

FARMALL® 40B
FARMALL® 50B
Tier 3
Compact Tractor

SERVICE MANUAL

Part number 47698302

2nd edition English

November 2016

Replaces part number 84542386





SERVICE MANUAL

Farmall® 40B
Farmall® 50B

Link Product / Engine

Product	Market Product	Engine
Farmall® 40B	North America	S4Q2
Farmall® 50B	North America	S4Q2

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INTRODUCTION

Safety rules

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

Safety rules - Personal safety

General safety rules

Read this manual carefully before starting, using carrying out maintenance, refueling or performing any other type of operation on the tractor.

Read all the safety decals on the tractor and follow the instructions thereon before starting, operating, refueling or carrying out maintenance on the tractor. Promptly replace any decals that are damaged, lost or illegible. Clean the decals if they are covered by mud or debris.

The tractor must only be used by responsible personnel, trained in tractor use and authorized to operate the tractor.

Use caution when operating the tractor on slopes. Raised equipment, full tanks and other loads will change the center of gravity of the tractor. The tractor can tip or roll over when near ditches and embankments or uneven surfaces.

Avoid using the tractor in unsuitable physical conditions, stop work instead.

Never permit anyone other than the operator to ride on the tractor.

Never operate the tractor under the influence of alcohol, drugs, or while otherwise impaired.

When digging or using ground engaging attachments be aware of buried cables. Contact local utilities to determine the locations of services.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety.

Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop engine, remove key and relieve the pressure before connecting or disconnecting fluid lines.
- Make sure all components are in good condition and tighten all connections before starting the engine or pressurizing the system.
- If hydraulic fluid or diesel fuel penetrates the skin, seek medical attention immediately.
- Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.
- Before removing any hydraulic tubing, check that the system is not pressurized.

Do not alter the calibration of the pressure relief valves in the various hydraulic circuits (steering, hydraulic lift, auxiliary distributors, etc.).

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair, and other loose or hanging items can become entangled in moving parts.

Wear protective equipment when appropriate.

DO NOT attempt to remove material from any part of the tractor while it is being operated or components are in motion.

Make sure all guards and shields are in good condition and properly installed before operating the tractor. Never operate the tractor with shields removed. Always close access doors or panels before operating the tractor.

Enter and leave the tractor using the steps and handles provided. Dirty or slippery steps, ladders, walkways, and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a tractor can be struck or crushed by the tractor or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment during operation.

Never operate engine in enclosed spaces as harmful exhaust gases may build up.

INTRODUCTION

Before starting the tractor, be sure that all controls are in neutral or park lock position.

Before starting the engine, make sure that all attached implements are lowered to the ground.

Start the engine only from the operator's seat. If the safety start switch is bypassed, the engine can start with the transmission in gear. Do not connect or short across terminals on the starter solenoid. Attach jumper cables as described in the manual. Starting in gear may cause death or serious injury.

Always keep windows, mirrors, all lighting, and Slow Moving Vehicle (SMV) emblem clean to provide the best possible visibility while operating the tractor.

Operate controls only when seated in the operator's seat, except for those controls expressly intended for use from other locations.



SERVICE MANUAL

Engine

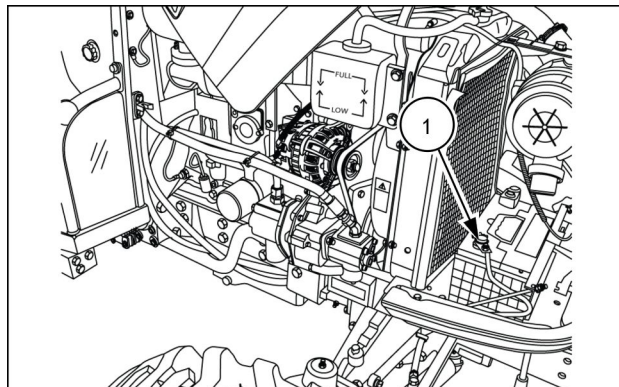
Farmall® 40B

Farmall® 50B

Engine - Remove - Separating the tractor at the clutch housing/engine

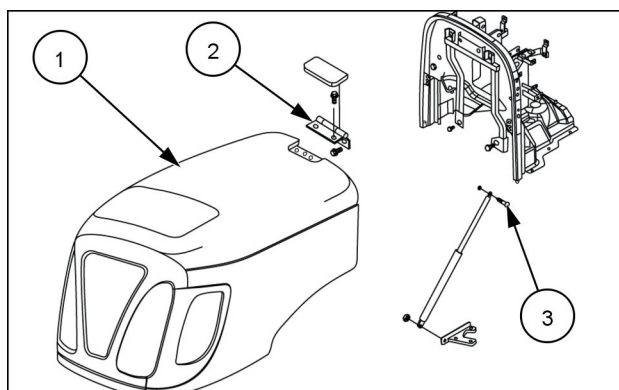
Farmall® 40B	NA Platform - With ROPS
Farmall® 50B	NA Platform - With ROPS

1. Chock all four wheels so that the tractor cannot move.
2. Disconnect negative (-) battery cable **(1)**.



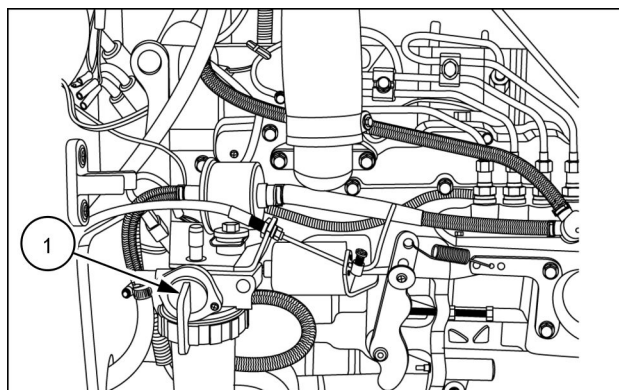
93100929 1

3. Disconnect headlight wire harness.
4. Disassemble the pin **(3)** at the hood strut and wire harness connector.
5. Remove hinge cover and M8 x 16mm bolt **(2)**.
6. Carefully remove hood **(1)**.



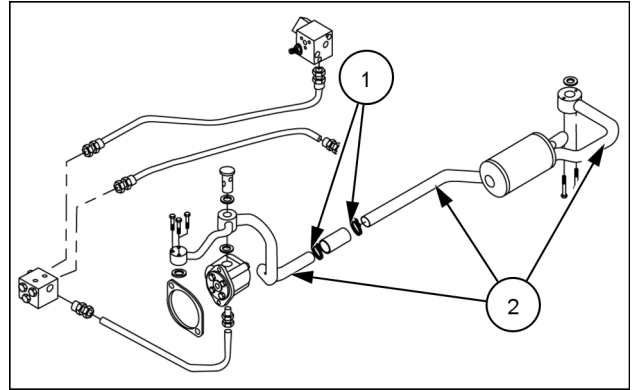
93102238 2

7. Disconnect the main and engine wire harnesses.
8. Turn off fuel supply at the filter **(1)**, and then disconnect fuel hose.



