DX23, DX26
REPAIR MANUAL
COMPLETE CONTENTS

The following pages are the collation of the contents pages from each section and chapter of the DX23, DX26 Repair manual. Complete Repair part # 87367148.

The sections used through out all Case IH product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the DX23, DX26 Tractors.

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SECTION 00 - GENERAL INFORMATION

Chapter 1 - General Information

CONTENTS

SAFETY

PRECAUTIONARY STATEMENTS

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this equipment. Equipment should be operated only by those who are responsible and instructed to do so.

Carefully review the procedures given in this manual with all operators. It is important that all operators be familiar with and Follow safety precautions.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved roll bar and seat belt for safe operation. Overturning a tractor without a roll bar can result in death or injury. If your tractor is not equipped with a roll bar and seat belt, see your Case IH Dealer.
3. Always use the seat belt. The only instance when the seat belt should not be used is if the roll bar has been removed from the tractor.
4. If a front end loader is to be installed, always use a FOPS (Falling Object Protective Structure) canopy to avoid injury from falling objects.
5. Use the handholds and step plates when getting on and off the tractor to prevent falls. Keep steps and platform cleared of mud and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Keep all safety decals clean of dirt and grime, and replace all missing, illegible, or damaged safety decals. See the list of decals in the Decal section of this manual.

SERVICING THE TRACTOR

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap entirely.
2. Keep any type of open flame away from the tractor and do not smoke while refueling. Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. Keep open flame or cold weather starting aids away from the battery to prevent fires or explosions. Use jumper cables according to instructions to prevent sparks which could cause explosion.
5. Stop the engine before performing any service on the tractor.
6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury. If fluid is injected into the skin, obtain medical attention immediately or gangrene may result.
   - DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
   - Stop the engine and relieve pressure before connecting or disconnecting lines.
   - Tighten all connections before starting the engine or pressurizing lines.
7. Do not modify or permit anyone else to modify or alter this tractor or any of its components or functions without first consulting a Case IH Dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle, or any other part of the fuel injection system. Failure to follow these instructions can result in serious injury.
9. Continuous long-term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.

10. Some components of your tractor, such as gaskets and friction surfaces (brake linings, clutch linings, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are advised to have any maintenance or repair on such components carried out by an authorized Case IH Dealer. However, if service operations are to be undertaken on parts that contain asbestos, the essential precautions listed below must be observed:
    - Work out of doors or in a well ventilated area.
    - Dust found on the tractor or produced during work on the tractor should be removed by extraction, not by blowing.
    - Dust waste should be dampened, placed in a sealed container, and marked to ensure safe disposal.
    - If any cutting, drilling, etc. is attempted on materials containing asbestos, the item should be dampened and only hand tools or low speed power tools used.

OPERATING THE TRACTOR

1. Before starting the tractor, apply the parking brake, place the PTO lever in the "OFF" position, the lift control lever in the down position, the remote control valve levers in the neutral position, and the transmission in neutral.
2. Always sit in the tractor seat when starting the engine or operating controls. Do not start the engine or operate controls while standing beside the tractor.
3. Do not bypass the neutral start switches. Consult your Case IH Dealer if your neutral start controls malfunction. Use jumper cables only in the recommended manner. Improper use can result in tractor runaway.
4. Avoid accidental contact with the gear shift lever while the engine is running, as this can cause unexpected tractor movement.
5. Before getting off the tractor, disengage the PTO, turn the engine off, and apply the parking brake. Never get off the tractor while it is in motion.
6. Do not park the tractor on a steep incline.
7. Do not operate the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death or illness.
8. If the power steering or engine ceases operating, stop the tractor immediately.
9. Pull only from the drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to upset.
10. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.
11. Always set the hydraulic selector lever in position control when attaching or transporting equipment. Ensure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement.
12. Do not leave equipment in the raised position.
13. Use the flasher/turn signal lights and SMV signs when traveling on public roads both day and night (unless prohibited by law).
14. When operating at night, adjust lights to prevent blinding oncoming drivers.

DRIVING THE TRACTOR

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the tractor with care and at a safe speed. Use extra caution when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. To provide two-wheel braking, lock tractor brake pedals together when transporting on roads.
4. Do not coast or free wheel down hills. Use the same gear when going downhill as is used when going uphill.
5. Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
6. If the tractor becomes stuck or the tires become frozen to the ground, back up the tractor to prevent upset.
7. Always check overhead clearance, especially when transporting the tractor.
8. When operating at night, adjust lights to prevent blinding oncoming drivers.

OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or when near rotating equipment.
3. When operating stationary PTO driven equipment, always place both gear shift levers in neutral, apply the tractor parking brake, and block the rear wheels front and back.
4. To avoid injury, do not clean, adjust, unclog, or service PTO driven equipment when the tractor engine is running.
5. Ensure the PTO master shield is installed at all times. Always replace the PTO shield cap when the PTO is not in use.

DIESEL FUEL

1. UNDER NO CIRCUMSTANCES should gasoline, alcohol, or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container such as a fuel tank. DO NOT USE THESE BLENDS.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling or when standing near fuel.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with a Case IH approved cap. A non-approved, proprietary cap may not be safe.
9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that winter grade fuels are not held over and used in the spring.

SAFETY FRAME (ROPS)

Your Case IH tractor is equipped with a safety frame. It must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

UNDER NO CIRCUMSTANCES should you:

- modify, drill, or alter the safety frame in any way. Doing so may render you liable to legal prosecution.
- attempt to straighten or weld any part of the main frame or retaining brackets which have suffered damage. Doing so may weaken the structure and endanger your safety.
- secure any parts on the main frame or attach your safety frame with anything other than the special high tensile bolts and nuts specified.
- attach chains or ropes to the main frame for pulling purposes.
- take unnecessary risks even though your safety frame affords you the maximum protection possible.

WHEN YOU SEE THIS SYMBOL

IT MEANS:

