TK75VA, TK80A, TK80MA, TK90A, TK90MA, TK100A REPAIR MANUAL COMPLETE CONTENTS

ENGINE OVERHAUL

ENGINE

Removal

⚠ DANGER ⚠

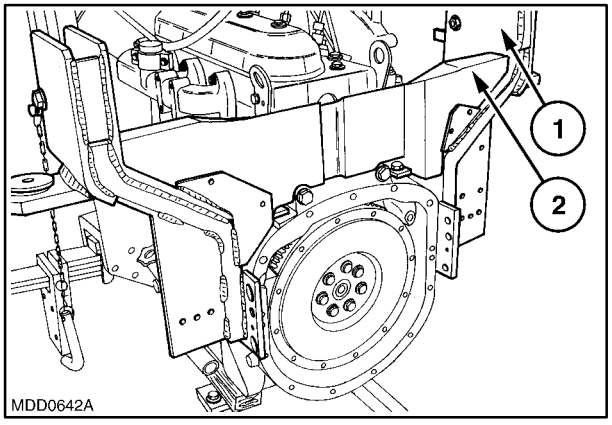
Lift and handle all heavy parts using suitable lifting equipment.

Make sure that assemblies or parts are supported by means of suitable slings and hooks. Make sure that no one is standing in the vicinity of the load to be lifted.

⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes. NEVER USE YOUR FINGERS OR HANDS.

1. Carry out operation for clutch removal.
2. Remove the rubber heat guard, 2, from the support, 1.



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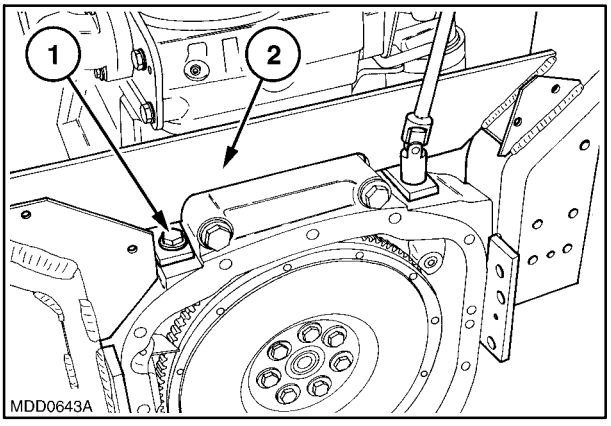
3. Remove the retaining bolts, 1, and the support, 2.



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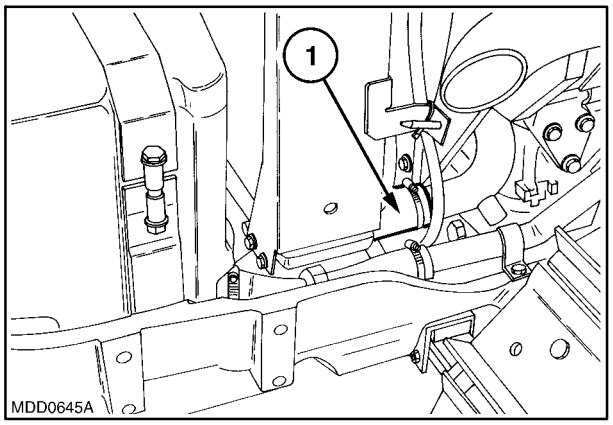
4. Remove the retaining bolts and the right and left-hand engine side guards.
5. Place a container for the coolant under the sleeve, 1.
6. Detach the sleeve, 1, on the lower pipe and drain off the coolant.



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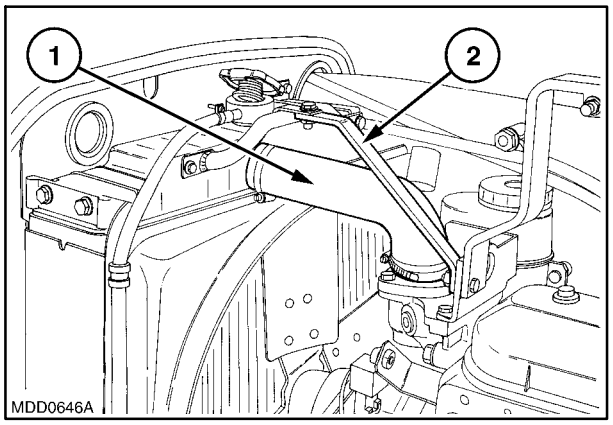
7. Detach the sleeve, 1, on the radiator upper piping.
8. Remove the retaining bolts and the radiator upper support, 2.



