JX95 STRADDLE MOUNT REPAIR MANUAL COMPLETE CONTENTS

The following pages are the collation of the contents pages from each section and chapter of the JX95 Straddle Mount Repair manual. Complete Repair part # 87519319.

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 JX95 Straddle Mount Tractors.

GENERAL INSTRUCTIONS

IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by the authorised 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.

GENERAL INSTRUCTIONS

PRECAUTIONARY NOTICE

Only authorized workshops should carry out maintenance and repair operations on the tractor, or tractor components. Carefully observe all instructions, safety precautions, and the use of equipment such as special tools, as detailed in this manual. Damage to the tractor, or injury to personnel is the direct responsibility of anyone who fails to observe these precautions.

EQUIPMENT NOTICE

The equipment proposed in this manual is:

- Designed and studied expressly for use on Case IH tractors
- Necessary for adequate and reliable repair of the tractor
- Strictly tested for the efficient and long lasting life cycle of the tractor

SPARE PARTS NOTICE

Genuine CASE IH spare parts guarantee the same quality, safety and life cycle as original components. These parts bear the logo.

GENERAL NOTICES

In this manual, the description 'FRONT', 'REAR', 'RIGHT-HAND' and 'LEFT-HAND' refer to the view seen by the operator while in the operator's seat, looking in the direction in which the tractor normally moves.

Wear limits detailed in this manual, although advised, are not binding.

HEALTH AND SAFETY

CONTENTS

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 vapours 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 vapours 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.

Vapours 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 vapour hazards do not arise at ambient temperatures because of the very low vapour 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 organise work practices and protective clothing to avoid soiling of the skin and eyes; breathing vapours/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.

DO NOTS

Do Not mix chemical materials except under the manufacturers instructions; some chemicals can form other toxic or harmful chemicals; give off toxic or harmful fumes; be explosive when mixed together.

Do Not spray chemical materials, particularly those based on solvents, in confined spaces e.g. when people are inside a vehicle.

Do Not apply heat or flame to chemical materials except under the manufacturers' instructions. Some are highly inflammable and some may release toxic or harmful fumes.

Do Not leave containers open. Fumes given off can build up to toxic, harmful or explosive concentrations. Some fumes are heavier than air and will accumulate in confined areas, pits etc.

Do Not transfer chemical materials to unlabelled containers.

Do Not clean hands or clothing with chemical materials. Chemicals, particularly solvents and fuels will dry the skin and may cause irritation with dermatitis. Some can be absorbed through the skin in toxic or harmful quantities.

Do Not use emptied containers for other materials, except when they have been cleaned under supervised conditions.

Do Not sniff or smell chemical materials. Brief exposure to high concentrations of fumes can be toxic or harmful.

Clutch Fluids - see Brake and Clutch Fluids.

Clutch Linings and Pads - see Brake and Clutch Linings and Pads.

CORROSION PROTECTION MATERIALS - see Solvents, Fire.

Highly flammable, flammable.

These materials are varied and the manufacturers instructions should be followed. They may contain solvents, resins, petroleum products etc. Skin and eye contact should be avoided. They should only be sprayed in conditions of adequate ventilation and not in confined spaces.

Cutting - see Welding.

De-Waxing - see Solvents and Fuels (Kerosene).

DUSTS

Powder, dusts or clouds may be irritant, harmful or toxic. Avoid breathing dusts from powdery chemical materials or those arising from dry abrasion operations. Wear respiratory protection if ventilation is inadequate.

ELECTRIC SHOCK

Electric shocks can result from the use of faulty electrical equipment or from the misuse of equipment even in good condition.

Ensure that electrical equipment is maintained in good condition and frequently tested.

Ensure that flexes, cables, plugs and sockets are not frayed, kinked, cut, cracked or otherwise damaged.

Ensure that electric equipment is protected by the correct rated fuse.

Never misuse electrical equipment and never use equipment which is in any way faulty. The results could be fatal.

Use reduced voltage equipment (110 volt) for inspection and working lights where possible.

Ensure that the cables of mobile electrical equipment cannot get trapped and damaged, such as in a vehicle hoist.

Use air operated mobile equipment where possible in preference to electrical equipment.

In cases of electrocution:-

- switch off electricity before approaching victim

- if this is not possible, push or drag victim from source of electricity using dry non-conductive material

- commence resuscitation if trained to do so

- SUMMON MEDICAL ASSISTANCE

EXHAUST FUMES

These contain asphyxiating, harmful and toxic chemicals and particles such as carbon oxides, nitrogen oxides, aldehydes, lead and aromatic hydrocarbons. Engines should only be run under conditions of adequate extraction or general ventilation and not in confined spaces.

Gasolene (Petrol) Engine

There may not be adequate warning properties of odour or irritation before immediate and delayed toxic or harmful effects arise.

Diesel Engine

Soot, discomfort and irritation usually give adequate warning of hazardous fume concentrations.

FIBER INSULATION - see Dusts.

Used in noise and sound insulation.

The fibrous nature of surfaces and cut edges can cause skin irritation. This is usually a physical and not a chemical effect.

Precautions should be taken to avoid excessive skin contact through careful organisation of work practices and the use of gloves.

FIRE - see Welding, Foams, Legal Aspects.

Many of the materials found on or associated with the repair of vehicles are highly flammable. Some give off toxic or harmful fumes if burnt.

Observe strict fire safety when storing and handling flammable materials or solvents, particularly near electrical equipment or welding processes.

Ensure before using electrical or welding equipment but that there is no fire hazard present.

Have a suitable fire extinguisher available when using welding or heating equipment.

FIRST AID

Apart form meeting any legal requirements it is desirable for someone in the workshop to be trained in first aid procedures.

Splashes in the eye should be flushed with clean water for at least ten minutes.

Soiled skin should be washed with soap and water.

Inhalation affected individuals should be removed to fresh air immediately.

If swallowed or if effects persist consult a doctor with information (label) on material used.

Do not induce vomiting (unless indicated by manufacturer).

FOAMS - Polyurethane - see Fire.

Used in sound and noise insulation. Cured foams used in seat and trim cushioning.

Follow manufacturers instructions.

Unreacted components are irritating and may be harmful to the skin and eyes. Wear gloves and goggles.

Individuals with chronic respiratory diseases, asthma, bronchial medical problems or histories of allergic diseases should not work with or near uncured materials.

The components, vapours, spray mists can cause direct irritation, sensitivity reactions and may be toxic or harmful.

Vapours and spray mists must not be breathed. These materials must be applied with adequate ventilation and respiratory protection. Do not remove respirator immediately after spraying, wait until vapour/ mists have cleared.

Burning of the uncured components and the cured foams can generate toxic and harmful fumes.

Smoking, open flames or the use of electrical equipment during foaming operations and until vapours/mists have cleared should not be allowed. Any heat cutting of cured foams or partially cured foams should be conducted with extraction ventilation.

FUELS - see Fire, Legal Aspects, Chemicals - General, Solvents.

Used as fuels and cleaning agents.

Gasolene (Petrol).

Highly flammable.

Swallowing can result in mouth and throat irritation and absorption from the stomach can result in drowsiness and unconsciousness. Small amounts can be fatal to children. Aspiration of liquid into the lungs, e.g. through vomiting, is a very serious hazard.

Gasolene dries the skin and can cause irritation and dermatitis on prolonged or repeated contact. Liquid in the eye causes severe smarting.

Motor gasolene may contain appreciable quantities of benzene, which is toxic upon inhalation and the concentrations of gasolene vapours must be kept very low. High concentrations will cause eye, nose and throat irritation, nausea, headache, depression and symptoms of drunkeness. Very high concentrations will result in rapid loss of consciousness.

Ensure there is adequate ventilation when handling and using gasolene. Great care must be taken to avoid the serious consequences of inhalation in the event of vapour build up arising from spillages in confined spaces.

Special precautions apply to cleaning and maintenance operations on gasolene storage tanks.

Gasolene should not be used as a cleaning agent. It must not be siphoned by mouth.

Kerosene (Paraffin)

Used also as heating fuel, solvent and cleaning agent.

Flammable.

Irritation of the mouth and throat may result from swallowing. The main hazard from swallowing arises if liquid aspiration into the lungs occurs. Liquid contact dries the skin and can cause irritation or dermatitis. Splashes in the eye may be slightly irritating.

In normal circumstances the low volatility does not give rise to harmful vapours. Exposure to mists and vapours from kerosene at elevated temperatures should be avoided (mists may arise in de-waxing). Avoid skin and eye contact and ensure there is adequate ventilation.

Gas-Oil (Diesel Fuel) - see Fuels (Kerosene).

Combustible.

Gross or prolonged skin contact with high boiling gas oils may also cause serious skin disorders including skin cancer.

GAS CYLINDERS - see Fire.

Gases such as oxygen, acetylene, carbon dioxide, argon and propane are normally stored in cylinders at pressures of up to 2000 lb/sq. in. (13,790 kn/m^2) and great care should be taken in handling these cylinders to avoid mechanical damage to them or to the valve gear attached. The contents of each cylinder should be clearly identified by appropriate markings.

Cylinders should be stored in well ventilated enclosures, and protected from ice and snow, or direct sunlight. Fuel gases (e.g. acetylene and propane) should not be stored in close proximity to oxygen cylinders.

