FARMALL 70, FARMALL 80, FARMALL 90, FARMALL 95 SERVICE MANUAL COMPLETE CONTENTS

The following pages are the collation of the contents pages from each section and chapter of the Farmall 70, Farmall 80, Farmall 90, Farmall 95 Service manual. Complete Service part # 84253591.

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

The sections listed above are the sections utilized for the Farmall 70, Farmall 80, Farmall 90, Farmall 95 Tractors.

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Replaces 87758589

SECTION 00 - GENERAL

Chapter 1 - General

CONTENTS

GENERAL INSTRUCTIONS

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 directives will be directly responsible for resulting consequences.

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 perpendicular 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.

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 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 and 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 and 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 vapor hazards do not arise at ambient temperatures because of the very low vapor 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 flammable 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 protective clothing to avoid soiling 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 (F5C)

CONTENTS

OVERHAUL

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REMOVAL

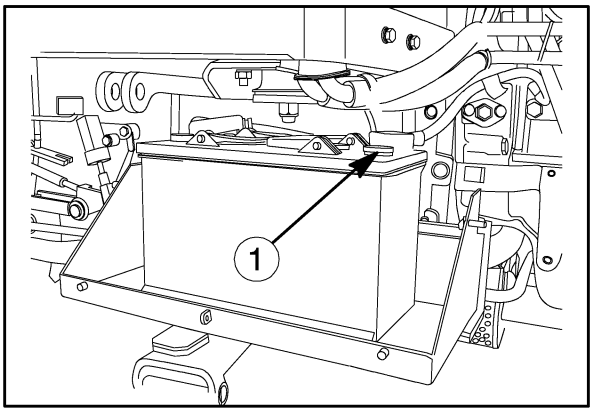
DANGER

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. Check that no one is in the vicinity of the load to be lifted.

CAUTION

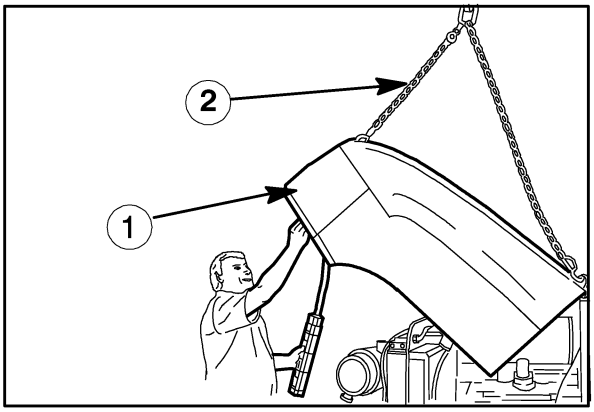
Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

1. Disconnect the battery negative lead (1).
2. Drain the oil from the transmission-gearbox housing.
3. Drain the cooling system.



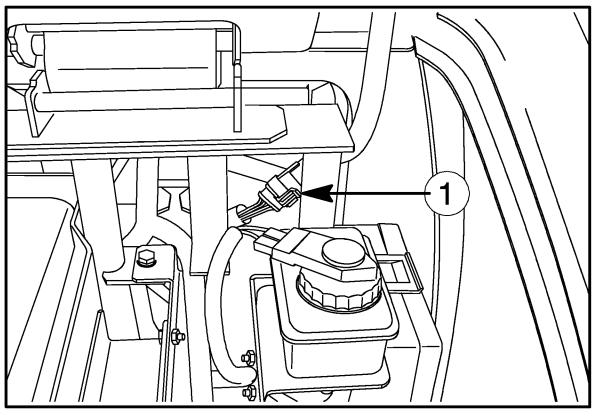
1

4. Remove the exhaust pipe, attach lifting chains (2) to the hood (1) and attach the chain to the hoist.



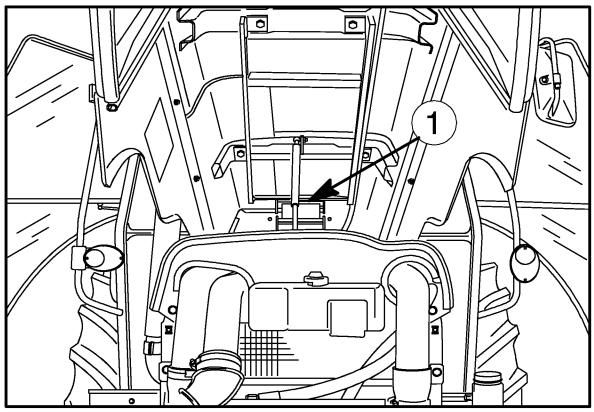
2

5. Disconnect the electrical connection (1) of hood.



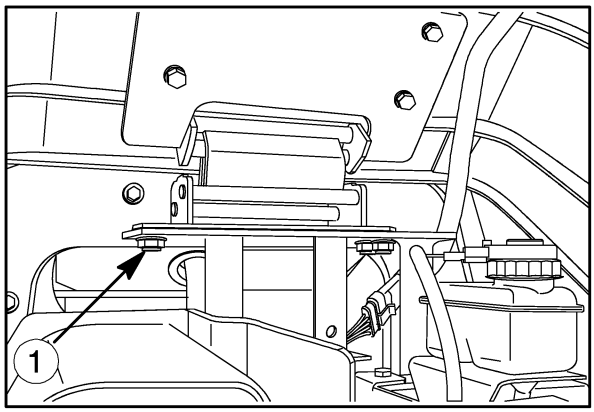
3

6. Detach the gas struts (1) from the hood.



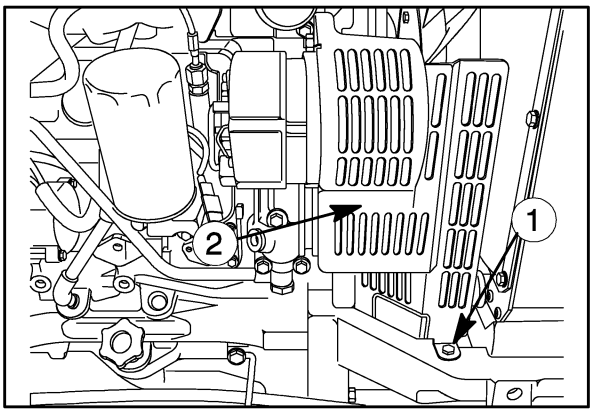
4

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



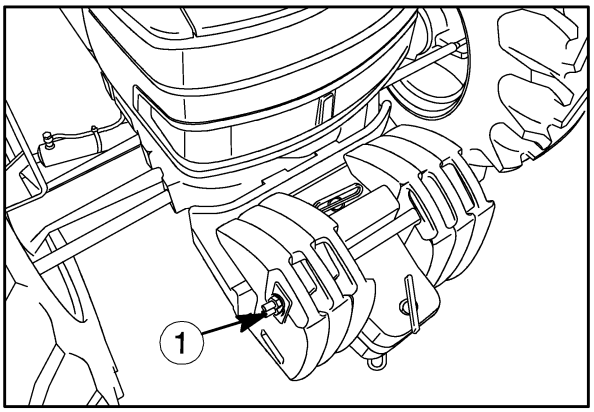
5

8. Remove the three retaining bolts (1) and the guard (2) on the right-left hand side of the fan.



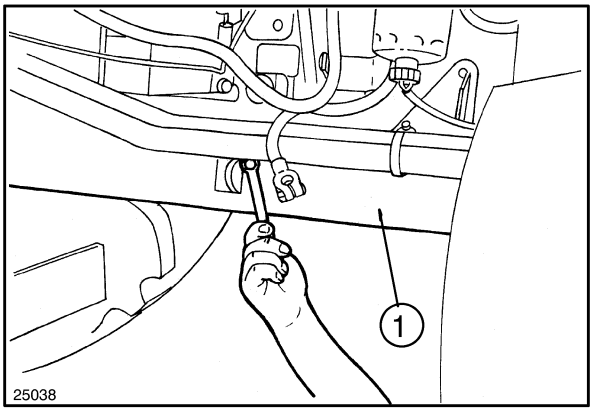
6

9. Unscrew the nut (1) from the weight retaining pin. Remove the weights from the front support.



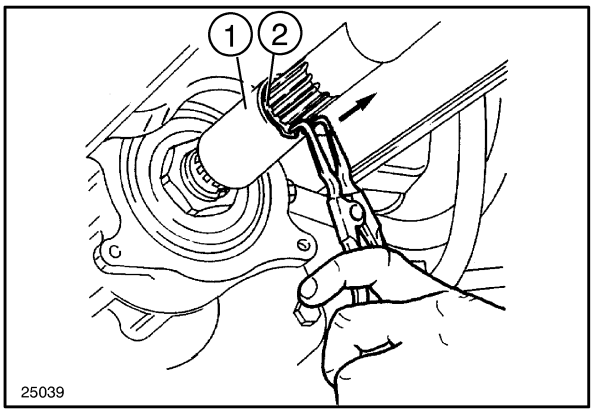
7

10. Unscrew the front central and rear retaining bolts on the front axle shaft guard, then remove the guard (1).



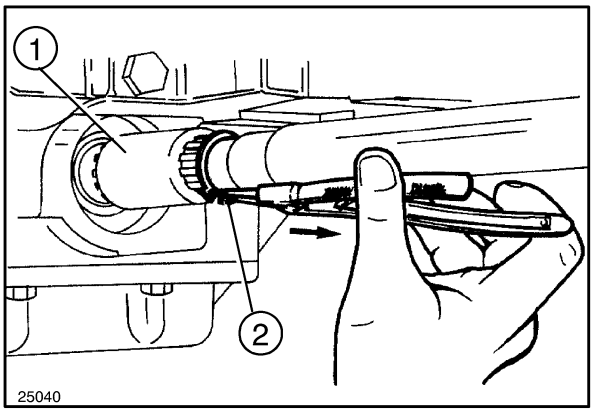
8

11. Remove the circlip (2) and move the front sleeve (1) in the direction indicated by the arrow until it is released from the groove on the front axle.