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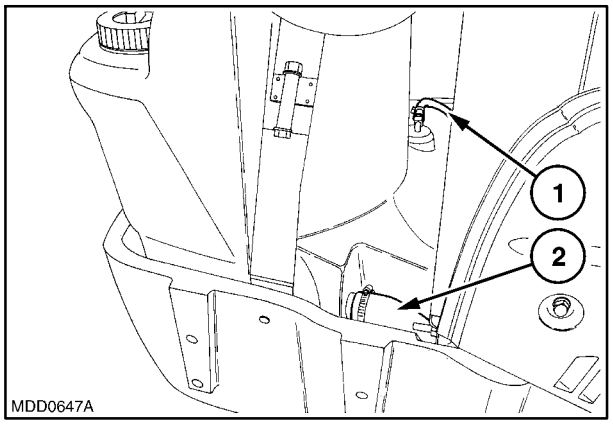
9. Remove the piping, 1, and the sleeve, 2, located on the lower part of the tank.



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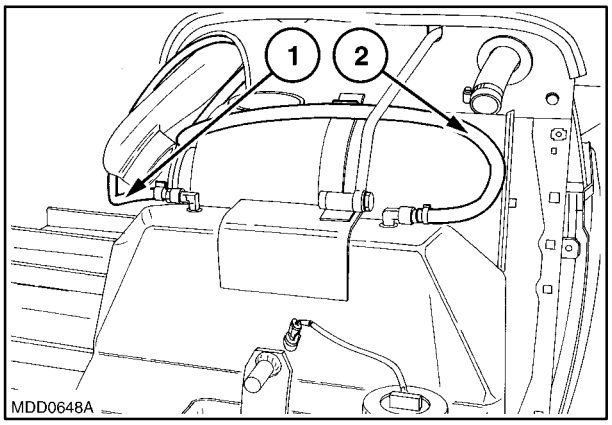
10. Remove the piping, 1, and, 2, located on the upper part of the tank.



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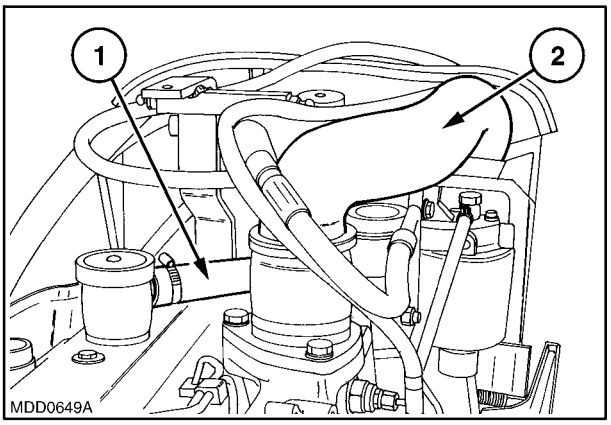
11. Detach the oil vapor breather pipes, 1, and the turbocharger feed piping, 2, as applicable.



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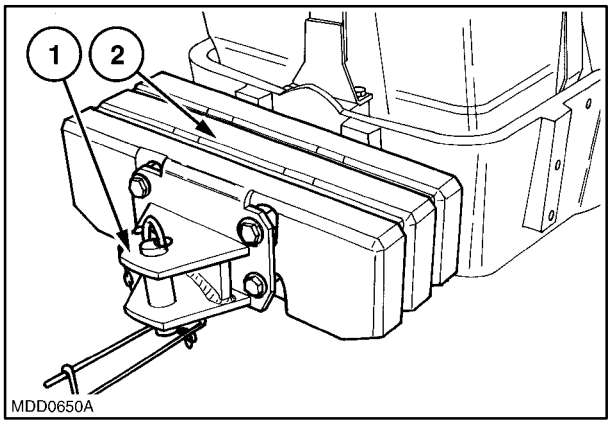
12. Remove the tow bar hook, 1, and the front ballast, 2.