Care should be exercised to prevent leaks from gas cylinders and lines, and to avoid sources of ignition.

Only trained personnel should undertake work involving gas cylinders.

Gases - see Gas Cylinders.

Gas Shielded Welding - see Welding.

Gas Welding - see Welding.

SECTION 10 - ENGINE

Chapter 1 - Engine

CONTENTS

SPECIFICATIONS

Engine type:	
– Model JX95 (Turbocharged)	8045.25L.939
Cycle	diesel, 4-stroke
Injection	direct
Number of on-line cylinders	4
Piston bore	104 mm (4.09 in)
Piston stroke	115 mm (4.53 in)
Total displacement	3908 cm^3 (238 in^3)
Compression ratio	16.5:1 turbocharged
Maximum power	gross 90 hp (66.5 kW)
Rated speed	2500 rpm
High idle speed	2700 ± 25 rpm
Low idle speed	650 ± 25 rpm
Maximum torque speed	1500 rpm
Number of main bearings	5
Sump pan	structural, cast iron

Speedometer/tachometer	incorporated in control panel
Operating system	from gear on camshaft
Hour counter calibrated for engine speed of	1800 rpm

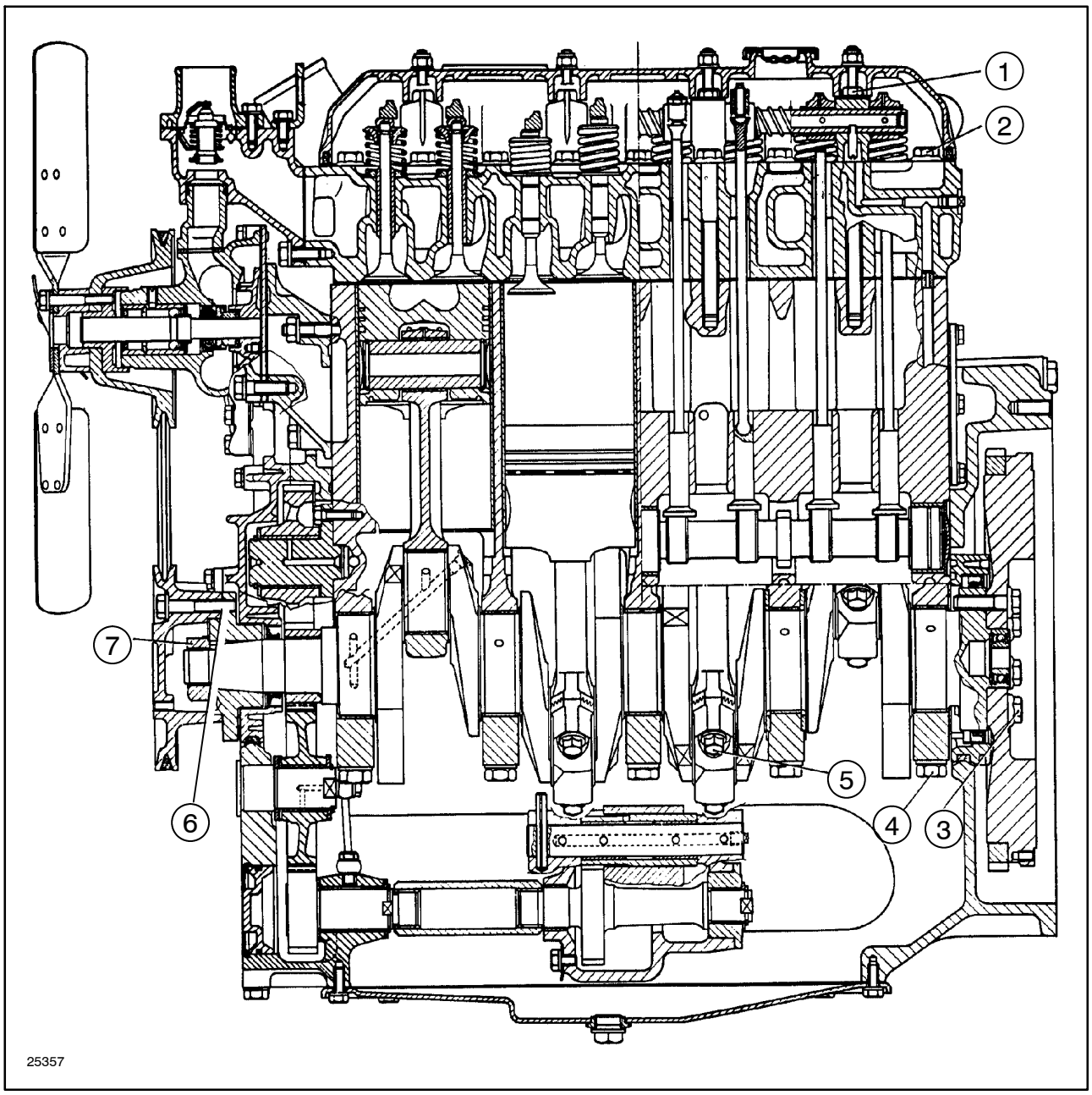
(continued)

Timing system	overhead valves operated by tappets, rods and rocker arms via the camshaft located in the engine block; the camshaft is driven by the crankshaft using helical gears
Intake:	
- start: before TDC.	12°
- end: after BDC.	31°
Exhaust:	
- start: before BDC.	50°
- end: after TDC.	16°
Valve-rocker arm clearance for timing check	0.45 mm (0.0177 in)
Valve-rocker arm clearance (with engine cold):	
- intake	0.30 ± 0.05 mm (0.011 ± 0.0019 in)
- exhaust	0.30 ± 0.05 mm (0.011 ± 0.0019 in)

CRANKCASE/CYLINDER BLOCK DATA	**mm (in)**
Cylinder Block	cast-iron monobloc with parent-bore cylinders, incorporating seatings for crank-shaft, camshaft and tappets
Diameter of cylinder bores	106.850 to 106.900 (4.206 to 4.208)
Maximum permissible cylinder ovality or taper due to wear	0.12 (0.0047) (1)
Main journal half bearing seat diameter	84.200 to 84.230 (3.3149 to 3.3161)
Camshaft bearing seat diameter:	
- front	54.780 to 54.805 (2.1566 to 2.1576)
- intermediate	54.280 to 54.305 (2.1370 to 2.1379)
- rear	53.780 to 53.805 (2.1173 to 2.1183)
Diameter of standard tappet bores in crankcase	15.000 to 15.018 (0.5905 to 0.5912)
Tappet oversizes	0.1 - 0.2 - 0.3 (0.0039 - 0.0078 - 0.0118)

(1) Measure in the area swept by piston rings, both parallel and perpendicular to the crankshaft axis.