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

SECTION 10 - ENGINE

Chapter 1 - Engine Systems

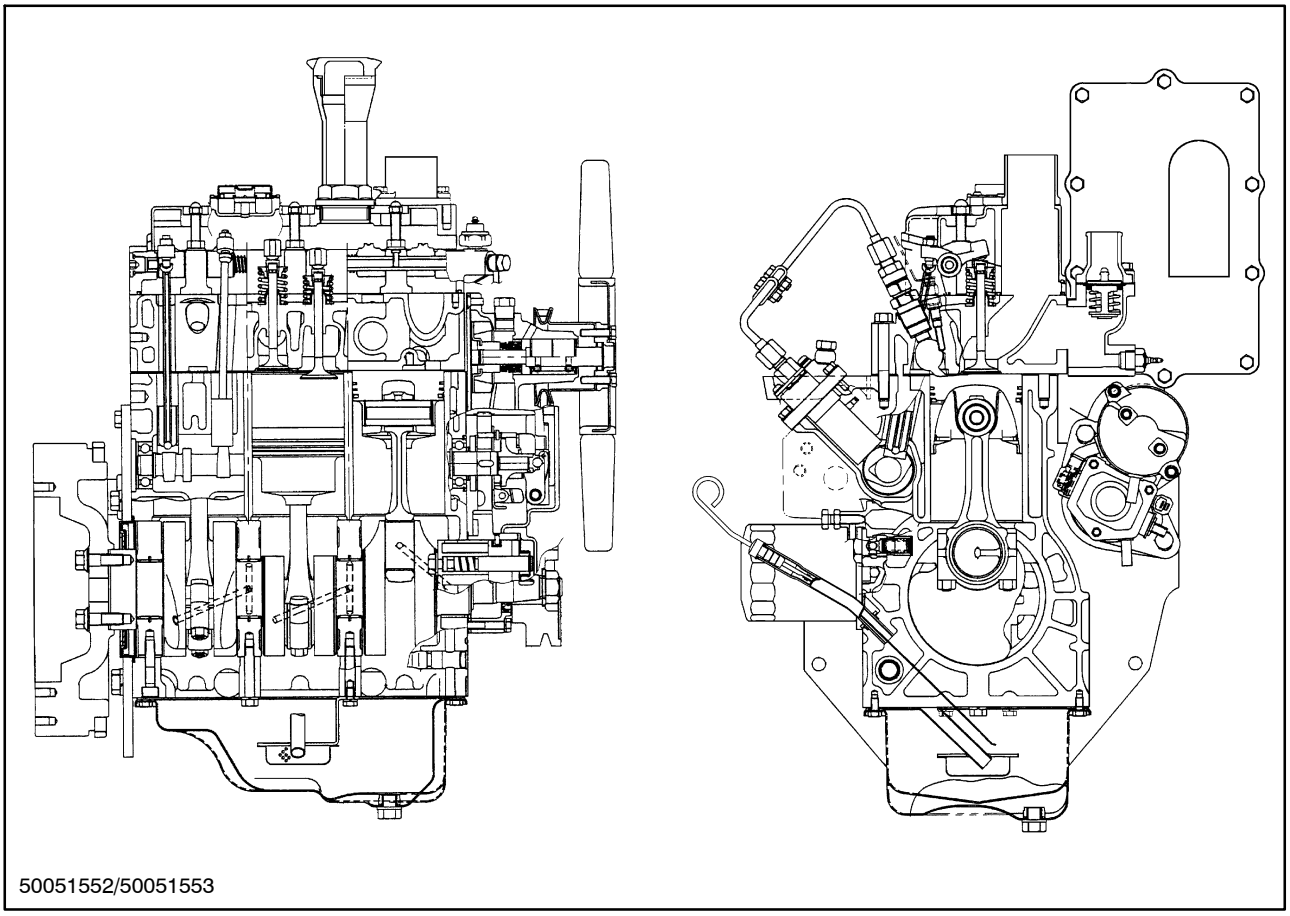
CONTENTS

SPECIFICATIONS

Op. 10 000

GENERAL		
Tractor Model	**DX23**	**DX26**
PTO H.P. (at engine rated speed) w/9x3 w/HST	 18.6 17.4	 NA 19.7
Engine Model	S773	S773L
Number of Cylinders	3	3
Bore x Stroke	77 x 72 mm (3.03 x 2.83 in.)	77 x 81 mm (3.03 x 3.19 in.)
Displacement	1.005 L, 1005 cc (61.3 cu. in.)	1.131 L, 1.131 cc (69.0 cu. in.)
Compression Ratio	24.5:1	23.5:1
Rated Speed (rpm)	2850	2850
Muffler	In the hood	In the hood
Firing Order	1 - 2 - 3	1 - 2 - 3
Low Idle Speed (rpm)	1100 - 1200	1100 - 1200
High Idle Speed (rpm)	3000 - 3050	3000 - 3050
Cylinder Arrangement	In-line Vertical	In-line Vertical
Valve Arrangement	Overhead	Overhead
Compression Pressure @ 200 rpm (cylinder speed) Variation between cylinders	427 ± 70 psi 70 psi	427 ± 70 psi 70 psi

CYLINDER HEAD		
Tractor Model	**DX23**	**DX26**
Head Warp Standard Maximum	 0.05 mm (0.002 in.) 0.12 mm (0.005 in.)	 0.05 mm (0.002 in.) 0.12 mm (0.005 in.)
Valve Seat Width Standard Maximum	 1.7 - 2.1 mm (0.067 - 0.082 in.) 2.5 mm (0.098 in.)	 1.7 - 2.1 mm (0.067 - 0.082 in.) 2.5 mm (0.098 in.)
Valve Seat Sink Standard Maximum	 0.85 - 1.15 mm (0.0334 - 0.0453 in.) 1.8 mm (0.0708 in.)	 0.85 - 1.15 mm (0.0334 - 0.0453 in.) 1.8 mm (0.0708 in.)
Valve Angle	45°	45°
Piston to Valve Clearance	1.0 mm (0.039 in.) @ Piston TDC (Minimum 0.8 mm [0.031 in.])	1.0 mm (0.039 in.) @ Piston TDC (Minimum 0.8 mm [0.031 in.])



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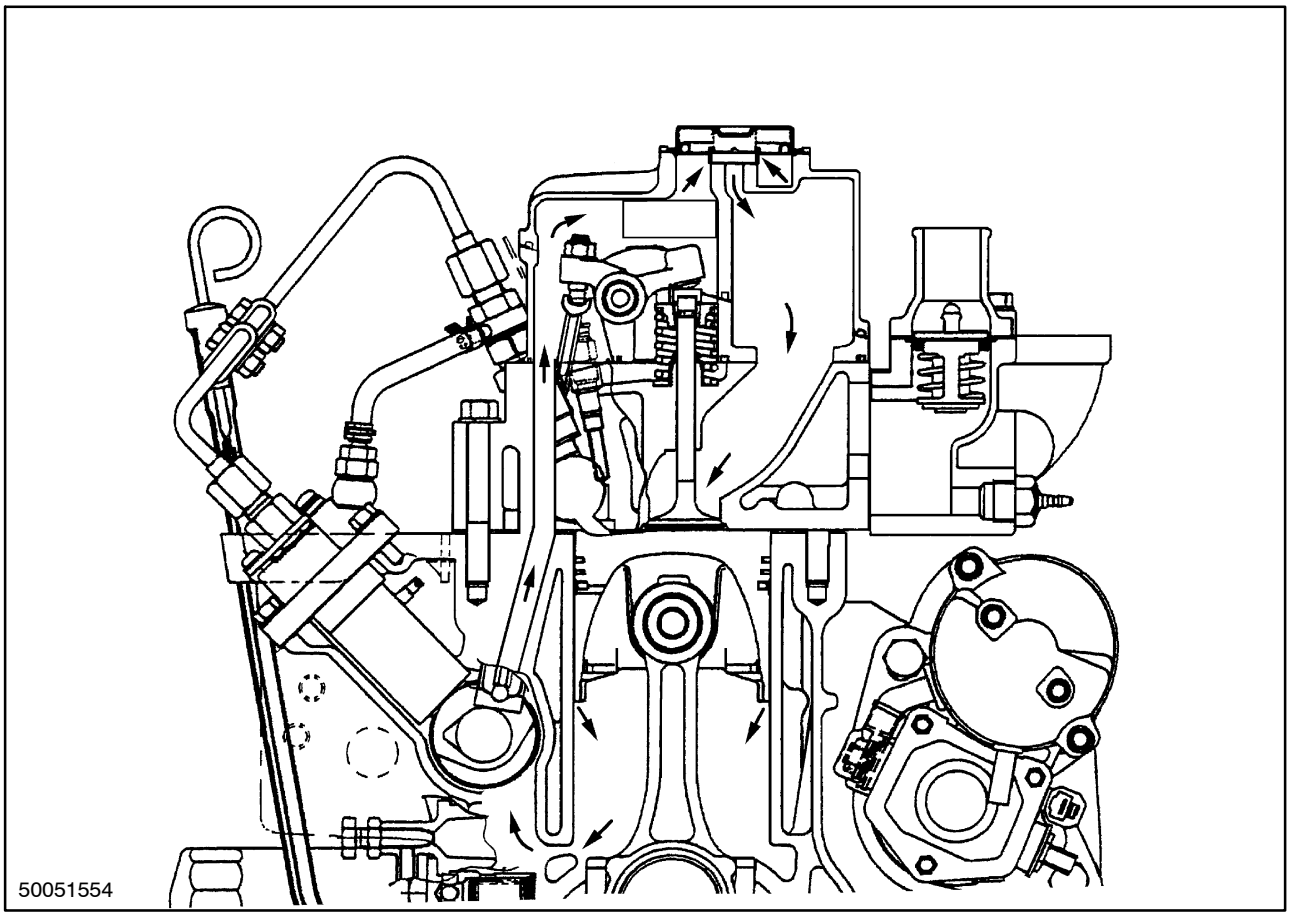
CYLINDER HEAD AND VALVE TRAIN COMPONENTS