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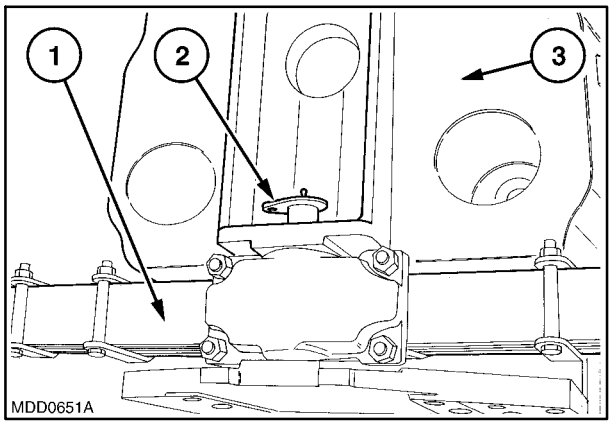
13. Hitch the front suspension, 1, to a hoist. Remove the suspension retaining pin, 2, on the support, 3, and remove the front suspension.
14. Hitch the front suspension support, 3, to a hoist, remove the sump retaining bolts and remove the support.



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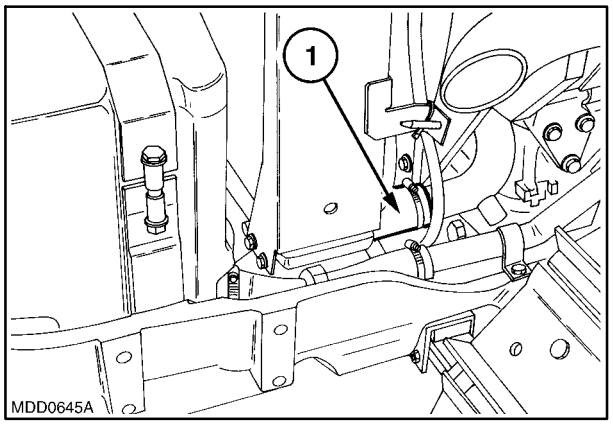
Installation

To install the engine, proceed as follows:

⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes. NEVER USE YOUR FINGERS OR HANDS.



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1. Apply the torque settings listed in the torque table.
2. Hitch the front suspension support to a hoist and install to the sump, securing in position with the retaining bolts.
3. Hitch the front suspension to a hoist. Install on the support and assemble the suspension retaining pin.
4. Install the front ballast and tow bar.
5. Install the oil vapor recovery piping and the turbocharger feed piping (where removed).
6. Install the piping on the upper part of the tank.
7. Install the piping and sleeve located on the lower part of the tank.
8. Install the upper tank support and tighten the retaining bolts.
9. Install the radiator upper piping sleeve.
10. Install the radiator lower piping sleeve.
11. Fill up with coolant.
12. Install the engine side guards and retaining bolts.
13. Assemble the roll bar support and retaining bolts.
14. Install the rubber heat guard on the support.
15. Carry out the relative clutch assembly operations.
16. Bleed the fuel system of air as described in this section.

Compression Test

In case of poor engine performance, in addition to checking the fuel injection system (injection nozzles and injection pump), also test the compression on each cylinder.

⚠ DANGER ⚠

Do not use matches, lighters, blowtorches or any form of naked flame as a source of light when inspecting the engine due to the presence of inflammable fluids and vapor.

Compression ratio

The compression ratio is a measure of the quantity of air drawn into the cylinder, and provides an indication of the efficiency of the sealing elements in the cylinder (piston rings and valves).

Uniform compression in all the cylinders ensures that they all perform an equal amount of work, provided that each cylinder is injected with the same quantity of fuel at the right time.

Low compression not only reduces engine performance, it also causes incomplete fuel combustion due to the lack of available combustion air.

The engine therefore gives poor performance with excessive fuel consumption and, consequently, exhaust smoke and restriction of the exhaust passages.

As the compression ratio **also varies with the temperature of the engine** (cold engines produce lower compression values than hot engines), the compression should only be tested when the engine is at normal operating temperature.

