

Farmall 45A Farmall 50A Tractor

SERVICE MANUAL

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SERVICE MANUAL

Farmall® 45A

Farmall® 50A 50 Hp, Tier 2 Utility tractor, Two-Wheel Drive (2WD), Europe

Farmall® 50A 50 Hp, Tier 2 utility tractor, Four-Wheel Drive (4WD), Europe

Link Product / Engine

Product	Market Product	Engine
Farmall® 45A 45 Hp, Tier 2 utility tractor, Four-Wheel Drive (4WD), Europe	Europe	N844LT
Farmall® 50A 50 Hp, Tier 2 Utility tractor, Two-Wheel Drive (2WD), Europe	Europe	N844L
Farmall® 50A 50 Hp, Tier 2 utility tractor, Four-Wheel Drive (4WD), Europe	Europe	N844L

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INTRODUCTION

Foreword

This repair manual provides the technical information needed to properly service the Case IH Farmall 45A and Farmall 55A model tractors. Use this manual in conjunction with the operator's manual for complete operation, adjustment, and maintenance information

On Case IH equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

Foreword Ecology and the Environment

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances which are required by advanced technology, common sense should govern the use and disposal of products of a chemical and petrochemical nature.

NOTICE: *The following are recommendations which may be of assistance:*

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use and dispose of these substances.
- Agricultural consultants will, in many cases, be able to help you as well.

HELPFUL HINTS

- Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems which may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances which 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 draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
- Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil but should be collected and disposed of properly.
- Do not open the air-conditioning system yourself. It contains gases which should not be released into the atmosphere. Your CASE IH dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system properly.
- Repair any leaks or defects in the engine cooling 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 as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

Safety rules

PRECAUTIONARY STATEMENTS

Personal Safety

Throughout this manual and on machine signs, you will find precautionary statements ("DANGER", "WARNING", and "CAUTION") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.



DANGER



This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

M1169



WARNING



This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

M1170



CAUTION



This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW .

M1171

FAILURE TO FOLLOW THE "DANGER", "WARNING", AND "CAUTION" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

Machine Safety

The precautionary statement ("IMPORTANT") is followed by specific instructions. This statement is intended for machine safety.

NOTICE: The word "IMPORTANT" is used to inform the reader of something they need to know to prevent minor machine damage if a certain procedure is not followed.

Information

NOTE: Instructions used to identify and present supplementary information.

LEGAL OBLIGATIONS

This machine may be equipped with special guarding or other devices in compliance with local legislation. Some of these require active use by the operator. Therefore, check local legislation on the usage of this machine.

ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of a non compliance to simple and fundamental safety regulations. For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of machines, regardless of how well the machine in question was designed and built.

A careful and informed service technician is the best guarantee against accidents.

Decisive awareness of the most basic safety rule is normally sufficient to avoid many serious accident.



Shut down the machine, remove key, be sure all moving parts have stopped and all pressure in the systems is relieved before cleaning, adjusting or lubricating the equipment. Failure to comply will result in death or serious injury.

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SAFETY REQUIREMENTS FOR FLUID POWER SYSTEMS AND COMPONENTS - HYDRAULICS (EUROPEAN STANDARD PR EM 982)

Flexible hose assemblies must not be constructed from hoses which have been previously used as part of a hose assembly.

Do not weld hydraulic piping.

When flexible hoses or piping are damaged, replace them immediately.

It is forbidden to modify a hydraulic accumulator by machining, welding or any other means.

Before removing hydraulic accumulators for servicing, the liquid pressure in the accumulators must be reduced to zero.

Pressure check on hydraulic accumulators shall be carried out by method recommended by the accumulator manufacturer.

Care must be taken not to exceed the maximum allowable pressure of the accumulator. After any check or adjustment there must be no leakage of gas.

SAFETY RULES

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this tractor. Equipment should be operated only by those who are responsible and instructed to do so.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved roll bar and seat belt for safe operation. Overturning a tractor without a roll bar can result in death or injury. If your tractor is not equipped with a roll bar and seat belt, see your CASE IH Dealer.
3. Always use the seat belt. The only instance when the seat belt should not be used is if the roll bar has been removed from the tractor or folding ROPS is in down position.
4. If a front end loader is to be installed, always use a FOPS (Falling Object Protective Structure) canopy to avoid injury from falling objects.
5. Use the handholds and step plates when getting on and off the tractor to prevent falls. Keep steps and platform cleared of mud and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Keep all safety decals clean of dirt and grime, and replace all missing, illegible, or damaged safety decals. See the list of decals in the Decal section of this manual.

SERVICING THE TRACTOR

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap entirely.
2. Keep any type of open flame away from the tractor and do not smoke while refueling. Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. Keep open flame or cold weather starting aids away from the battery to prevent fires or explosions. Use jumper cables according to instructions to prevent sparks which could cause explosion.
5. Stop the engine before performing any service on the tractor.

INTRODUCTION

6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury. If fluid is injected into the skin, obtain medical attention immediately or gangrene may result.
 - DO NOT use your hand to check for leaks.
 - Use a piece of cardboard or paper to search for leaks.
 - Stop the engine and relieve pressure before connecting or disconnecting lines.
 - Tighten all connections before starting the engine or pressurizing lines.
7. Do not modify or permit anyone else to modify or alter this tractor or any of its components or functions without first consulting a CASE IH Dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle, or any other part of the fuel injection system. Failure to follow these instructions can result in serious injury.
9. Continuous long-term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.
10. Some components of your tractor, such as gaskets and friction surfaces (brake linings, clutch linings, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are advised to have any maintenance or repair on such components carried out by an authorized CASE IH Dealer. However, if service operations are to be undertaken on parts that contain asbestos, the essential precautions listed below must be observed:
 - Work out of doors or in a well ventilated area.
 - Dust found on the tractor or produced during work on the tractor should be removed by extraction, not by blowing.
 - Dust waste should be dampened, placed in a sealed container, and marked to ensure safe disposal.
 - If any cutting, drilling, etc. is attempted on materials containing asbestos, the item should be dampened and only hand tools or low speed power tools used.