The cylinder head incorporates the valve assemblies, rocker arms, rocker shaft, push rods, lifters, and pre-combustion chambers. The air intake manifold is incorporated into the left hand side of the valve cover assembly. The exhaust manifold is bolted on the left-hand side of the cylinder head. The cylinder heads have integral valve guides. Standard size valves only are used. Figure 2 provides a cut-away front and side view of an engine.

A pre-combustion chamber is located between the injector assembly and the combustion chamber of the cylinder and provides an area for initial ignition of the fuel for improved starting. A glow plug located in the head extends into the pre-combustion chamber and, when energized, pre-heats the fuel-air mixture for improved fuel ignition under cold weather conditions.

CYLINDER BLOCK ASSEMBLY

The cylinder block assembly contains the pistons, connecting rods, crankshaft, timing gears, and engine oil pump. The engine crankshaft is supported by four main bearings. The front main bearing is a full circle bearing positioned in a bore in the front of the block. The second, third, and fourth main bearings are split liners located in holders bolted to the block. The camshaft is supported by two ball bearings one located on each end of the block. The engines utilize a straight connecting rod and a three ring piston.



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A breather valve is located on the valve cover between the air intake manifold and the valve room.

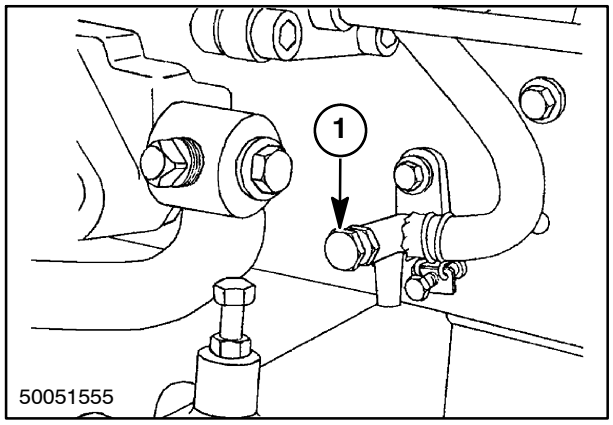
The valve is opened when the crankcase (blow by gas) pressure increases to approximately 25 mm Aq. Once the valve is open, blow by gas passes into the intake manifold, and is burned with the aspirated air.

OVERHAUL - ENGINE

ENGINE PREPARATION

Disassembly

1. Open the radiator drain, 1, and drain and remove the radiator assembly. See “Radiator Removal” discussed later in this section.



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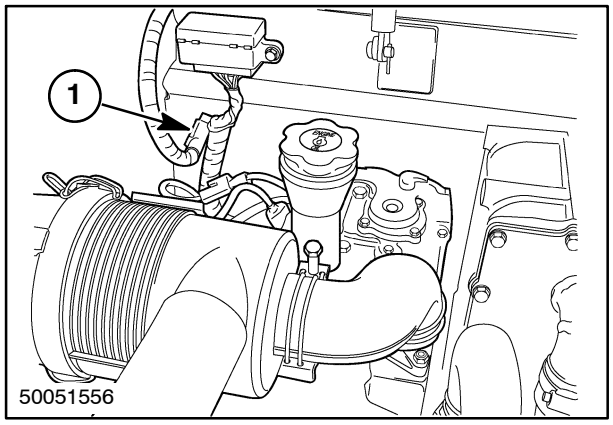
2. Disconnect the electrical connector, 1, for the head lamps.



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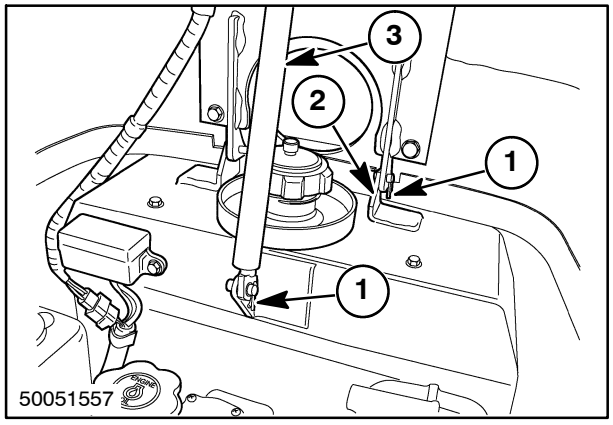
3. Remove the clip pins, 1, from the hood support, 2, and damper, 3, and gradually slide to the left and remove the hood.



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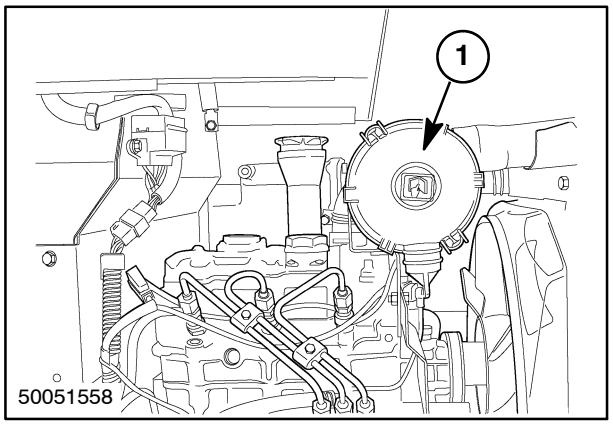
4. Remove the air cleaner assembly, 1, along with the air cleaner hoses.



