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

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The following pages are the collation of the contents pages from each section and chapter of the TKA Series Repair manual. Complete Repair part # 87582124.

The sections used through out all New Holland 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 TKA Series Tractors.

**SECTION 00 - GENERAL**

**Chapter 1 - General**

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## GENERAL INSTRUCTIONS



All maintenance and repair work described in this manual must be performed exclusively by **NEW HOLLAND service technicians** in strict accordance with the instructions given and using any specific tools necessary.

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Anyone who performs the operations described herein without strictly following the instructions is personally responsible for resulting injury or damage to property.

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The Manufacturer and all organizations belonging to the Manufacturer's distribution network, including but not restricted to national, regional or local distributors, will accept no responsibility for personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer, including those used for maintenance and/or repair of the product manufactured or marketed by the Manufacturer. In any case, the product manufactured or marketed by the Manufacturer is covered by no guarantee of any kind against personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer.

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### IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by the authorized workshops. All instructions detailed should be carefully observed and special equipment indicated should be used if necessary.

Everyone who carries out service operations described without carefully observing these prescriptions will be directly responsible of deriving damages.

### SHIMMING

At each adjustment, select adjusting shims, measure them individually using a micrometer and then sum up recorded values. Do not rely on measuring the whole shimming set, which may be incorrect, or on the rated value indicated for each shim.

### ROTATING SHAFT SEALS

To correctly install rotating shaft seals, observe the following instructions:

- Let the seal soak into the same oil as it will seal for at least half an hour before mounting.

- Thoroughly clean the shaft and ensure that the shaft working surface is not damaged.
- Place the sealing lip towards the fluid. In case of a hydrodynamic lip, consider the shaft rotation direction and orient grooves in order that they deviate the fluid towards the inner side of the seal.
- Coat the sealing lip with a thin layer of lubricant (oil rather than grease) and fill the gap between the sealing lip and the dust lip of double lip seals with grease.
- Insert the seal into its seat and press it down using a flat punch. Do not tap the seal with a hammer or a drift.
- Take care to insert the seal perpendicularly to its seat while you are pressing it. Once the seal is settled, ensure that it contacts the thrust element, if required.
- To prevent damaging the sealing lip against the shaft, place a suitable protection during installation.

### O-RINGS

Lubricate the O-rings before inserting them into their seats. This will prevent the O-rings from roll over and twisting during mounting, which will jeopardize sealing.

### SEALERS

Apply silicone/gasket eliminator over the mating surfaces marked with an X.

Before applying the sealer, prepare the surface as follows:

- Remove possible scales using a metal brush.
- Thoroughly degrease the surfaces using one of the following cleaning agents: trichlorethylene, diesel fuel or a water and soda solution.

### BEARINGS

It is advisable to heat the bearings to 80° to 90°C (176° to 194°F) before mounting them on their shafts and cool them down before inserting them into their seats with external tapping.

### SPRING PINS

When mounting split socket spring pins, ensure that the pin notch is oriented in the direction of the effort to stress the pin.

Spiral spring pins should not be oriented during installation.

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## HEALTH AND SAFETY

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### HEALTH AND SAFETY PRECAUTIONS

Many of the procedures associated with vehicle maintenance and repair involve physical hazards or other risks to health. This section lists, alphabetically, some of these hazardous operations and the materials and equipment associated with them. The precautions necessary to avoid these hazards are identified.

The list is not exhaustive and all operations and procedures and the handling of materials, should be carried out with health and safety in mind.

**ACIDS AND ALKALIS** - see Battery acids, e.g. caustic soda, sulfuric acid.

Used in batteries and cleaning materials.

Irritant and corrosive to the skin, eyes, nose and throat. Causes burns.

Avoid splashes to the skin, eyes and clothing. Wear suitable protective gloves and goggles. Can destroy ordinary protective clothing. Do not breathe mists.

Ensure access to water and soap is readily available for splashing accidents.

**ADHESIVES AND SEALERS** - see Fire

Highly Flammable, Flammable, combustible.

Generally should be stored in "No Smoking" areas; cleanliness and tidiness in use should be observed, e.g. disposable paper covering benches; should be dispensed from applicators where possible; containers, including secondary containers, should be labelled.