OPERATING THE TRACTOR

1. Before starting the tractor, apply the parking brake, place the PTO lever in the 'OFF' position, the lift control lever in the down position, the remote control valve levers in the neutral position, and the transmission in neutral.
2. Always sit in the tractor seat when starting the engine or operating controls. Do not start the engine or operate controls while standing beside the tractor.
3. Do not bypass the neutral start switches. Consult your CASE IH Dealer if your neutral start controls malfunction. Use jumper cables only in the recommended manner. Improper use can result in tractor runaway.
4. Avoid accidental contact with the gear shift lever while the engine is running, as this can cause unexpected tractor movement.
5. Before getting off the tractor, disengage the PTO, turn the engine off, and apply the parking brake. Never get off the tractor while it is in motion.
6. Do not park the tractor on a steep incline.
7. Do not operate the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death or illness.
8. If the power steering or engine ceases operating, stop the tractor immediately.
9. Pull only from the drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to upset.
10. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.
11. Always set the hydraulic selector lever in position control when attaching or transporting equipment. Ensure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement.
12. Do not leave equipment in the raised position.
13. Use the flasher/turn signal lights and SMV signs when traveling on public roads both day and night (unless prohibited by law).
14. When operating at night, adjust lights to prevent blinding oncoming drivers.

DRIVING THE TRACTOR

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the tractor with care and at a safe speed. Use extra caution when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. To provide two-wheel braking, lock tractor brake pedals together when transporting on roads.
4. Do not coast or free wheel down hills. Use the same gear when going downhill as is used when going uphill.
5. Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
6. If the tractor becomes stuck or the tires become frozen to the ground, back up the tractor to prevent upset.
7. Always check overhead clearance, especially when transporting the tractor.
8. When operating at night, adjust lights to prevent blinding oncoming drivers.

OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or when near rotating equipment.
3. When operating stationary PTO driven equipment, always place all gear shift levers in neutral position.
4. To avoid injury, do not clean, adjust, unclog, or service PTO driven equipment when the tractor engine is running.
5. Ensure the PTO master shield is installed at all times. Always replace the PTO shield cap when the PTO is not in use.

DIESEL FUEL

1. UNDER NO CIRCUMSTANCES should gasoline, alcohol, or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container such as a fuel tank. DO NOT USE THESE BLENDS.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling or when standing near fuel.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with a CASE IH approved cap. A non-approved, proprietary cap may not be safe.
9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that winter grade fuels are not held over and used in the spring.

SAFETY FRAME (ROPS)

Your CASE IH tractor is equipped with a safety frame. It must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

UNDER NO CIRCUMSTANCES should you:

- Modify, drill, or alter the safety frame in any way. Doing so may render you liable to legal prosecution.
- Attempt to straighten or weld any part of the main frame or retaining brackets which have suffered damage. Doing so may weaken the structure and endanger your safety.
- Secure any parts on the main frame or attach your safety frame with anything other than the special high tensile bolts and nuts specified.
- Attach chains or ropes to the main frame for pulling purposes.



SERVICE MANUAL

Engine

Farmall® 45A

Farmall® 50A 50 Hp, Tier 2 Utility tractor, Two-Wheel Drive (2WD), Europe

Farmall® 50A 50 Hp, Tier 2 utility tractor, Four-Wheel Drive (4WD), Europe

Engine - General specification

General		
Engine Model	ISM N844L	ISM N844LT
Number of Cylinders	4	4
Bore x Stroke	84 mm x 100 mm (3.31 in x 3.94 in)	84 mm x 100 mm (3.31 in x 3.94 in)
Displacement	2216 cm ³ (135.2 in ³)	2216 cm ³ (135.2 in ³)
Compression Ratio	22.4:1	23.4:1
Rated Speed	2700 RPM	2700 RPM
Gross Engine Horsepower	33.6 kW (45.7 Hp)	41 kW (55.7 Hp)
PTO Horsepower at 2250 Engine and 766 PTO rpm	26.1 kW (35.5 Hp)	31.3 kW (42.6 Hp)
Firing Order	1-3-4-2	1-3-4-2
Low Idle Speed	1050±50 RPM	1100±50 RPM
Maximum No-Load Speed	2900~2950 RPM	2900~2950 RPM
Cylinder Arrangement	In-Line Vertical	In-Line Vertical
Valve Arrangement	Overhead	Overhead
Compression Pressure at 200 RPM(cylinder speed)	2944 ± 345 kPa (427 ± 50 psi)	2944 ± 345 kPa (427 ± 50 psi)
Variation between cylinders	345 kPa (50 psi)	345 kPa (50 psi)