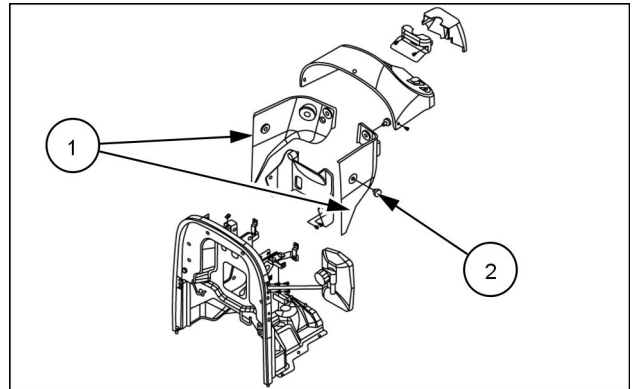
93102239 3

9. Position a drain pan to collect drain oil and unfasten clamps **(1)**.
10. Disassemble suction tube assembly **(2)**.



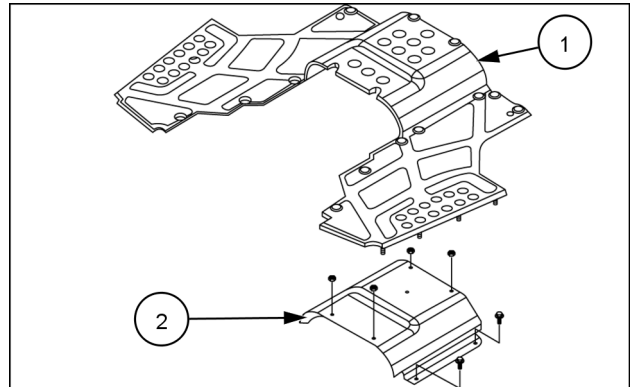
93102240 4

11. Remove the knobs **(2)** on both rear cover halves **(1)** and remove.



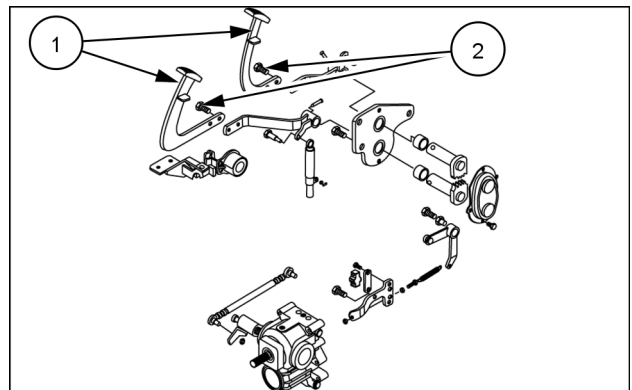
93102241 5

12. Remove the mat **(1)**.
13. Remove the M8 nuts and bolts and remove cover **(2)**.



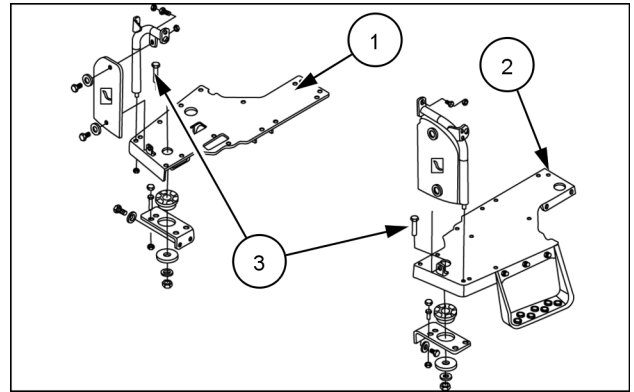
93102242 6

14. Remove the bolts **(2)** and remove the pedals **(1)**.



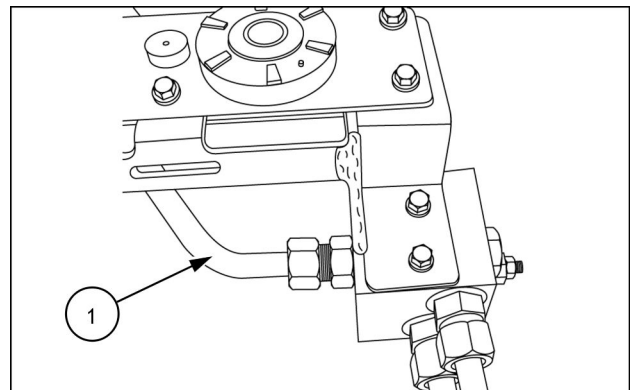
93102243 7

15. Remove the seven M8 and one M24 bolts **(3)**.
16. Remove right-hand step **(1)** and left-hand step **(2)**.



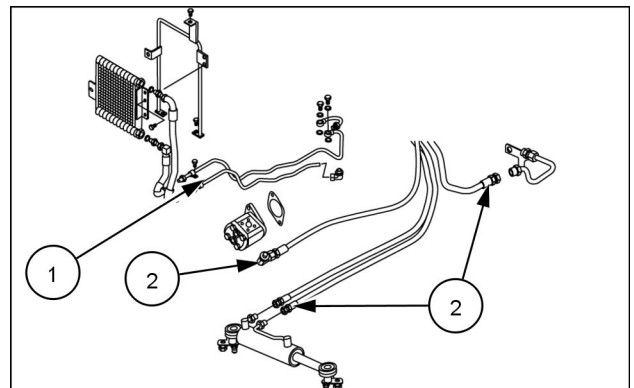
93102244 8

17. Disconnect the front high pressure tube **(1)**.



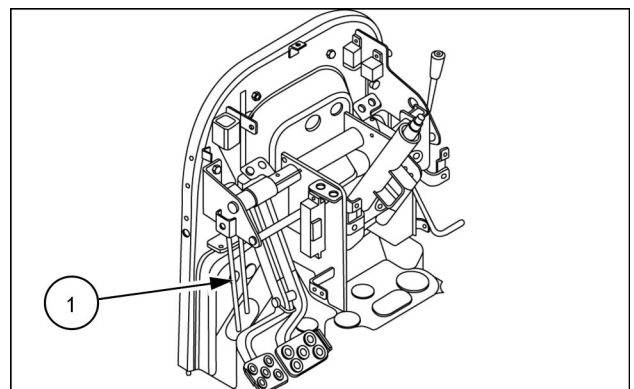
93102245 9

18. Disconnect steering hoses **(2)** and tubes **(1)**.



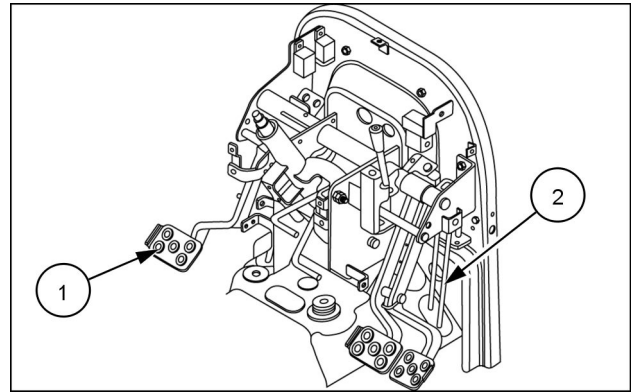
93102246 10

19. Disconnect brake the rod **(1)**, HST or gear transmission.



93102247 11

20. Disconnect brake rod **(2)** on the right-hand side and clutch rod on the left-hand side; gear transmission only.

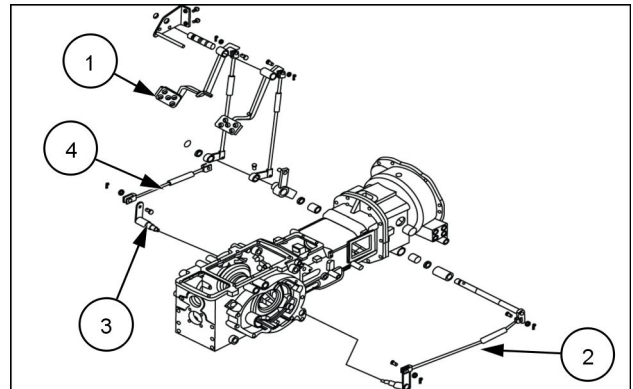


93102248 12

(1) Clutch pedal

Brake rod connection; HST transmission

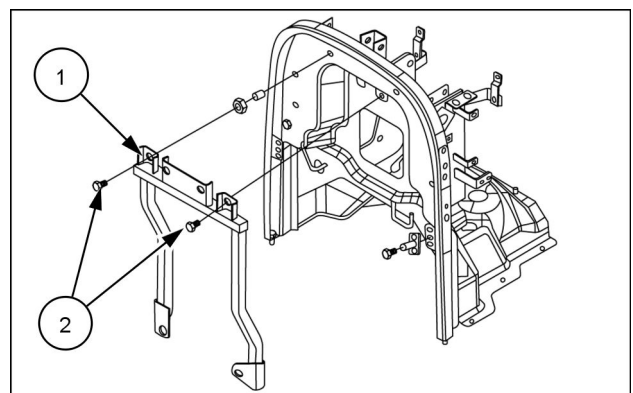
1. Disassemble the brake rods as shown in figure 13 .