**Solvent based Adhesives/Sealers** - See Solvents.

Follow manufacturers instructions.

**Water based Adhesives/Sealers**

Those based on polymer emulsions and rubber lattices may contain small amounts of volatile toxic and harmful chemicals. Skin and eye contact should be avoided and adequate ventilation provided during use.

Follow manufacturers instructions.

**Resin based Adhesives/Sealers** - e.g. epoxide and formaldehyde resin based.

Mixing should only be carried out in well ventilated areas as harmful or toxic volatile chemicals may be released.

Skin contact with uncured resins and hardeners can result in irritation; dermatitis and absorption of toxic or harmful chemicals through the skin. Splashes can damage the eyes.

Provide adequate ventilation and avoid skin and eye contact. Follow manufacturers instructions.

**Anaerobic, Cyanoacrylate and other Acrylic Adhesives**

Many are irritant, sensitizing or harmful to the skin. Some are eye irritants.

Skin and eye contact should be avoided and the manufacturers instructions followed.

Cyanoacrylate adhesives (super glues) must not contact the skin or eyes. If skin or eye tissue is bonded, cover with a clean moist pad and get medical attention. Do not attempt to pull tissue apart. Use in well ventilated areas as vapors can cause irritation of the nose and eyes.

For two-pack systems, see Resin based adhesives/sealers.

**Isocyanate (Polyurethane) Adhesives/Sealers** - see Resin based Adhesives.

Individuals suffering from asthma or respiratory allergies should not work with or near these materials as sensitivity reactions can occur.

Any spraying should preferably be carried out in exhaust ventilated booths, removing vapors and spray droplets from the breathing zone. Individuals working with spray applications should wear supplied air respirators.

**ANTIFREEZE** - see Fire, Solvents e.g. Isopropanol, Ethylene Glycol, Methanol.

Highly Flammable, Flammable, Combustible.

Used in vehicle coolant systems, brake air pressure systems, screenwash solutions.

Vapors given off from coolant antifreeze (glycol) arise only when heated.

Antifreeze may be absorbed through the skin in toxic or harmful quantities. Antifreeze if swallowed is fatal and medical attention must be found immediately.

**ARC WELDING** - see Welding.

**BATTERY ACIDS** - see Acids and Alkalis.

Gases released during charging are explosive. Never use naked flames or allow sparks near charging or recently charged batteries.

**BRAKE AND CLUTCH FLUIDS (Polyalkylene Glycols)** - see Fire.

Combustible.

Splashes to the skin and eyes are slightly irritating. Avoid skin and eye contact as far as possible. Inhalation of vapors hazards do not arise at ambient temperatures because of the very low vapors pressure.

**BRAZING** - see Welding.

**CHEMICAL MATERIALS - GENERAL** - see Legal Aspects.

Chemical materials such as solvents, sealers, adhesives, paints, resin foams, battery acids, antifreeze, brake fluids, oils and grease should always be used with caution and stored and handled with care. They may be toxic, harmful, corrosive, irritant or highly inflammable and give rise to hazardous fumes and dusts.

The effects of excessive exposure to chemicals may be immediate or delayed; briefly experienced or permanent; cumulative; superficial; life threatening; or may reduce life-expectancy.

**DO'S**

**Do** remove chemical materials from the skin and clothing as soon as practicable after soiling. Change heavily soiled clothing and have it cleaned.

**Do** carefully read and observe hazard and precaution warnings given on material containers (labels) and in any accompanying leaflets, poster or other instructions. Material health and safety data sheets can be obtained from Manufacturers.

**Do** organize work practices and wear protective clothing to avoid irritation of the skin and eyes; breathing vapors/aerosols/dusts/fumes; inadequate container labelling; fire and explosion hazards.

**Do** wash before job breaks; before eating, smoking, drinking or using toilet facilities when handling chemical materials.