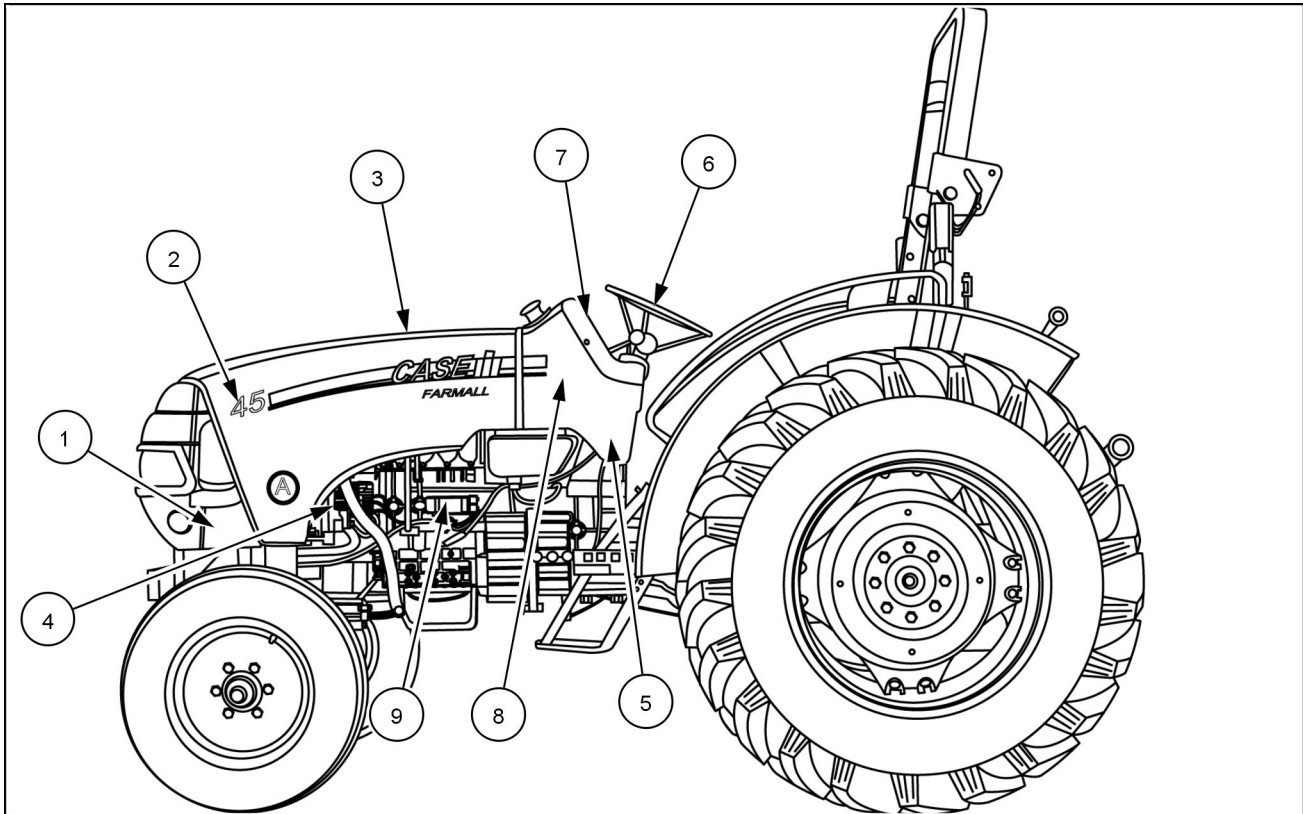
NOTE: If bore size exceeds 85.2 mm (3.3543 in) replace with long block.

Engine - Torque

Model		Farmall 50A
Engine Model	ISM N844L	ISM N844LT
TORQUE SPECIFICATION		
Connecting Rod Cap Bolts	49 – 54 N·m (36 – 40 lb ft)	49 – 54 N·m (36 – 40 lb ft)
Main Bearing Retaining Bolts	49 – 54 N·m (36 – 40 lb ft)	49 – 54 N·m (36 – 40 lb ft)
Relief Valve Assembly	59 – 69 N·m (43 – 51 lb ft)	59 – 69 N·m (43 – 51 lb ft)
Crankshaft Main Bearing Holder Bolts		
Rear Main	25 – 29 N·m (18 – 22 lb ft)	25 – 29 N·m (18 – 22 lb ft)
Center Mains	49 – 54 N·m (36 – 40 lb ft)	49 – 54 N·m (36 – 40 lb ft)
Engine Rear Mounting Plate	12 – 17 N·m (9 – 12 lb ft)	12 – 17 N·m (9 – 12 lb ft)
Flywheel Retaining Bolts	68 – 78 N·m (51 – 58 lb ft)	68 – 78 N·m (51 – 58 lb ft)
Engine Front Plate	9 – 12 N·m (6 – 9 lb ft)	9 – 12 N·m (6 – 9 lb ft)
Crankshaft Pulley Nut	274 – 333 N·m (202 – 246 lb ft)	274 – 333 N·m (202 – 246 lb ft)
Cylinder Head Bolts	98 – 103 N·m (72.3 – 76 lb ft)	98 – 103 N·m (72.3 – 76 lb ft)
Rocker Arm Assembly	27 – 39 N·m (20 – 29 lb ft)	27 – 39 N·m (20 – 29 lb ft)
Rocker Arm Locknut	11 – 16 N·m (8 – 12 lb ft)	11 – 16 N·m (8 – 12 lb ft)
Oil Tube Banjo Bolt	9 – 13 N·m (7 – 9 lb ft)	9 – 13 N·m (7 – 9 lb ft)
Oil Pressure Switch	14 – 20 N·m (10 – 14 lb ft)	14 – 20 N·m (10 – 14 lb ft)
Rocker Cover Bolts	7 – 12 N·m (6 – 9 lb ft)	7 – 12 N·m (6 – 9 lb ft)
Glow Plugs	14 – 20 N·m (10 – 14 lb ft)	14 – 20 N·m (10 – 14 lb ft)
Cooling Fan Bolts	9 – 13 N·m (7 – 9 lb ft)	9 – 13 N·m (7 – 9 lb ft)
Balancer		
Retaining Bolts	49 – 53.9 N·m (36 – 39 lb ft)	49 – 53.9 N·m (36 – 39 lb ft)