93102250 13

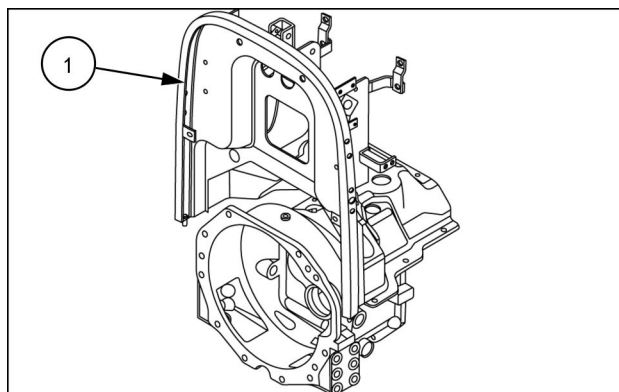
(1) Pedal **(3)** Arm
(2) Arm assembly **(4)** Rod

2. Remove the bolts **(2)** securing frame **(1)** to fire wall, and remove frame.



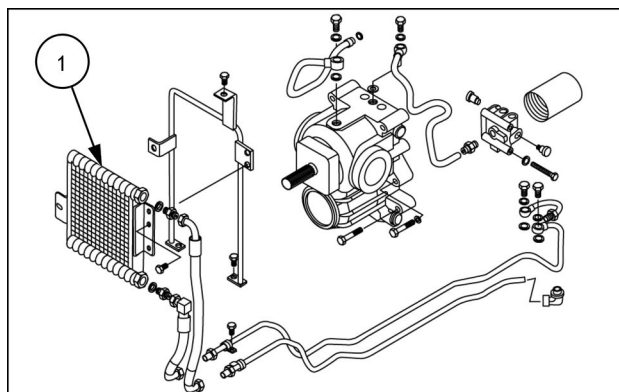
93102251 14

3. Remove the fire wall (1) with the aid of a hoist.



93102252 15

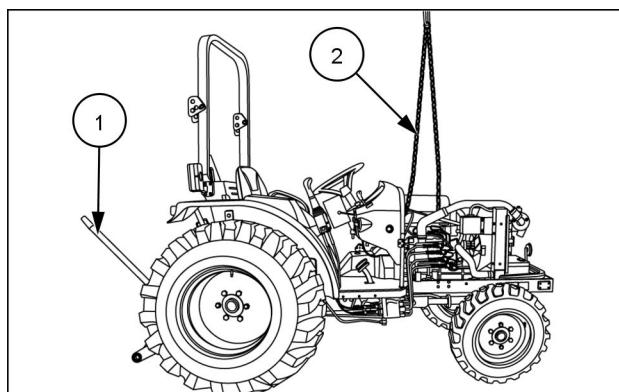
4. Disconnect and remove the oil cooler (1) and related parts, as shown in figure 16.



93102253 16

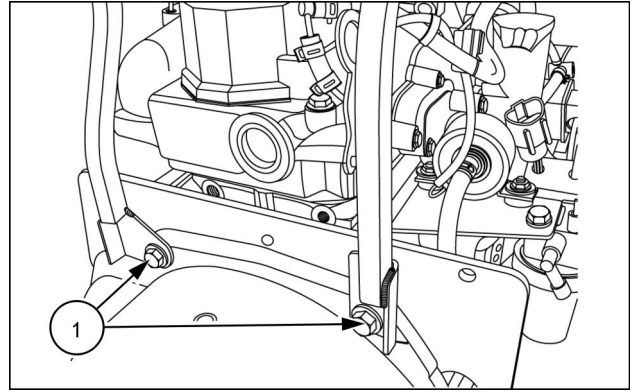
Secure the tractor for separation:

1. Attach a chain sling (2) to the two hoist eyes on the engine: One located on the left-hand side above the exhaust manifold, the other on the right-hand side to the rear of the injector rail.
2. Attach a suitable hoist to the chain sling.
3. Roll a floor jack (1) under the tractor from the rear of the tractor, and place under the clutch housing. Raise the jack enough to support the drive train.

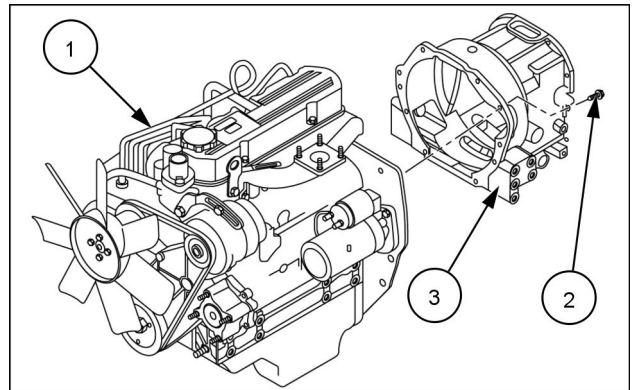


93105782 17

4. Remove the eight M12 bolts (2) holding the engine (1) and transmission (3), while checking front wheel drive shaft for separation from the transmission.



93102254 18



93105783 19

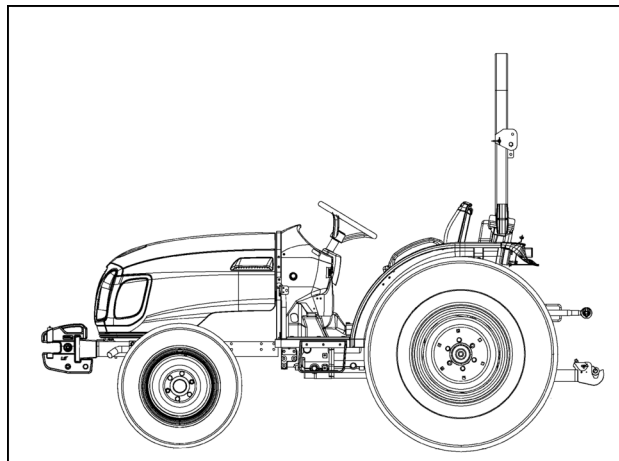
NOTE: The hoist and/or the floor jack may need to be raised or lowered to allow the separation of the engine from the clutch housing.