**Do** keep work areas clean, uncluttered and free of spills.

**Do** store according to national and local regulations.

**Do** keep chemical materials out of reach of children.

**SECTION 10 - ENGINE**

**Chapter 1 - Engine**

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## SPECIFICATIONS

Engine, type:	
- Models TK75VA .....	8035.25.921
- Models TK80A, TK80MA .....	8045.05R.921
- Models TK90A, TK90MA .....	8045.25.921
- Models TK100A .....	8045.25L.921
Cycle .....	diesel, 4-stroke
Fuel injection .....	direct
Number of cylinders in line	
- Models TK75VA .....	3
- Models TK80A, TK80MA, TK90A, TK90MA, TK100A .....	4
Piston diameter .....	104 mm (4.0944 in)
Piston stroke .....	115 mm (4.5275 in)
Total displacement:	
- Models TK75VA .....	2931 cm <sup>3</sup> (179 cu in)
- Models TK80A, TK80MA .....	3908 cm <sup>3</sup> (238 cu in)
- Models TK90A, TK90MA .....	3908 cm <sup>3</sup> (238 cu in)
- Models TK100A .....	3908 cm <sup>3</sup> (238 cu in)
Compression ratio:	
- Models TK80A, TK80MA .....	17:1 naturally aspirated
- Models TK75VA, TK90A, TK90MA, TK100A .....	16.5:1 turbocharged
Maximum power:	
- Models TK75VA .....	55.5 kw (net 76 hp)
- Models TK80A, TK80MA .....	58.5 kw (net 80 hp)
- Models TK90A, TK90MA .....	65.5 kw (net 90 hp)
- Models TK100A .....	69 kw (net 94 hp)
Maximum power speed	
- Models TK75VA .....	2300 rpm
- Models TK80A, TK80MA .....	2500 rpm
- Models TK90A, TK90MA .....	2500 rpm
- Models TK100A .....	2500 rpm
Maximum torque speed	
- Models TK75VA .....	1400 rpm
- Models TK80A, TK80MA .....	1500 rpm
- Models TK90A, TK90MA .....	1500 rpm
- Models TK100A .....	1500 rpm
Number of main bearings .....	5
Sump pan .....	structural, cast iron

**SECTION 10 - ENGINE - CHAPTER 1**

<p><b>Lubrication system</b> .....</p> <p>1st 50 hr (Break-in Engine Oil) .....</p> <p>After 50 hr (AMBRA SUPER GOLD Engine Oil) .....</p> <p>Pump drive .....</p> <p>Engine speed/oil pump speed ratio .....</p> <p>Oil cleaning .....</p> <p>Normal oil pressure, warm engine running at max speed .....</p> <p>TK75VA .....</p> <p>TK80A, TK80MA .....</p> <p>TK90A, TK90MA .....</p> <p>TK100A .....</p> <p>Pressure relief valve .....</p> <p>Valve opening pressure .....</p>	<p>forced, with gear pump</p> <p>10W-40 - API SE/CC 10W-40</p> <p>15W-40 - Premium Multi-grade NH 330G</p> <p>camshaft</p> <p>2:1</p> <p>mesh screen on oil pick-up and filter cartridge in delivery line</p> <p>≥ 2 bar (29 psi)</p> <p>2.9 to 3.9 bar (42 to 56 psi)</p> <p>≥ 2 bar (29 psi)</p> <p>≥ 4 bar (58 psi)</p> <p>built into pump housing</p> <p>3.5 bar (50.8 psi)</p>
<p><b>Cooling system</b> .....</p> <p>Radiator .....</p> <p>Fan, attached to coolant pump pulley .....</p> <p>Coolant pump .....</p> <p>Engine speed/coolant pump speed ratio .....</p> <p>Temperature control .....</p> <p>Coolant thermometer .....</p> <p>Temperature ranges corresponding to each section:</p> <p>- initial white section .....</p> <p>- middle green section (normal working conditions) .....</p> <p>- final red section .....</p>	<p>water circulation</p> <p>4-row vertical pipes with copper fins</p> <p>4-blade in sheet metal</p> <p>centrifugal vane-type</p> <p>1:1.403</p> <p>thermostat</p> <p>colored scale divided into 3 sections</p> <p>30° to 65°C (86° to 149°F)</p> <p>65° to 105°C (149° to 221°F)</p> <p>105° to 115°C (221° to 239°F)</p>
<p><b>Rev counter/hourmeter</b> .....</p> <p>Operating system .....</p> <p>Hour counter calibrated for engine speed of .....</p>	<p>incorporated in control panel</p> <p>from gear on camshaft</p> <p>1800 rpm</p>

