

FARMALL® 40B CVT
FARMALL® 45B CVT
FARMALL® 50B CVT

Compact Tractor

PIN ZCME21001 and above

SERVICE MANUAL

Part number 48080062

2nd edition English

November 2016

Replaces part number 47454114





SERVICE MANUAL

Farmall® 40B CVT [ZDME21931 -]
Farmall® 45B CVT [ZDME21931 -]
Farmall® 50B CVT [ZDME21931 -]

Link Product / Engine

Product	Market Product	Engine
Farmall® 40B CVT [ZDME21931 -]	North America	N844
Farmall® 45B CVT [ZDME21931 -]	North America	N844L
Farmall® 50B CVT [ZDME21931 -]	North America	N844L

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INTRODUCTION

Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your CASE IH Sales and Service Networks.

Safety rules

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE IH strongly recommends that you return all used batteries to a CASE IH dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



Mandatory battery recycling

NOTE: The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling



SERVICE MANUAL

Engine

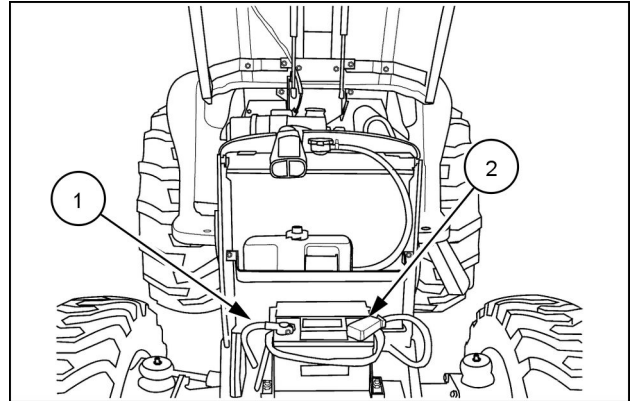
Farmall® 40B CVT [ZDME21931 -]
Farmall® 45B CVT [ZDME21931 -]
Farmall® 50B CVT [ZDME21931 -]

Engine - Remove Separating the tractor at the engine - front transmission box

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

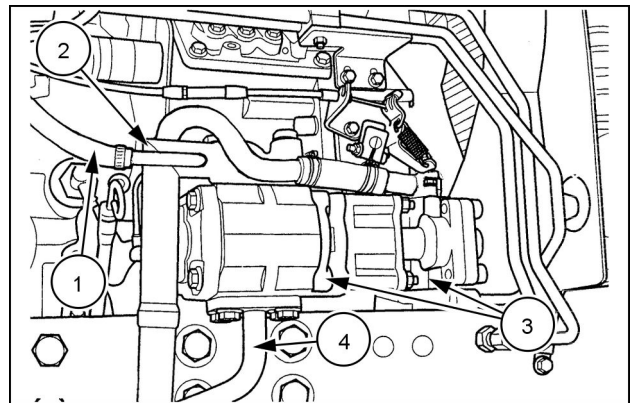
NOTE: To separate the tractor between the engine and the front transmission box, the hood and cab must be removed. To accomplish this, see "Platform" Section 90, for removal procedures.

1. Remove the negative (-) battery cable, **(1)**, and the positive (+) battery cable, **(2)**, from the battery.



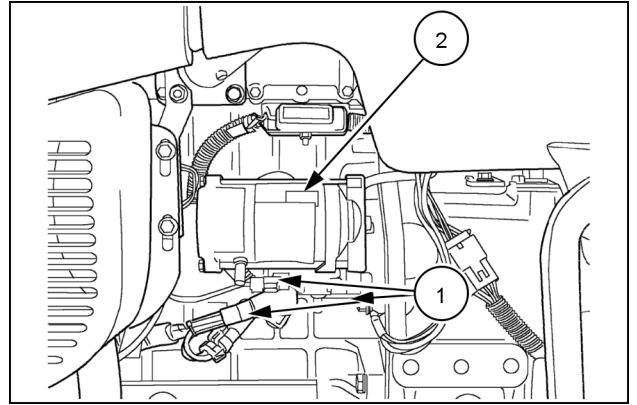
76083810N 1

2. Disconnect the power steering return hose, **(1)**, from the hydraulic system inlet tube, **(2)**. Remove the hydraulic system inlet tube, **(2)**, from the hydraulic pump, **(3)**.
3. Remove the hydraulic system pressure tube, **(4)**, from the hydraulic pump, **(3)**, and the diverter valve.



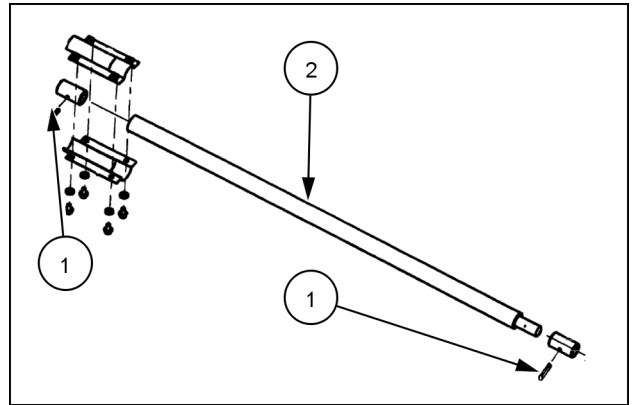
76075731N 2

4. Disconnect the wires, **(1)**, on the starter, **(2)**, and remove the starter from the tractor.



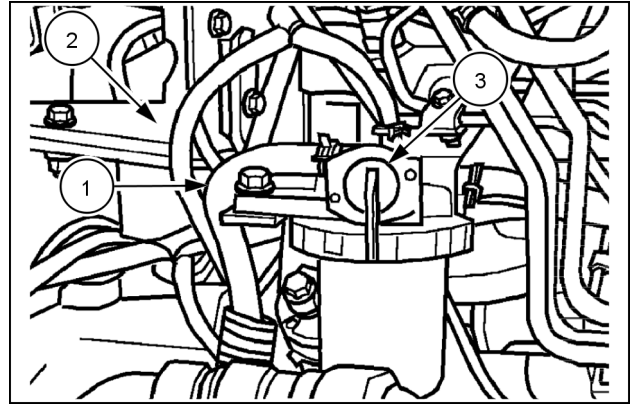
30997565N 3

5. If equipped with FWD, remove the roll pins, **(1)**, from the front and rear of the FWD driveshaft, **(2)**, and remove the driveshaft from the tractor.
6. Drain the engine oil into a suitable container and remove the oil filter.



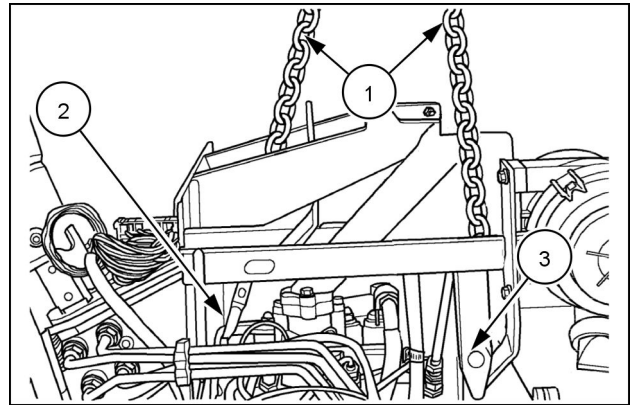
20000904N 4

7. Remove the fuel supply, (1), and return, (2), lines from the fuel filter, (3).
8. Drain the fuel tank into a suitable container.