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

Engine - Remove - Separating the tractor at the center case/rear axle

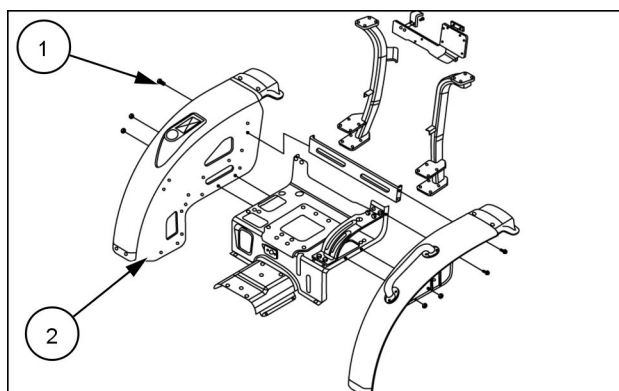
Farmall® 40B	NA Platform - With ROPS
Farmall® 50B	NA Platform - With ROPS

1. Block or jack both rear axle shaft housing so that the rear tires are lifted off the ground.
2. Use a suitable chain sling and hoist to support, but not lift, the engine and front of the tractor.
3. Drain transmission oil completely.
4. Remove rear tires.
5. Support rear axles.



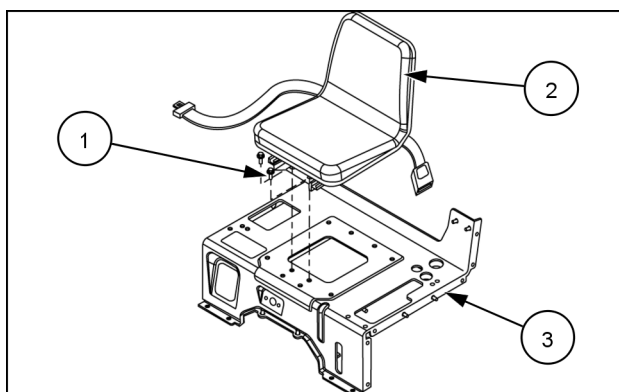
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6. Remove the M8 bolts (1) securing fenders (2), and remove fenders.



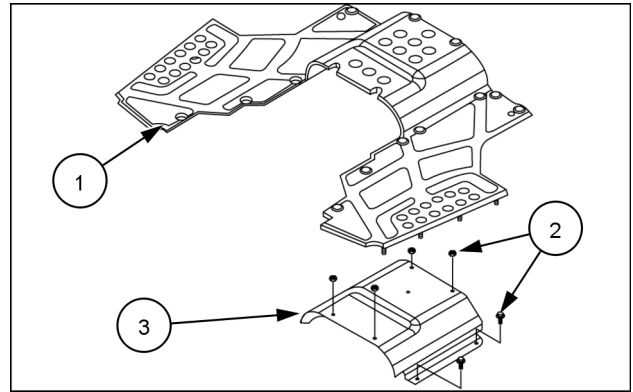
93102256 2

7. Remove M10x25 bolts (1), and remove seat (2) from center cover (3).



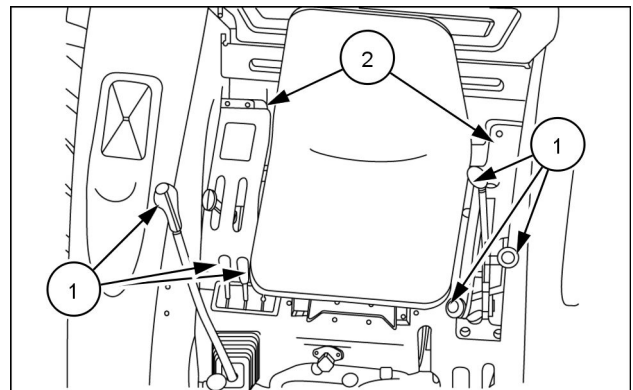
93102257 3

8. Remove mat **(1)**.
9. Remove securing bolt and nuts **(2)**, and remove cover **(3)**.



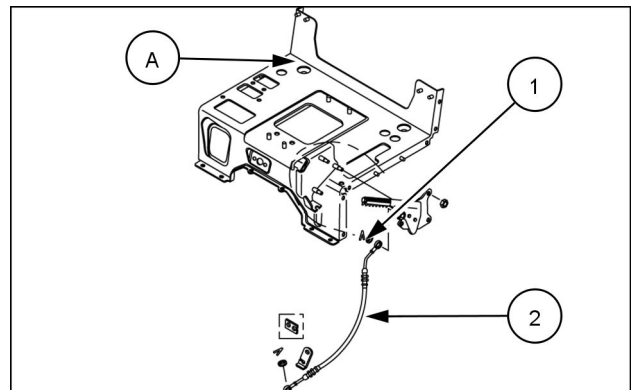
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10. Remove control knobs and grips **(1)**.
11. Disconnect wire harness from PTO and lift control.
12. Remove M8x16 bolts securing lever guides **(2)**.



93102259 5

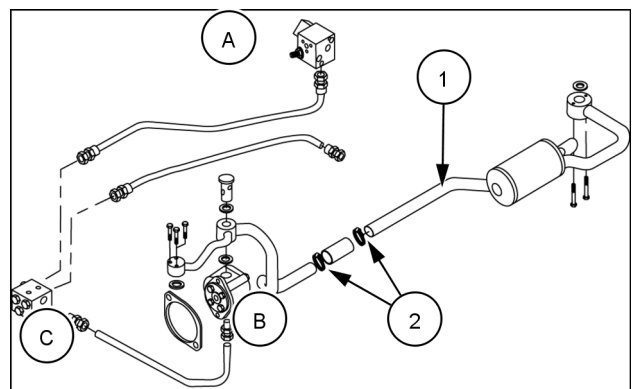
13. Remove snap ring **(1)** and disconnect the parking brake cable **(2)**.
14. Disconnect all rods.



93102260 6

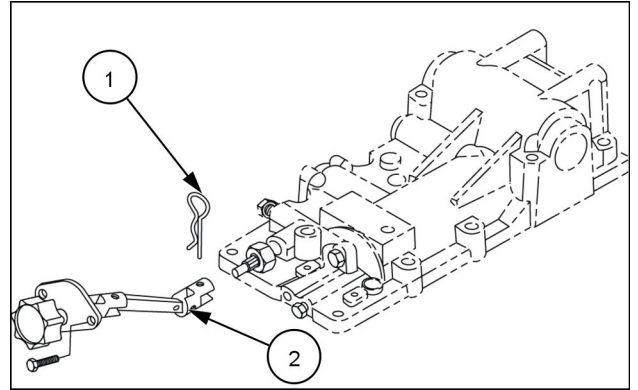
(A) Center cover

15. Position a drain pan beneath hydraulic suction tube **(1)** to collect oil.
16. Disassemble hydraulic suction tube, unfastening clamps **(2)**.
(A) PTO valve
(B) Pump
(C) Front valve