*(continued)*

ENGINE OVERHAUL

ENGINE

Removal

————— **⚠ DANGER ⚠** —————

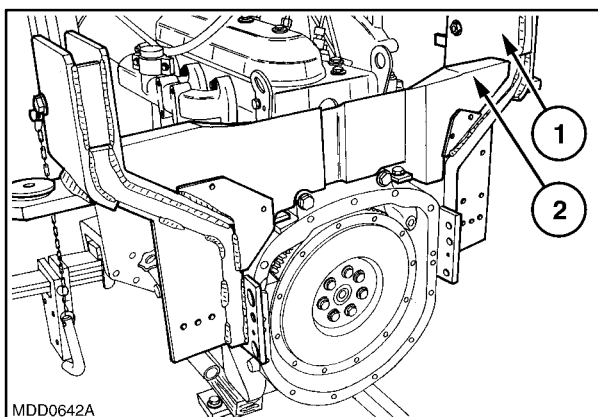
Lift and handle all heavy parts using suitable lifting equipment.

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 ⚠** —————

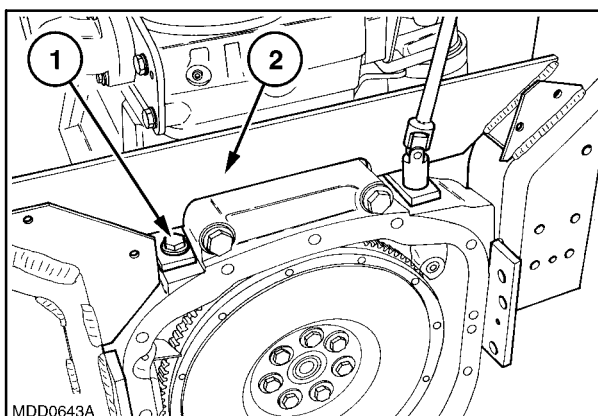
Always use appropriate tools to align fixing holes. NEVER USE YOUR FINGERS OR HANDS.

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



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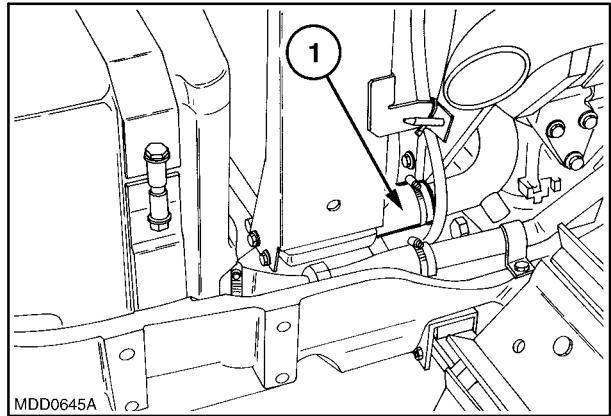
3. Remove the retaining bolts, 1, and the support, 2.



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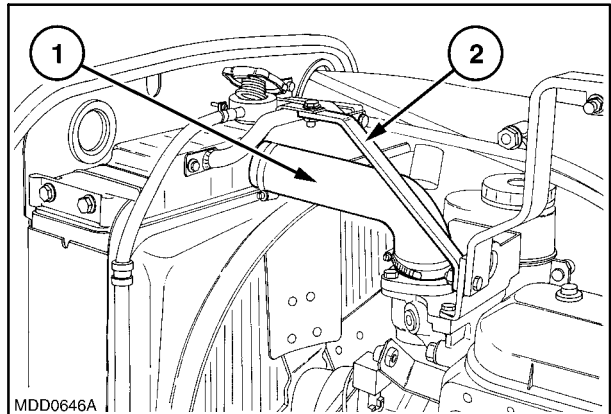
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4. Remove the retaining bolts and the right and left-hand engine side guards.
5. Place a container for the coolant under the sleeve, 1.
6. Detach the sleeve, 1, on the lower pipe and drain off the coolant.