76075737N 5

9. Attach a chain sling, (1), to the two hoist eyes, (2) and (3), on the engine.

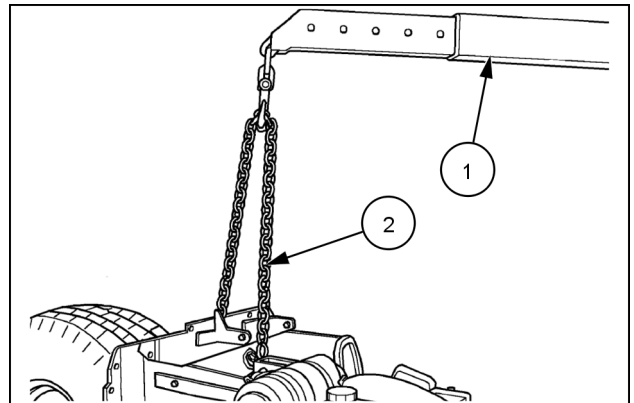


76075738N 6

10. Attach a suitable hoist, (1), to the chain sling, (2).

NOTE: The hoist is used for supporting the engine and axle assembly, not for lifting.

11. Roll a floor jack under the tractor from the rear of the tractor, and place under the front transmission box. Raise the jack enough to support the drive train.

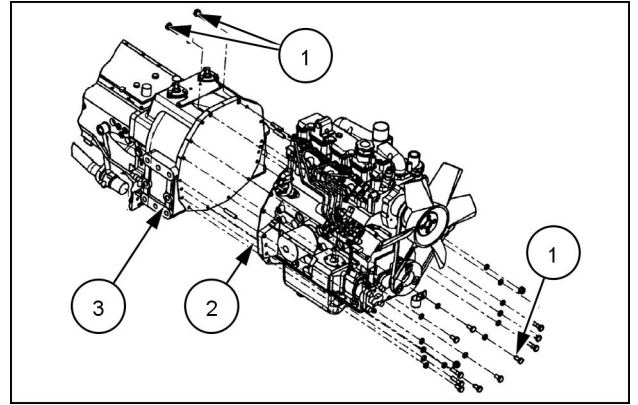


76083809N 7

12. Remove the buckle-up bolts, (1), that secure the engine, (2), to the front transmission box, (3).

NOTE: The hoist and/or the floor jack may need to be raised or lowered to allow the separation of the engine from the front transmission box.

13. Carefully roll the drive train away from the engine, using the floor jack for support.



76083811N 8

Engine - Remove Separating the tractor at the engine/frame

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

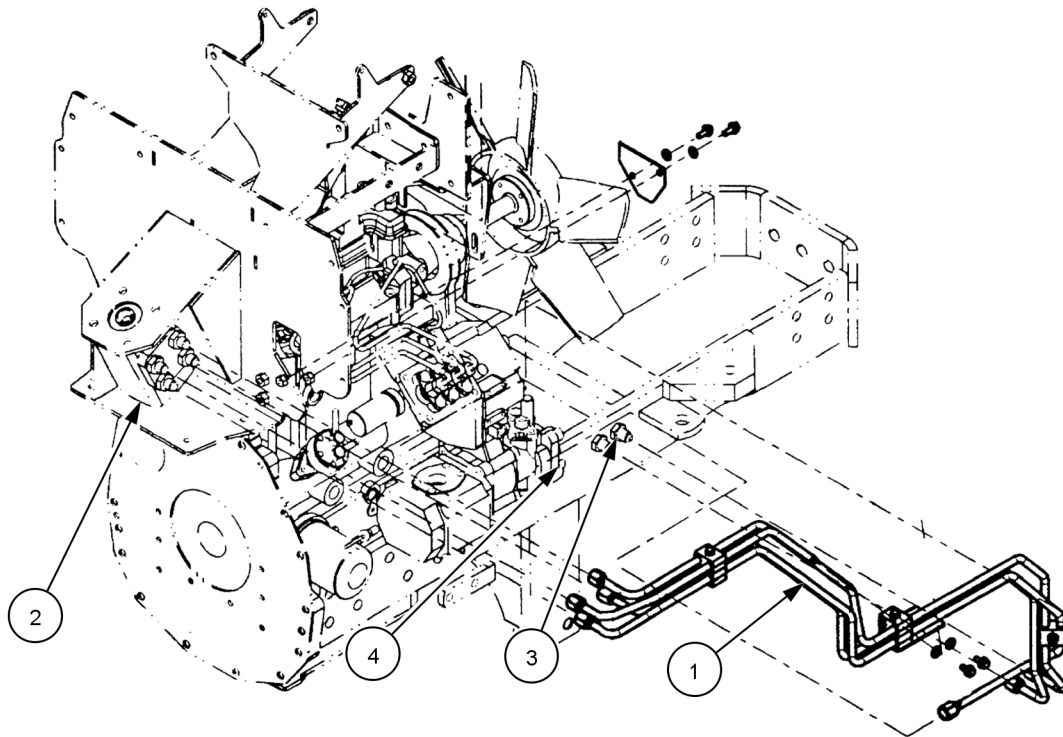
⚠ DANGER

Heavy objects!

Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders. Failure to comply will result in death or serious injury.

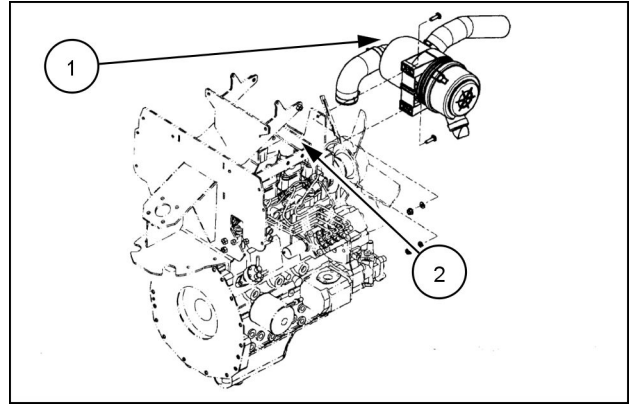
D0076A

1. Use jack stands under the frame rails to support the front frame/engine assembly.
2. Remove the chain sling from the two hoist eyes on the engine.
3. Remove the power steering lines, (1), from the power steering control motor, (2), the frame, (3), and the power steering pump, (4).