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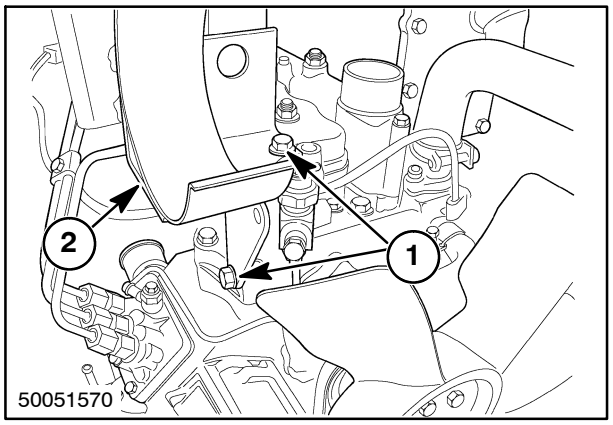
5. Remove the two capscrews, 1, and remove the air cleaner mounting bracket, 2.



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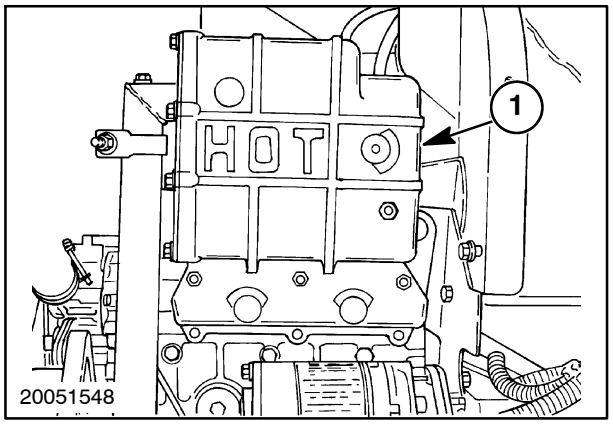
6. Remove the exhaust muffler and manifold assembly, 1.



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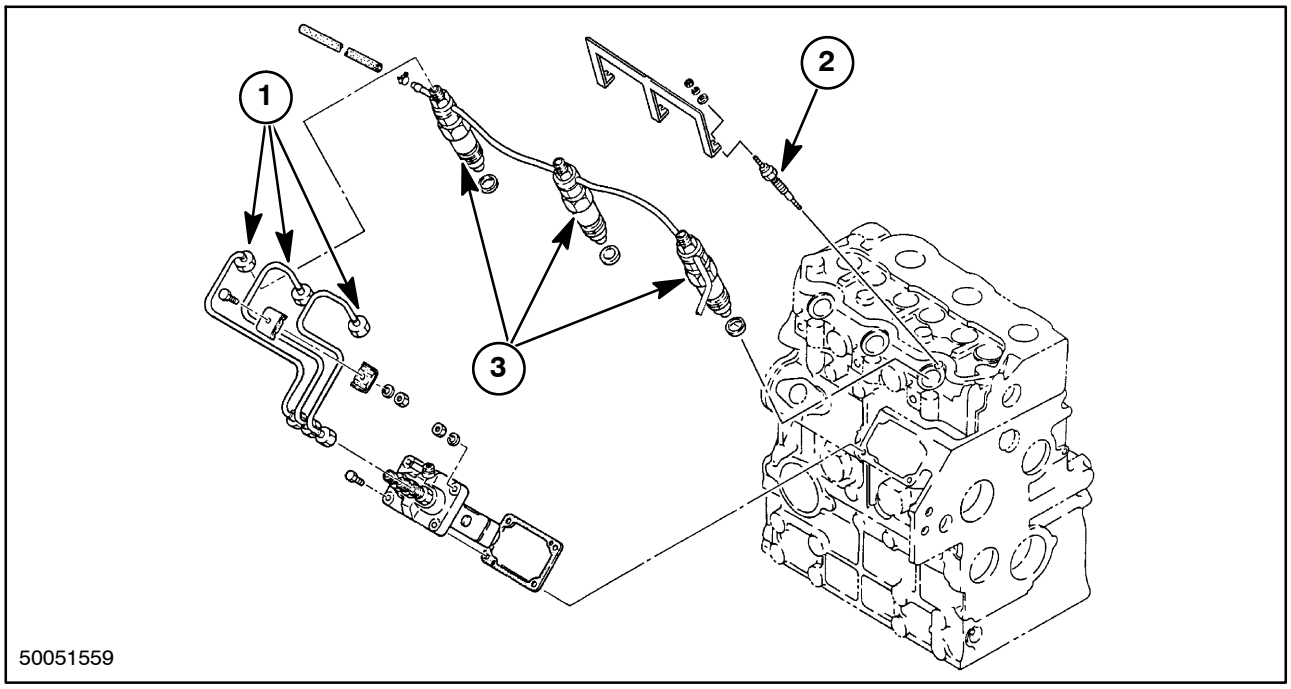

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FUEL INJECTOR AND GLOW PLUG

Removal

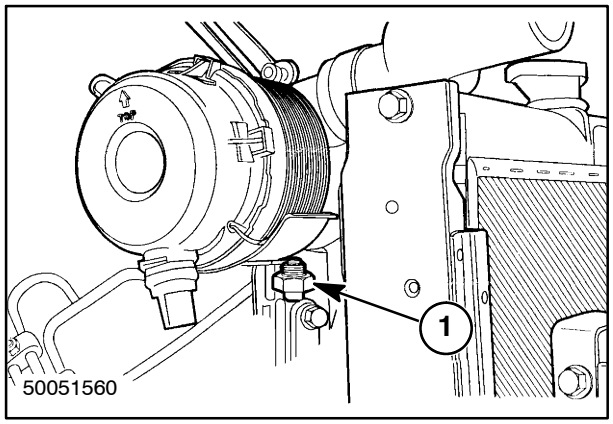
1. Clean all dirt and oil from the injectors and surrounding areas.
2. Disconnect the fuel lines, 1, from the injectors and cap all openings.
3. Remove the three glow plugs, 2.
4. Disconnect the return line to the fuel tank from the number three injector.
5. Remove the injector assemblies, 3.

NOTE: *Be sure to remove the injector sealing washer from the injector bore, if not removed with the injector.*

OIL PRESSURE SWITCH

Removal

1. Disconnect and remove the oil pressure switch, 1.



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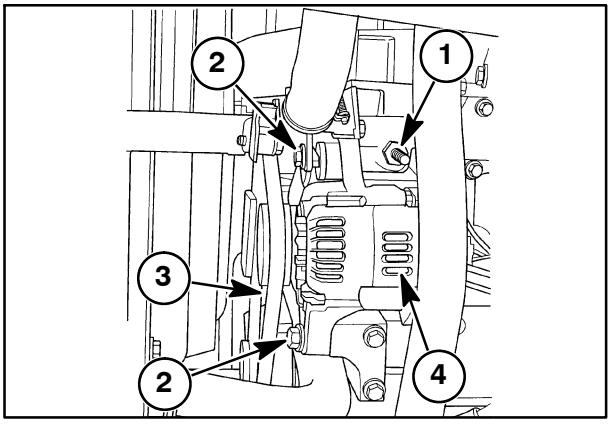
TEMPERATURE SENDING SWITCH AND ALTERNATOR

Removal

1. Remove the temperature sending switch, 1, from the front of the cylinder head.
2. Loosen the alternator mounting bolts, 2, and remove the V-belt, 3, from the drive pulley.
3. Disconnect the wires from the back of the alternator.
4. Remove the alternator mounting bolts and remove the alternator, 4.