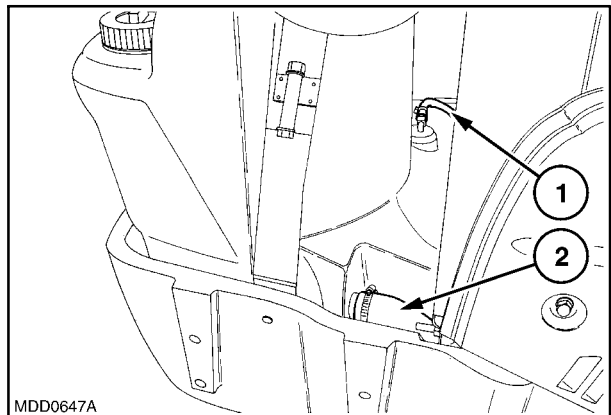
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7. Detach the sleeve, 1, on the radiator upper piping.
8. Remove the retaining bolts and the radiator upper support, 2.



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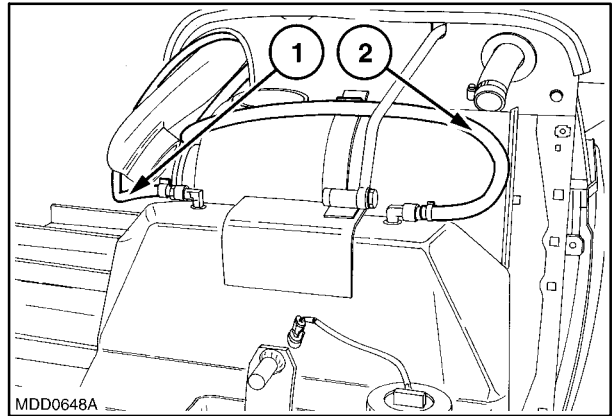
9. Remove the piping, 1, and the sleeve, 2, located on the lower part of the tank.



11

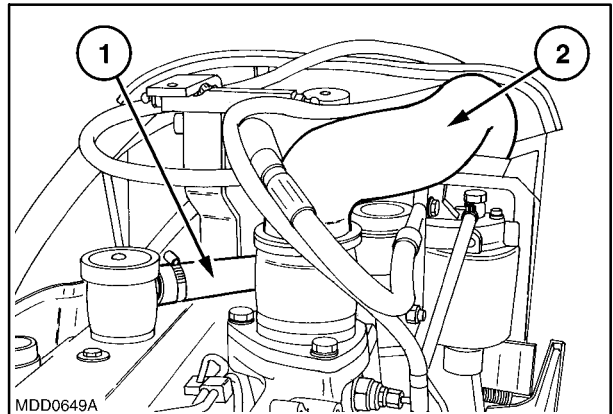
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10. Remove the piping, 1, and, 2, located on the upper part of the tank.



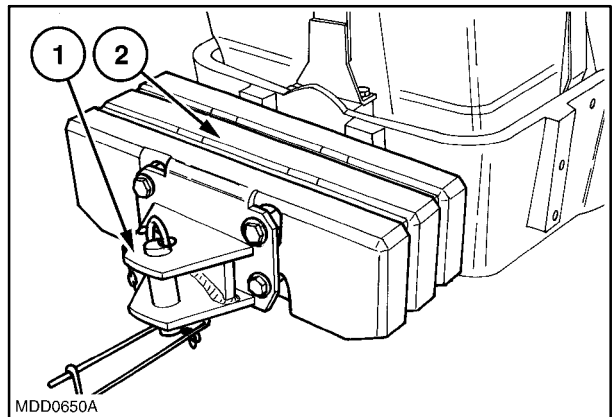
12

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



13

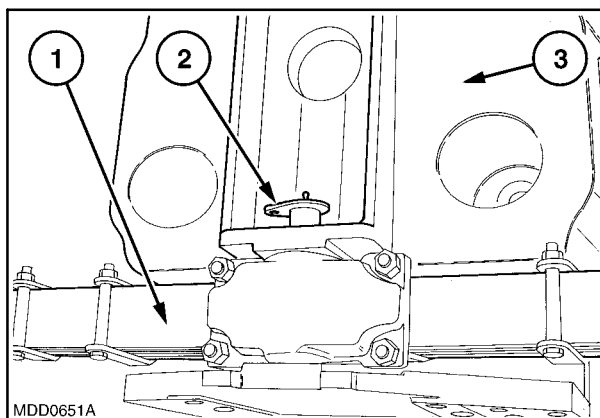
12. Remove the tow bar hook, 1, and the front ballast, 2.