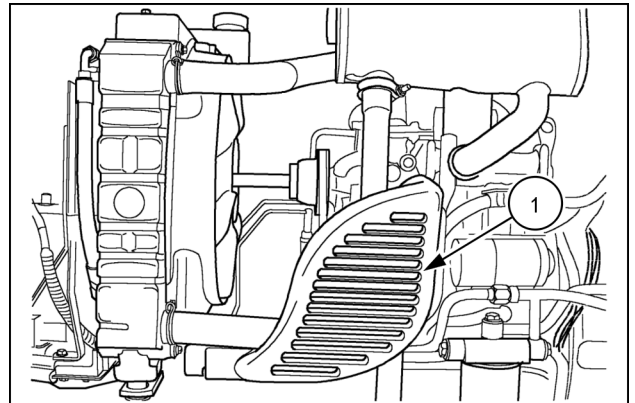
76075732N 1

4. Remove the air cleaner assembly, **(1)**, from the firewall, **(2)**.



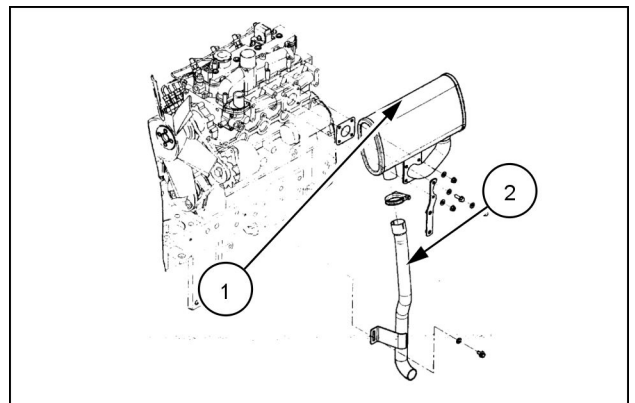
76083813N 2

5. Remove the muffler guard, **(1)**, from the tractor.



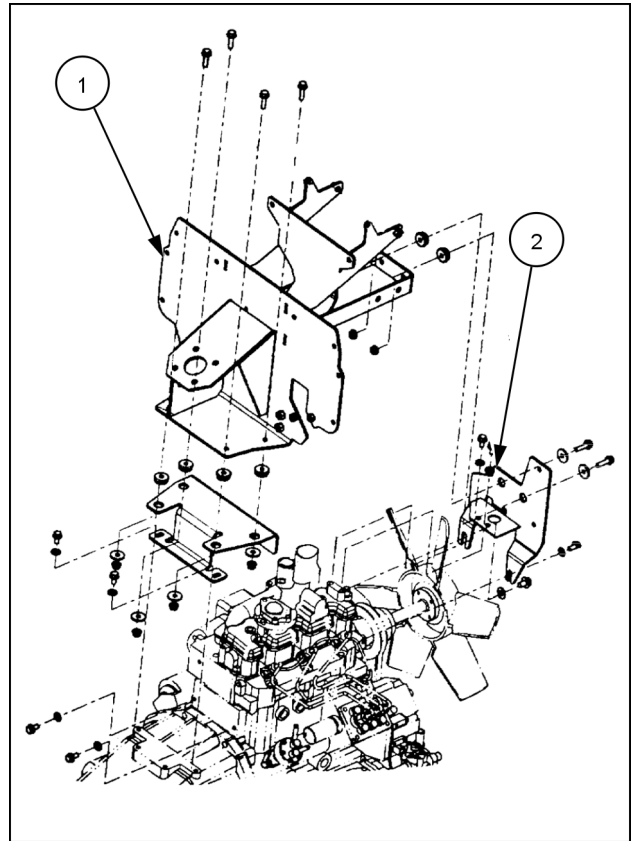
30996394N 3

6. Remove the muffler, **(1)**, and the exhaust pipe, **(2)**, from the tractor.
7. Drain the coolant from the radiator into a suitable container.
8. Remove the top, **(3)**, and the bottom, **(4)**, radiator hoses.
9. Remove the radiator, **(5)**, and the oil cooler (if equipped) from the tractor.



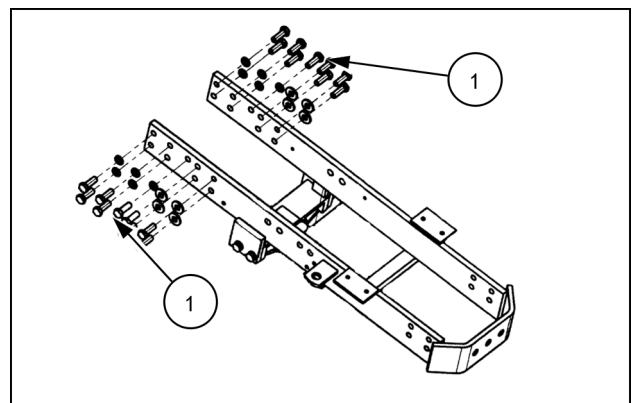
76083814N 4

10. Remove the firewall, **(1)**, and the air cleaner mounting bracket, **(2)**, from the engine.
11. Attach a chain sling to the two hoist eyes on the engine.
12. Attach a suitable hoist to the chain sling, and raise the hoist enough to support the engine.



76083812N 5

13. Loosen and remove the engine mounting bolts, **(1)**, on both sides of the frame.
14. Carefully lift the engine from the frame.
15. Attach the engine to a suitable engine stand.
16. With the engine securely attached to the engine stand, remove the chain sling from the two engine hoist eyes.



20002365N 6

Next operation:
Engine - Install (10.001)

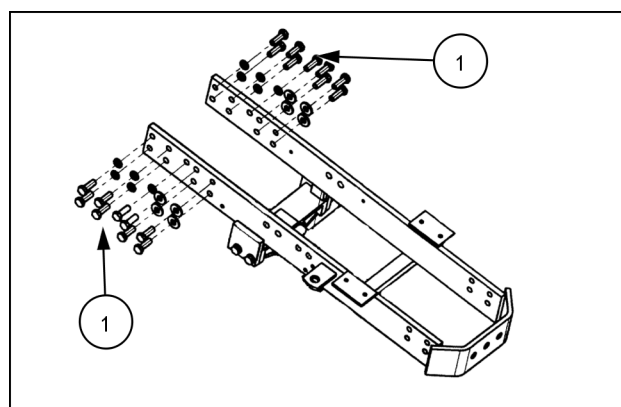
Engine - Install

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Prior operation:

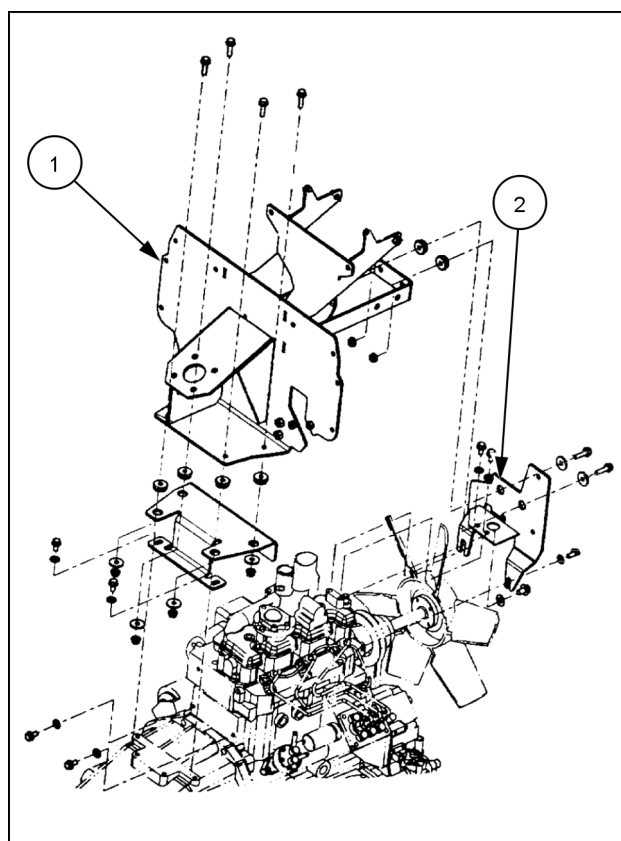
Engine - Remove Separating the tractor at the engine/frame (10.001)