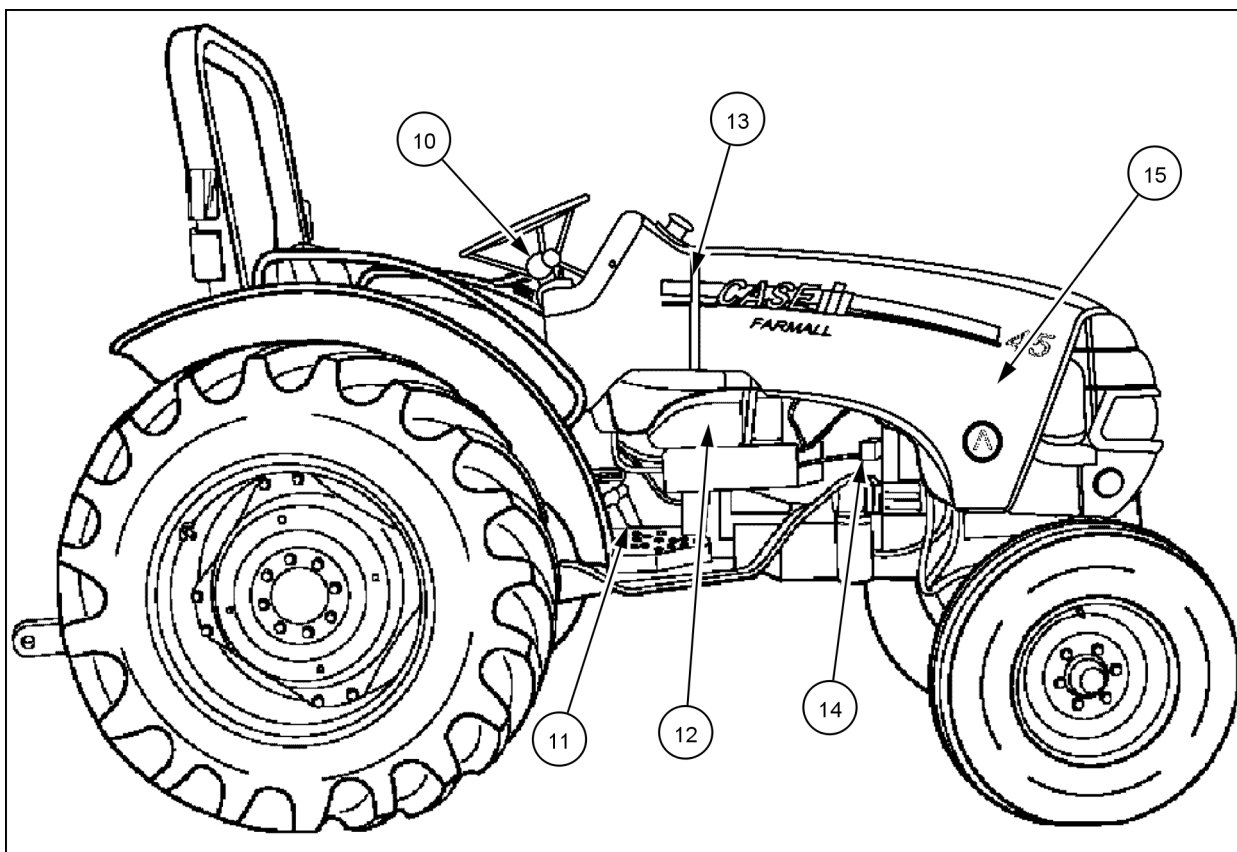
Engine - Remove Separating the tractor at the clutch housing/engine - 8x8 transmission

Removal



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1. Disconnect the negative (-) battery cable, and the positive (+) battery cable from the battery, **(1)**.
2. Disconnect the headlight wiring harness, **(2)**, and remove the hood, **(3)**.
3. If equipped, remove the remote loader control valve, and all the connecting hydraulic tubes from the right side loader tower.
4. Remove the left-hand and right-hand engine side covers, **(4)**.
5. Remove the left-hand, right-hand and center rear hood panels, **(5)**.
6. Remove the steering wheel, **(6)**.
7. Remove the instrument panel, **(7)**, from the dash housing. Disconnect all electrical connectors from the instrument panel.
8. Remove the dash housing, **(8)**, from the firewall. Disconnect all electrical connectors from the dash housing.
9. Disconnect electrical harness to the starter, **(9)**.

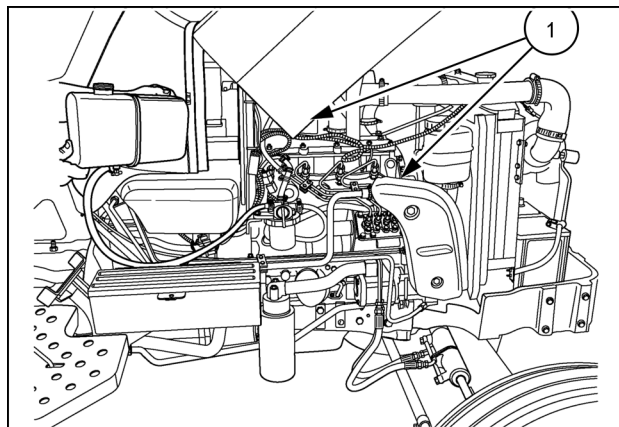


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10. Disconnect and remove the throttle cable from the dash mounted throttle control lever, (10).
11. Disconnect and remove the throttle cable from the foot control pedal, (11).
12. Drain fuel from fuel tank, (12), into a suitable container. Remove fuel tank from firewall.
13. Remove the firewall, (13), from the tractor.
14. Disconnect all hydraulic tubes (14), to the hydraulic pump, (15).
15. Attach a chain sling to the two hoist eyes, (1).
16. Attach a suitable hoist to the chain sling.

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

17. Roll a floor jack under the rear of the tractor, and place under the clutch housing. Raise the jack enough to support the drive train.

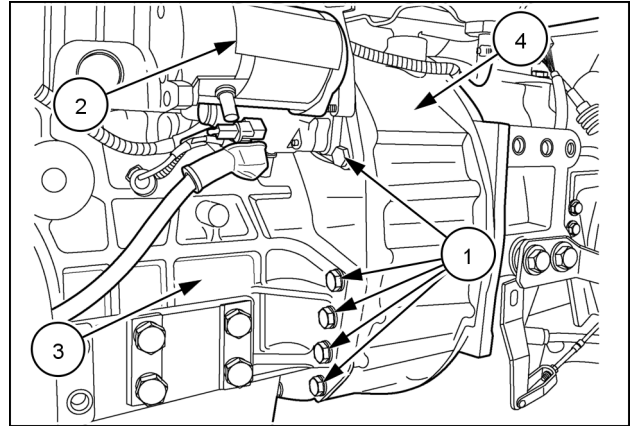


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18. Remove the buckle-up bolts, **(1)**, and starter, **(2)**, that secure the engine, **(3)**, to the clutch housing, **(4)**.