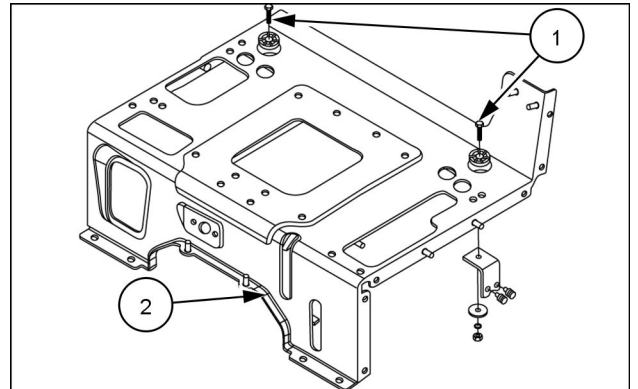
93102261 7

17. Remove cotter pin **(1)** at the end of drop speed control arm **(2)**.



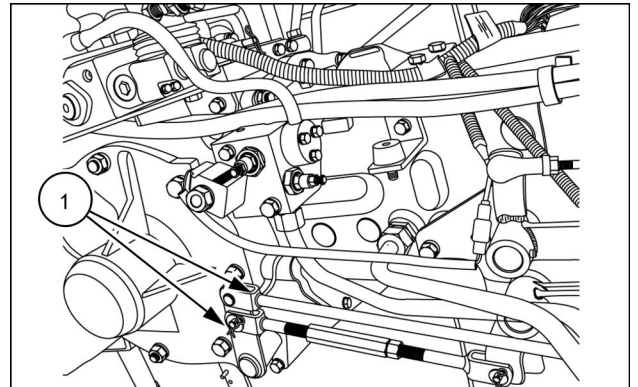
93102262 8

18. Remove M16 bolts **(1)**, and remove center cover **(2)**.



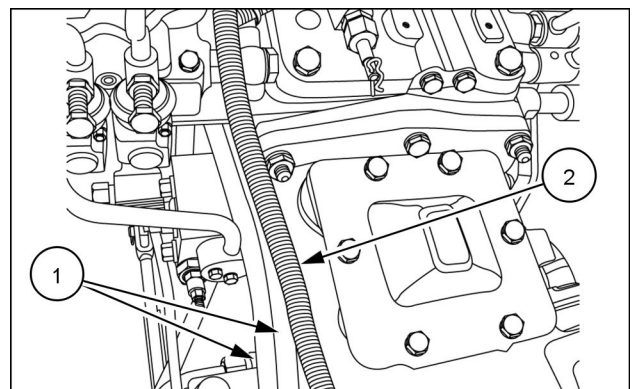
93102263 9

19. Disconnect brake rods **(1)**.



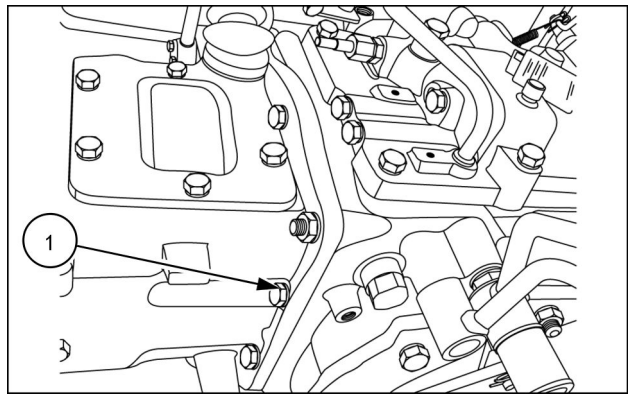
93102264 10

20. Disconnect fuel lines **(1)**, and harness **(2)**.



93102265 11

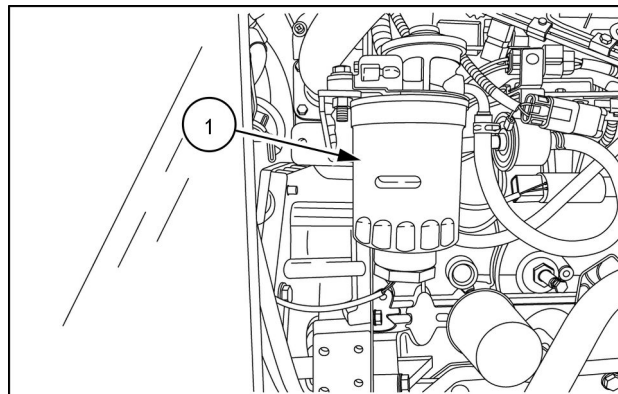
21. Remove M12 bolts (1), and separate cases.



93102266 12

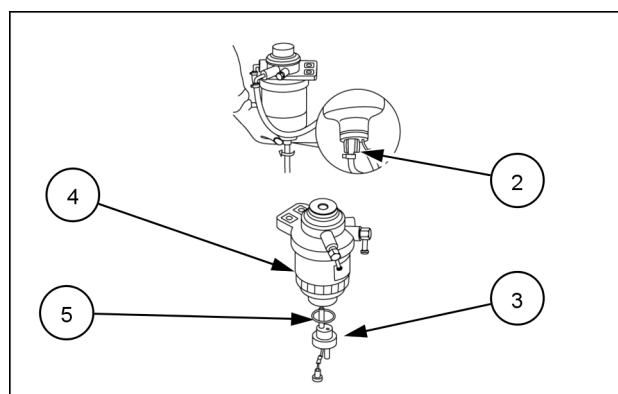
Fuel filters - Replace fuel filter

NOTE: Change the diesel fuel filter (1) after the first 50 hours of operation, then following every 500 operating hours thereafter.

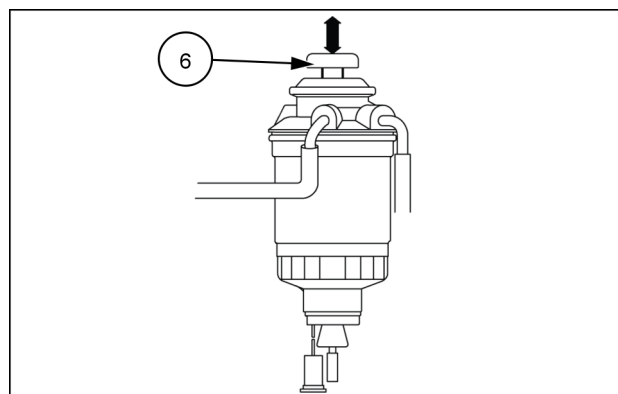


NHIL13CT01068AA 1

1. Loosen fuel filter drain plug (2) and drain fuel from the filter.
2. Disconnect the electrical connector from the fuel filter sensor (3).
3. Remove the fuel filter element (4) from the filter base
4. Remove the fuel filter sensor (3) from the original element and install sensor with O-ring (5) onto new element.
5. Install new element onto the filter base.
6. Connect electrical connector to the fuel filter sensor.
7. Tighten fuel filter drain plug.
8. Bleed the air from the fuel filter, by pressing the manual fuel feed pump (6) several times. The manual feed pump will bleed the air back to the fuel tank. There is no need to open any bleed ports in the fuel system.



93100920 2

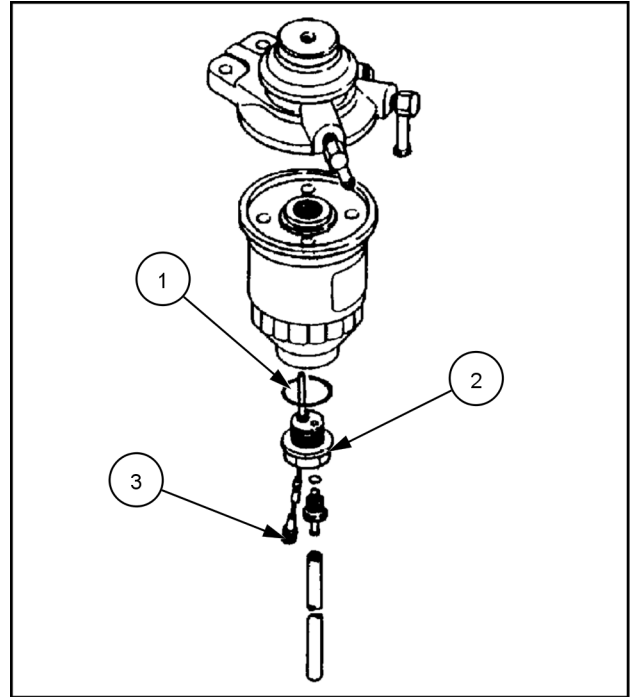


NHIL13CT01251AA 3

Fuel filters - Remove - Fuel filter sensor

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Farmall® 50B	NA Platform - With ROPS

1. Disconnect the sensor electrical connector **(3)** from the tractor wiring harness.



761002933 1

2. Rotate sensor **(2)** counterclockwise until sensor is free from the bottom of the fuel filter.
3. Inspect O-ring **(1)** for damage and replace if necessary.