1. Attach a chain sling to the two hoist eyes on the engine.
2. Attach a suitable hoist to the chain sling and raise the hoist enough to support the engine.
3. Remove the engine from the engine stand.
4. Using the hoist, position the engine in the frame, aligning the mounting holes in the frame with the mounting holes in the engine.
5. Install the engine mounting bolts, (1), on both sides of the frame. Tighten the mounting bolts to **139 - 175 N·m (103 - 129 lb ft)**.
6. With the engine securely installed into the frame, remove the chain sling from the two engine hoist eyes.



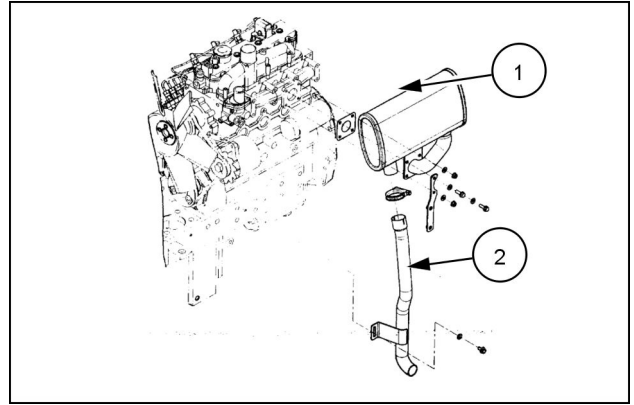
20002365N 1

7. Install the firewall, (1), and the air cleaner mounting bracket, (2), onto the engine.



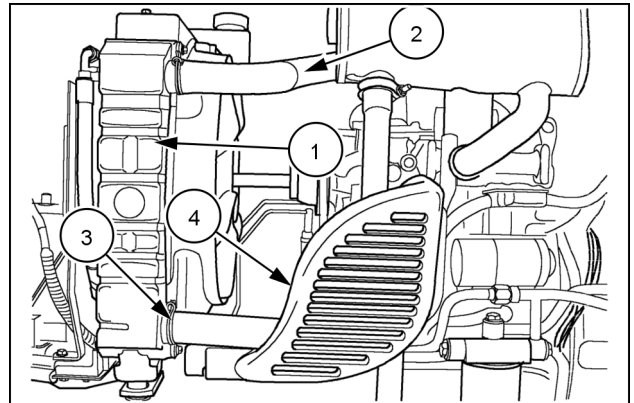
76083812N 2

8. Install the muffler, **(1)**, onto the exhaust manifold, and attach the exhaust pipe, **(2)**, onto the muffler.



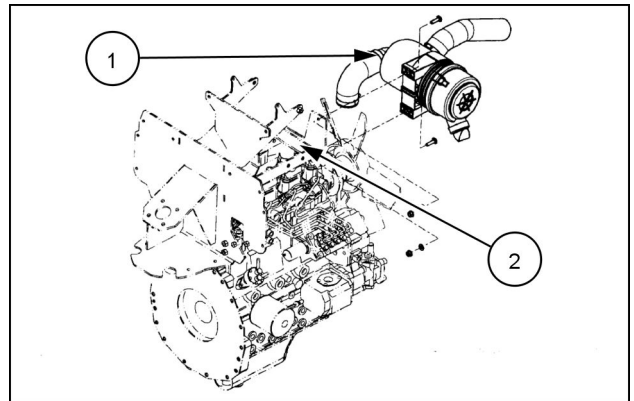
76083814N 3

9. Install the radiator, **(1)**, and the oil cooler (if equipped) onto the tractor frame.
10. Install the top, **(2)**, and bottom, **(3)**, radiator hoses.
11. Fill the radiator with new coolant to the proper level.
12. Install the muffler guard, **(4)**, on the tractor.



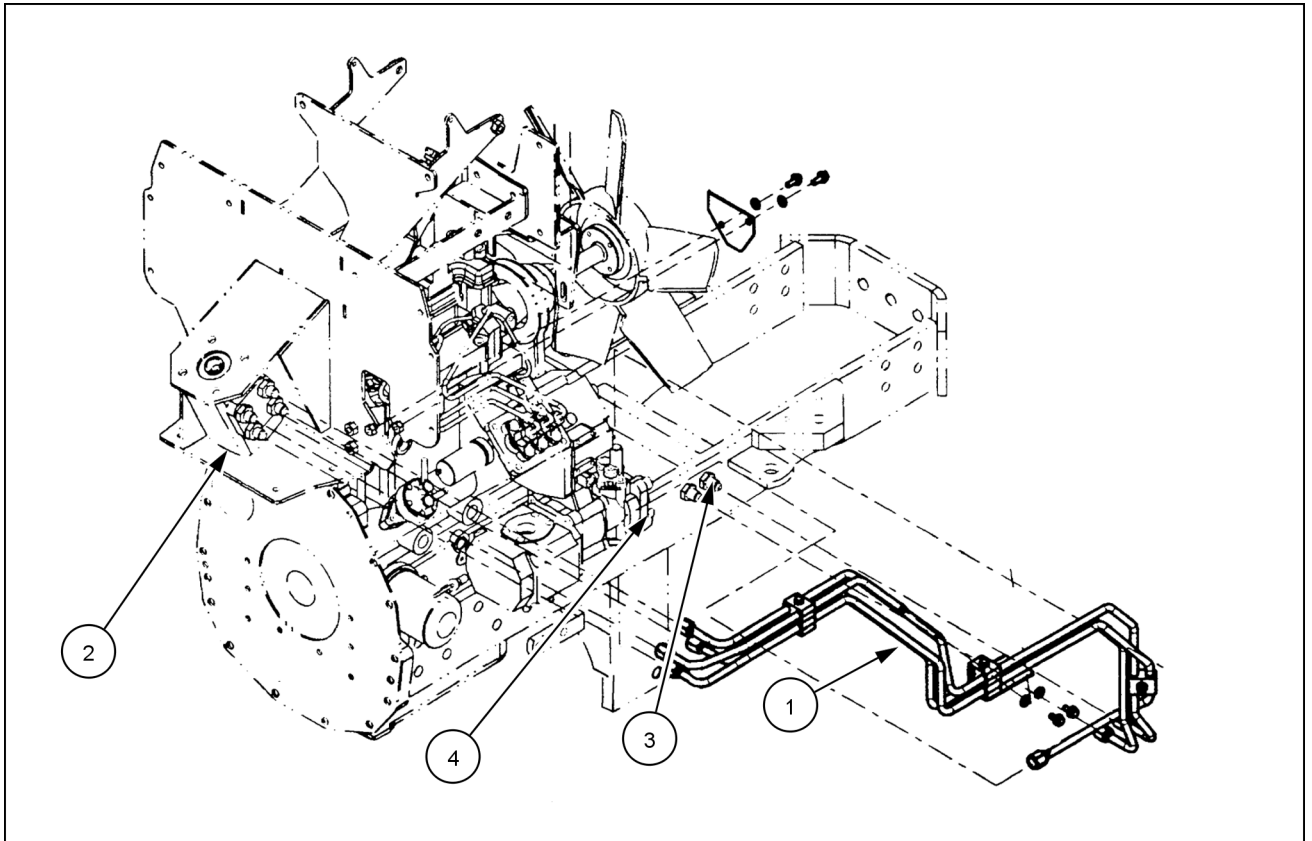
30996394N 4

13. Install the air cleaner assembly, **(1)**, on the firewall, **(2)**, and connect the air inlet hose to the air inlet manifold pipe.