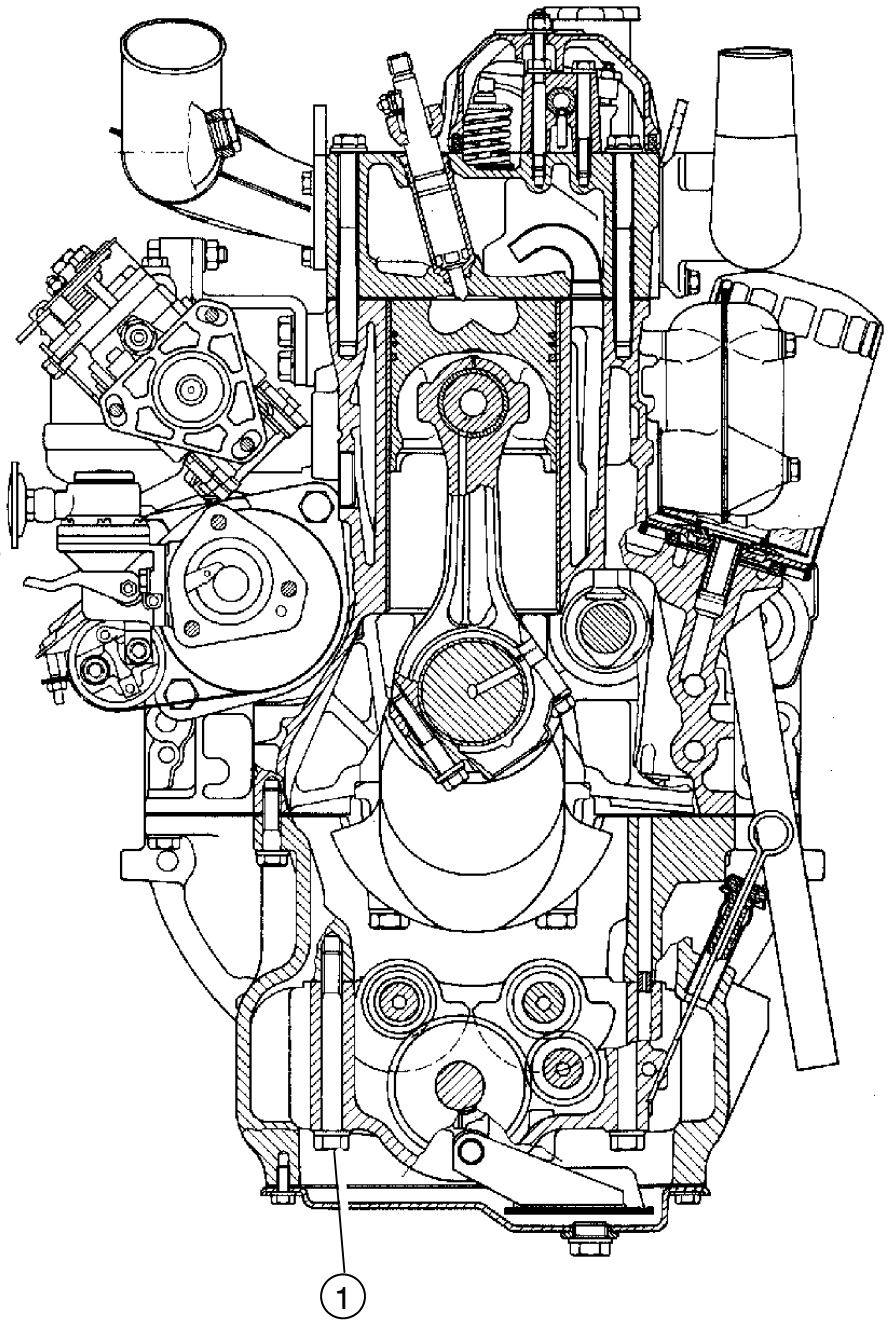
SECTIONAL VIEWS



5

Longitudinal View of 4-Cylinder Engine

1. Rocker Shaft Pedestal Bolts
2. Cylinder Head Bolts
3. Flywheel Mounting Bolts
4. Main Bearing Cap Bolts
5. Big-end Cap Bolts
6. Fan and Alternator Pulley Bolts
7. Crankshaft Hub Retaining Bolts



6

Cross-sectional View of 4-Cylinder Engine

1. Counterweight retaining bolts

OVERHAUL

ENGINE

Removal

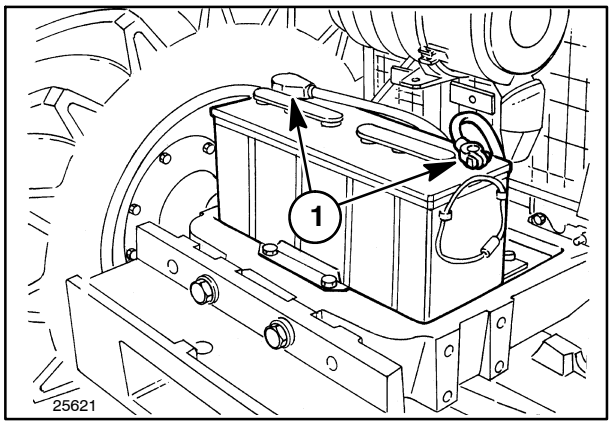
⚠ DANGER ⚠

Lift and handle all heavy parts using suitable lifting equipment.
Make sure that the load is supported by means of suitable slings and hooks.
Make sure that no-one is standing in the vicinity of the load to be lifted.

⚠ WARNING ⚠

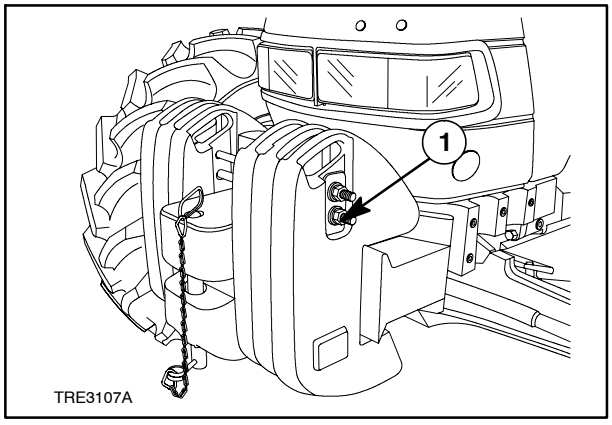
Always use suitable tools to align holes in parts. NEVER USE YOUR FINGERS OR HANDS.

1. Disconnect the battery negative (ground) and positive cables (1).
2. Drain oil from the transmission/gearbox.
3. Drain the cooling system.



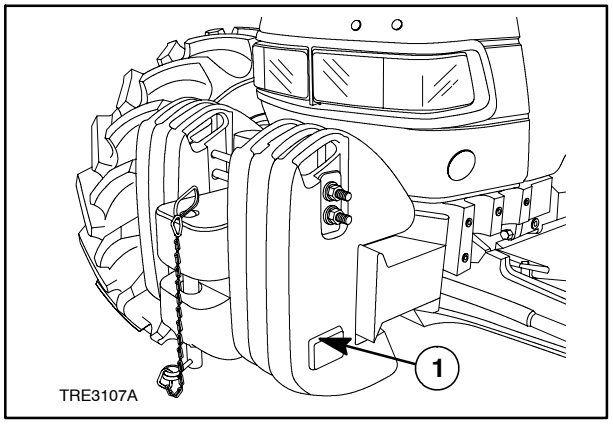
8

4. Unscrew the nut (1) from the front ballast retaining pin.



9

5. Remove the ballast (1) from the front support.



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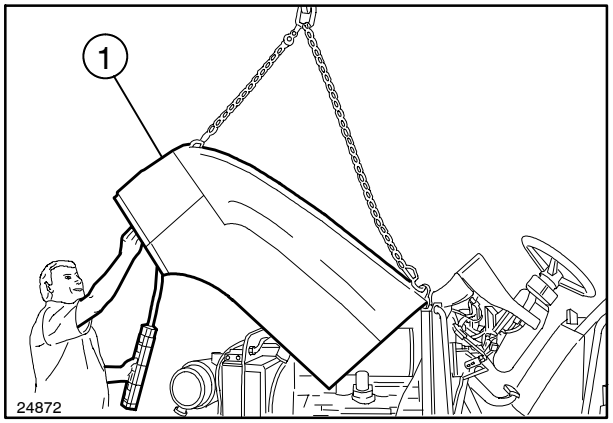
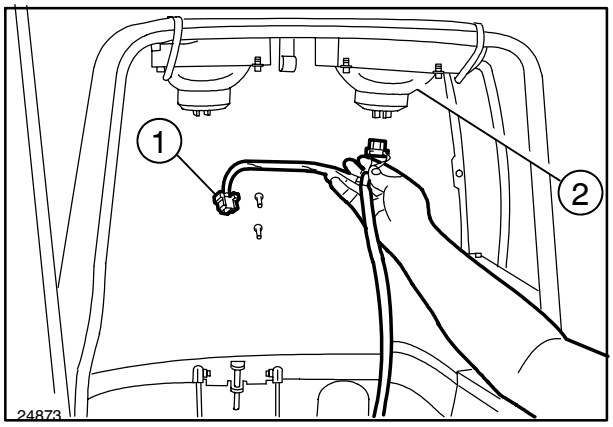
6. Remove the exhaust pipe. Attach lifting chains to the hood (1) using tools 50131 and 50132 and attach the chain to the hoist.