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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.



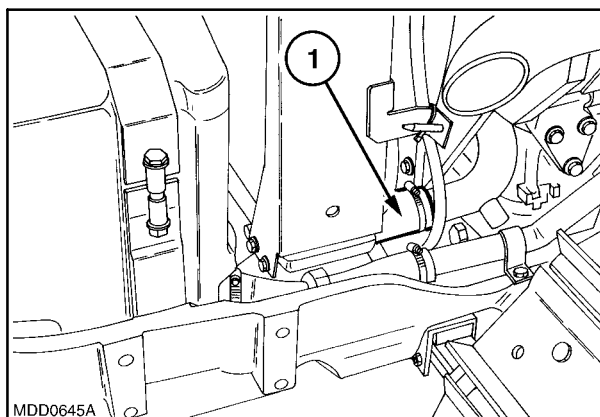
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**Installation**

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.



**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.



**Suggest:**

**If the above button click is invalid.**

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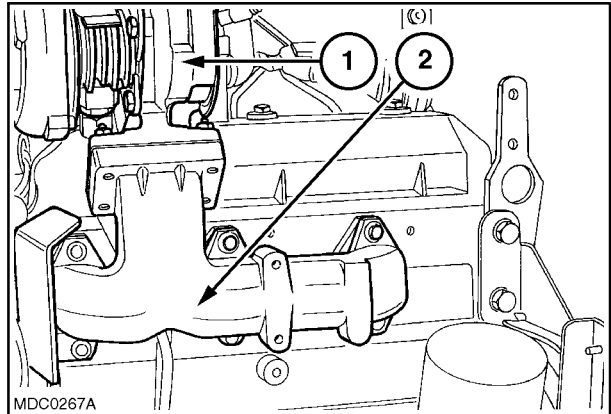
Disassembly

⚠ CAUTION ⚠

Handle all parts carefully.

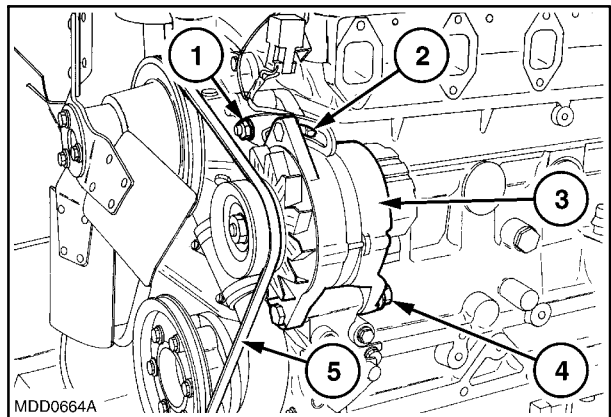
Do not put your hands or fingers between parts.  
Wear suitable safety clothing - safety goggles, gloves and shoes.

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.



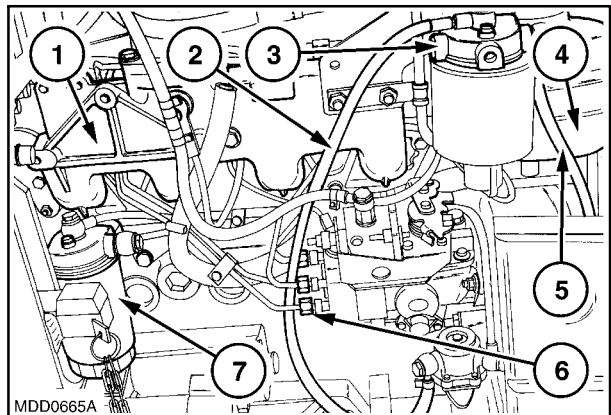
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3. Remove retaining nuts, 1, and 2, and the belt tension adjustment bracket.
4. Remove the alternator lower bolt, 4.
5. Remove the alternator, 3, and the belt, 5.



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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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