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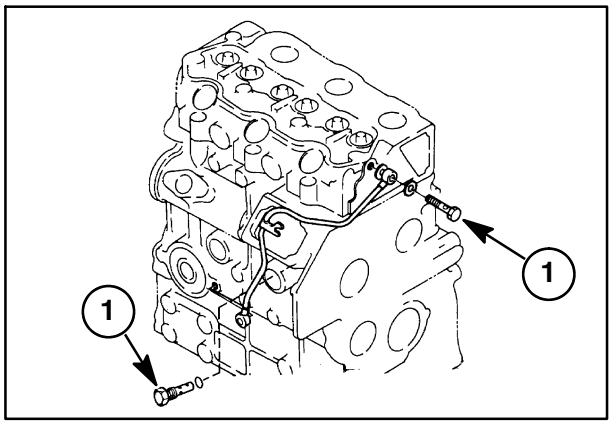
FAN, WATER PUMP, AND EXTERNAL OIL TUBE

Removal

1. Remove the fan and water pump assembly. See “Water Pump and Thermostat Removal” discussed later in this section.
2. Remove the external oil transfer tube banjo bolts, 1, from the front of the cylinder head and the side of the cylinder block and remove the external oil transfer tube.



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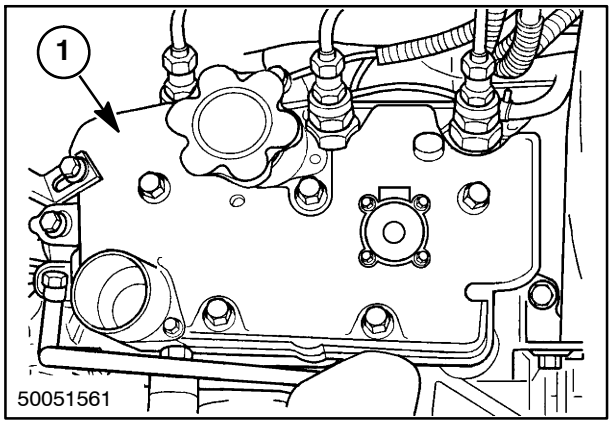
VALVE COVER

Removal

1. Remove the valve cover, 1, and gasket.



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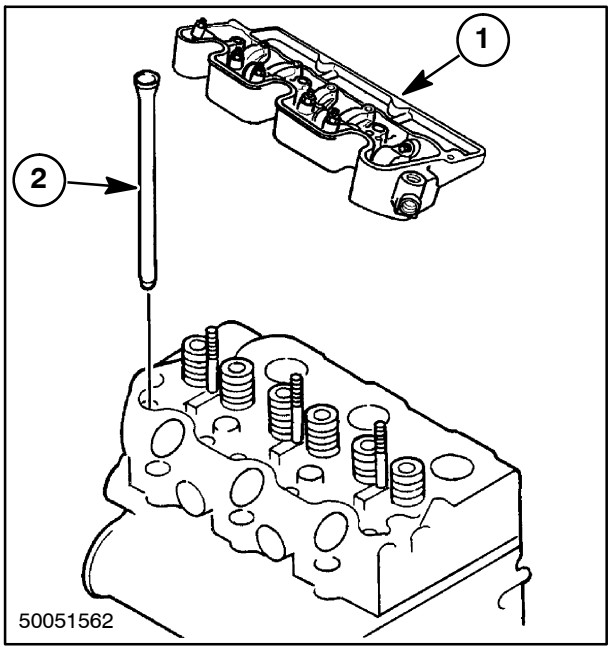
ROCKER SHAFT AND PUSH ROD

Removal

1. Remove the valve rocker arms, shaft, rocker arm supports and springs, as an assembly, 1.
2. Remove the push rods, 2.

NOTE: *Be sure to keep the valve components in separately marked containers for re-assembly in their original position.*



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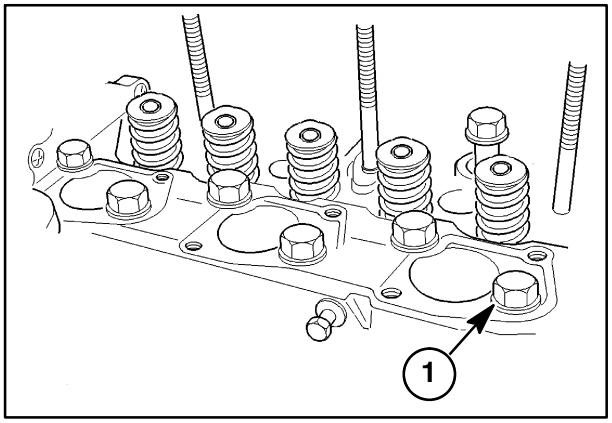
CYLINDER HEAD

Removal

1. To remove the cylinder head, remove the cylinder head bolts, 1, by alternately loosening a half turn at a time to prevent warping the head.



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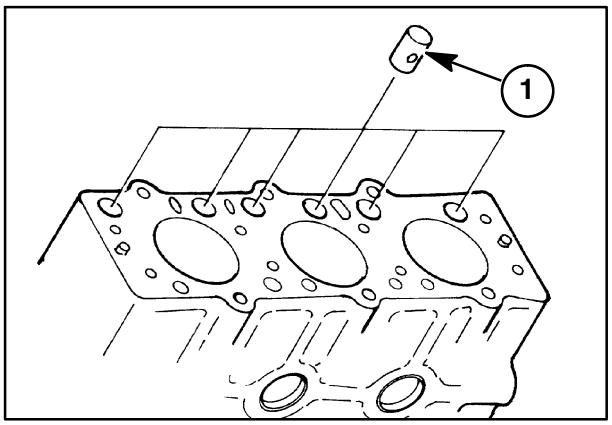
VALVE TAPPET

Removal

1. Remove the valve tappets, 1, from the machined bore in the cylinder block.

NOTE: *Be sure to keep the valve components in separately marked containers for re-assembly in their original position.*