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

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



86071895 4

Next operation:

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

Engine - Remove Separating the tractor at the engine/frame

Prior operation:

Engine - Remove Separating the tractor at the clutch housing/engine - 8x8 transmission (10.001)

1. Use jack stands under the frame rails to support the front frame/engine assembly.



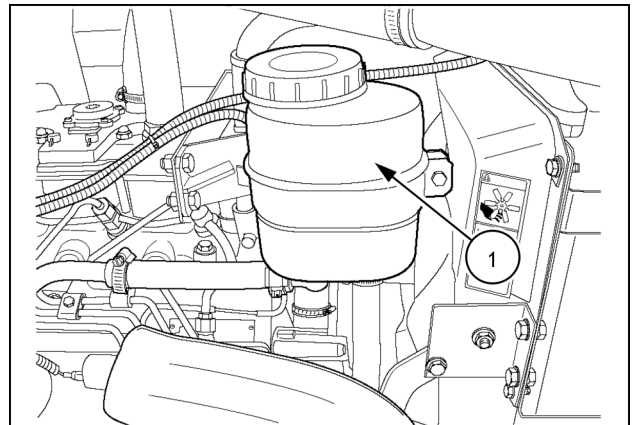
WARNING



The front frame/engine assembly is extremely heavy and awkward. Make sure the assembly is securely supported before removing chain sling from engine. Failure to comply could result in death or serious injury.

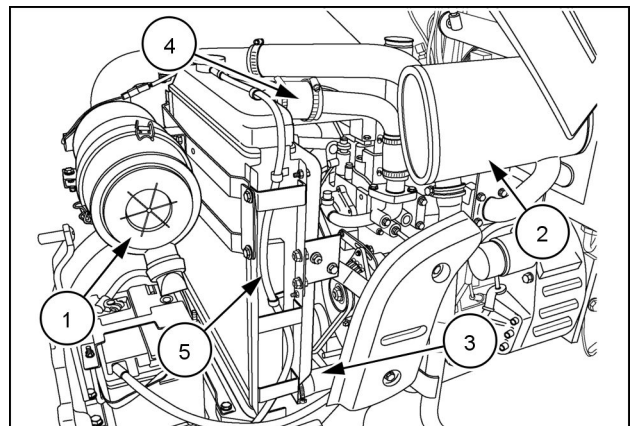
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2. Remove the chain sling from the two hoist eyes on the engine.
3. Drain the hydraulic fluid from the power steering reservoir, (1), into a suitable container. Remove the reservoir, (1), and mounting bracket from the engine.



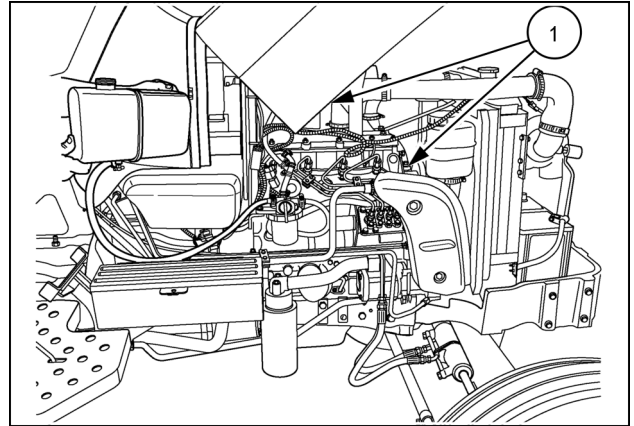
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4. Remove the air cleaner assembly, (1), from the tractor.
5. Remove the muffler and tailpipe assembly, (2), from engine.
6. Loosen the lower radiator hose, (3), and drain the coolant into a suitable container.
7. Remove the lower, (3), and upper, (4), radiator hoses.
8. Remove the radiator, (5), from the tractor.



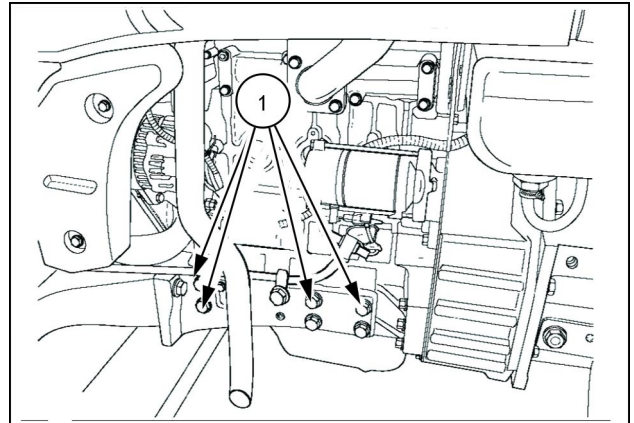
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9. Attach a chain sling to the two hoist eyes, **(1)**.
10. Attach a suitable hoist to the chain sling, and raise the engine enough to support the engine.