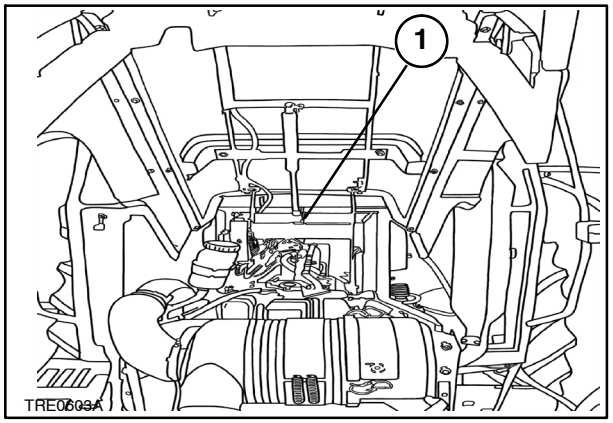
11

7. Detach the electrical leads (1) from the headlamps (2).



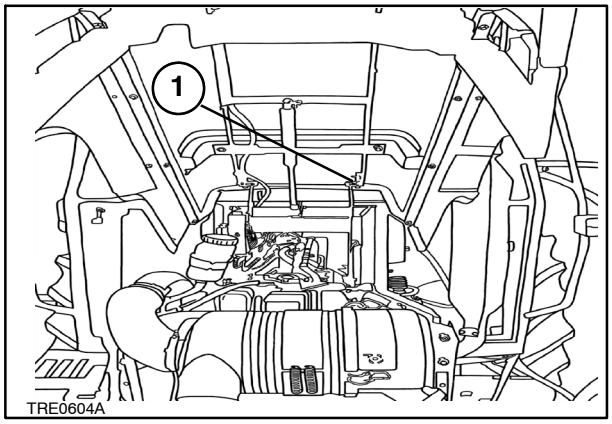
12

8. Detach the struts (1) from hood.



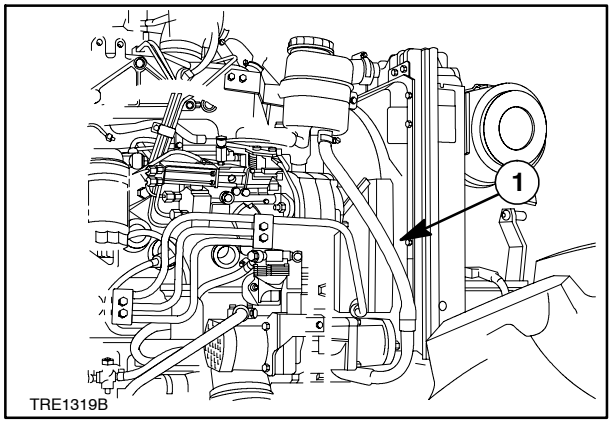
13

9. Remove the four hood hinge bolts (1) and lift the hood clear.



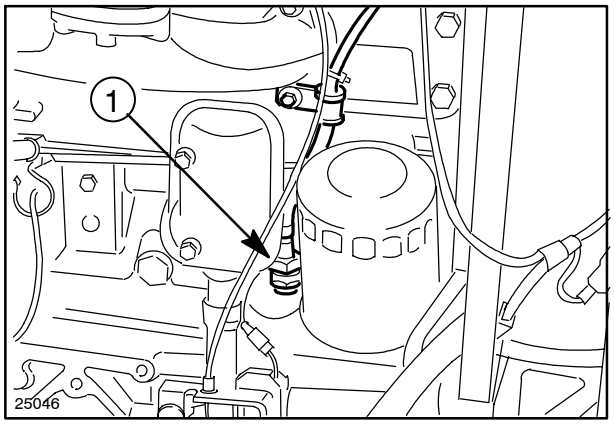
14

10. Remove the fan guard (1) from right-hand side of the fan.



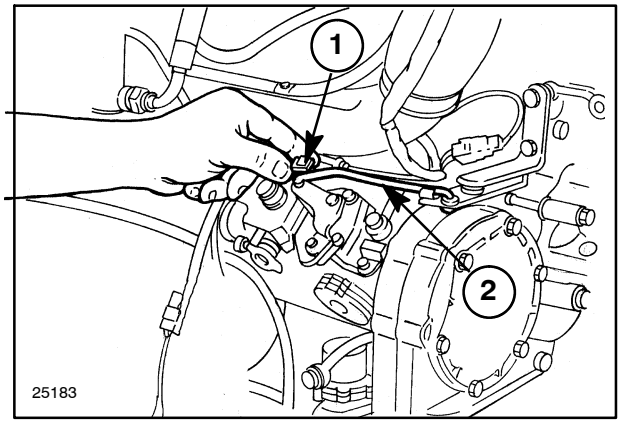
15

11. Disconnect the tachometer cable (1) and remove the retaining ring and sleeve.



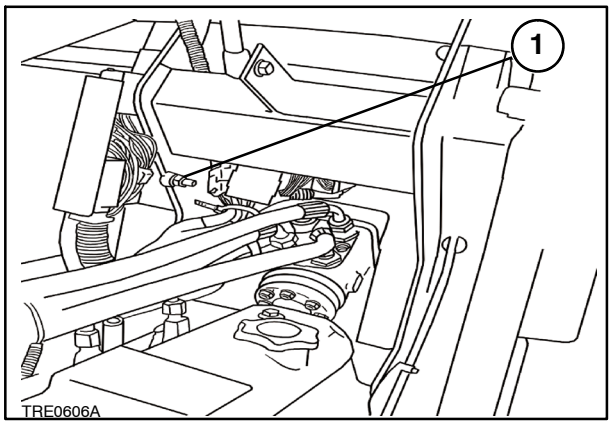
16

12. Detach the throttle control spring (1) and remove the throttle lever (2).



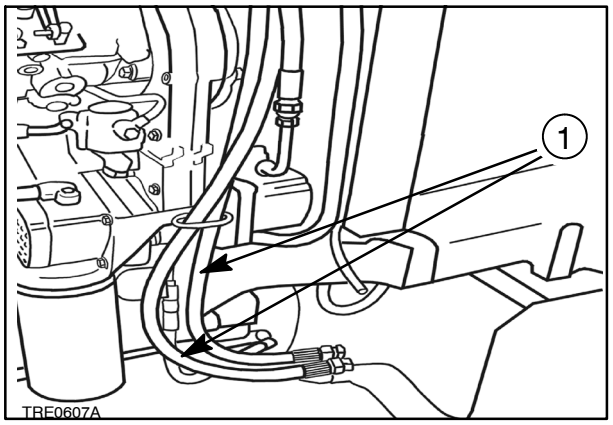
17

13. Remove the fusebox by unscrewing the nut (1)



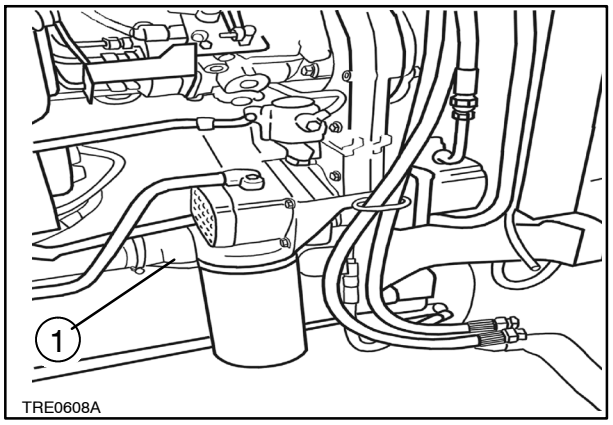
18

14. Disconnect the delivery and return lines (1) to the power steering cylinders.



19

15. Remove the supply hose (1) from the lift pump.



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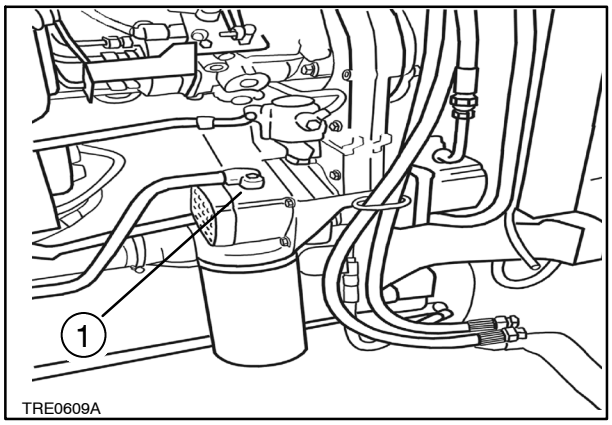
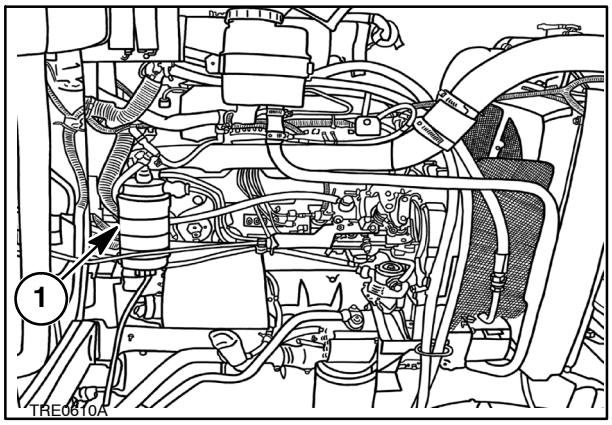
16. Detach the lift pump delivery pipe (1).



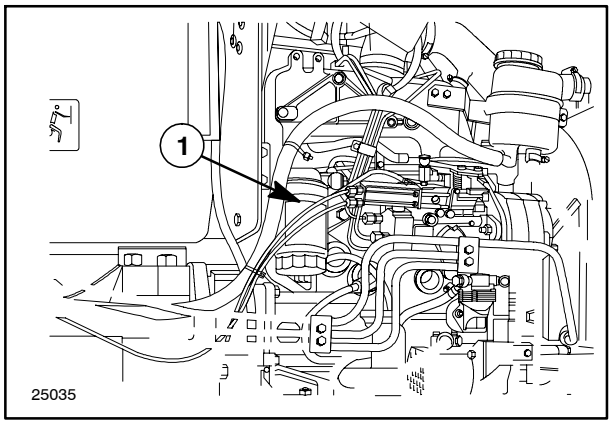
21

17. Detach the fuel pipes from the fuel injection pump and the pipe connecting the fuel tank to the fuel filter (1).



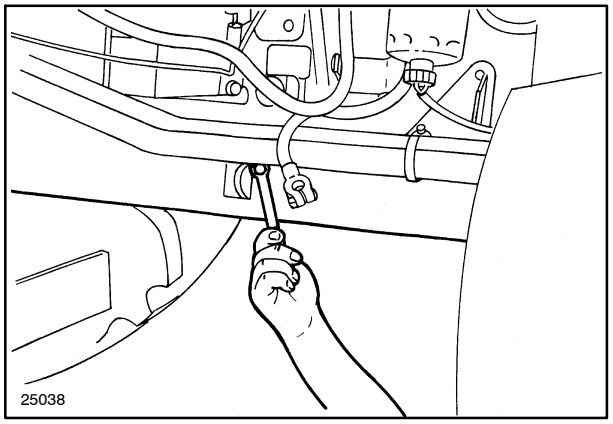
22

18. Remove the fuel filter (1) and support.



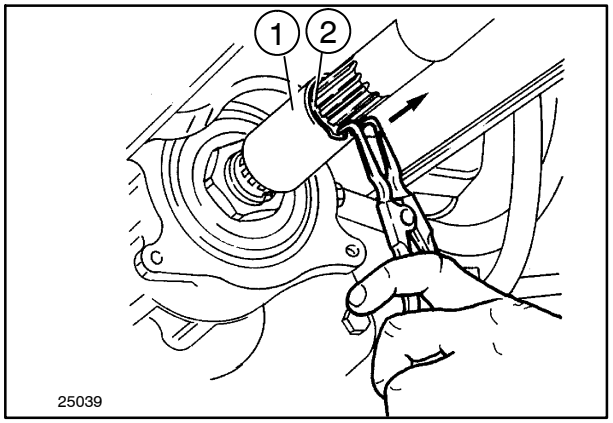
23

19. Remove the front, center and rear retaining bolts from the front axle drive shaft guard and remove the guard (models with MFD).