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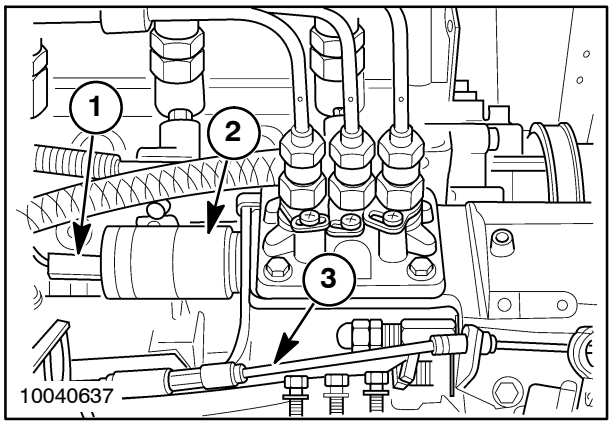
FUEL SHUT-OFF SOLENOID

Removal

1. Remove the wire connector, 1, and unscrew the fuel shut-off solenoid, 2.



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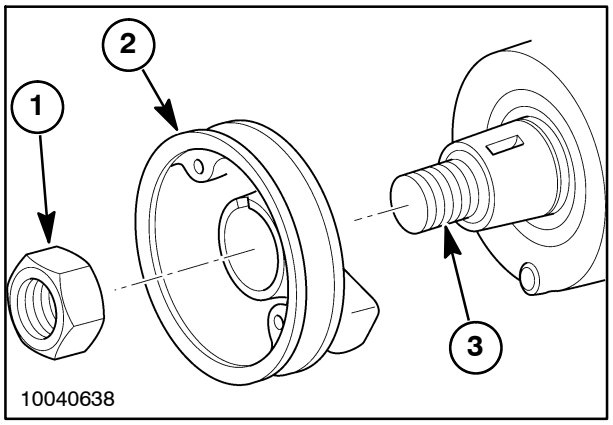
ENGINE TIMING GEAR COVER

Removal

1. Drain the engine crankcase oil into a suitable container.
2. Remove the nut, 1, and remove the pulley, 2, from the crankshaft, 3.
3. Disconnect the throttle control cable, 3, from the governor lever, Figure 18.



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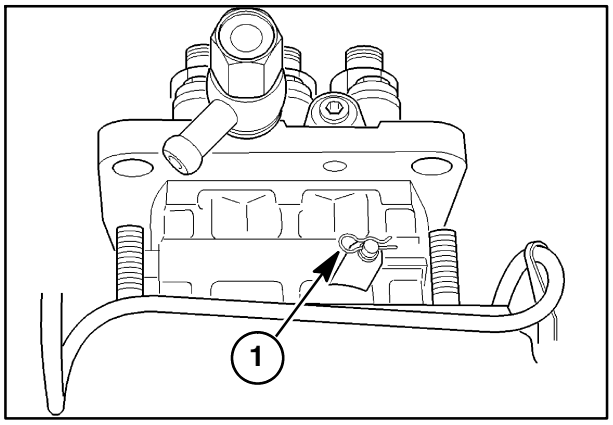
4. Remove the injection pump mounting bolts and raise the injection pump enough to remove the spring pin, 1, and separate the governor link from the control rack.



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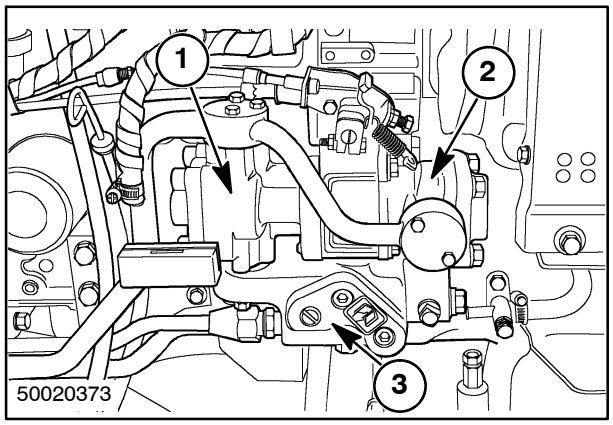
5. Drain the hydraulic oil from the transmission into a suitable container.
6. Disconnect oil lines from the hydraulic pump and the power steering pump.
7. Remove the hydraulic pump, 1, the power steering pump, 2, and the diverter valve, 3, from the engine.
8. Cap or plug any openings.



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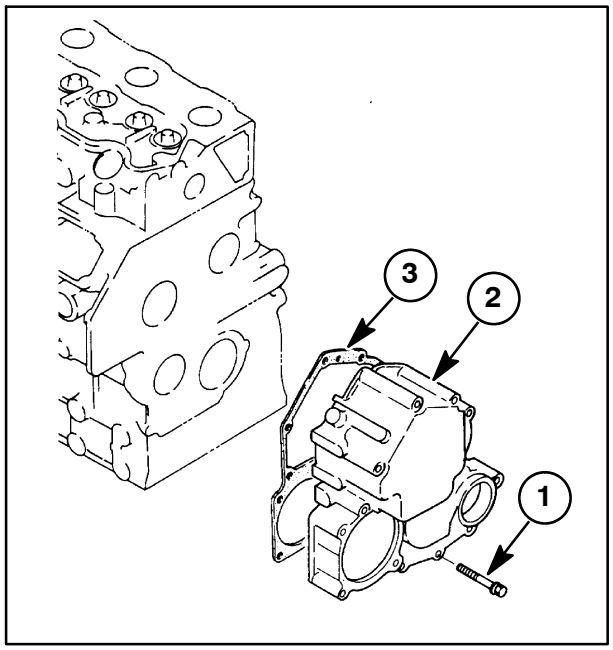
9. Remove the retaining bolts, 1, and lift the front cover, 2, and gasket, 3, off the locating dowels.



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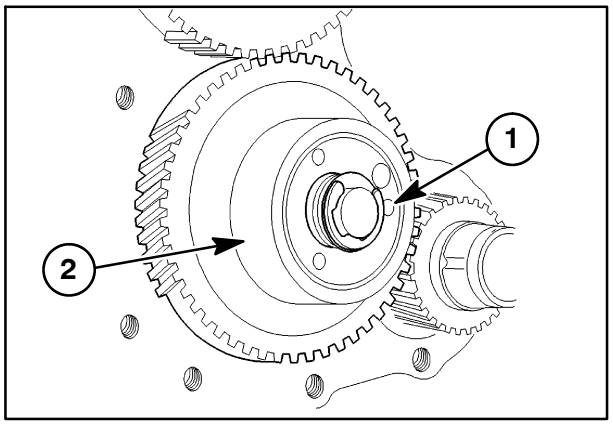
TIMING GEARS AND CAMSHAFT

Removal

1. Remove the retaining ring, 1, and remove the idler gear and oil pump assembly, 2.



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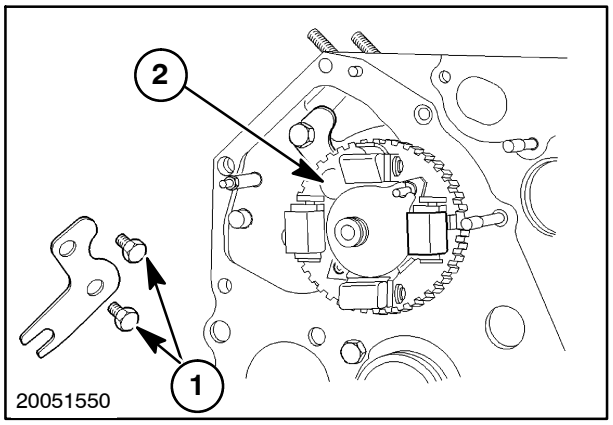
2. Remove the two bolts securing the keeper plate, 1. One bolt must be accessed using the access hole, 2, in the cam gear.
3. Slide the camshaft and gear out of the camshaft bore.