76083813N 5

14. Connect the power steering tubes, (1), to the power steering control motor, (2), the frame, (3), and the power steering pump, (4).



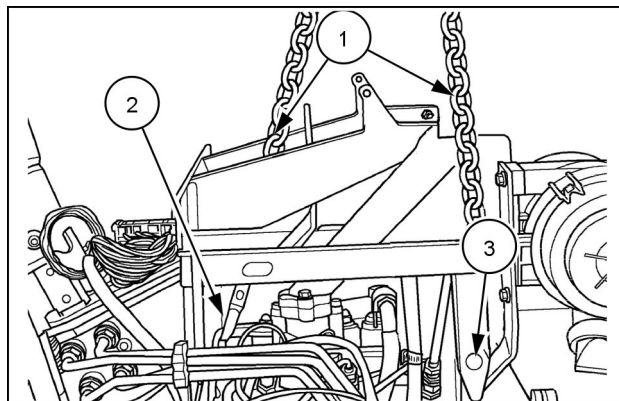
76075732N 6

Engine - Install Attaching the front transmission box to the engine

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

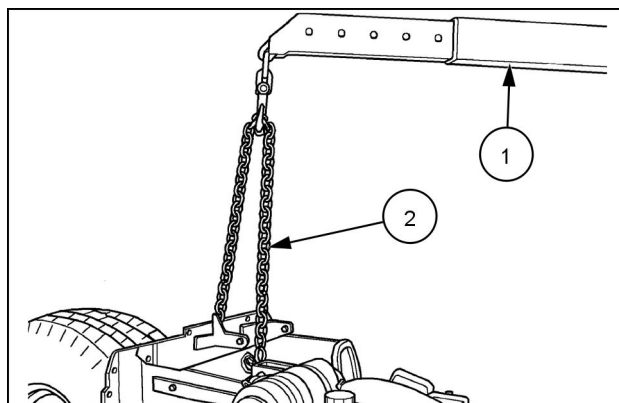
NOTICE: Do not use the buckle-up bolts to draw the drive train together with the engine. Severe damage to the drive train may result.

1. Attach a chain sling, (1), to the two hoist eyes, (2) and (3), on the engine.



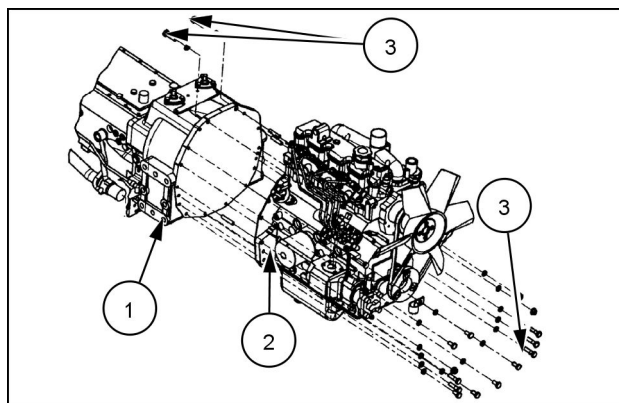
76075738N 1

2. Attach a suitable hoist, (1), to the chain sling, (2).
3. Carefully roll the drive train into alignment with the engine. Align the splines on the front transmission box input shaft with the engine flywheel. Rotate the engine fan to align the input shaft and the flywheel. The floor jack or the hoist may need to be raised or lowered to make alignment possible.



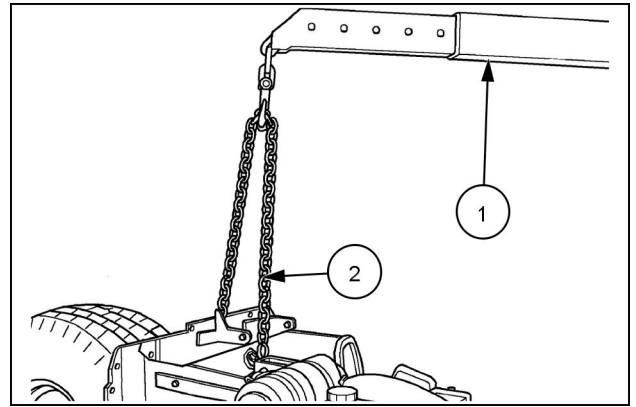
76083809N 2

4. Connect the drive train, (1), to the engine, (2), and install the buckle-up bolts, (3). Tighten the buckle-up bolts in a criss-cross pattern. Torque the M10 bolts and nuts to 43 - 55 N·m (32 - 41 lb ft). Torque the two M12 bolts to 81 N·m (60 lb ft).



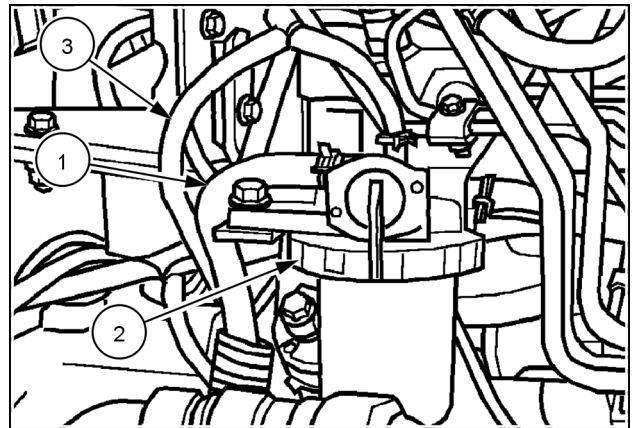
76083811N 3

5. Remove the chain hoist, **(1)**, and the sling, **(2)**, from the engine hoist eyes. Remove the floor jack from the tractor.