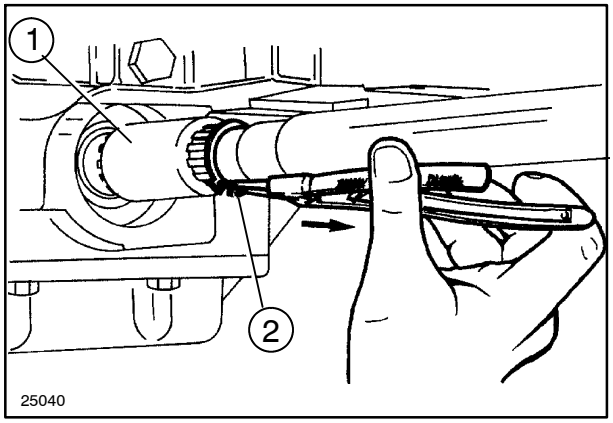
24

20. Remove the circlip (2) from the front of the drive shaft and slide the sleeve (1), in the direction shown by the arrow (see figure), until it is free of the splines on the front axle (models with MFD).



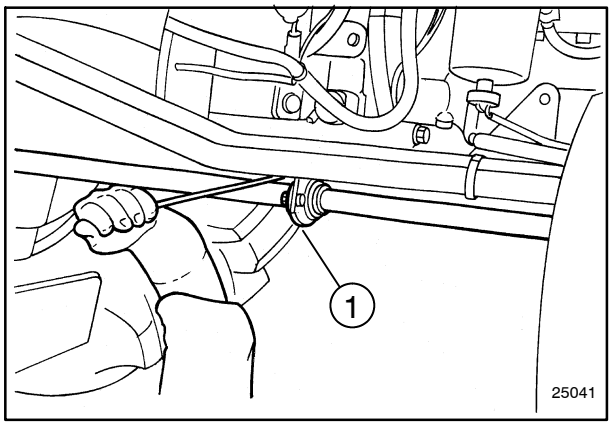
25

21. Remove the circlip (2) from the rear of the drive shaft and slide the sleeve (1), in the direction shown by the arrow (see figure), until it is free of the spines on the drive shaft (models with MFD).



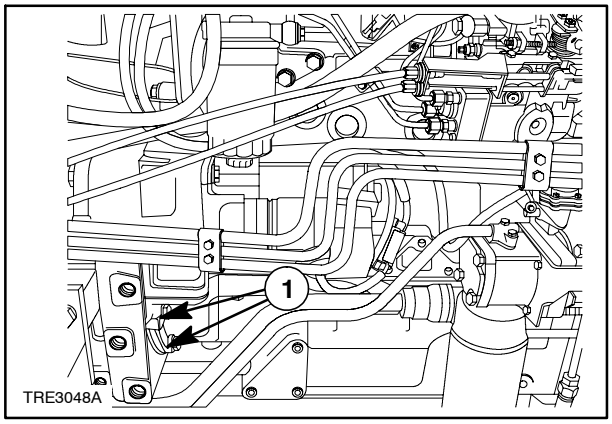
26

22. Remove the retaining bolts from the central drive shaft support (1) and remove the shaft complete with support (models with MFD).



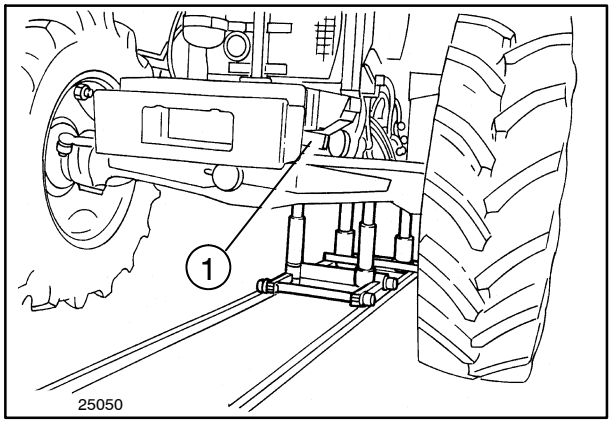
27

23. Unscrew the four lower bolts (1) securing the engine to the transmission.



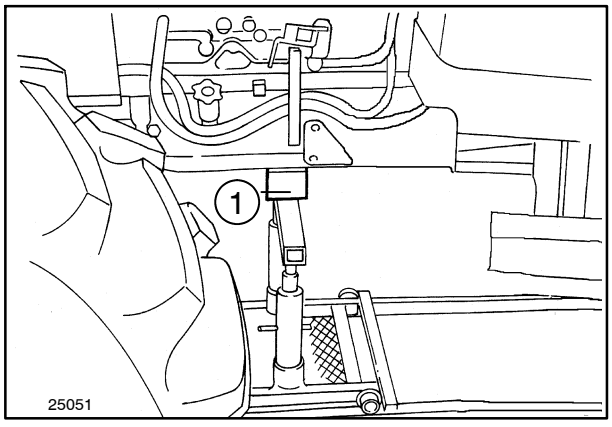
28

24. Position stand 380000236 underneath the tractor and insert a wedge (1), either side of the axle, to prevent the axle from pivoting.



29

25. Insert a wooden block between the stands and the tractor.



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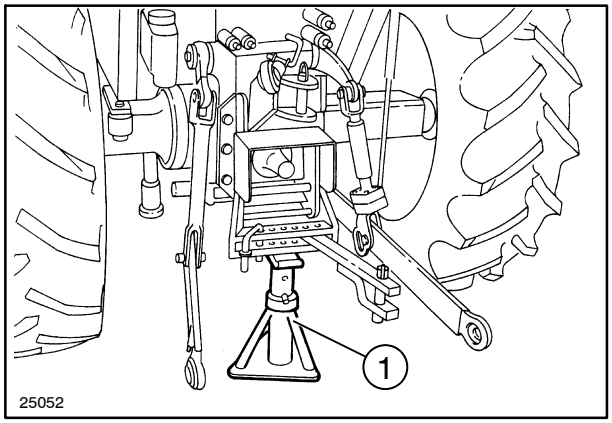
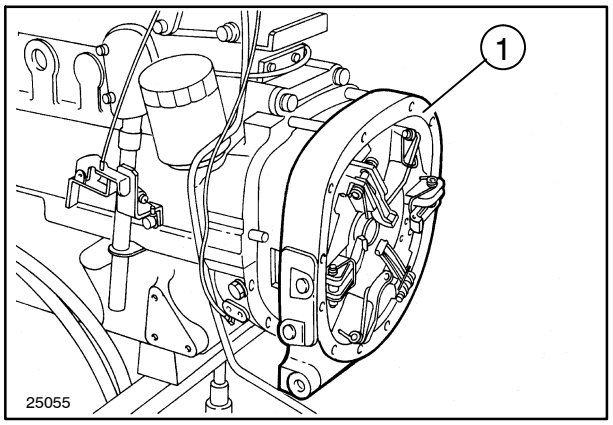
26. Place a fixed stand (1) underneath the drawbar support and apply the handbrake.



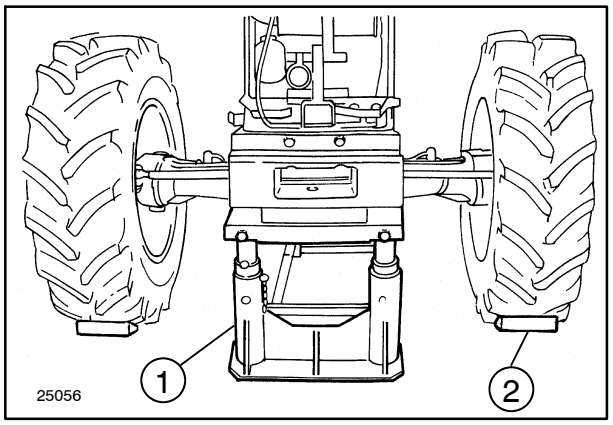
31

27. Unscrew the four remaining bolts securing the engine to the transmission.
28. Separate the engine from the transmission.
29. Remove the distance collar (1) between the engine and transmission.