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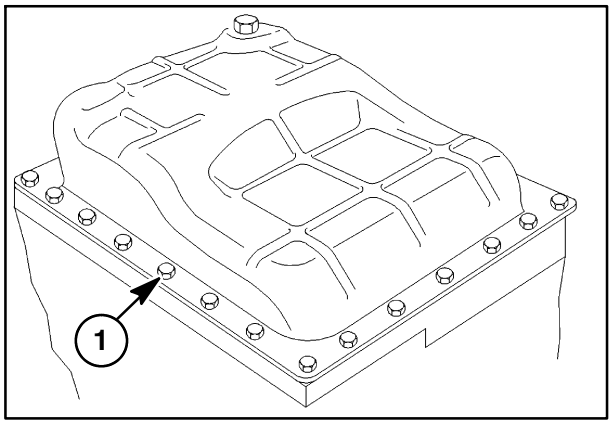
OIL SUMP

Removal

1. Remove the oil sump retainer bolts, 1.
2. Remove the oil sump and discard gasket.



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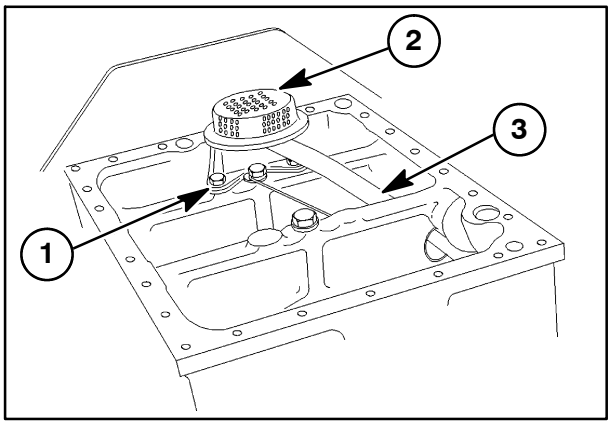
OIL SUCTION PIPE AND STRAINER

Removal

1. Remove the two retaining bolts, 1.
2. Remove the oil strainer, 2, and rotate the oil suction pipe, 3, out of it's bore.



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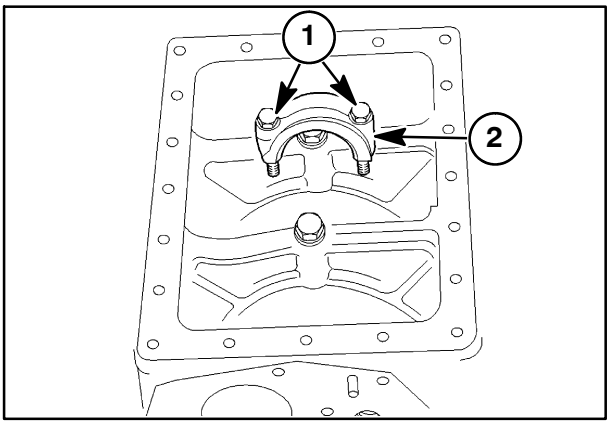
CONNECTING RODS, BEARINGS, AND PISTON

Removal

1. Remove the bolts, 1, retaining the three connecting rod caps, 2.
2. Remove the connecting rod caps with lower half of the connecting rod bearing.



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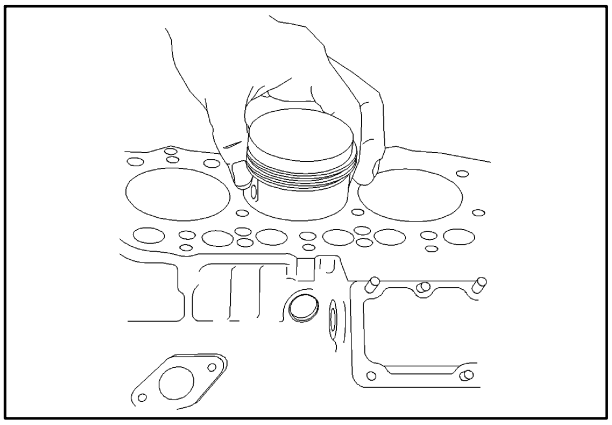
3. If necessary, remove any ridge from the top of the cylinder bores using a suitable ridge reamer.
4. Push the piston and connecting rod out of the cylinder block.
5. Replace the connecting rod caps to the piston assembly it was removed from. Keep together in cylinder sequence.



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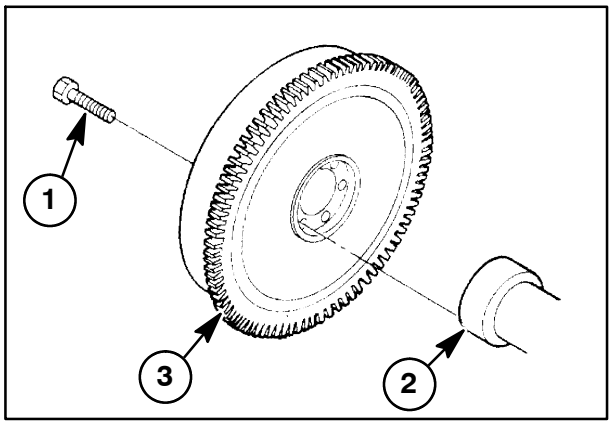
FLYWHEEL

Removal

1. Loosen the flywheel retaining bolts, 1.
2. Using a brass drift and hammer, tap the end of the crankshaft, 2, to loosen the flywheel, 3, from the shaft.
3. Remove the retaining bolts, lock washers, and flywheel from the crankshaft.



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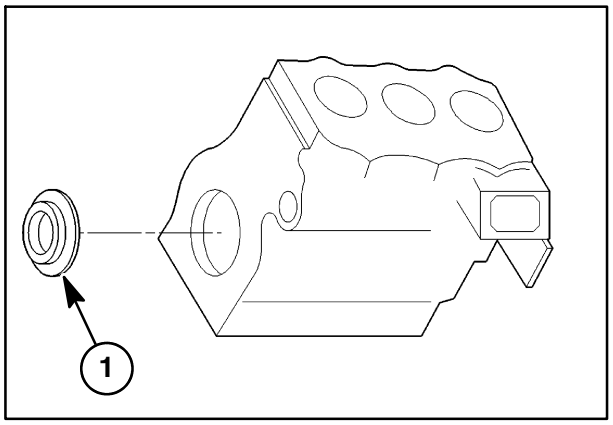
BACKPLATE AND OIL SEAL

Removal

1. Remove the backplate retaining bolts and remove the backplate.
2. Remove the rear oil seal, 1.



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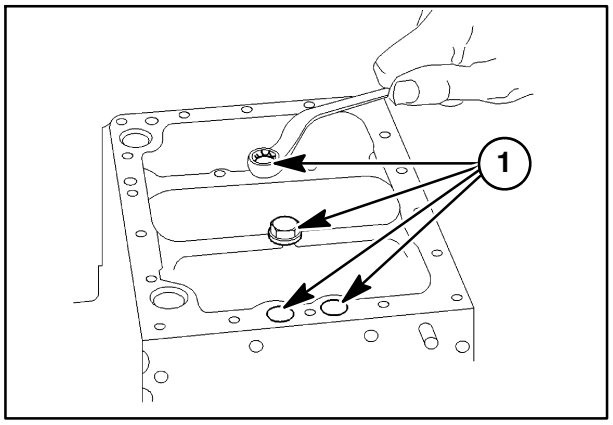
CRANKSHAFT AND MAIN BEARINGS

Removal

1. Remove the crankshaft bearing holder retaining bolts, 1.
2. Slide the crankshaft and main bearing assembly through the rear of the engine.