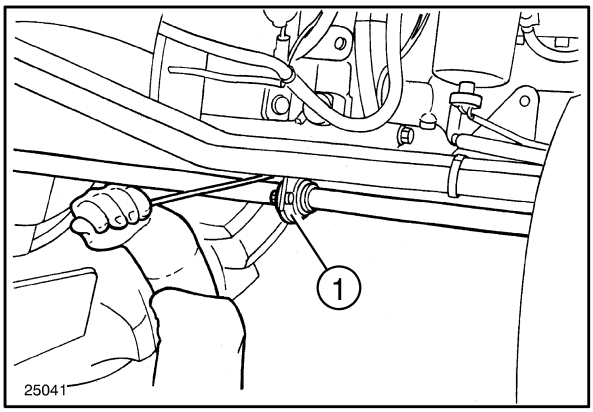
9

12. Remove the circlip (2) and move the rear sleeve (1) in the direction indicated by the arrow until it is released from the groove on the drive.



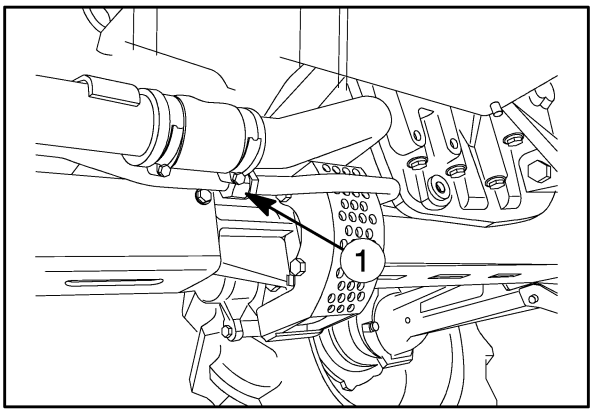
10

13. Remove the propeller shaft central support (1) retaining bolts and extract the shaft together with the support.



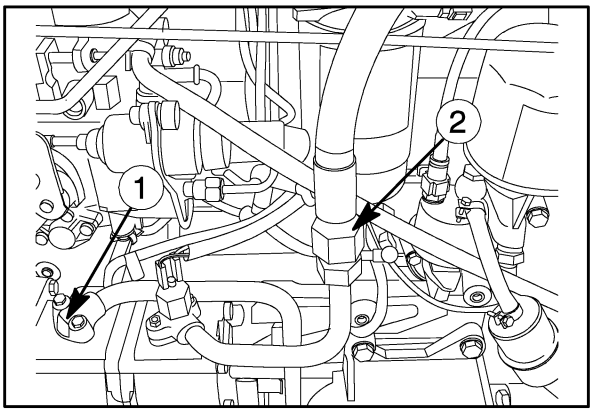
11

14. Dicconnect the pressure pipe connection (1) of the lift pump.



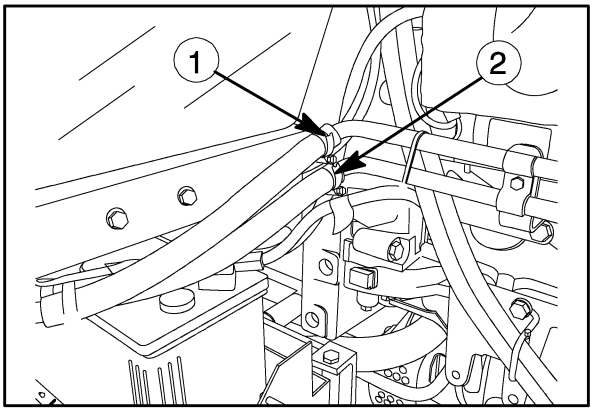
12

15. Disconnect the delivery lines of both hydraulic lift pump (1) and hydrostatic steering pump (2).



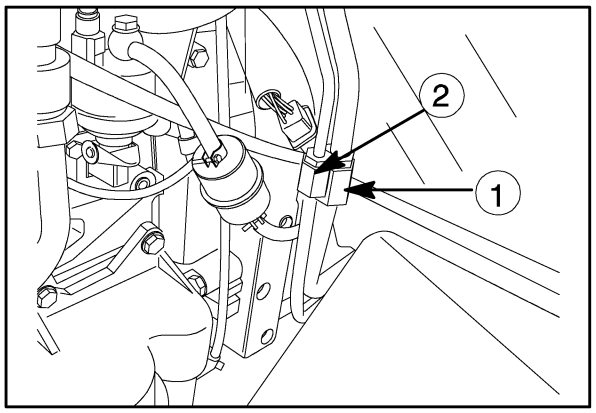
13

16. Detach the cab heating pipes (1) and (2).



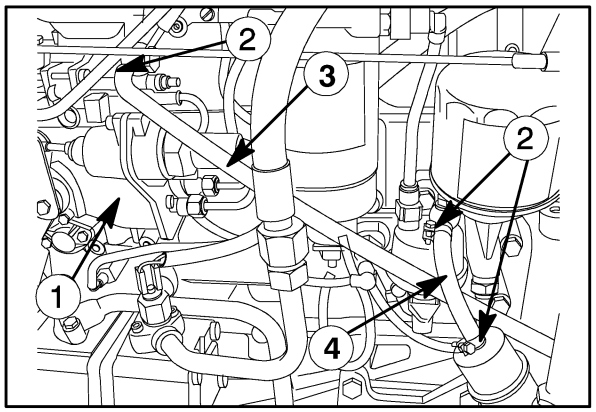
14

17. Detach the cab air-conditioning pipes (1) and (2).



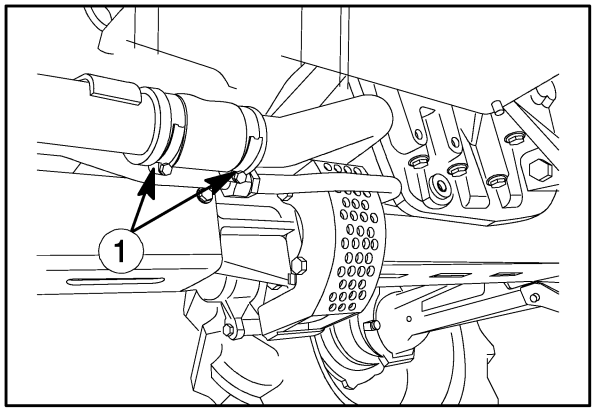
15

18. Extract the plastic fasteners (2) and detach the diesel recovery pipe (3) and delivery pipe (4) to the diesel pump (1).



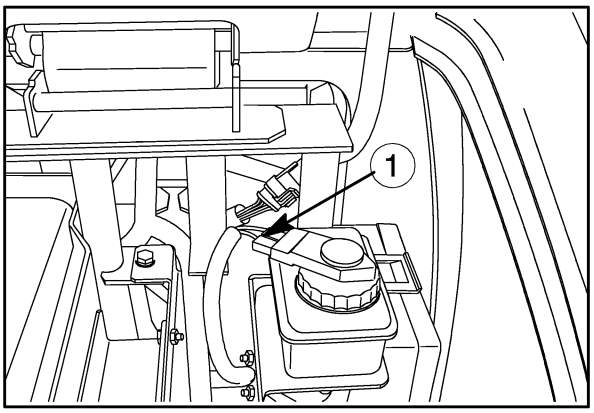
16

19. Remove two metal clamps (1) and the rigid pipe of drawing oil from the transmission housing via lift pump.



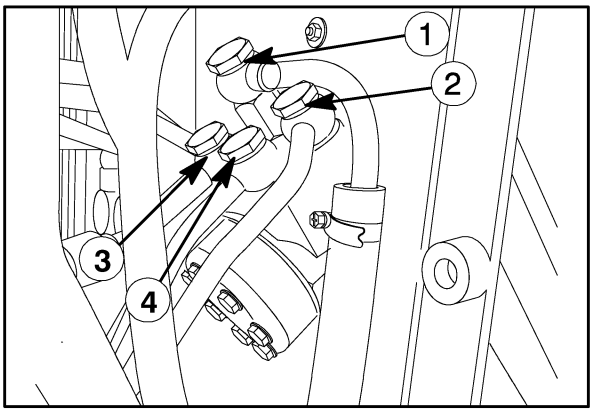
17

20. Remove the electrical connection from the brake fluid reservoir and take the brake fluid reservoir (1) from the bracket.



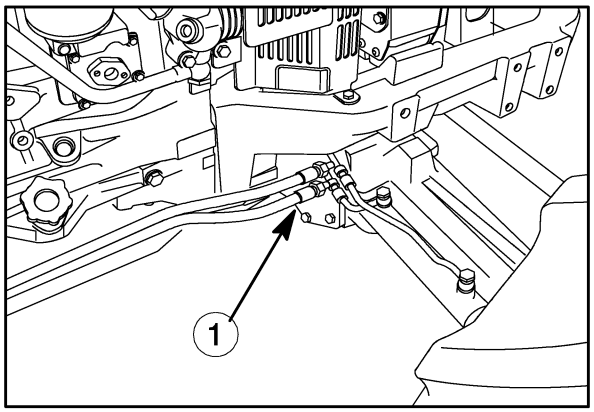
18

21. Disconnect the steering oil delivery and return hoses (1) and (2). Disconnect the steering cylinder lines (3) and (4).