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



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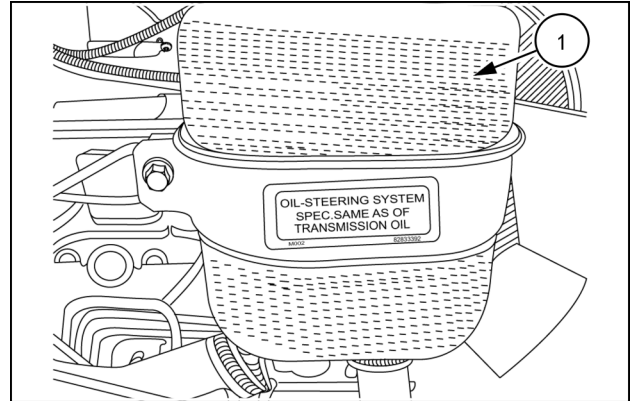
Next operation:
Engine - Install - To frame (10.001)

Engine - Remove Separating the tractor at the engine/frame

Prior operation:

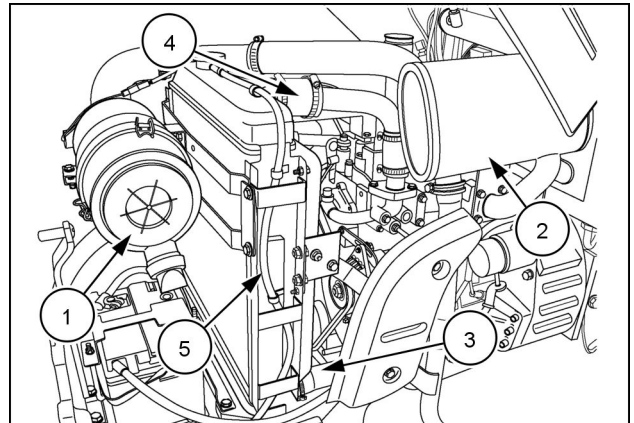
Engine - Remove Separating the tractor at the clutch housing/engine - 8x8 transmission (10.001)

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. Drain the hydraulic fluid from the power steering reservoir, (1), into a suitable container. Remove the reservoir, (1), and mounting bracket from the engine.



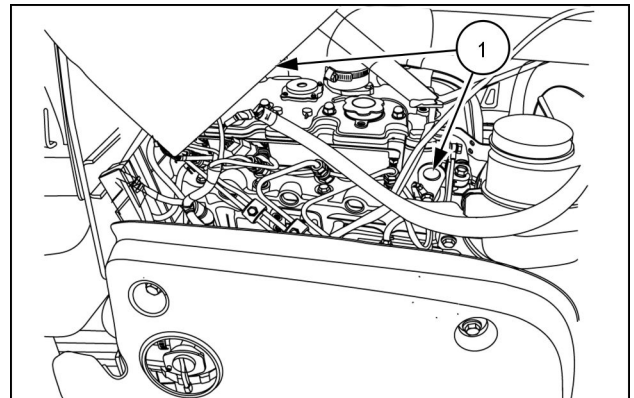
20108451 1

4. Remove the air cleaner assembly, (1), from the tractor.
5. Remove the muffler and tailpipe assembly, (2), from engine.
6. Loosen the lower radiator hose, (3), and drain the coolant into a suitable container.
7. Remove the lower, (3), and upper, (4), radiator hoses.
8. Remove the radiator, (5), from the tractor.



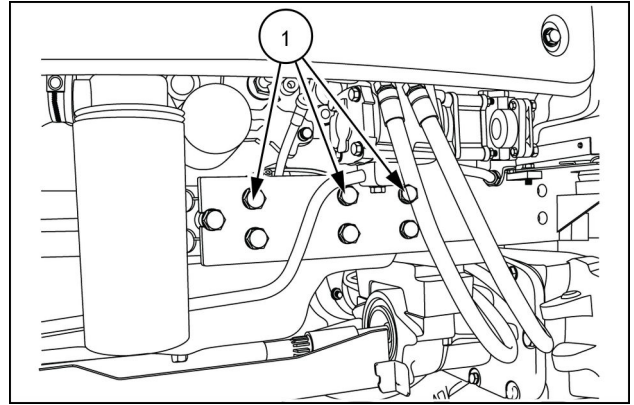
86071897 2

9. Attach a chain sling to the two hoist eyes, (1).
10. Attach a suitable hoist to the chain sling, and raise the engine enough to support the engine.



20108454 3

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



20108469 4

Next operation:

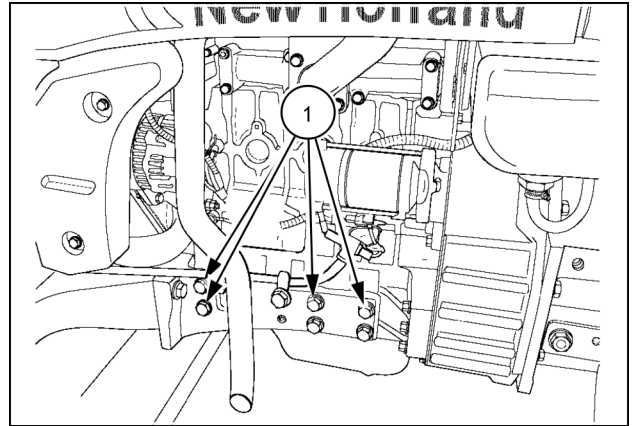
Engine - Install - To frame (10.001)

Engine - Install - To frame

Prior operation:

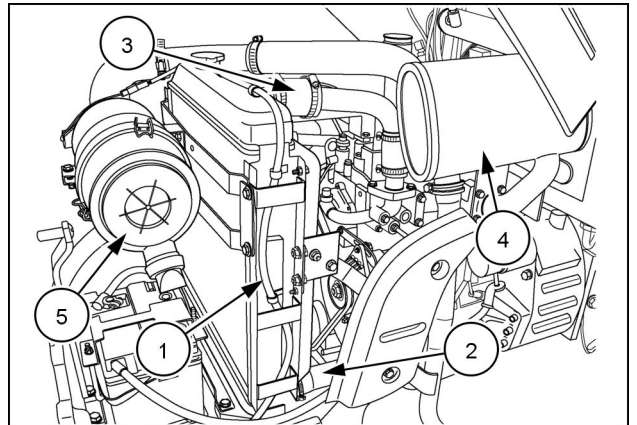
Engine - Remove Separating the tractor at the engine/frame (10.001)

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 (102 – 129 lb ft)**.
6. With the engine securely installed into the frame, remove the chain sling from the two engine hoist eyes.