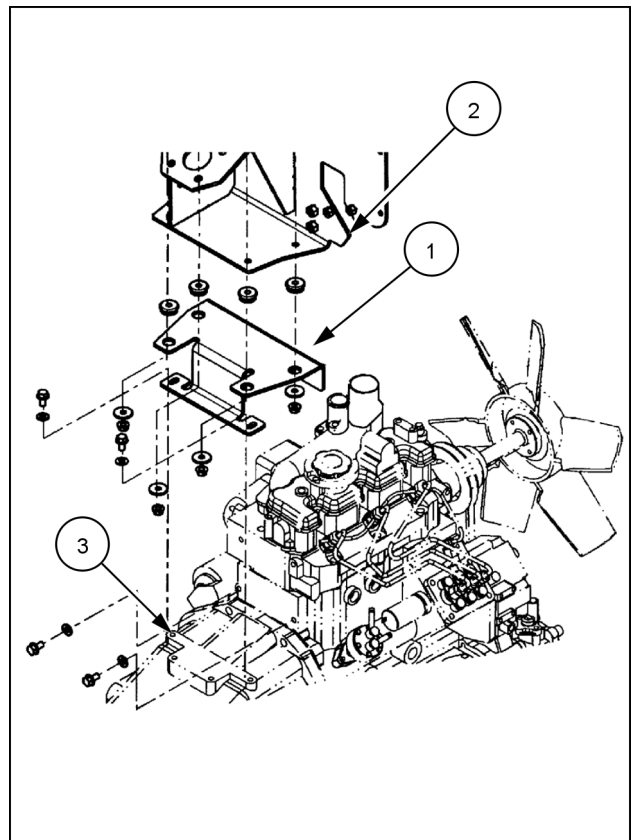
76083809N 4

6. Connect the fuel supply line, **(1)**, to the fuel shutoff/filter, **(2)**, and connect the fuel tank vent line, **(3)**, to the tee fitting.



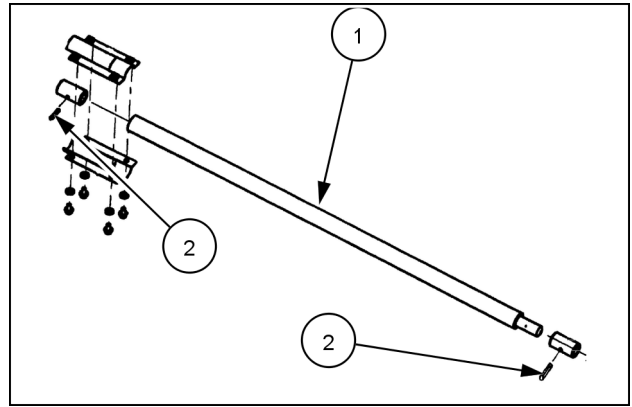
76075737 5

7. Attach the firewall support, **(1)**, to the firewall, **(2)**, and the front transmission box, **(3)**. Secure with the retaining bolts.



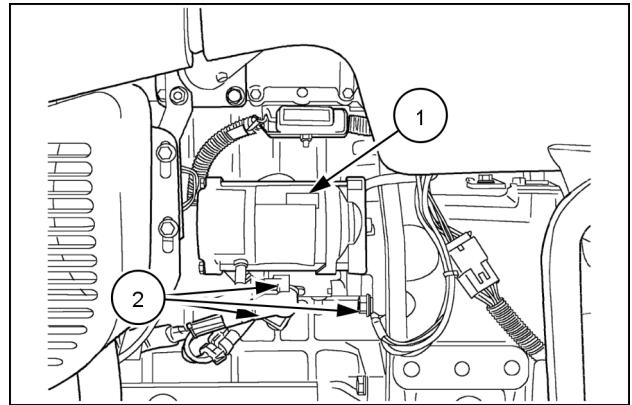
76083815N 6

8. If equipped, Install the FWD driveshaft, **(1)**, and secure with the two roll pins, **(2)**.



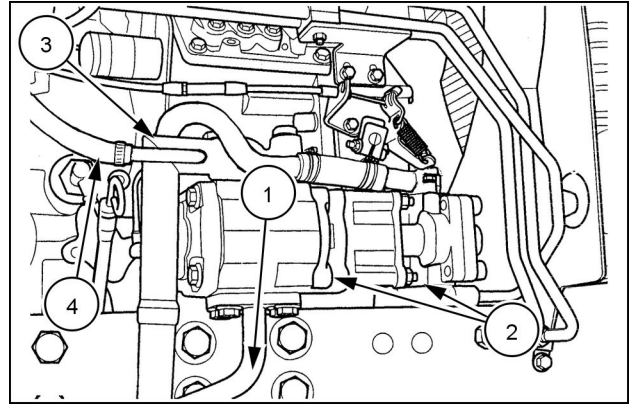
20000904N 7

9. Install the starter, **(1)**, onto the engine, and secure with the retaining nuts. Connect the wires, **(2)**, to the starter, **(1)**.



30997565N 8

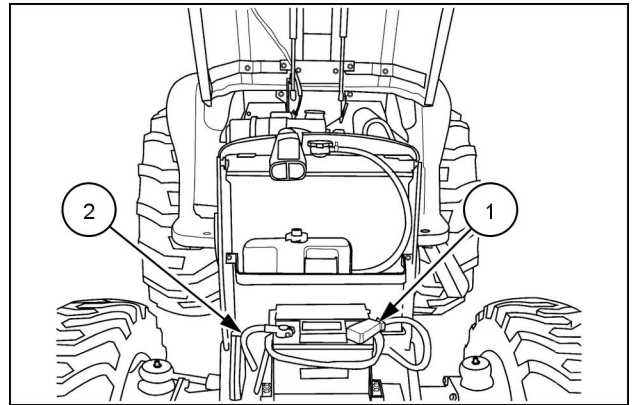
10. Install the hydraulic system pressure tube, **(1)**, on the hydraulic pump, **(2)**, and the diverter valve.
11. Install the hydraulic system inlet tube, **(3)**, onto the hydraulic pump, **(2)**, and connect the power steering return hose, **(4)**, to the inlet tube, **(3)**.



76075731N 9

NOTE: Reattach the tractor cab and hood at this time. To accomplish this, see "Platform" Section 90, for installation procedure.

12. If the engine oil was drained, and the oil filter was removed during disassembly, install a new oil filter on the engine, and fill the engine with the recommended oil to the proper level.
13. Connect the positive (+), **(1)**, and the negative (-), **(2)**, battery cables to the battery.
14. Check the fluid levels and start the tractor. Check for leaks and proper operation of all systems.
15. Make any adjustments necessary for proper operation of the tractor.



76083810N 10

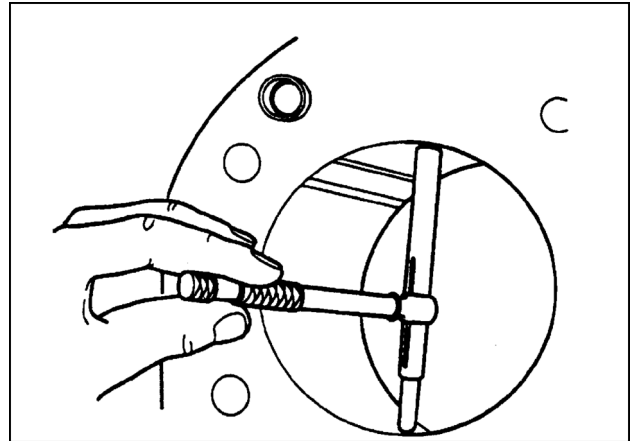
Crankcase - Inspect

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Prior operation:

Cylinder head - Assemble (10.101).