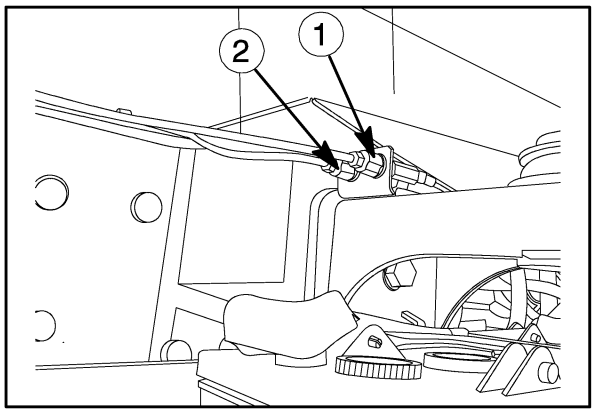
19

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



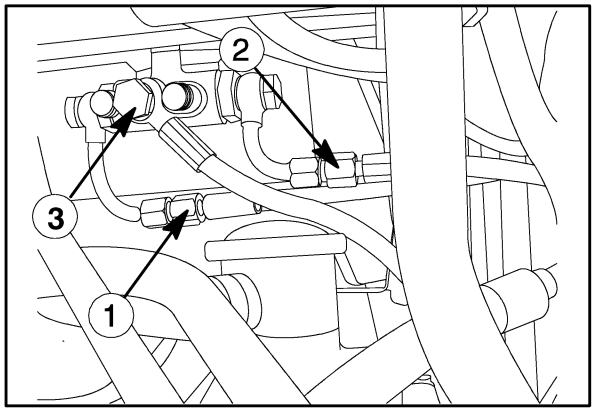
20

23. Disconnect rear brakes oil distribution connection pipes (1) and (2).



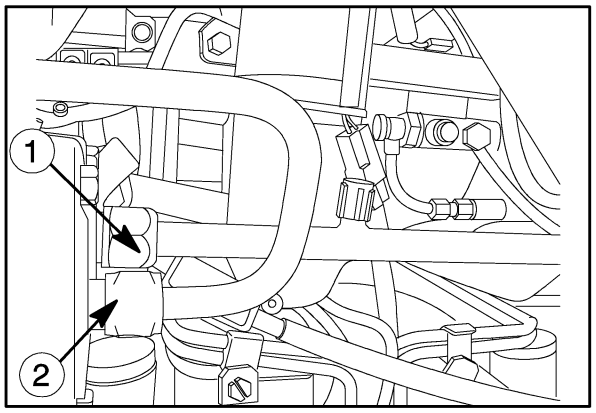
21

24. Disconnect brake distributor valve connections (1) and (2).



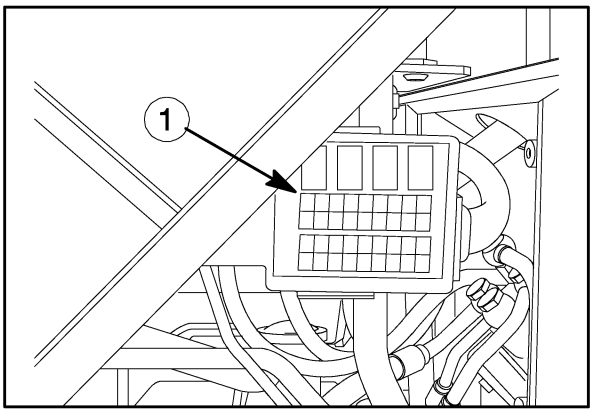
22

25. Disconnect A/C compressor inlet (1) and outlet (2) hoses.



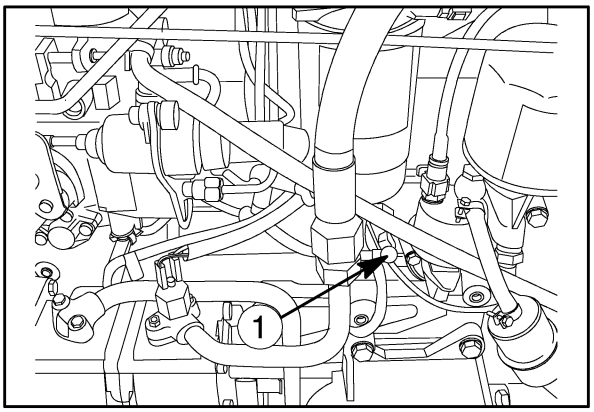
23

26. Remove the fusebox (1) from the hood support.



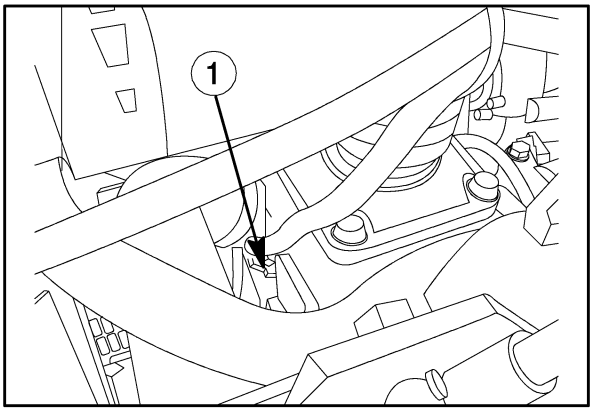
24

27. Remove the electrical oil pressure switch (1).



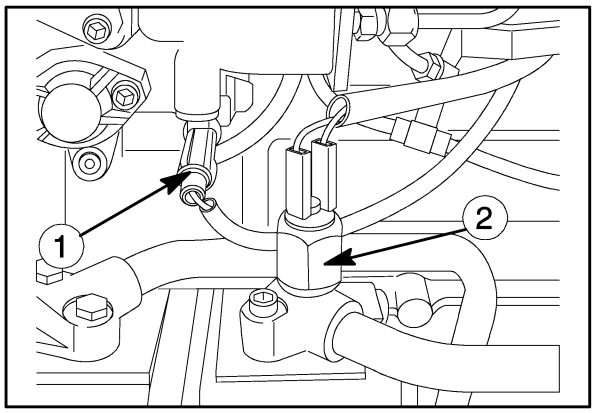
25

28. Remove the electrical connections of coolant temperature sender (1).



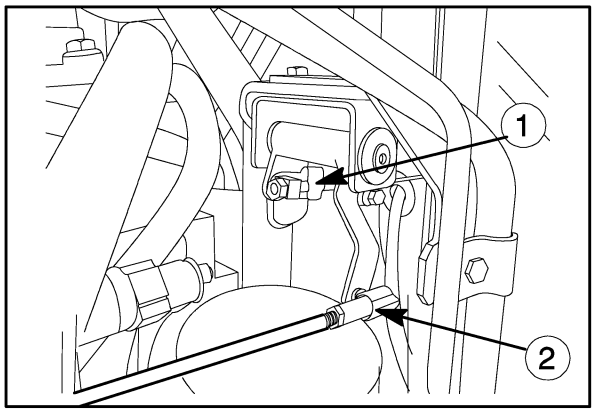
26

29. Remove the electrical connection of pump cut-out solenoid sender (1) and hydrostatic steering pump oil pressure switch (2).



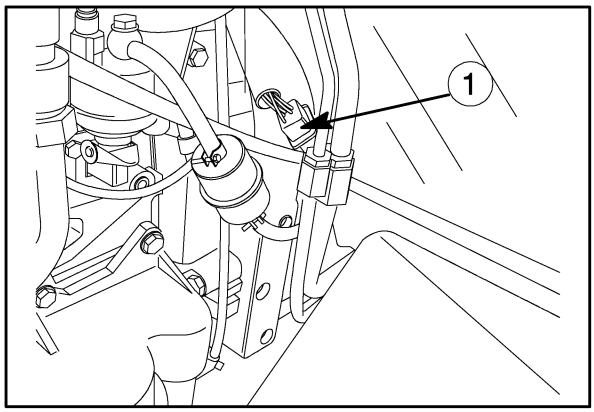
27

30. Remove the retaining retaining clips (1) and detach the flexible cables governing the hand throttle and pedal throttle.
31. Remove the retaining clip (2) and detach the throttle control tie-rod connected to the injection pump.



