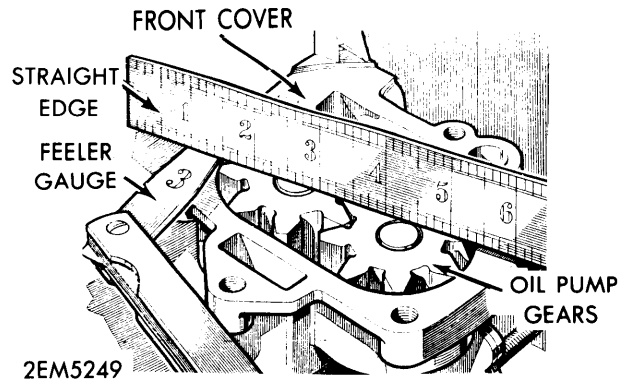
**Priming Oil Pump** – 1) Remove gears from cover. Pack cover housing full with petroleum jelly. Use only petroleum jelly, no other grease is suitable.

2) Force gears into cover so that every cavity between gear teeth is filled with petroleum jelly. **NOTE** – This is very important, unless pump is fully packed, it may not prime itself when engine is started.

**Installation** – 1) Use a new gasket and place oil cover assembly in position. Install attaching bolts and torque to specifications.

2) Fit new oil filter.

3) Reconnect wire to oil pressure switch and transmitter.



OIL PUMP

### ENGINE COOLING

#### WATER PUMP

**Removal** – 1) Drain cooling system and save solution in a clean container. **NOTE** – Always use proper solution of water and anti-freeze when filling or topping-up cooling system to prevent corrosion to aluminum alloy engine parts.

2) Remove fan guard.

3) Remove fan blades.

4) Loosen nut attaching clutch coupling.

5) Loosen alternator attaching bolts, remove fan belt and lift off clutch coupling.

6) Remove bolt attaching alternator to adjusting bracket and move alternator aside.

7) Disconnect heater return hose, thermostat by-pass hose and bottom hose at water pump.

8) Remove two bolts, washers and spacer which attach bracket for power steering pump to water pump housing.

9) Remove bolts attaching water pump assembly to front cover and lift off pump and gasket.

**Disassembly** – 1) Clamp an impeller vane in a suitable vise and cut impeller and insert assembly from pump shaft (See Illustration).

2) Remove ceramic sealing washer and rubber bushing from pump shaft.

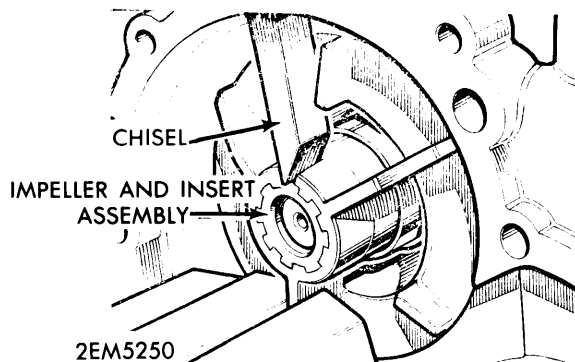
3) Pry out seal assembly from pump body.

4) Warm pump body in very hot water. Support pump body and press out shaft, bearing, thrower and drive hub assembly from pump body.

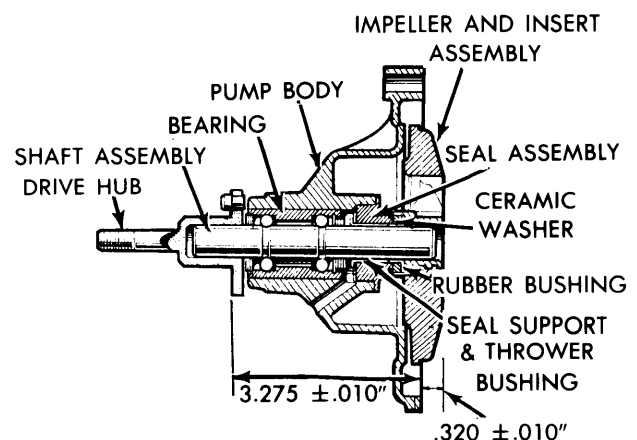
5) No further disassembly is required. For replacement purposes pump drive shaft, thrower, bearing and drive hub is regarded as a complete assembly.

**Reassembly** – 1) Warm pump body and support in position under a suitable press.

2) Press in pump shaft, bearing and drive hub assembly into pump body until a dimension of  $3.275" \pm .010$  in. is obtained, measure between hub and pump faces (See Illustration). As a guide, when fitted shaft bearing outer face should be flush with top surface of water pump body.



WATER PUMP IMPELLER ASSEMBLY



2EM5251

WATER PUMP

# Rover Engines

## 1971-72 ROVER 3500S V8 (Cont.)

### ENGINE COOLING (Cont.)

- 3) Coat larger outside diameter of seal assembly with suitable sealing compound.
- 4) Place seal over shaft and into housing. Make sure seal flange is fully home onto water pump body.
- 5) Coat shaft and ceramic with suitable lubricant. Place sealing ring and rubber bushing onto shaft, with plain ungrooved face of sealing ring toward carbon seal.
- 6) Support shaft and press impeller into position (See Illustration).
- 7) Rotate shaft assembly by hand to see that it is free to turn in pump body.
- 8) Reinstall pump.

#### THERMOSTAT

**Removal** – 1) Partly drain coolant and disconnect water outlet hose from engine.

- 2) Remove outlet pipe from intake manifold.
- 3) Lift out thermostat.
- 4) Test thermostat by immersing in hot water. It should start to open at 187° to 194°F.

**Installation** – 1) Reverse removal procedure. Be sure that thermostat is positioned with its jiggle pin upwards in a 12 o'clock position. This is to assist in filling and prevent air locks.

#### Cooling System Capacity

**Capacity** – 18.5 pts.

**Thermostat** – Opens at 187°F-194°F.

**Radiator Cap** – 15 psi.

### TIGHTENING SPECIFICATIONS

Application	Torque (Ft. Lbs.)
Intake Manifold .....	25-30
Intake Manifold Clamp .....	10-15
Rocker Shaft .....	25-30
Head .....	65-70
Exhaust Manifold .....	10-15
Distributor Drive Gear .....	40-45
Connecting Rods .....	30-35
Flexible Drive Plate-to-Crankshaft .....	50-60
Rear Main Bearing .....	65-70
Other Main Bearings .....	50-55
Oil Pump .....	10-15
Pressure Relief Valve .....	30-35
By-Pass Valve .....	30-35
Starter-to-Block .....	30-35
Vibration Damper .....	140-160
Timing Cover .....	20-25
Power Steering Pump .....	20-25
Water Pump and Timing Cover .....	20-25
Water Pump-to-Timing Cover .....	6-8
Torque Converter-to-Drive Housing .....	30
Torque Converter-to-Drive Plate .....	25-30

**CAUTION** – Whenever a new oil filter is installed, it must be replaced with a minimum of delay. If filter is removed for more than a few minutes, oil pump may drain and must be primed before running engine.