1. Inspect the cylinder block top face for cracks, damage, and warping in the same way as for the cylinder head. Replace the cylinder block if warp is greater than **0.12 mm (0.005 in)**.
2. Visually inspect the cylinder bore. There should be no scoring, rust, or corrosion.
3. Using a telescoping gauge in line with the crankshaft, measure the inside diameter of the top of the bore (approximately **15 mm (0.59 in)** below the top of the block) on all models.
4. Repeat this measurement at right angles to the crankshaft at the same distance.
5. In line with the crankshaft at the bottom of the bore, measure (approximately **117 mm (4.6 in)** Model ISM N844, and **127 mm (5 in)** Model ISM N844L) from the top of the cylinder.
6. Repeat this measurement at right angles to the crankshaft at the same distance.
7. If any of the measurements taken indicate worn or damaged cylinder bores, replace engine block with a long block assembly.



20093380 1

NOTE: If the cylinder bore measures **84.2 mm (3.315 in)** long replace the block assembly.

Next operation:

Connecting rod and piston - Inspect (Piston) (10.105).

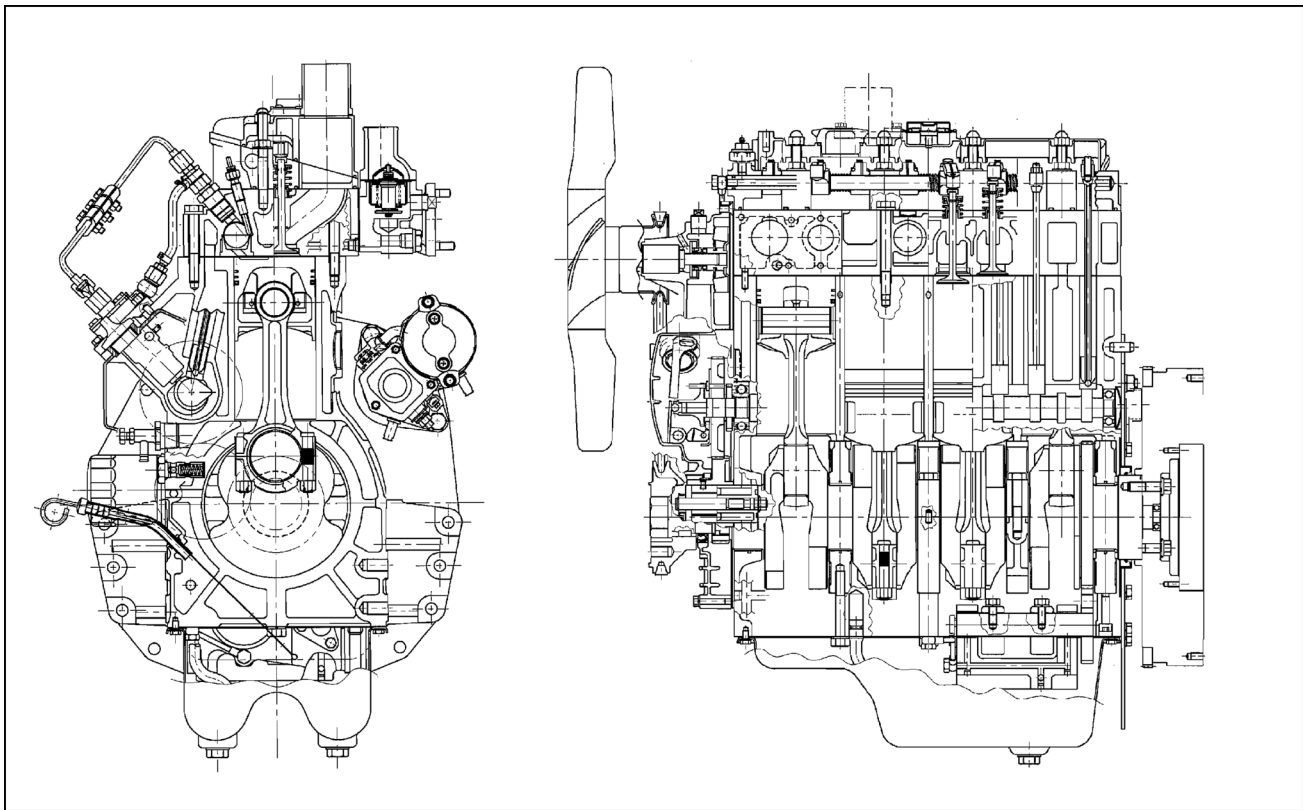
Cylinder head - Static description

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Cylinder Head and Valve Train Components

The cylinder head incorporates the valve assemblies, rocker arms, rocker shaft, push rods, and lifters. A swirl chamber located between the injector assembly and the main combustion chamber of the cylinders provides improved starting and greater fuel efficiency. Initial combustion starts in the precombustion chamber and as the expansion occurs a strong swirl pattern is created in the main combustion chamber for more complete combustion of the air-fuel mixture. The air intake manifold is separate from the cast aluminum valve cover on all these engines. The exhaust manifold is bolted on the left-hand side of the cylinder head on each of the models. Cylinder heads have integral valve guides. Standard size valves only are used.

The cylinder block assembly contains the pistons, connecting rods, crankshaft, timing gears, and engine oil pump. The crankshaft is supported on five main bearings. The front bearing is positioned in a bore in front of the block. The other bearings are split liners located in holders bolted to the block. The camshaft is supported on four ball bearings located in the block.



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Engine models ISM N844 and ISM N844L

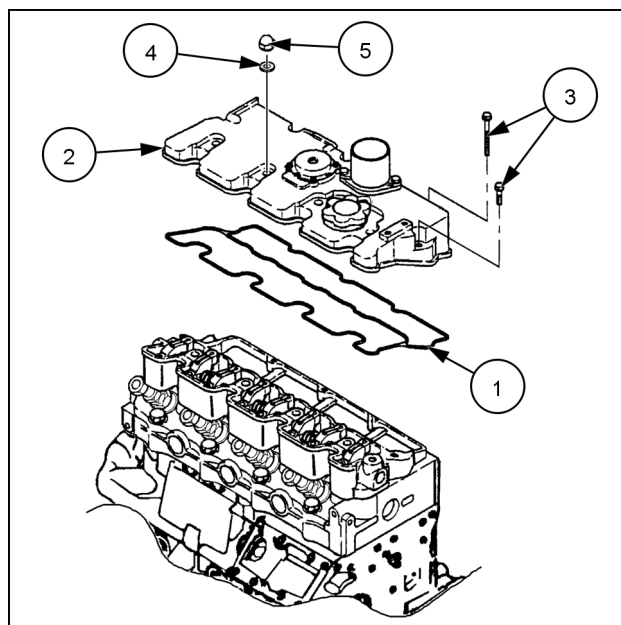
Valve cover - Install

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Prior operation:

Valve drive and gears - Clearance (Valves) (10.106).

1. Install a new gasket (1) and position the valve cover (2) over the rocker arms.
2. Install the valve cover retaining bolts (3), and tighten to **12 - 16 N·m (9 - 19 lb ft)**.
3. Install and tighten the seal washer (4), and cap nuts (5).