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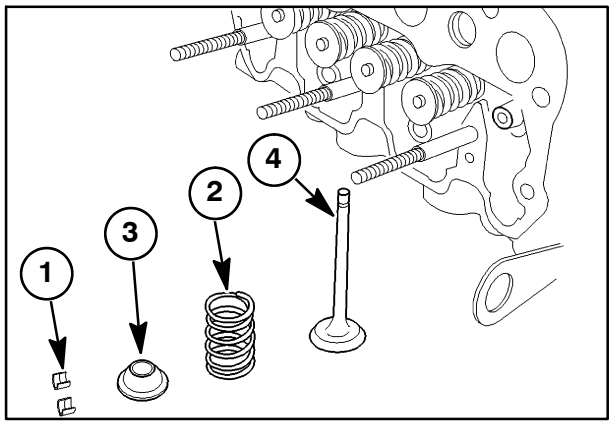
CYLINDER HEAD

Disassembly

1. Clean the cylinder head and remove any carbon deposits from around the heads.
2. Use a valve spring compressor and remove the valve spring retainer locks, 1, spring, 2, and spring retainer, 3, from each valve, 4.
3. Remove the valves and place the valve components together in separately marked containers for re-assembly in their original position.



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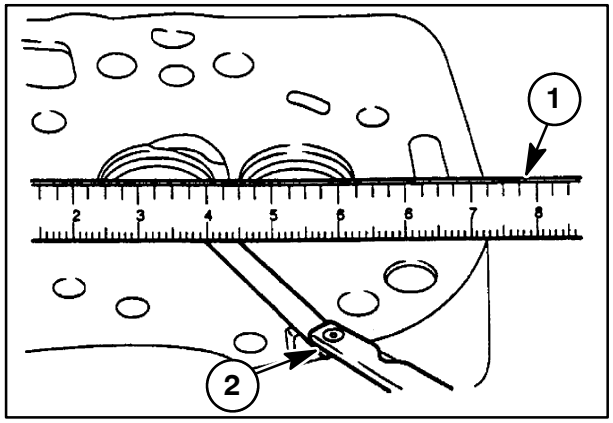
Inspection

1. Clean all carbon deposits from the combustion chamber and valve ports using a wire brush and scraper.
2. Clean all dirt and residue from the gasket surface using care not to scratch or nick the machined surface.
3. Clean the cylinder head in solvent and air dry.
4. Inspect the head for cracks in the following areas:
   - Valve ports
   - Valve seats
   - Pre-chamber
5. Inspect the gasket surfaces for scratches or nicks, which could cause leakage.
6. Examine the core hole plugs for rust or signs of leakage. If a plug shows signs of damaging rust or leakage, replace all plugs in the head.
7. Using a straight edge, 1, and a feeler gauge, 2, check the cylinder head for warpage lengthwise, crosswise, and diagonally. Resurface or replace the head if the warpage is greater than 0.12 mm (0.005 in.).

NOTE: *If resurfacing requires removal of more than 0.50 mm (0.020 in.) material replace the head.*

8. Inspect the pre-chamber for carbon deposits and looseness. Remove any carbon deposits found. If the pre-chamber is found to be loose, the cylinder head is warped and must be replaced.



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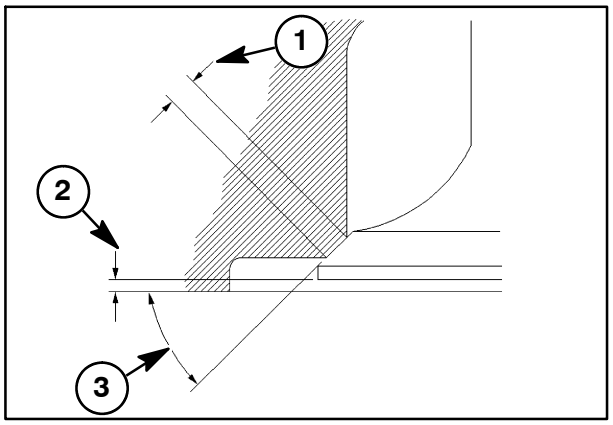
VALVE SEATS

Inspection

Examine the valve seat and reface the seat if damaged. Valve seat grinding requires that the seat be ground to a specific width and positioned to contact the valve face at a specified point. A valve that extends too deep into the combustion chamber will result in valve burning, and if the valve is recessed too deep into the head it will cause a rapid build-up of carbon deposits.



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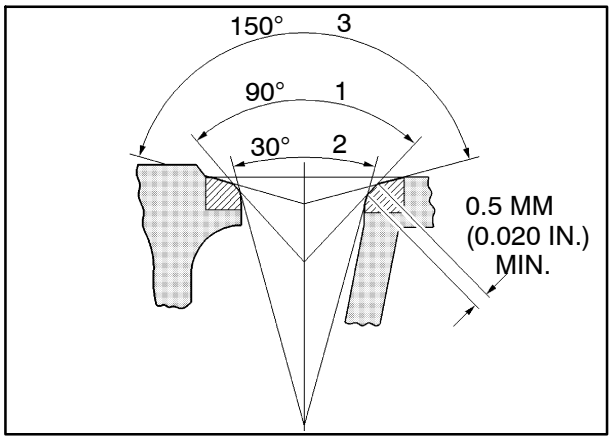
1. Correct Valve Seat Width - 1.7 - 2.1 mm (0.067 - 0.0826 in.) - Seat must strike center of valve face
2. Correct Valve Head Margin - 0.775 - 1.075 mm (0.0305 - 0.042 in.)
3. Angle of Valve Seat - 45°

1. Check the seat for surface defects. Use a 45° stone if necessary to reface. Grind away only enough material to provide a smooth even seat.
2. Check the seat width. If necessary, use a 15° stone to lower the seat contact point and a 75° stone to raise the seat contact point.

NOTE: *Refacing the seat should always be coordinated with refacing the valve to assure a compression tight fit.*



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1. Seat angle - 45° Stone
2. Lower Seat Location - 15° Stone
3. Raise Seat Location - 75° Stone