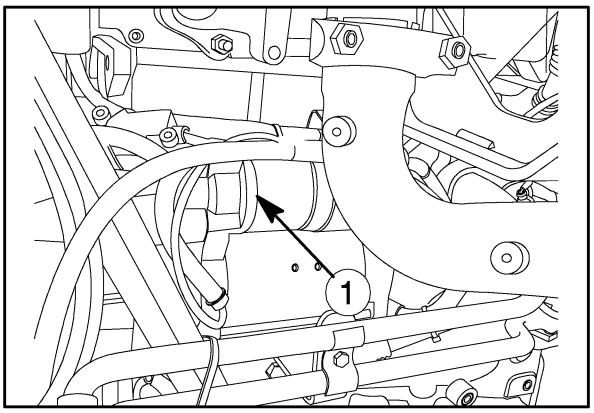
28

32. Disconnect the electrical connection (1) between the cab and the engine.



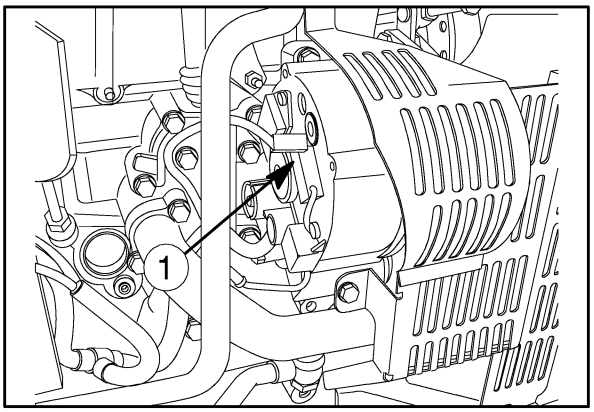
29

33. Disconnect the electrical connections from starter motor (1).



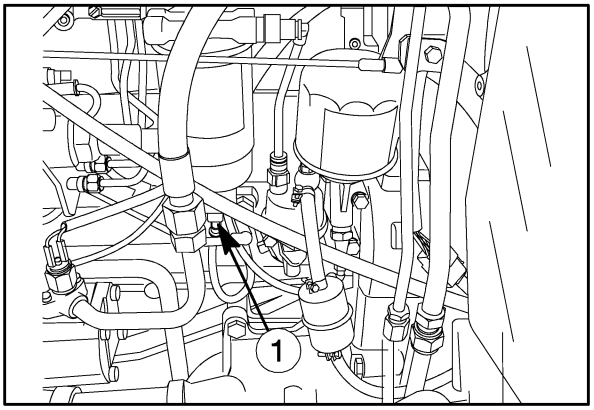
30

34. Disconnect the electrical connections from alternator (1).



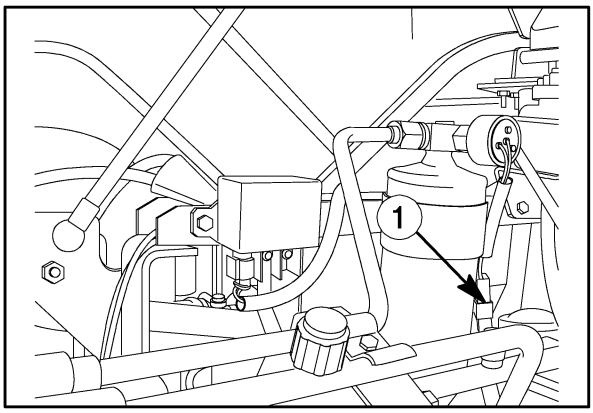
31

35. Disconnect the electrical connection of water in fuel sensor (1).



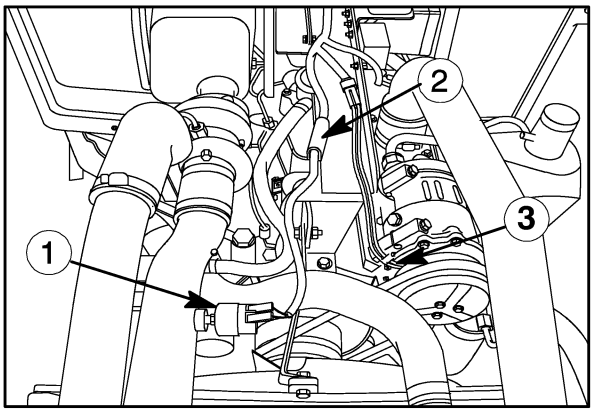
32

36. Disconnect the electrical connections of dryer filter sensor (1).



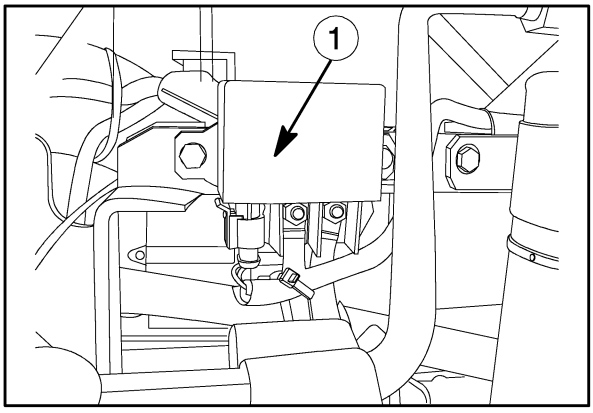
33

37. Remove the electrical connection (1), air filter clogging sensor (2) and AC compressor electrical connection (3).



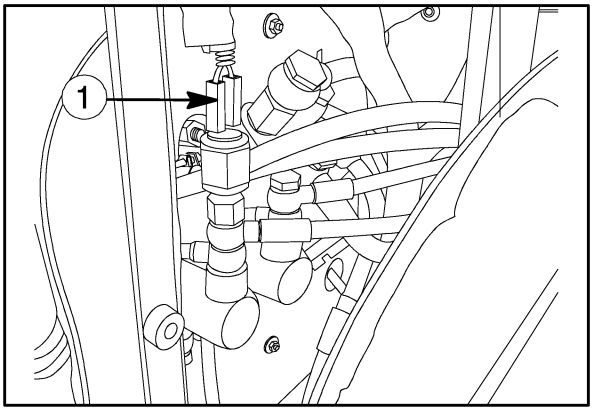
34

38. Remove the two retaining bolts and the support together with relays protecting system (1).



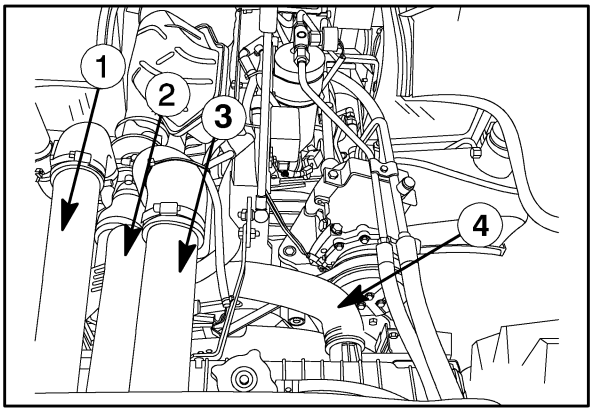
35

39. Remove the two connectors of the brake lights switch (1).



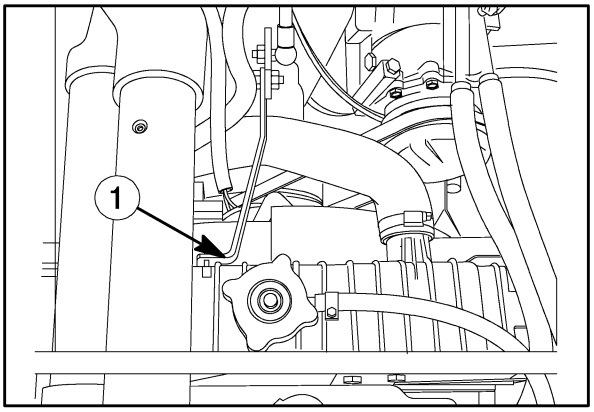
36

40. Loosen the corresponding retaining clamps and extract the pipes (1), (2), (3) and (4).



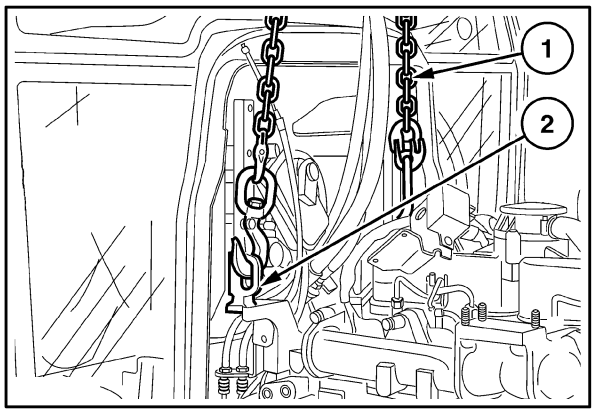
37

41. Loosen the corresponding retaining bolts and remove the bracket (1).



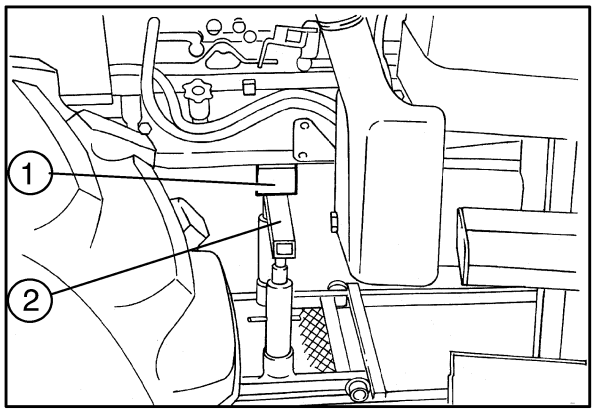
38

42. Hitch the engine to the hoist with the chains anchoring it to the attachments on the engine.



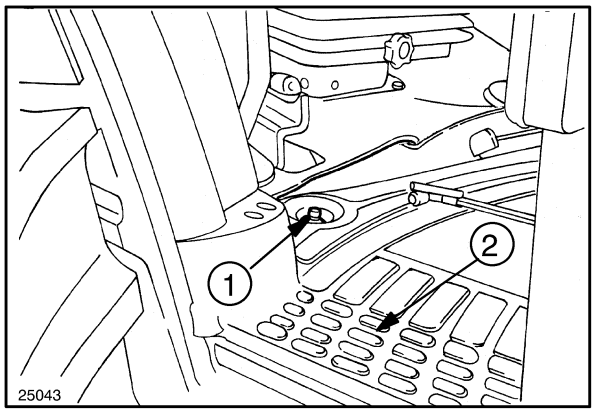
39

43. Position the movable tool for dismantling tractors 380000569 with the bracket 380000500 and adapter plate 380000844 under the engine and place a wooden block in between the points of contact between the tool and tractor.