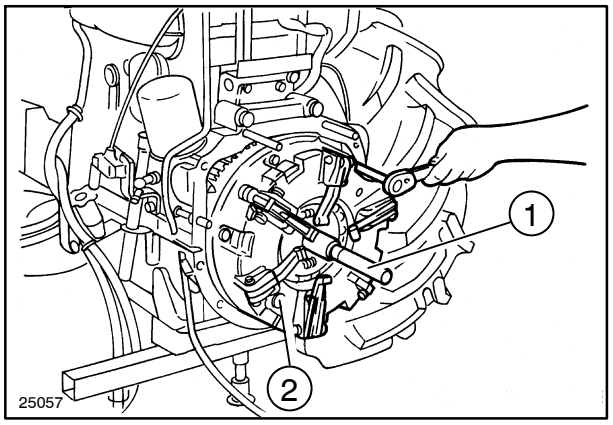
32

30. Place a fixed stand (1) underneath the front ballast support and chock the wheels with wooden wedges (2).



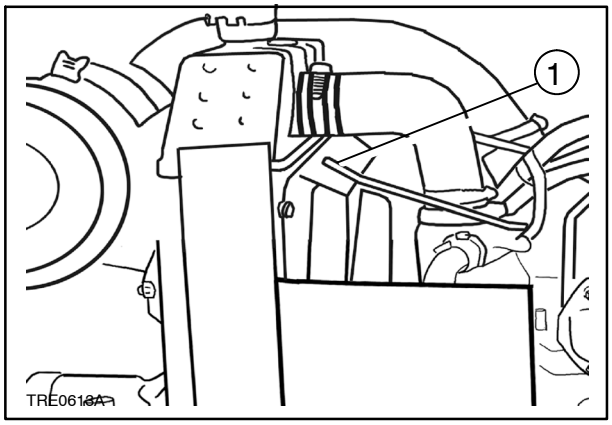
33

31. Insert tool 380000292 (1) in the clutch center hole. Unscrew the six bolts (2) securing the clutch to the flywheel and remove complete clutch assembly.



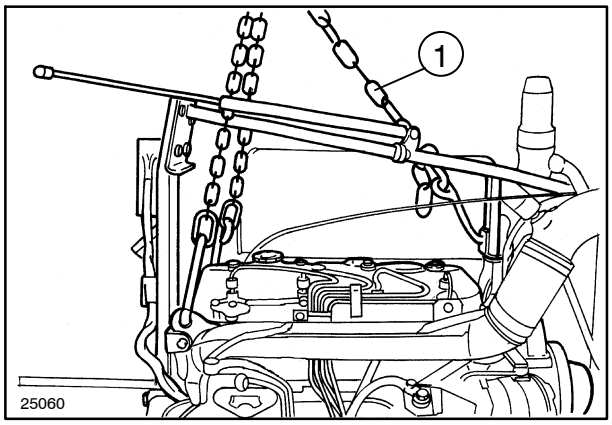
34

32. Remove the radiator support bracket (1).



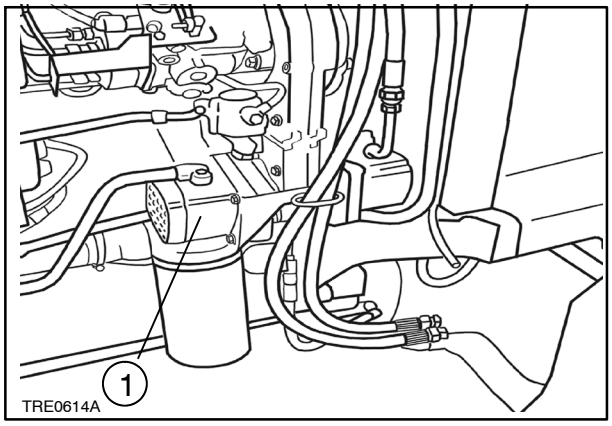
35

33. Attach the engine to the hoist using an adjustable chain (1) attached to the lifting points provided on the engine.



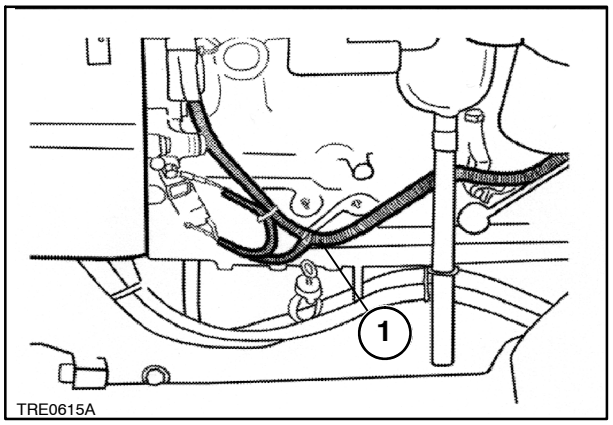
36

34. Remove the lift pump (1) complete with the filter by unscrewing the four retaining bolts.



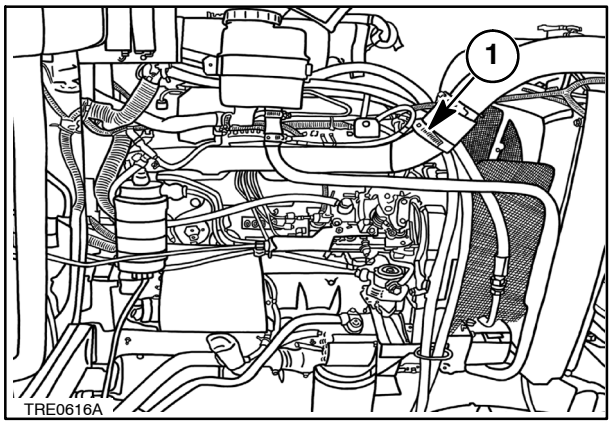
37

35. Disconnect all electrical connectors and remove the complete wiring harness (1).



38

36. Loosen of the hose clamp and detach hose (1) from the inlet manifold.



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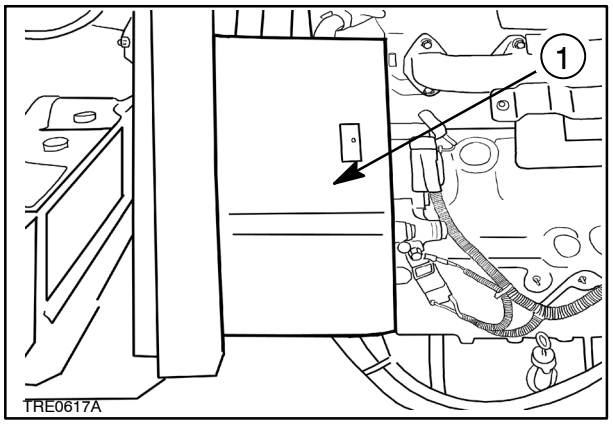
37. Remove the left-hand side fan guard (1).



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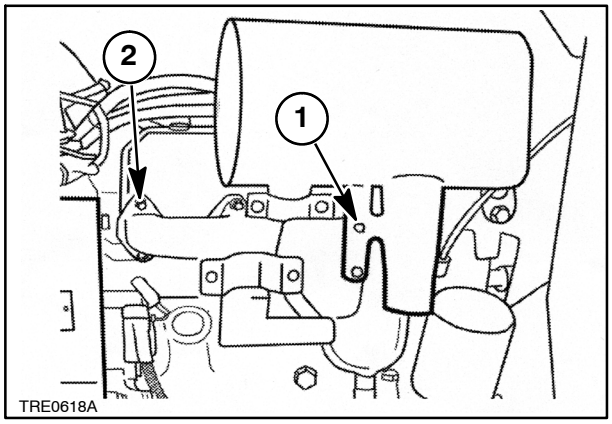
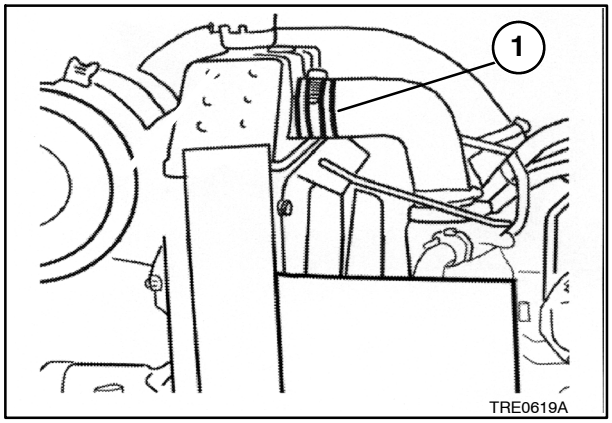
38. Unscrew the bolts (1) securing the muffler to the bracket.
39. Unscrew the three nuts securing the muffler (2) to the manifold and lift off the entire muffler assembly.