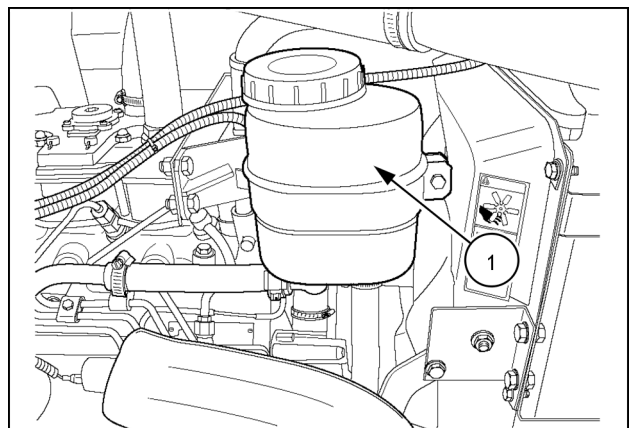
20098751 1

7. Reinstall the radiator, (1), into the tractor.
8. Reinstall the lower, (2), and upper, (3), radiator hoses.
9. Fill the radiator, (1), with new coolant to the proper level.
10. Reinstall the muffler and exhaust pipe, (4), onto the exhaust manifold.
11. Reinstall the air cleaner assembly, (5), onto the engine.



86071897 2

12. Reinstall the power steering reservoir and mounting bracket, (1), onto the engine. Reconnect the hydraulic lines to the reservoir.
13. Refill the reservoir to the proper level with **CASE IH AKCELA HY-TRAN® ULTRA™ HYDRAULIC TRANSMISSION OIL**.



83071900 3

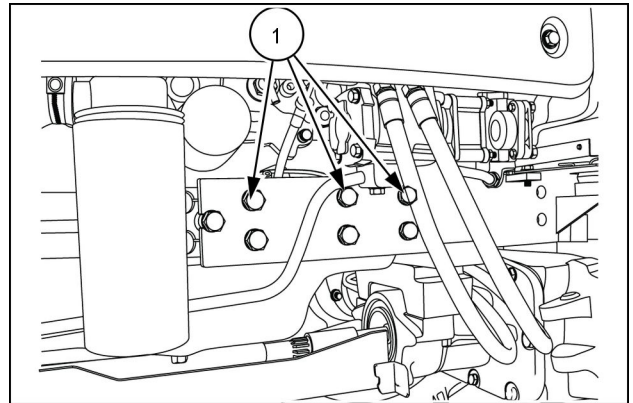
Next operation:

Engine - Install - To frame

Prior operation:

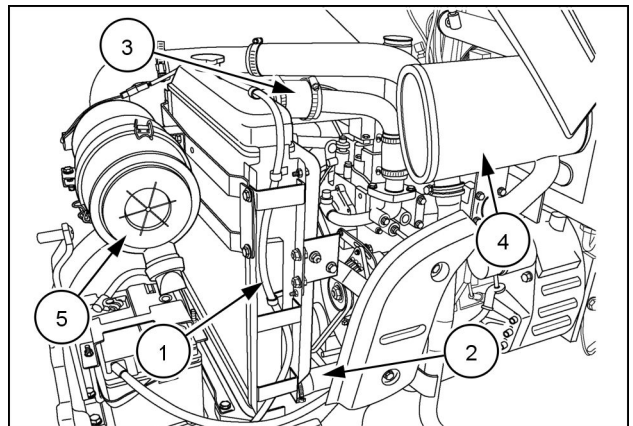
Engine - Remove Separating the tractor at the engine/frame (10.001)

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 (102 – 129 lb ft)**.
6. With the engine securely installed into the frame, remove the chain sling from the two engine hoist eyes.



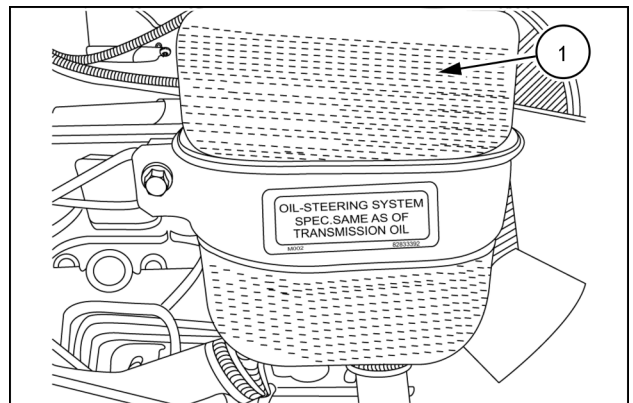
20108469 1

7. Reinstall the radiator, (1), into the tractor.
8. Reinstall the lower, (2), and upper, (3), radiator hoses.
9. Fill the radiator, (1), with new coolant to the proper level.
10. Reinstall the muffler and exhaust pipe, (4), onto the exhaust manifold.
11. Reinstall the air cleaner assembly, (5), onto the engine.



86071897 2

12. Reinstall the power steering reservoir and mounting bracket, (1), onto the engine. Reconnect the hydraulic lines to the reservoir.
13. Refill the reservoir to the proper level with **CASE IH AKCELA HY-TRAN® ULTRA™ HYDRAULIC TRANSMISSION OIL**.