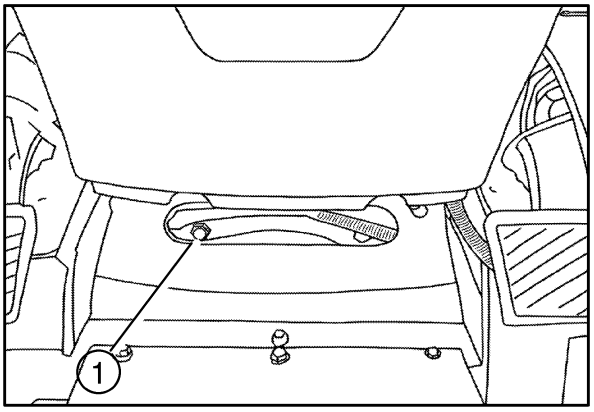
40

44. Extract the differential lock pedal retaining pin from the drive shaft (1), remove the pedal and footboard (2).



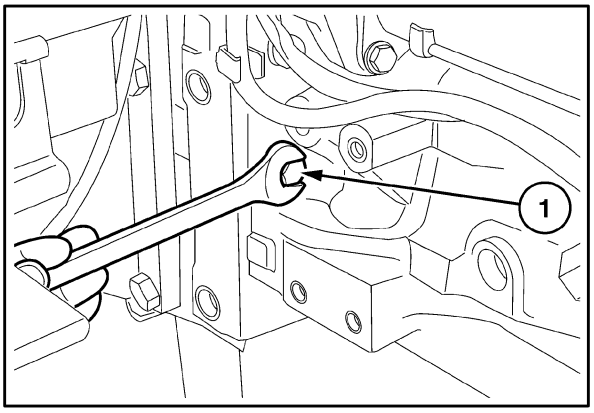
41

45. Unscrew the nuts (1) and the bolts securing the engine to the transmission. Access is through the two slots in the cab floor.



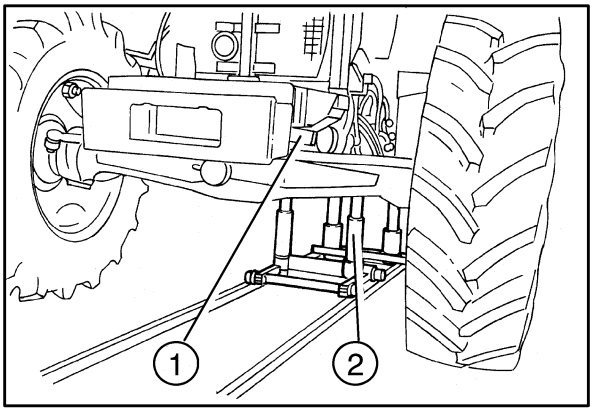
42

46. Remove the remaining six retaining bolts at the bottom and side.



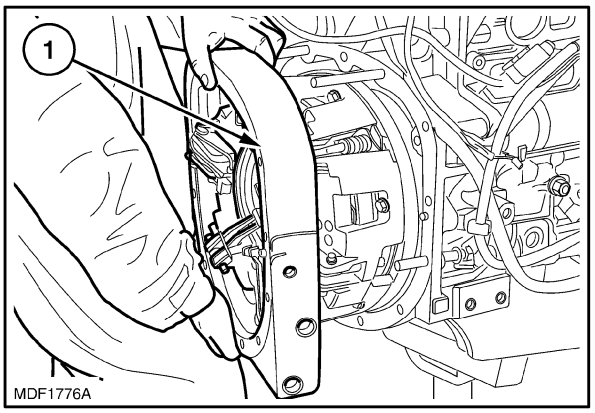
43

47. Seperate the engine from the transmission with the tool 380000569.



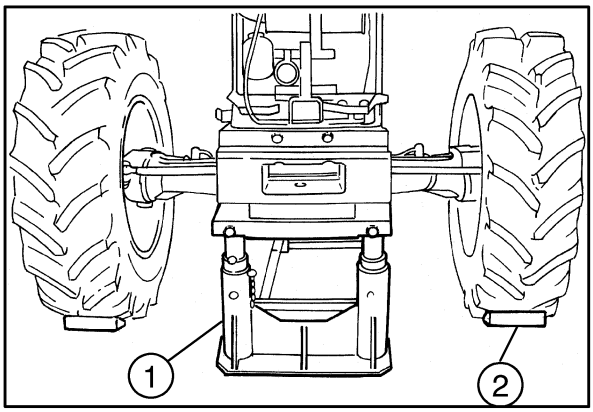
44

48. Remove the spacer located between the engine and the transmission.



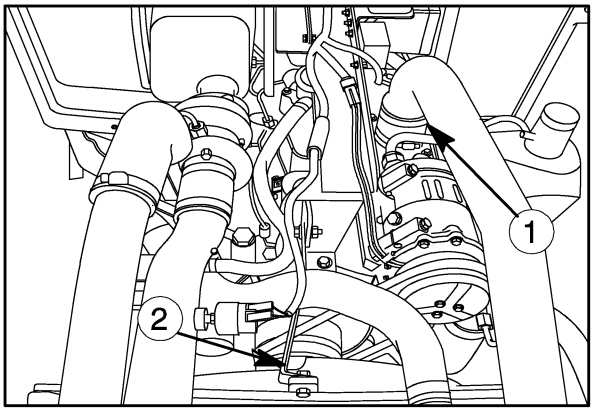
45

49. Insert the fixed under the balast support and secure the front wheels with wooden blocks.



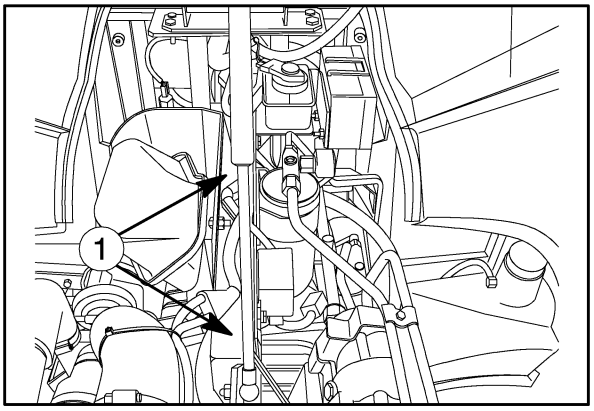
46

50. Loosen the corresponding retaining clamp (1) and extract the pipes. And remove the bracket (2).



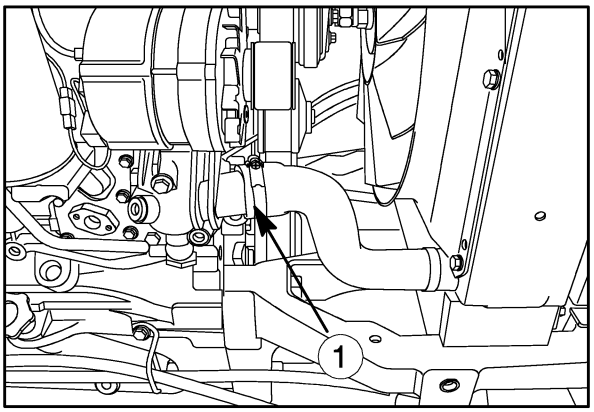
47

51. Remove the hood support (1).



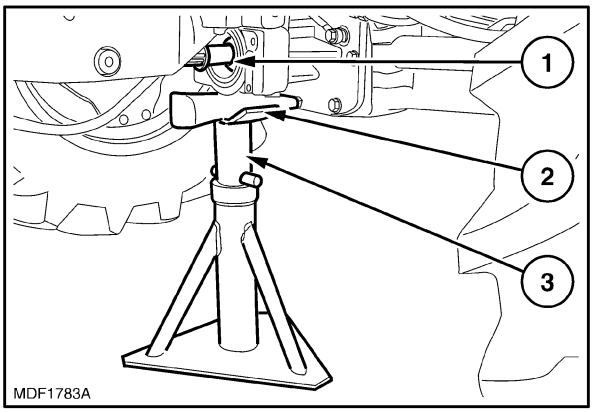
48

52. Loosen the retaining clamp and extract the pipe (1) joining the coolant pump to the bottom of the radiator.



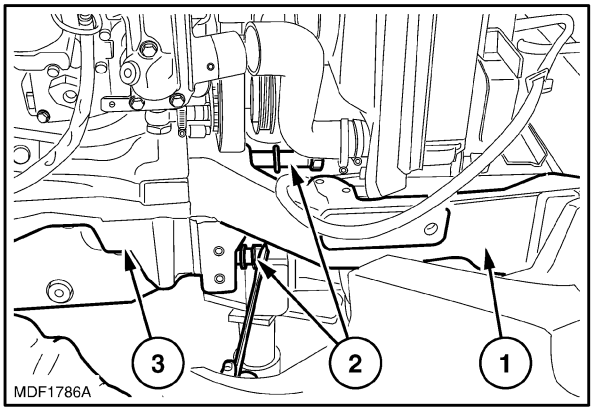
49

53. Position a fixed stand (3) under the support of the groove (1) of the front axle drive placing a wooden plug (2) between the parts (3) and (1).