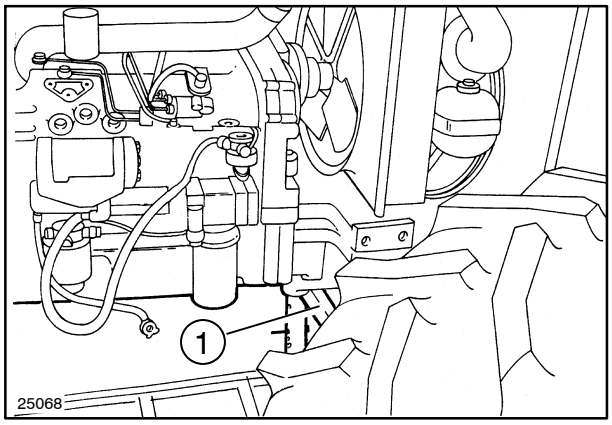
41

40. Remove the hose clamp and disconnect the top radiator hose (1).



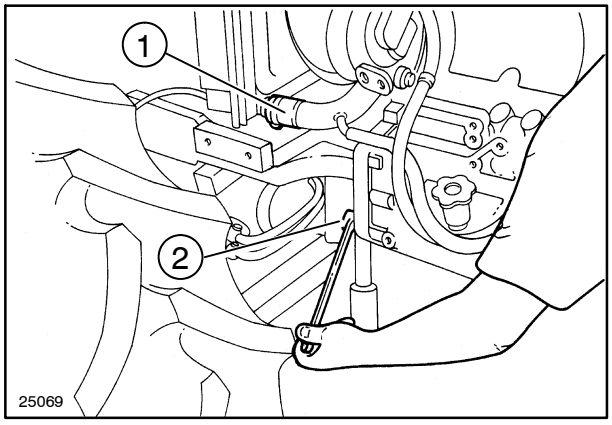
42

41. Using the hoist, raise the engine slightly and position the moveable stand (1) under the front axle.



43

42. Remove the hose clamp and disconnect the bottom radiator hose (1).
43. Unscrew the four bolts (2) securing the engine to the front axle support, and lower the engine onto a wooden platform.



44

Installation

To install the engine, proceed as follows:

1. Attach the three hooks of an adjustable lifting chain to three eye bolts on the engine. Raise the engine from the platform and position it in front of the front axle support. Join the two units using the four securing bolts.
2. Move the mobile stand from under the front axle differential housing to under the engine sump, inserting a suitably shaped block of wood between the stand and the sump pan.
3. Attach the top radiator hose to the thermostat housing and secure with an adjustable hose clamp.
4. Connect the bottom radiator hose to the coolant pump and secure at both ends with adjustable hose clamps.
5. Install the lift pump. Connect the throttle control linkage.
6. Detach the lifting chain from the engine.
7. Connect the rigid pipe from the air cleaner to the inlet manifold and secure with the relative clamp.
8. Reconnect all electrical leads: thermostart glow plug, coolant temperature sensor, 'air filter blocked' sensor, horn, front axle support ground, engine stop on injection pump, leads to the alternator and relay, oil pressure sensor, starter motor, fuel dryer filter. Secure all leads with plastic ties.
9. Install the clutch to the engine flywheel using the six retaining bolts.
10. Connect the oil delivery pipe to the DT control valve. Tighten the pipe union on the anti-cavitation accumulator; install the bracket on the left-hand side near the engine oil filter.
11. Clean the distance collar and the mating surfaces of the overdrive clutch housing; scrape away all traces of old sealing compound.
12. Apply LOCTITE sealing compound to the mating surfaces of engine and distance collar. Install the distance ring on the engine studs.
13. Apply LOCTITE sealing compound to the mating surfaces of the overdrive clutch housing.
14. Remove the fixed stand from under the front weight support. Remove the wooden wedges from under the front wheels.
15. Attach the adjustable lifting chain to the eyebolts on the engine.
16. Place wooden wedges under the rear wheels, check that the handbrake is fully on and that the fixed and moveable stands are firmly in place.
17. Detach the lifting chain from the engine. Attach two cables to the hook of the hoist. Raise the rear part of the tractor about 6 cm. (2.36 in.)
18. Replace and tighten all the bolts securing the engine to the overdrive clutch housing.
19. Lower the hoist and detach the cables.
20. Lower the stands under the engine sump and the clutch housing. Remove tool 380000236 and the stand from under the drawbar support.
21. Connect the injector leak-off pipe. Connect the pipes to the glowplug and to the fuel dryer filter.
22. Install the fuel filter mounting to the engine. Connect the two semi-rigid pipes to the mounting.
23. Connect the oil suction pipes to the pumps; secure the rubber hoses with hose clamps.
24. Connect the lift control valve supply pipe to the lift pump with a new O-ring.

25. Secure the three pipes with the adjustable hose clamp.
26. Attach all the electrical leads to the connectors on the vertical support bracket.
27. Connect the two flexible power steering pipes to the union on the left-hand side of the front axle. Secure the two pipes with a special clamp and fix the clamp to the tractor with a screw.
28. Install the tachometer cable and secure the sleeve with the retaining ring.
29. Install the muffler onto the exhaust manifold with a new gas seal. Fix the front of the muffler to the vertical support bracket. Attach the flexible DONASPIN pipe.
30. Attach the support bracket to the radiator.
31. Install the MFD transmission shaft and the guard.
32. Connect the throttle cable to the accelerator pedal. It may be necessary to adjust the cable at the injection pump lever end.
33. Install the clutch cable to the clutch pedal. Fix the sleeve to the travel stop.
34. Install the steering column cover panels.
35. Replace the fan guards.
36. Attach slings to the hood in the manner described previously in the engine removal instructions. Screw the hood hinge to its bracket. Attach the gas strut, the electrical leads to the headlamps, and then remove the slings.
37. Install the secondary bracket (battery support) to the overdrive clutch housing. Install the rotating bracket with the battery on the fixed support.
38. Install the front ballast and secure with the lock pin.
39. Install the tool box support bracket and then the tool box.
40. Fill the transmission/gearbox with oil (refer to Section 00).
41. Fill the radiator with coolant mixture (refer to Section 00).
42. Connect the positive and negative battery leads. Install the plastic battery cover.

Op. 10 001 30

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, blow torches 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 means equal workload for each cylinder, 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. Install the test injector 380000617, in place of the injector removed previously, with the copper sealing washer. Test injector 380000617 is part of tool 380000303.
7. Connect the compression test instrument 380000303 and record readings while turning the engine over with the starter motor.

   On engines in perfect working order, with the sump oil at approx. 40°C (104°F) at sea level (760 mm [29.92 in.] of mercury) and at an engine speed of 200 to 280 rpm, the compression should be 25 to 27 bar (369 to 398 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 bar (313 psi).

   The maximum permissible compression difference between cylinders is 3 bar (43 psi).

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

Uniform Compression

Although high compression is important for a smooth running engine, it is equally important to have uniform compression in all cylinders.

If extremely low pressure readings are obtained on one cylinder repeat the test as follows:

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 or cylinders.

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

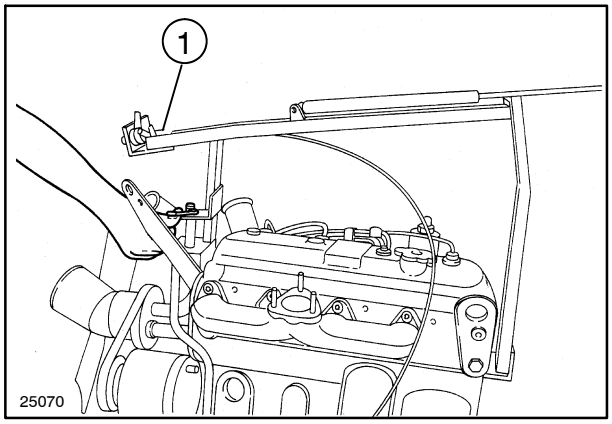
If the second test reading shows only a slight improvement, the problem may be both the valves and the rings.

Disassembly

⚠ WARNING ⚠

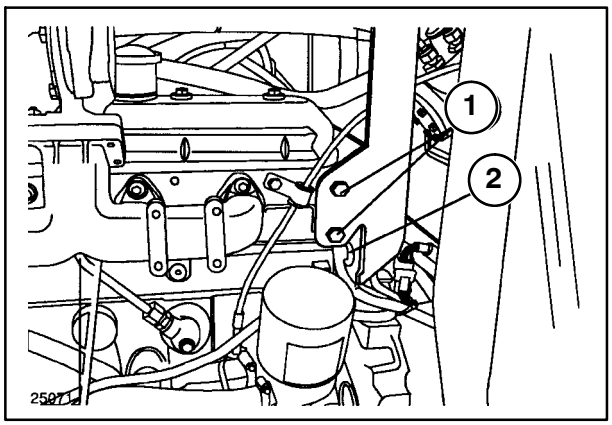
Handle all parts carefully. Do not put your hands or fingers between parts.
Wear suitable safety clothing - safety goggles, gloves and shoes.

1. Remove the front and rear retaining screws from the hood stay bracket (1).



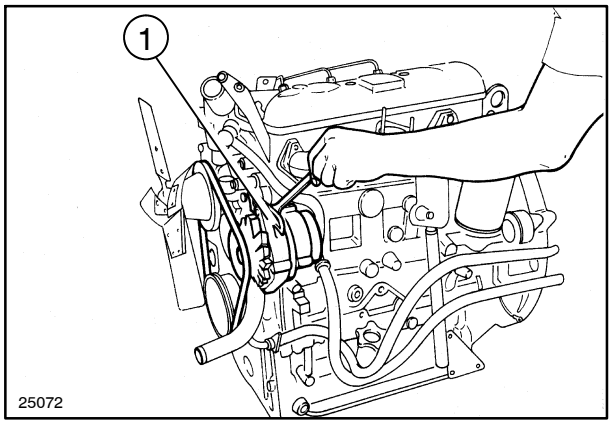
45

2. Remove the hood catch support side retaining bolts (1) and rear retaining bolts (2). Remove the hood catch and stay bracket.