Compression should be tested using the compression test kit **380000303,** as follows:

1) run the engine until it reaches normal operating temperature;

2) switch off the engine;

3) disconnect the lead from the engine stop electromagnet on the injection pump in order to close the valve, and block the flow of fuel to the injectors;

4) remove the injector from the cylinder to be tested;

5) turn the engine over a few times with the starter motor in order to expel any carbon residue;

6) fit the dummy injector **380000617** in place of the injector removed previously, interposing the copper sealing washer;

7) connect the compression test instrument **380000303** and take readings while turning the engine over with the starter motor.

On engines in perfect working order, with the sump oil at approximately 40 °C (104 °F) at sea level (760 mm [29.9212 in, mercury]) and at an engine speed of 200 to 280 rpm, the compression should be 25.5 to 27.5 bar (369.8 to 398.8 psi).

8) Test the compression on the other cylinders, repeating steps 4-5-6-7, bearing in mind that:

The minimum permissible compression on a used engine is 21.6 bar (313.2 psi).

The maximum permissible compression difference between cylinders is 3 bar (43.5 psi).

Every 100 meters (109.36 yards) above sea level corresponds to a reduction in compression by approximately 1%.

Considerations:

Uniform compression

Although high compression is important, it is more important for smooth engine running that compression is uniform in all cylinders.

Low compression readings

If extremely low pressure readings are obtained on one cylinder it is advisable to repeat the test.

Before testing this time, pour approximately one spoonful of engine oil into the cylinder through the injector bore.

Turn over the engine a few times to distribute the oil evenly over the cylinder walls, and then repeat the test.

If the second test readings are significantly higher, suspect worn piston rings, out-of-round or damaged pistons.

If the second test readings are not higher, the problem will be the valves.

On the other hand, if the second test reading shows only a slight improvement, the problem will be due to both the valves and the rings.

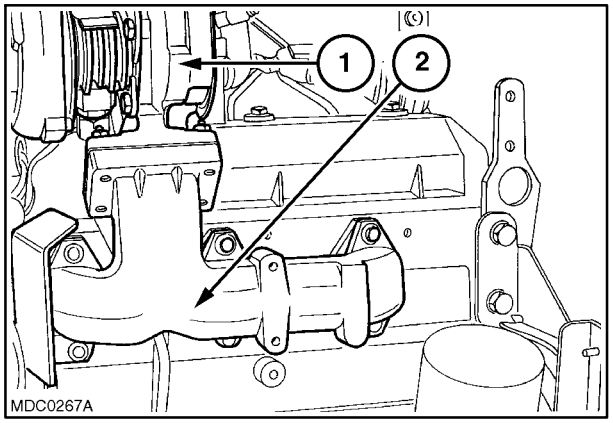
Disassembly

⚠ CAUTION ⚠

Handle all parts carefully.

Do not put your hands or fingers between parts. Wear suitable safety clothing - safety goggles, gloves and shoes.

1. Position the engine on a rotating stand (380000301) using brackets (380000313). Ensure the engine is secured.
2. Disconnect the turbocharger lube pipe, 1. Remove the turbocharger along with the exhaust manifold, 2.



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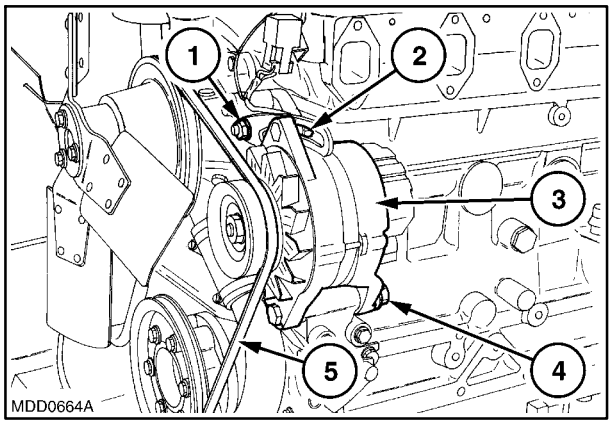
3. Remove retaining nuts, 1, and, 2, and the belt tension adjustment bracket.
4. Remove the alternator lower bolt, 4.
5. Remove the alternator, 3, and the belt, 5.