Fuel filters - Test - Fuel filter sensor

Farmall® 40B

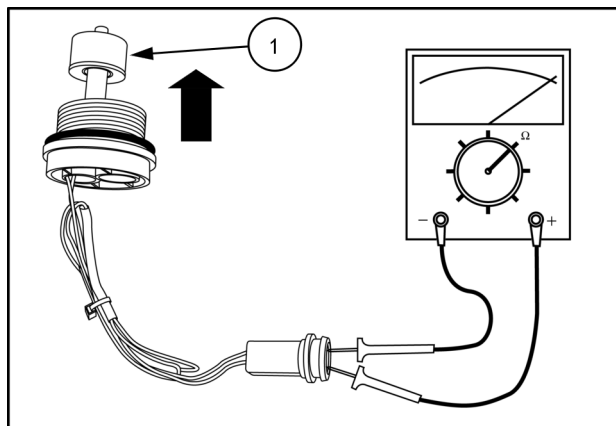
NA Platform - With ROPS

Farmall® 50B

NA Platform - With ROPS

Float in "TOP" position

1. Install an ohmmeter across the terminals of the sensor connector.

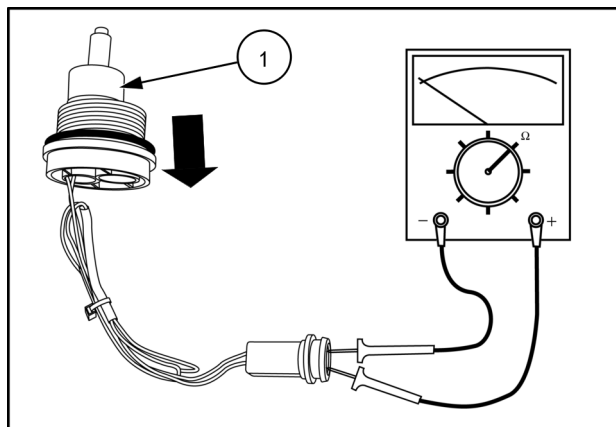


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2. Move the float (1) to the full top position.
3. There should be continuity across the terminals.
4. If continuity reading does not match as stated in the test procedure, replace the sensor.

Float in "BOTTOM" position

1. Install an ohmmeter across the terminals of the sensor connector.



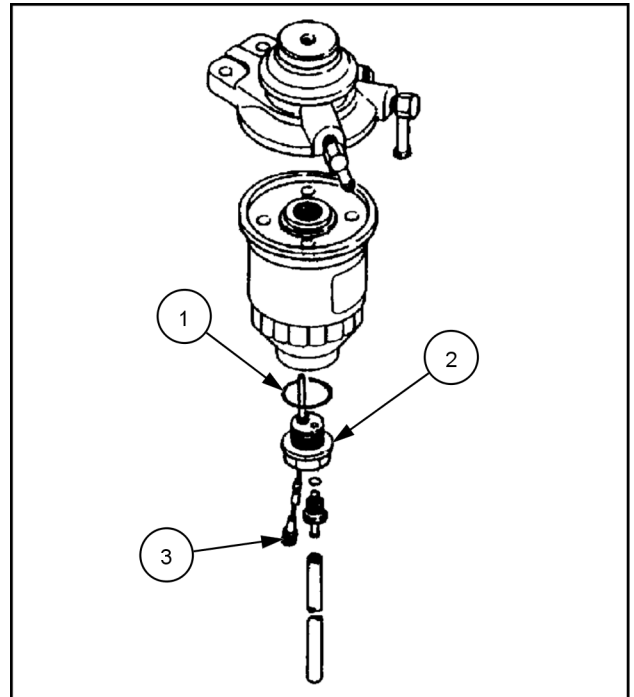
76110377 2

2. Move the float (1) to the full bottom position.
3. There should not be any continuity across the terminals.
4. If continuity reading does not match as stated in the test procedure, replace the sensor.

Fuel filters - Install - Fuel filter sensor

Farmall® 40B	NA Platform - With ROPS
Farmall® 50B	NA Platform - With ROPS

1. Install O-ring **(1)**.
2. Thread sensor **(2)** into the bottom of the fuel filter.
3. Connect sensor electrical connector **(3)** with tractor wiring harness.