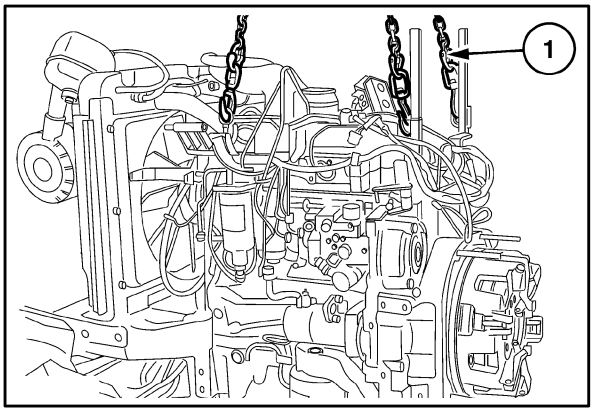
50

54. Remove the four bolts (2) fastening the front axle support (1) to the engine (3).



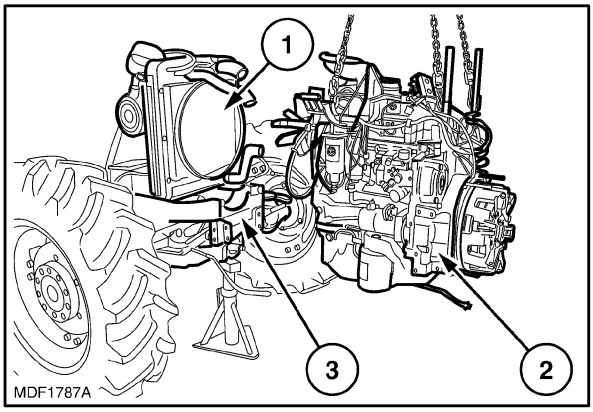
51

55. Insert the hooks of the lifting chains (1) in the eyelets shown in the figure, afterwards tensioning the chains with the hoist.



52

56. Detach the engine (2) from the front axle (3), trying to avoid incorrect operations with the hoist so as not to let the engine fan damage the fins of the radiator (1), left on the axle (3).
57. Then rest the engine on a platform support.



53

INSTALLATION

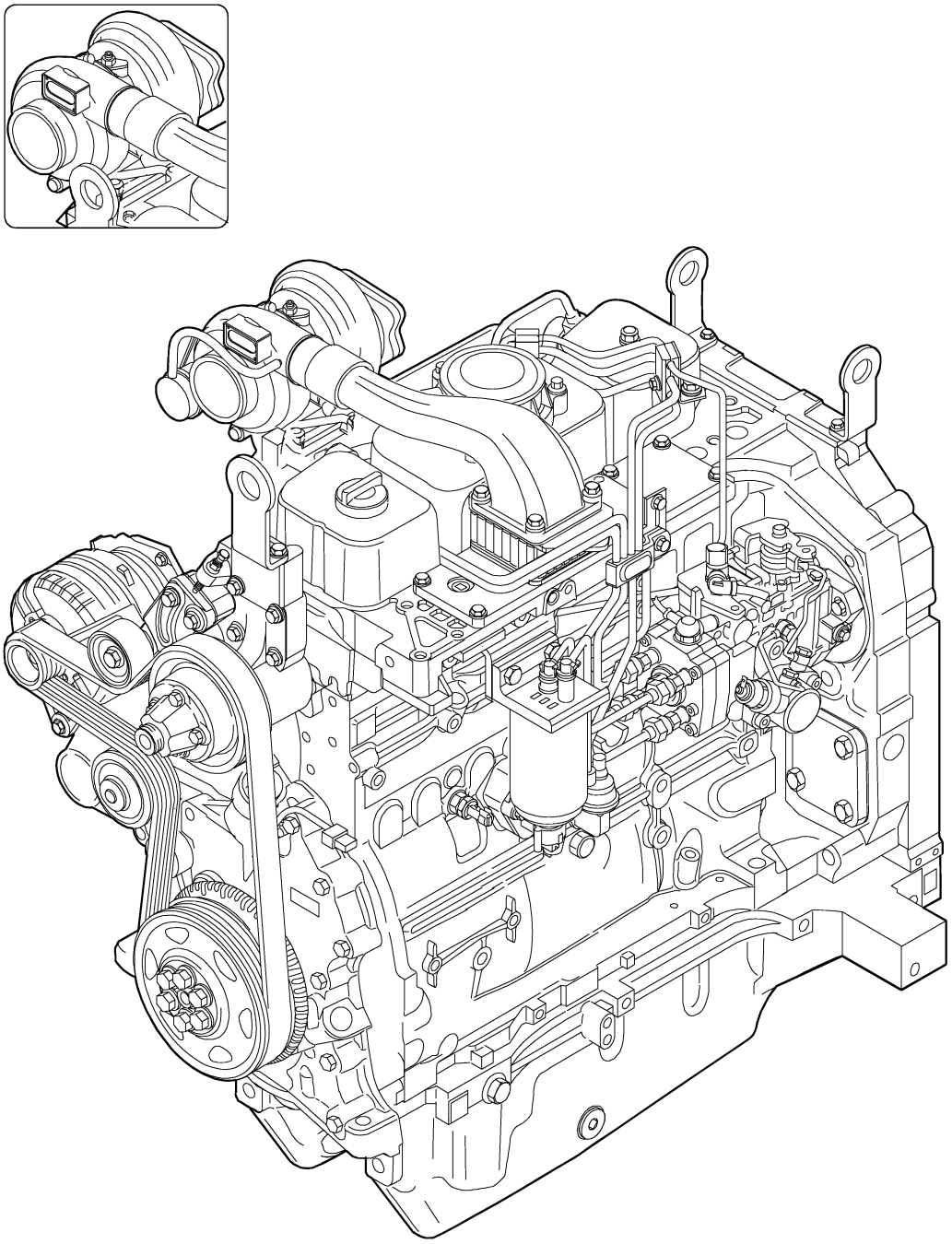
CAUTION

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

1. Apply the torque settings listed at F5C Engines Repair Manual (Print No: 87736548A).
2. Insert the three hooks of the chain in the eyelets on the engine and, using the hoist, lift the assembly off the platform support.
3. Position the engine on the front axle, trying to avoid incorrect operations with the hoist so as not to let the engine fan damage the fins of the radiator, then join the two assemblies together with the four retaining bolts.
4. Reposition the movable tool for dismantling tractors **380000569** under the engine and place a wooden block in between the point of contact between the tool and engine.
5. With the aid of the hoist, place the engine on the tool **380000569** and remove the lifting eyelet previously fitted on the front of the engine.
6. Remove the fixed stand previously positioned under the support of the groove of the drive of the front axle and the wooden plug.
7. Refit the pipe joining the coolant pump to the bottom of the radiator and the associated retaining clamp.
8. Refit the oil vapour suction pipe, filter/intake manifold connecting pipe and the pipe connecting the radiator at the top to the thermostat valve, re-installing the associated retaining clamps.
9. Fit the left-right hand side guard of the engine fan and the three retaining bolts.
10. Remove the fixed U-bolt fitted beforehand under the ballast support and the two wooden wedges locking the front wheels.
11. Remove the old sealing compound from both surfaces of the spacer between the engine and the overdrive clutch housing, and do the same also on the contact surface of the overdrive clutch housing and on that of the engine.
12. Apply LOCTITE sealing compound on the engine/spacer contact surfaces and fit the spacer on the stud bolts screwed into the engine.
13. Also apply LOCTITE sealing compound on the clutch overdrive casing surfaces.
14. Position wooden blocks under the rear wheels, make sure that the handbrake is fully applied and that all fixed and mobile stands are safely positioned.
15. The installation phase described here requires the presence of two or three workers to use the movable tool for dismantling tractors **380000569** to move the engine/front axle assembly close to the overdrive clutch casing.
16. In the phase of installing the engine/front axle assembly to the overdrive clutch casing, it is necessary to push on the front wheels, taking great care in the end phase of coupling over both the pipes and the cables/electrical connections to prevent crushing between the two bodies. During this phase, it is moreover necessary to turn the crankshaft with the aid of the radiator cooling fan to help the coupling between the sleeve and the drive shaft.
17. Secure both assemblies by tightening all the bolts locking the engine to the overdrive clutch casing.
18. Remove the U-bolt previously fitted under the clutch casing and recover the movable tool for dismantling tractors **380000569**.
19. Fit the electric cable connected to the fuse-holder box and the retaining nut.
20. Working from the side of the starter motor, fit the protective cable housing and the retaining nut.
21. Fit the electrical connections installed on the brake pump and on the brake fluid reservoir.
22. Refit the power steering piping on the engine and reconnect the electrical connections to the pressure switch.
23. Refit the power steering return pipe with its bracket and retaining bolt.
24. Refit the brake piping support and the two retaining bolts.
25. Refit the condenser, air cooler and radiator pipes.