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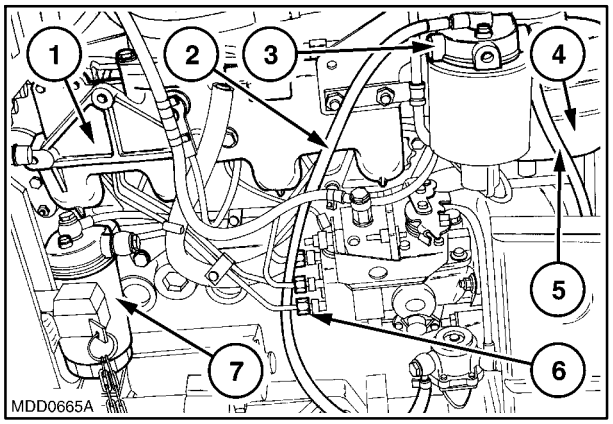
6. Disconnect piping, 2, and 5, on the sediment filter.
7. Remove the intake manifold, 1, and sediment filter, 3.
8. Disconnect the piping and remove the manipulator oil tank, 4, and bracket.
9. Remove the injection pump/injectors unions, 6, and piping.
10. Remove the fuel filter, 7, connections and piping.



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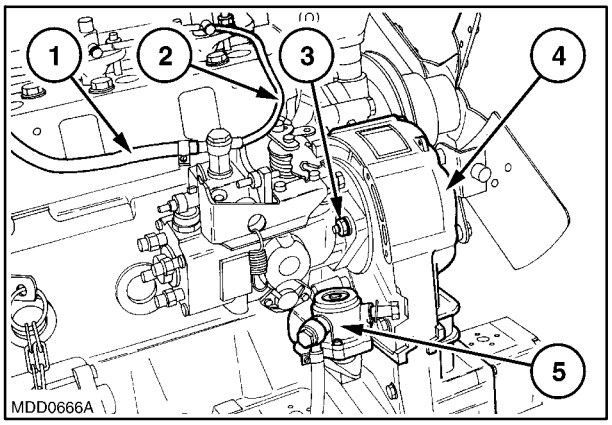
11. Disconnect piping, 1, and, 2, on the injection pump.
12. Remove the retaining nuts, 3, that secure the pump to the timing casing and the access cover, 4, to the gear unit.
13. Remove the pump retaining nuts and gear unit, extracting the gear unit with tool **380000322**; recover the pump and the Woodruff key.
14. Disconnect the piping and remove the fuel pump, 5.



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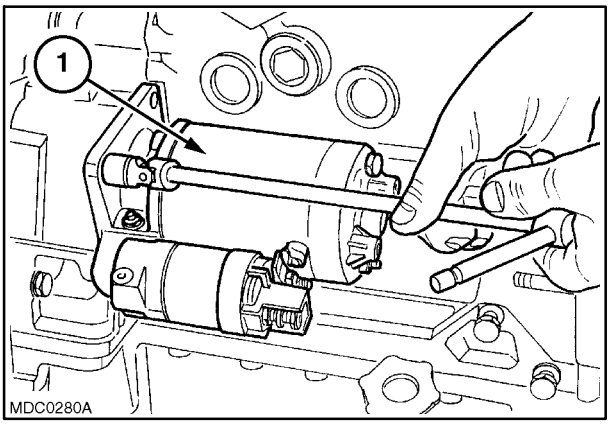
15. Remove the retaining bolts and the starter motor, 1.



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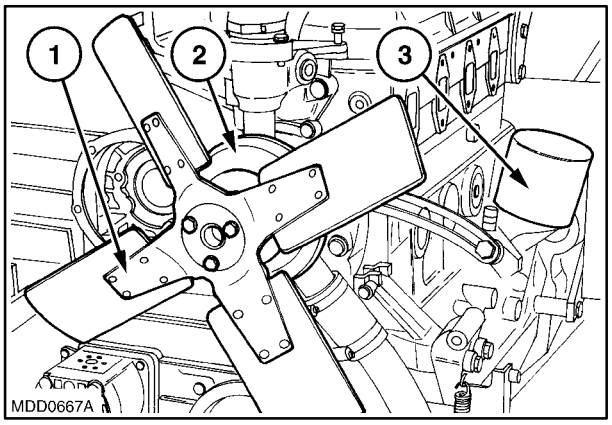
16. Remove the retaining bolts, detach the fan, 1, and relative pulley, 2.
17. Remove the oil filter, 3.



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