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Next operation:

Water pump - Install (with Cooling Fan) (10.400).

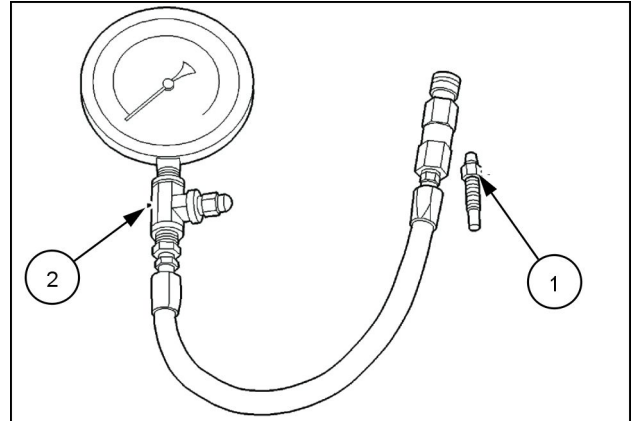
Cylinder head - Compression test

Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Compression test is performed through the glow plug ports. The test adapter tool **(1)**, is equipped with quick coupler ends for easy installation of the hose and gauge.

The procedures to perform a compression test are as follows:

1. Remove the wire lead from the fuel injection pump solenoid.
2. Remove the glow plug electrical wire and wire connector from top of the glow plugs.

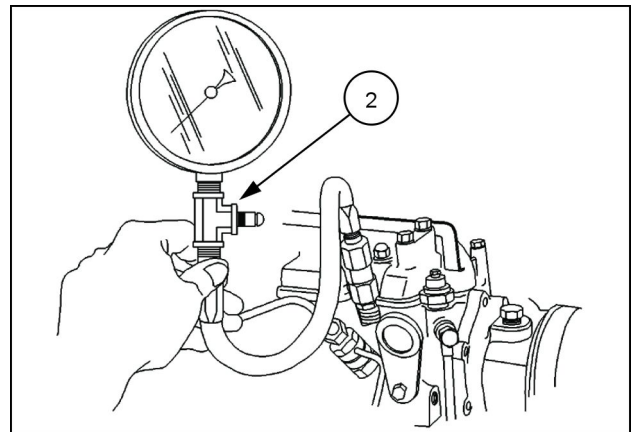


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3. Remove all of the glow plugs.

NOTE: Be sure all the glow plugs are removed before starting the compression tests.

4. Install the adapter Tool No. **FNH00120** , hose and gauge assembly OEM1074 **(2)**, in each port and crank the engine until pressure stabilizes. The gauge should read **2944 kPa (427 psi)**) plus or minus **345 kPa (50 psi)** .



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NOTE: It may be necessary to remove some injector fuel lines to install the adapter tool.

NOTE: There should not be more than **345 kPa (50 psi)** variation between the cylinders.

5. When all cylinders have been tested, reinstall the glow plugs and electrical connections.

Cylinder head - Remove

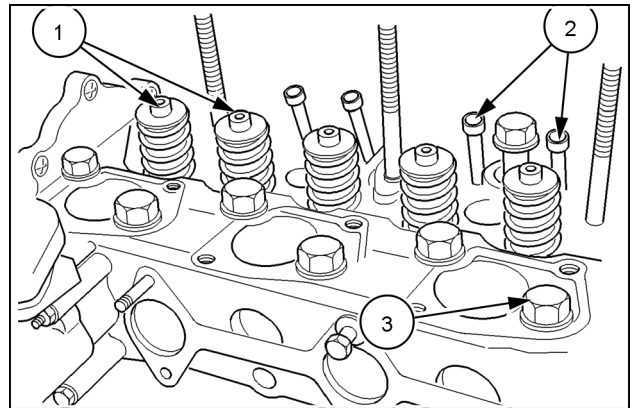
Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Prior operation:

Rocker Arm Shaft and Support Bracket - Remove; See: "Engine Disassemble"..

1. Remove the valve stem caps (1), and push rods (2).
2. To remove the cylinder head, remove the cylinder head bolts (3), by alternately loosening a half turn at a time to prevent warping the head.

NOTE: Keep all valve components in separately marked containers for reassembly in their original location.



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Next operation:

Valve Tappet - Removal; See: "Engine Disassemble".



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Cylinder head - Inspect

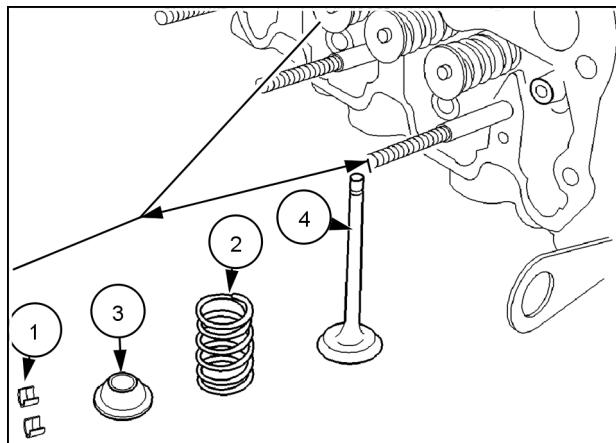
Farmall® 40B CVT	NA
Farmall® 45B CVT	NA
Farmall® 50B CVT	NA

Prior operation:

Crankcase gears - Remove - with Camshaft (10.114).

1. Disassembly

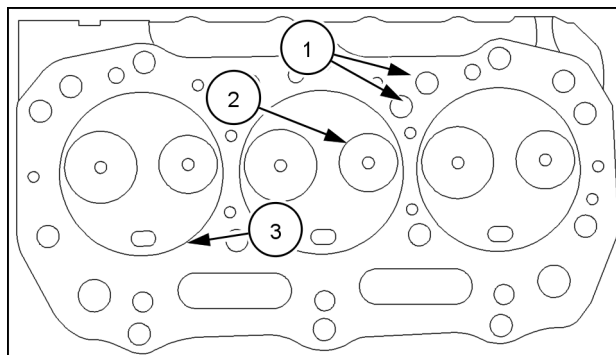
1. Clean the cylinder head and remove any carbon deposits from around the valve heads.
2. Use a valve spring compressor and remove the valve spring retainer locks **(1)**, spring **(2)**, and spring retainer **(3)**, from each valve **(4)**.
3. Remove the valves and place the valve components together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



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2. Inspection and Repair

1. Clean all carbon deposits from the combustion chamber and valve ports using a wire brush and scraper.
2. Clean all dirt and residue from the gasket surface using care not to scratch or nick the machined surface.
3. Clean the cylinder head in solvent and air dry.
4. Inspect the head for cracks or damage in the following areas:
 - Valve ports
 - Valve seats **(2)**.
 - Prechamber **(3)**.
 - External cracks in the water jackets **(1)**..
5. Inspect the gasket surfaces for scratches or nicks, which could cause leakage.
6. Examine the core hole plugs for rust or signs of leakage. If a plug shows signs of damaging rust or leakage, replace all plugs in the head.
7. Inspect the prechamber for carbon deposits and looseness. Remove any carbon deposits found. If prechamber is found to be loose, cylinder head may be warped.



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