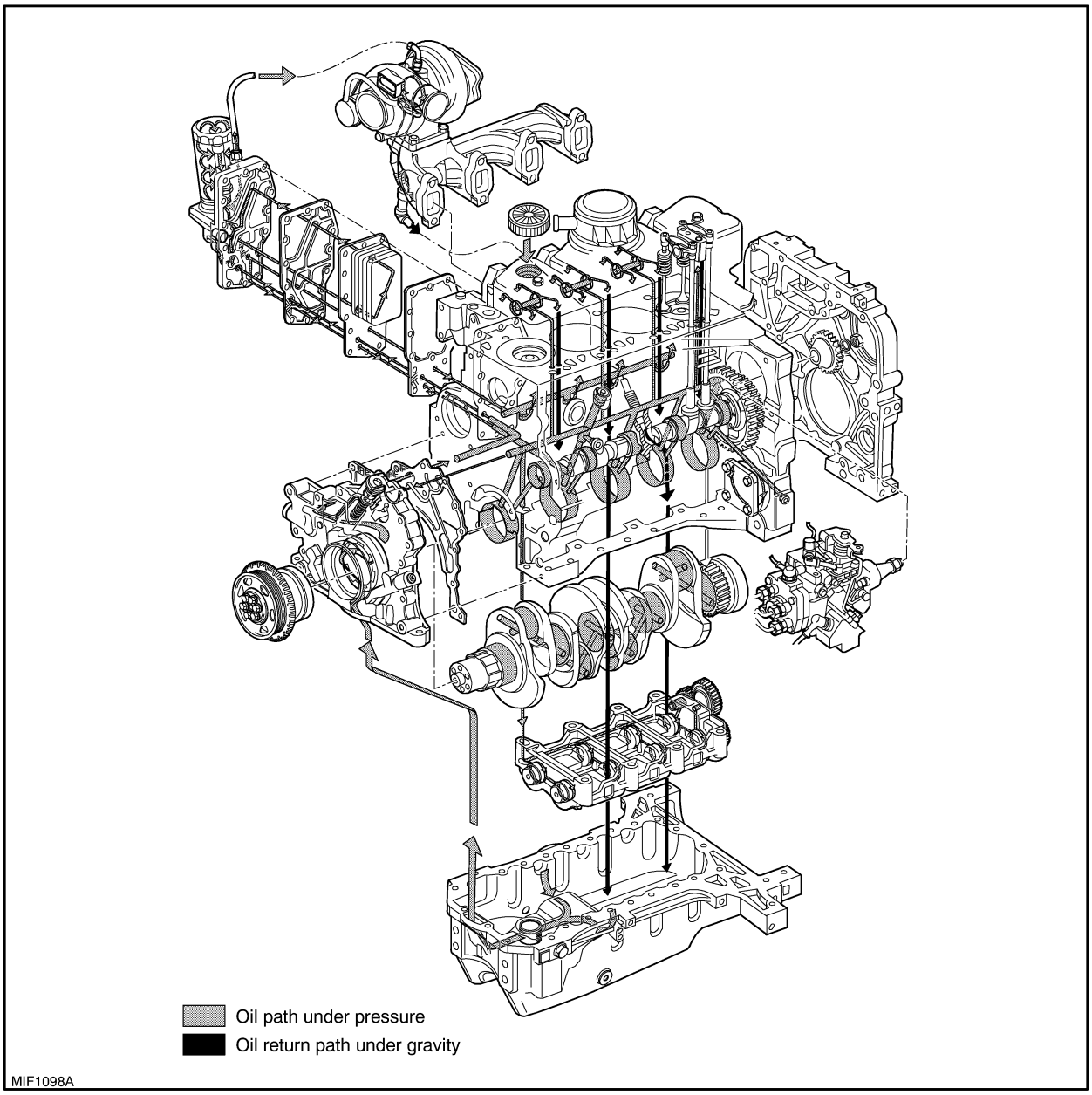
26. Refit the dryer filter together with its support and piping, tightening the two retaining bolts.
27. Refit the hood support, tightening the retaining bolts.
28. Refit the support with the fuse-holder box on the hood support, tightening the two retaining bolts.
29. Refit the support together with the relays protecting the system on the hood support, fitting the two retaining bolts.
30. Refit the brake fluid reservoir onto the support and the two retaining clips.
31. Refit the silencer together with the exhaust pipe.
32. Secure the silencer to the exhaust manifold with the four nuts and connect the air filter dust extractor pipe to the silencer exhaust, inserting the retaining clamp.
33. Refit the three rear retaining bolts of the exhaust silencer.
34. Fit the cab heater delivery and return pipes and insert the associated clamps.
35. Refit the fitting of the hose delivering power steering oil to the hydraulic cylinders governing the front wheel steering.
36. Install the flexible cables governing the hand and pedal throttle, inserting the retaining clips.
37. Reconnect the throttle control tie-rod to the injection pump, inserting the retaining clip.
38. Working from inside the cab, fit the four plugs to gain access to the upper bolts securing the engine, located at the base of the steering column.
39. Refit the pedal on the differential lock drive shaft, the retaining pin and the footboard.
40. Refit the two right- and left-hand dashboard panels and the relevant four fixing knobs.
41. Refit the two power steering cylinder oil delivery and return hoses.
42. Install the electrical connections between the cab and the engine.
43. Reconnect the diesel delivery and return pipes to the diesel pump and install the relevant plastic fasteners.
44. Working on the left-hand side of the engine, install the lift pump draw pipe and tighten the retaining bolts.
45. Install the delivery pipe of the services pump on the right-hand side of the engine and tighten its fitting.
46. Refit the rigid pipe for drawing oil from the transmission and the two metal clamps.
47. Refit the power steering/four-wheel drive drain pipe on both the left- and right-hand sides of the engine.
48. Refit the lift pump draw pipe and lock the retaining bolts.
49. Refit the propeller shaft with its central support and the retaining bolts.
50. Refit the front axle drive shaft guard, tightening the front, central and rear retaining bolts.
51. Refit the front ballast together with the support and insert the retaining pin and the split pins.
52. Install the fitting of the cab heater radiator coolant return pipe connected to the bottom of the coolant pump and refill the engine coolant.
53. Refit the guard on the right-hand side of the fan, tightening the three retaining bolts.
54. Refill the transmission-gearbox housing with oil.
55. Install the hood. Reconnect the battery negative lead.

SECTIONAL VIEWS



1

View of Farmall 90 tractor engines of 65 kW (88 HP) and Farmall 95 of 70 kW (95 HP)

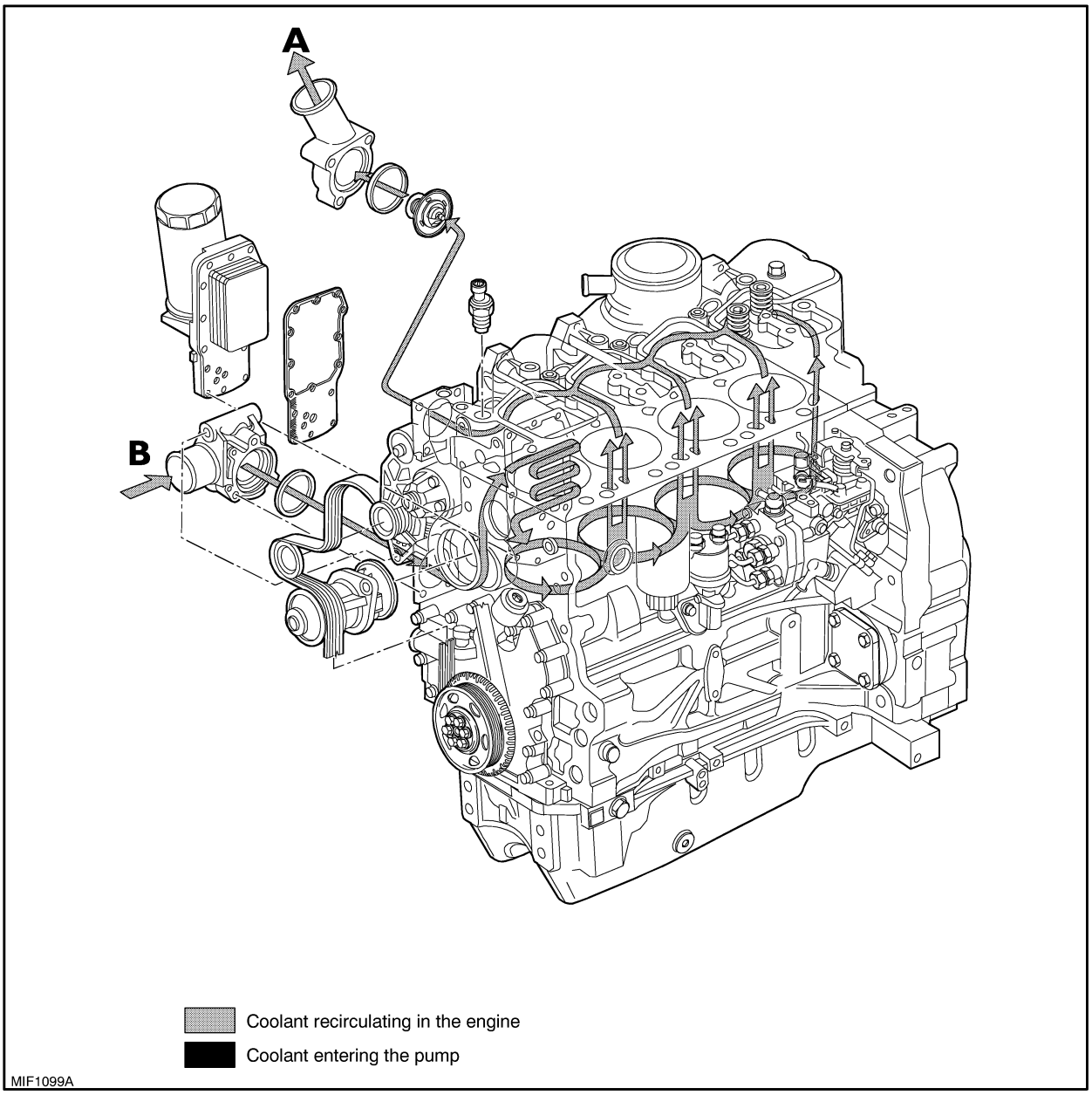


2

Lubrication diagram for engines mod. Farmall 90 and Farmall 95

Forced-circulation lubrication is accomplished by the following components:

- oil pump, housed at the front of the crankcase, driven by the grooved bushing keyed onto the shank of the crankshaft;
- water / oil cooler, housed in the crankcase;
- oil pressure control valve incorporated in the cooler assembly;
- by-pass valve to cut off clogged oil filter, incorporated in the cooler assembly;
- cartridge oil filter.