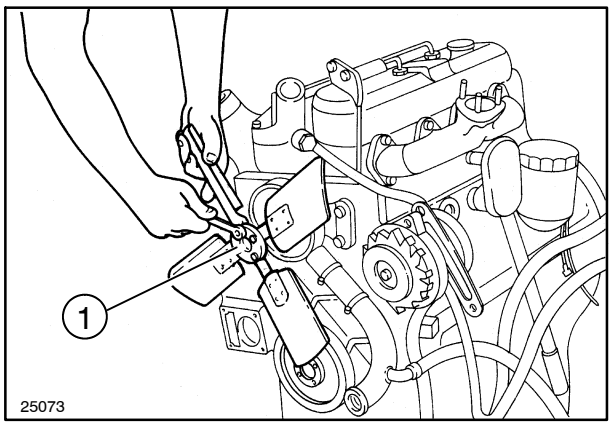
46

3. Loosen the alternator pivot bolt.
4. Loosen the belt tension adjustment bolt (1).
5. Release the belt tension adjustment arm by unscrewing the retaining nut.
6. Remove the alternator and coolant pump drive belt.



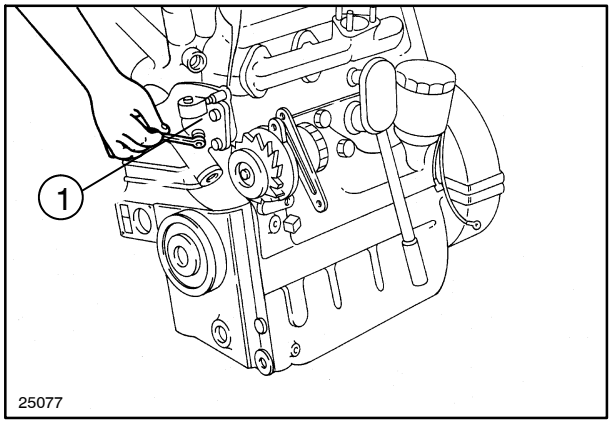
47

7. Unscrew the bolts securing the fan (1) and pulley to the coolant pump. Remove the fan and pulley.



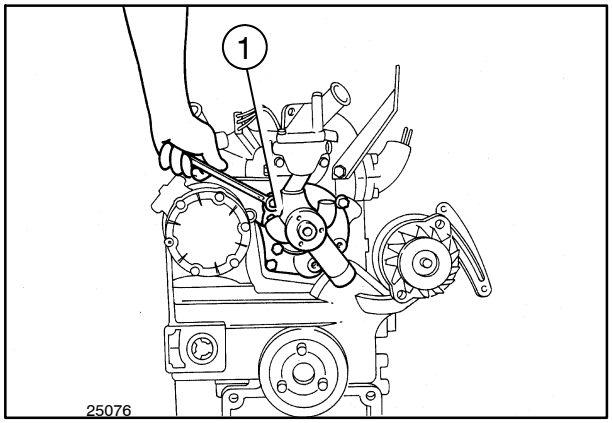
48

8. Remove the union (1) in order to gain access to the pump retaining bolt.



49

9. Unscrew the coolant pump retaining bolts (1) and remove the pump.



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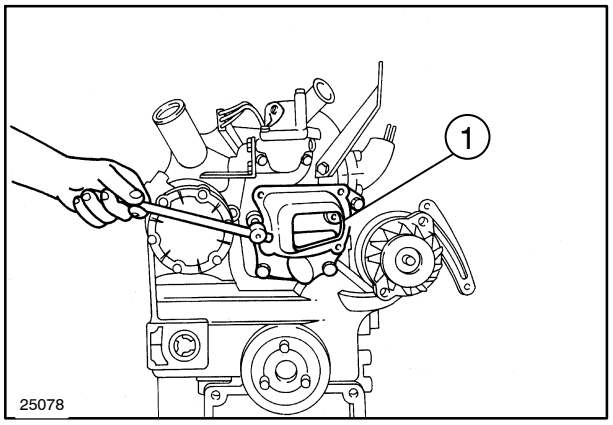
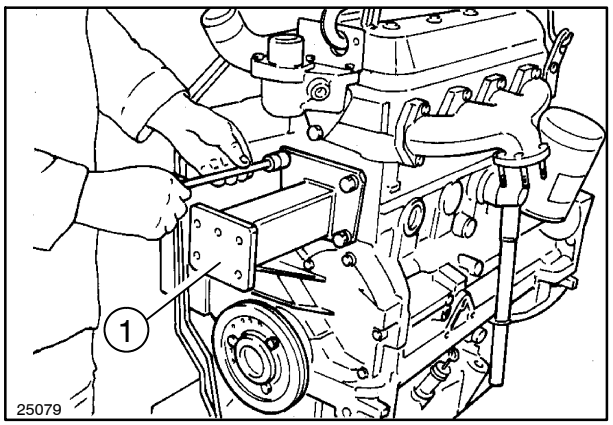
10. Unscrew the pump support bolts (1) and the muffler support bolt. Remove the two supports.



51

11. Install mounting bracket (1) of the set 380000313 to permit attachment of the engine to the rotary stand 380000301.



52

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first, and then click the above link

to download the complete manual.

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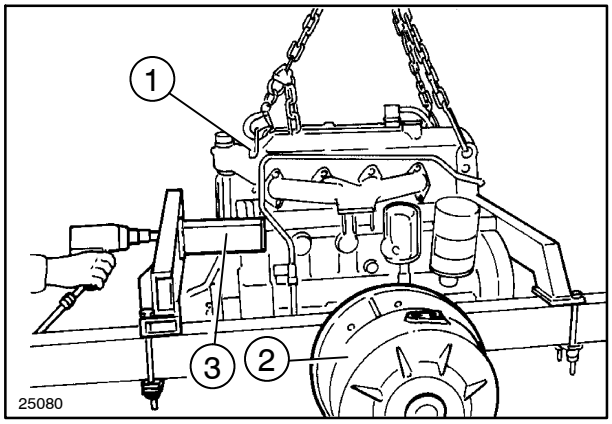
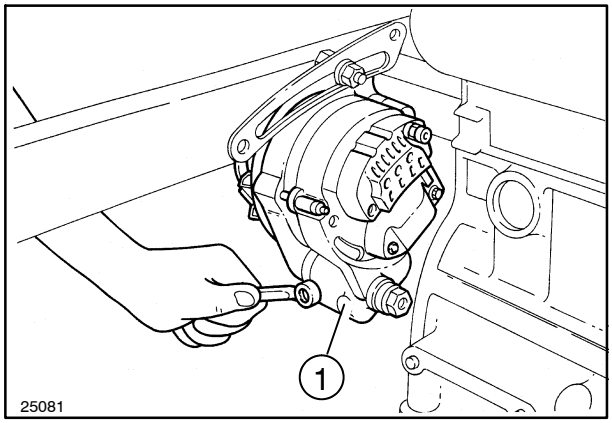
12. Install an eyebolt (1) on the front of the engine in place of the muffler support.
13. Raise the engine from the wooden platform and secure it to rotary stand 380000301 (2) by means of the bracket (3) from the set 380000313.



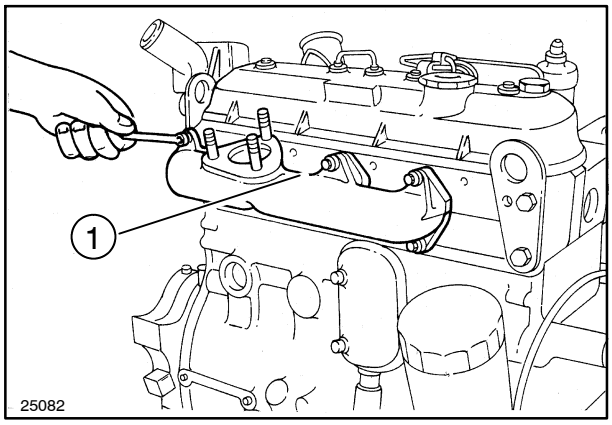
53

14. Remove the alternator support retaining bolts (1) and remove the complete alternator assembly.



54

15. Unscrew the bolts (1) securing the exhaust manifold to the cylinder head and remove the manifold.



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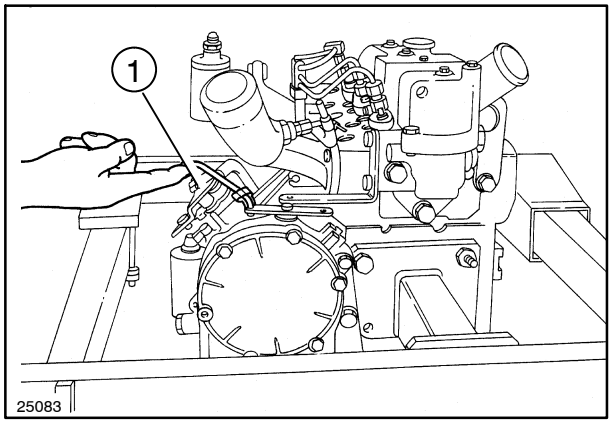
16. Detach the throttle control lever (1) from the injection pump.



56