761002933 1

Injection pump - Timing adjust

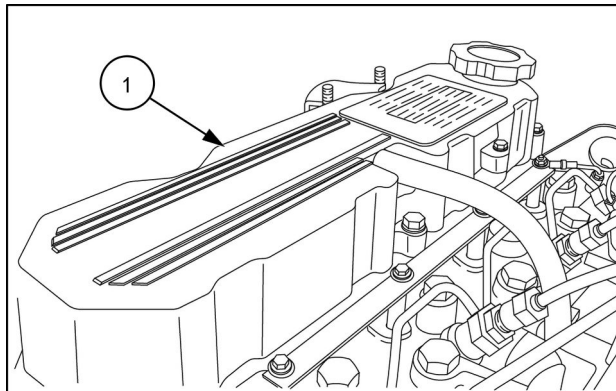
Farmall® 40B

NA Platform - With ROPS

Farmall® 50B

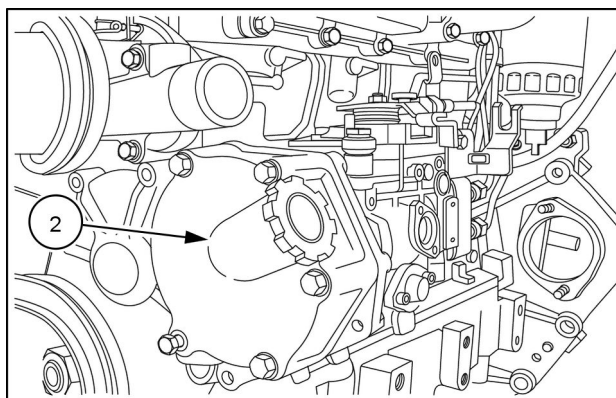
NA Platform - With ROPS

1. Remove the engine valve cover (1).

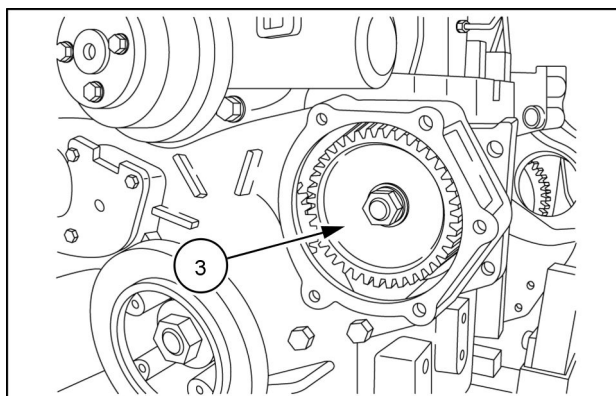


NHIL13CT00757AA 1

2. Remove the oil fill cover (2) from the timing gear housing to gain access to the injection pump gear (3).

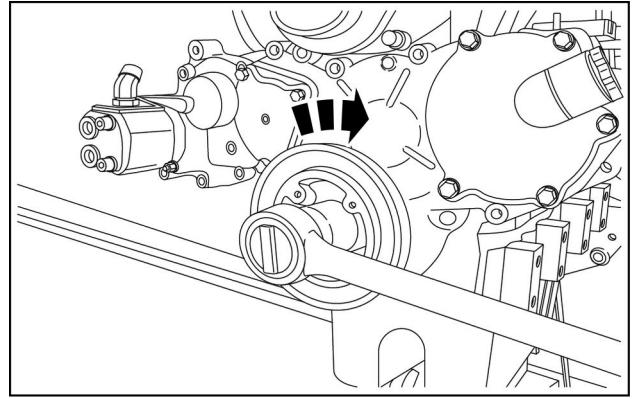


NHIL13CT00756AA 2

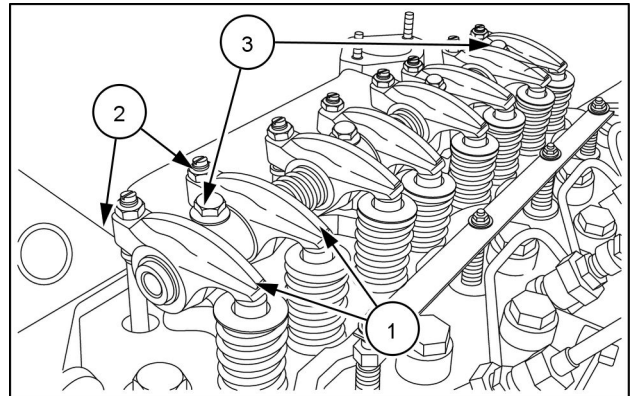


NHIL12ENG0079AA 3

3. Rotate the engine crankshaft clockwise until both #1 cylinder valve rockers (1) and push rods (2) are loose. This indicates compression stroke of #1 cylinder.
4. Remove rocker arm assembly (3) from the engine cylinder head.

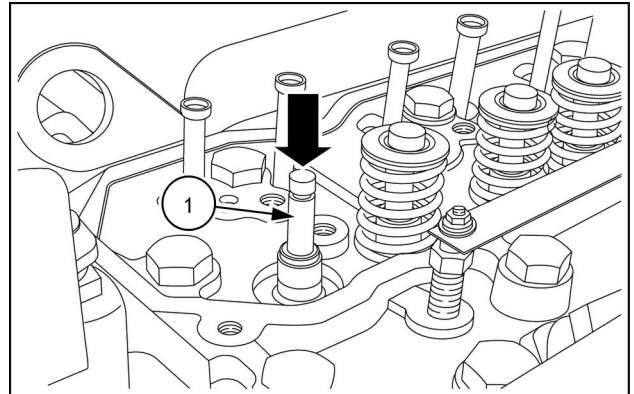


NHIL13CT00761AA 4



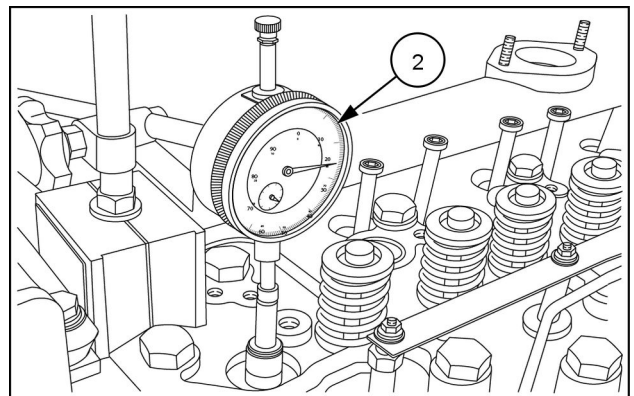
NHIL13CT00758AA 5

5. Remove the valve keepers and spring from one of the #1 cylinder valves.
6. Push valve (1) downwards until valve contacts the top of the piston.



NHIL13CT00760AA 6

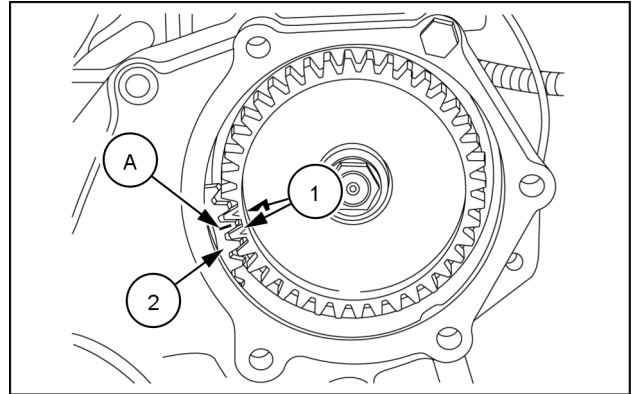
7. Install a dial indicator (2) of top of the valve stem.



NHIL13CT00759AA 7

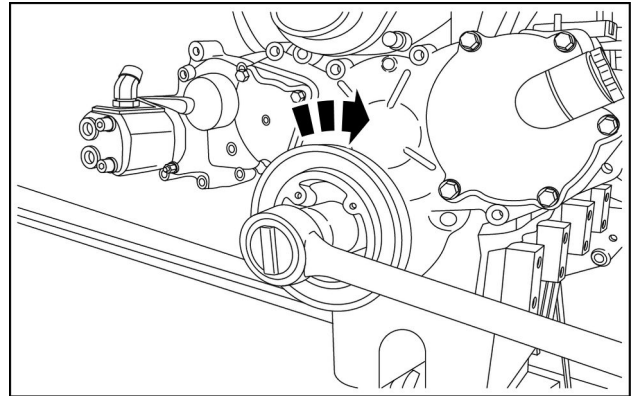
NOTICE: Read the following procedure before removing the injection pump from the engine.

8. Rotate the crankshaft clockwise until the “V V” timing marks **(1)** on the injection pump gear are at approximately 8 o'clock position and are in full tooth engagement with the idler gear **(2)**. Mark the idler gear tooth **(A)** with a paint pen at this time.

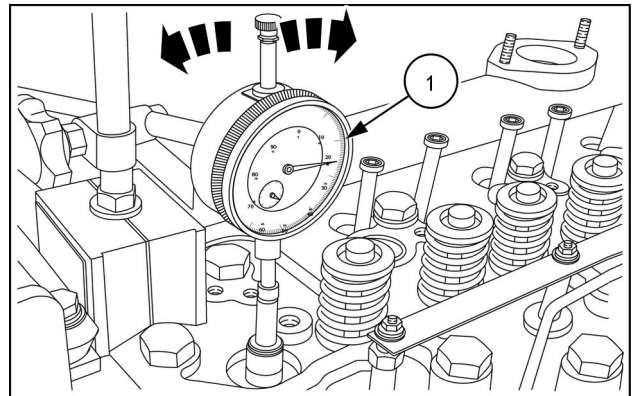


NHIL12ENG0075AA 8

9. Rotate the crankshaft clockwise until the valve travel shown on the dial indicator **(1)** reverses direction. The point at when the valve direction reverses is top dead center or “TDC” of the #1 piston travel.