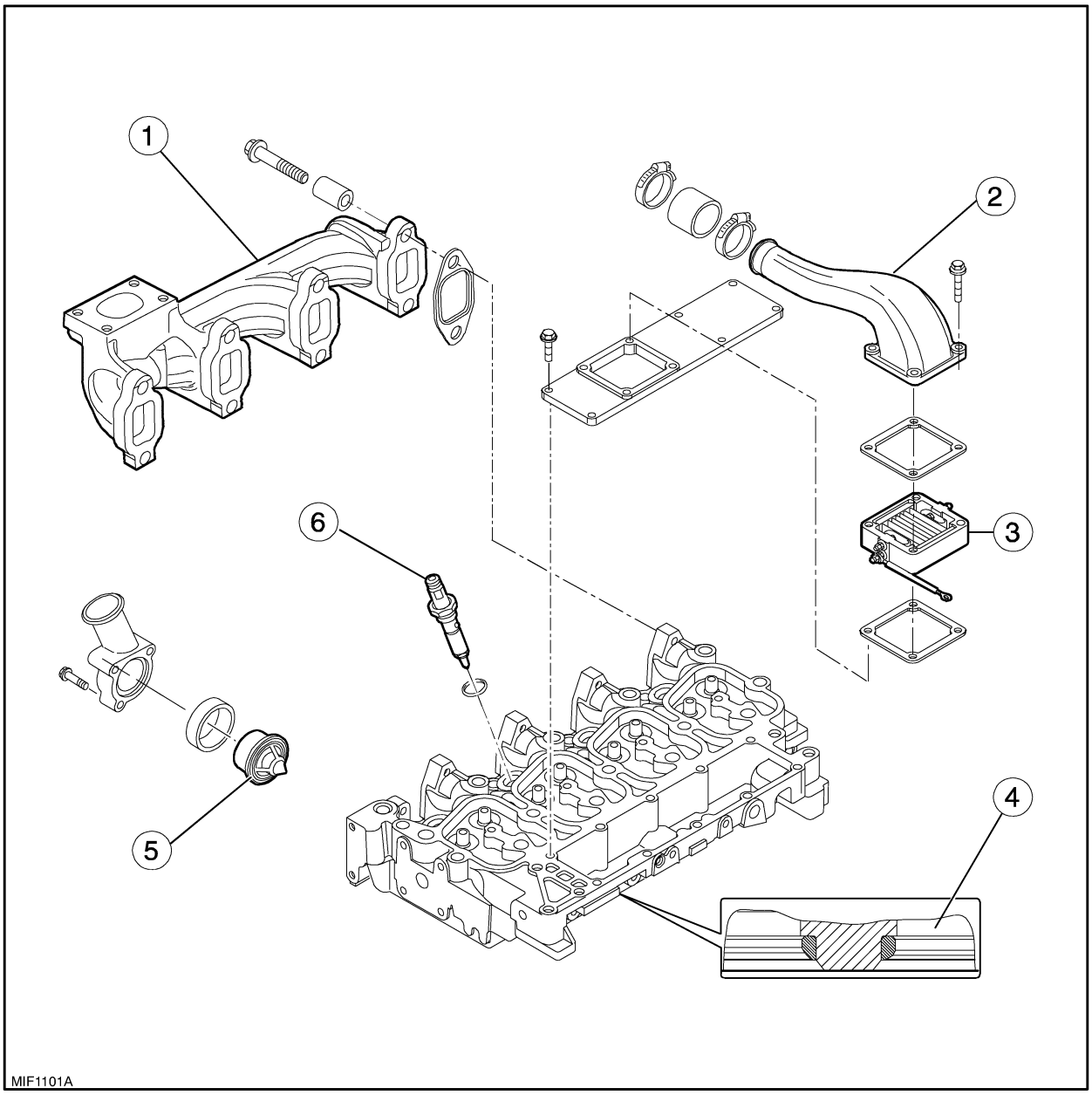


3

Cooling system diagram

The forced circulation, closed-circuit engine cooling system is composed of the following components:

- a lubricating oil cooler;
- a centrifugal coolant pump housed at the front of the crankcase;
- a thermostat valve governing coolant circulation.



4

Detail of cylinder head with valve seats fitted in engines mod. Farmall 90, Farmall 95

1. Exhaust manifold
2. Intake manifold
3. Air heater
4. Fitted valve seats
5. Thermostat valve
6. Injector

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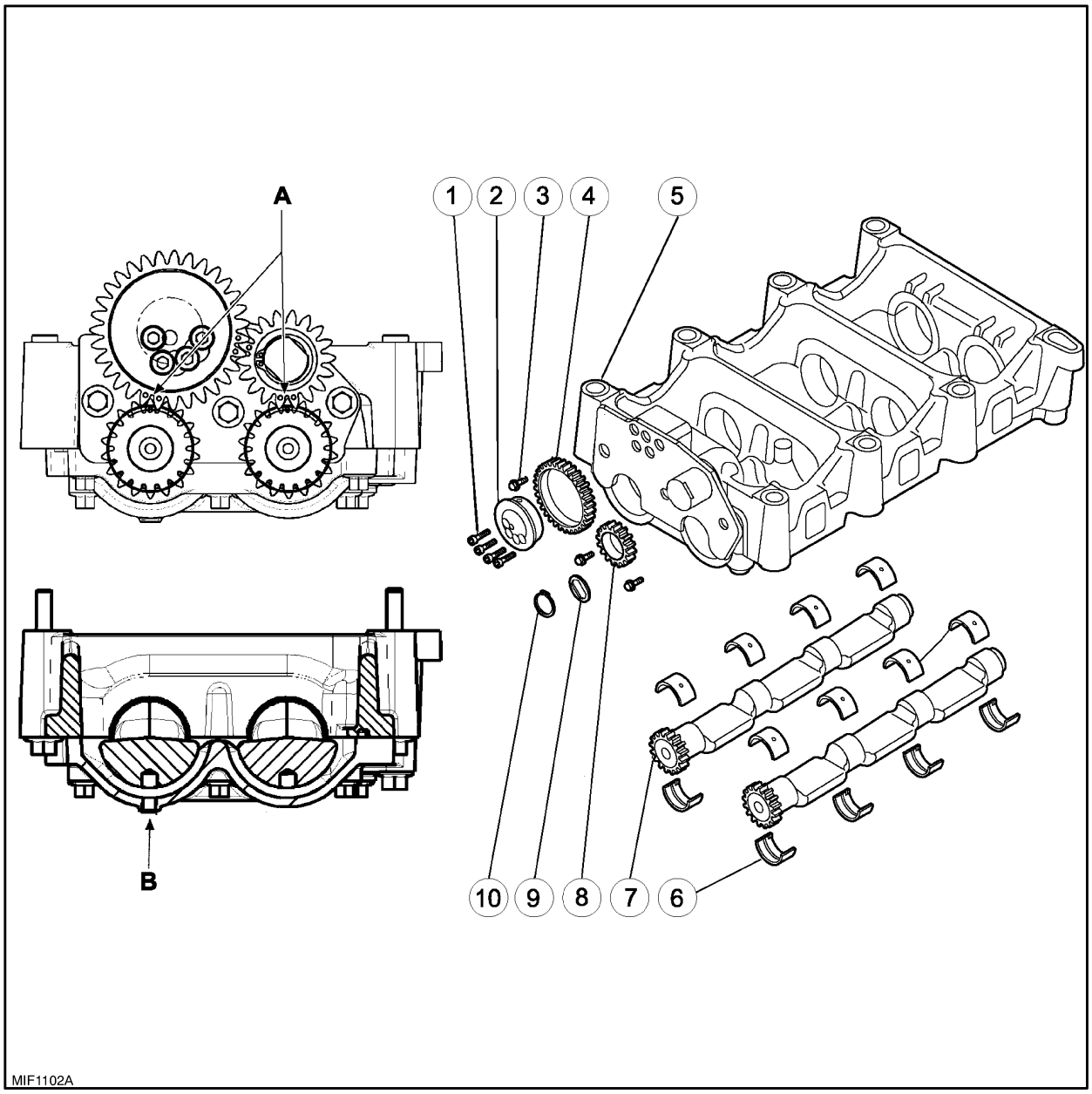

5

Additional counterweights

1. Retaining bolts
2. Support
3. Retaining bolts
4. Gear
5. Balancing weight
6. Half bearings
7. Counter-shaft
8. Gear
9. Ring
10. O-Ring