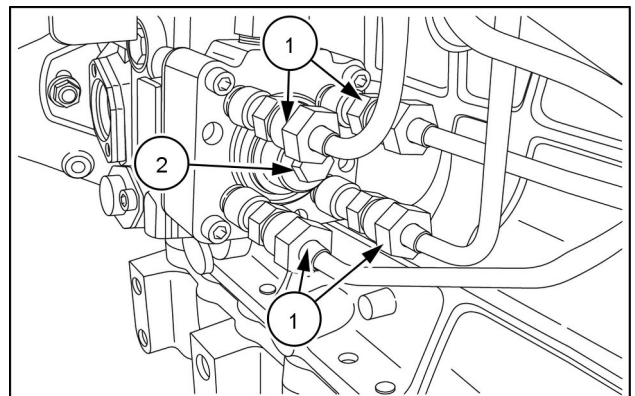


NHIL13CT00761AA 9



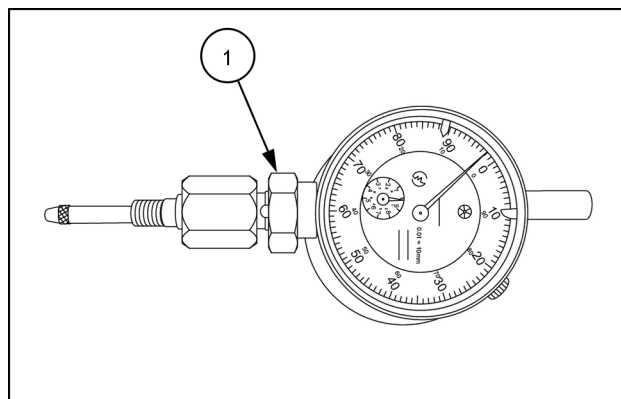
NHIL13CT00759AA 10

10. Remove injector lines **(1)** and head bolt **(2)** from the rear of the fuel injection pump.

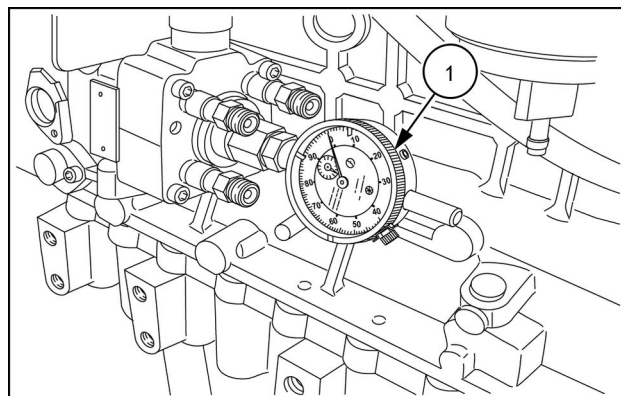


NHIL13CT00755AA 11

11. Install special adapter with dial indicator (**1**) tool # **CAS1745** into the rear of the injection pump.
12. Pre load the dial indicator approximately **2.5 mm (0.098 in)** .

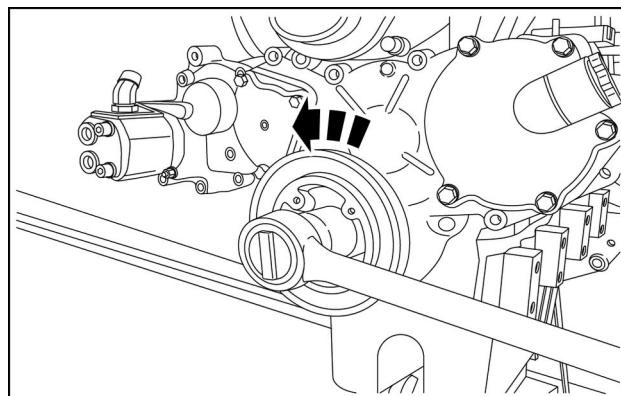


NHIL13CT00763AA 12



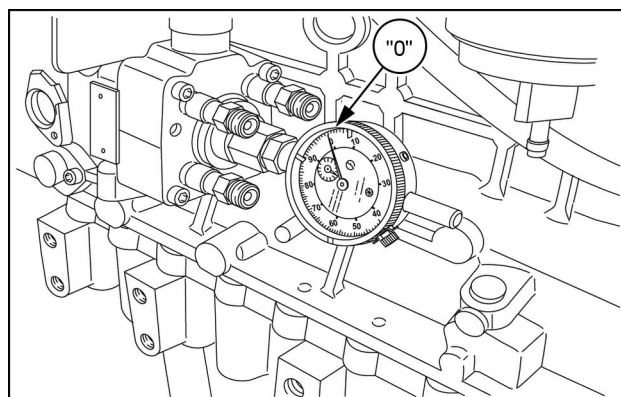
NHIL13CT00764AA 13

13. Rotate the crankshaft counter-clockwise approximately 30 ° until the dial indicator on the injection pump STOPS moving. Stop rotating the crankshaft at this point.



NHIL13CT00761AA 14

14. Adjust the dial indicator to ZERO at this time.



NHIL13CT00764AA 15



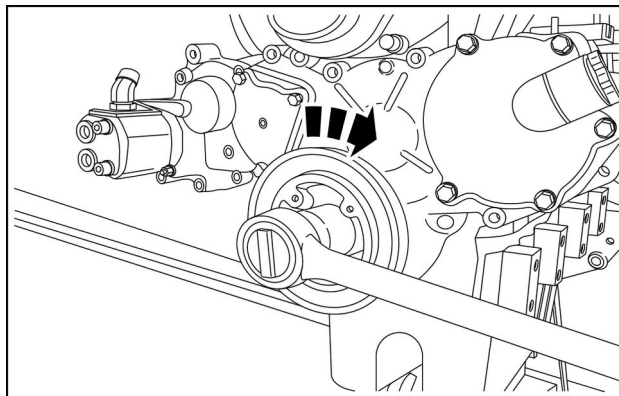
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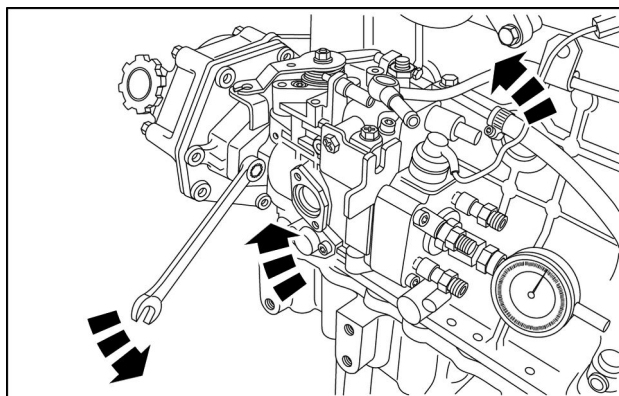
Thank you so much for reading

15. Rotate the crankshaft pulley clockwise until the until top dead center (TDC) of #1 cylinder is obtained.

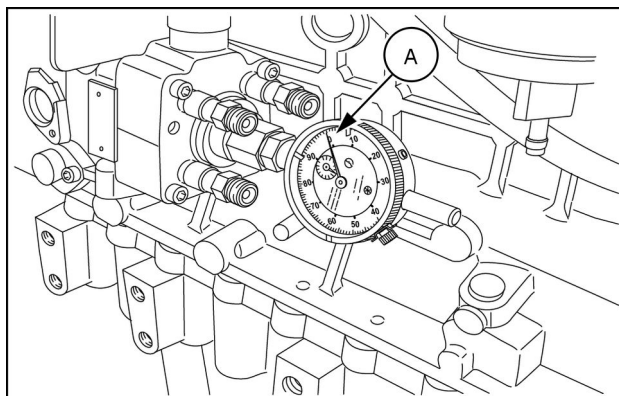


NHIL13CT00761AA 16

16. Loosen the injection pump mounting bolts and rotate the pump to adjust pump timing until total dial indicator movement (A) from the ZERO setting reads the following:



NHIL13CT00765AA 17



NHIL13CT00764AA 18

Engine model	Tractor model	Dial indicator total movement (A)
S4QL-D (41 HP)	Boomer 40	1.05mm (0.041 in)
S4QL (47 HP)	Boomer 50	0.945mm (0.037 in)

Engine model	Tractor model	Injection pump timing specification
S4QL-D (41 HP)	Boomer 40	After top dead center 1° (ATDC1)
S4QL (47 HP)	Boomer 50	Before top dead center 1° (BTDC1)

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