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Next operation:

Engine - Install - Attaching the tractor at the clutch housing/engine - 8x8 transmission (10.001)

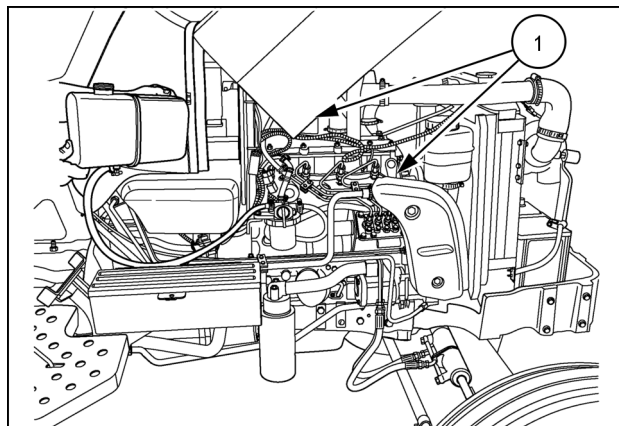
Engine - Install - Attaching the tractor at the clutch housing/engine - 8x8 transmission

Prior operation:

Engine - Remove Separating the tractor at the clutch housing/engine - 8x8 transmission (10.001)

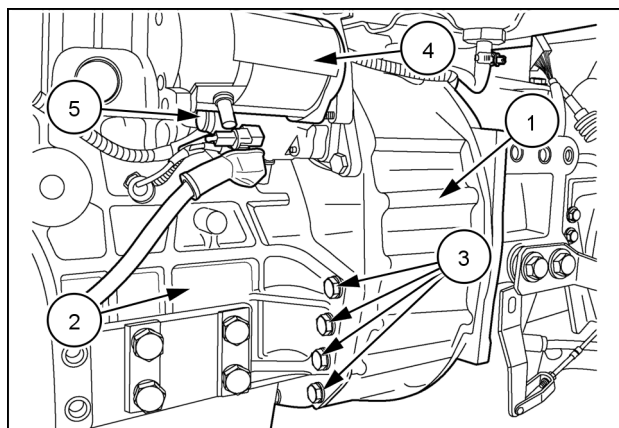
NOTICE: Do not use the buckle-up bolts to draw the drive train together with the engine. Severe damage to the drive train may result.

1. Attach a chain sling to the two hoist eyes, **(1)**, on the engine.
2. Attach a suitable hoist to the chain sling.
3. Carefully roll the drive train into alignment with the engine. Align the splines on the 8x8 input shaft with the clutch and the engine flywheel. Rotate the engine fan to align the input shaft and the clutch/flywheel. The floor jack or the hoist may need to be raised or lowered to make alignment possible.

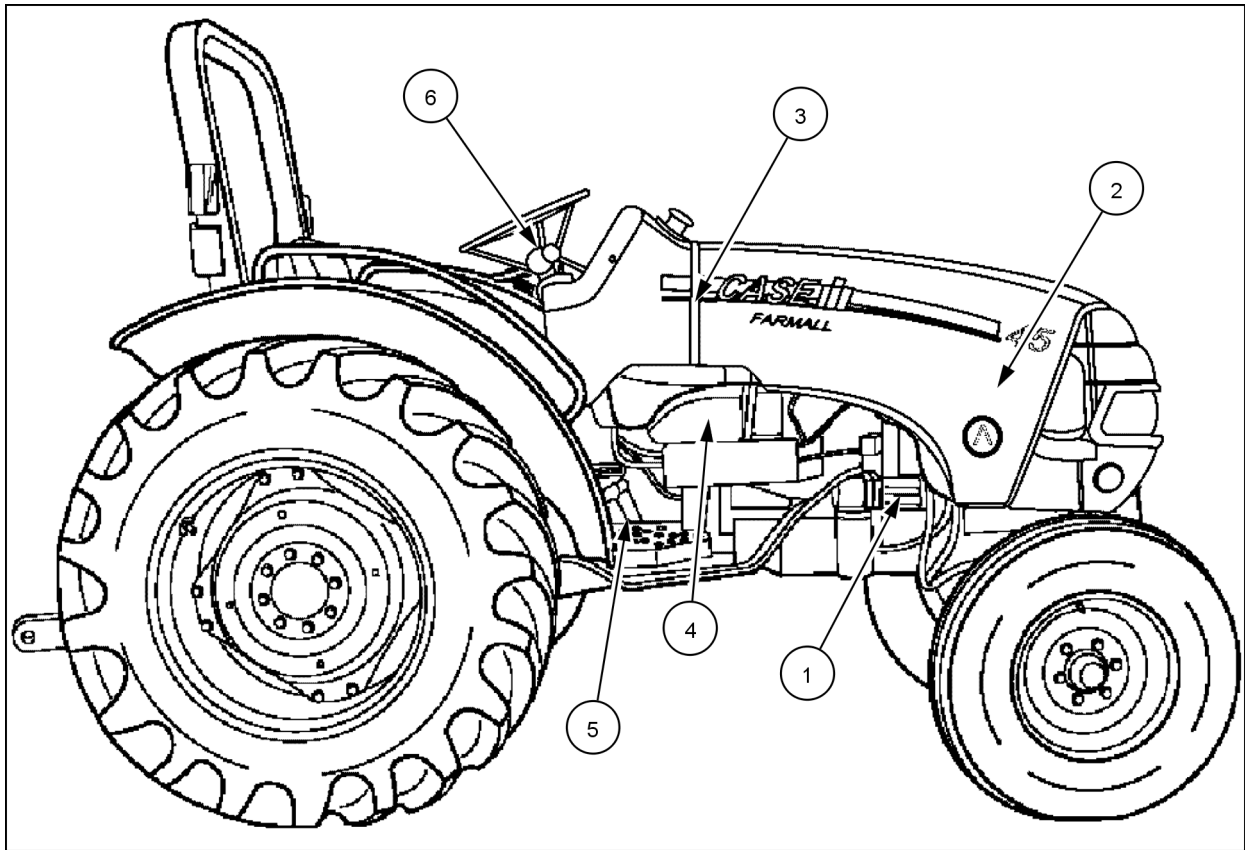


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4. Connect the clutch housing, **(1)**, to the engine, **(2)**, and install the buckle-up bolts, **(3)**.
5. Reinstall the starter, **(4)**, and secure with the retaining nuts. Connect the wiring harness, **(5)**, to the starter.
6. Tighten the buckle-up bolts, **(3)**, in a criss-cross pattern. Torque the M10 bolts and nuts to **68 N·m (50 lb ft)**. Torque the M12 bolts to **81 N·m (60 lb ft)**.
7. Remove the chain hoist and sling from the engine hoist eyes. Remove the floor jack from under the tractor.

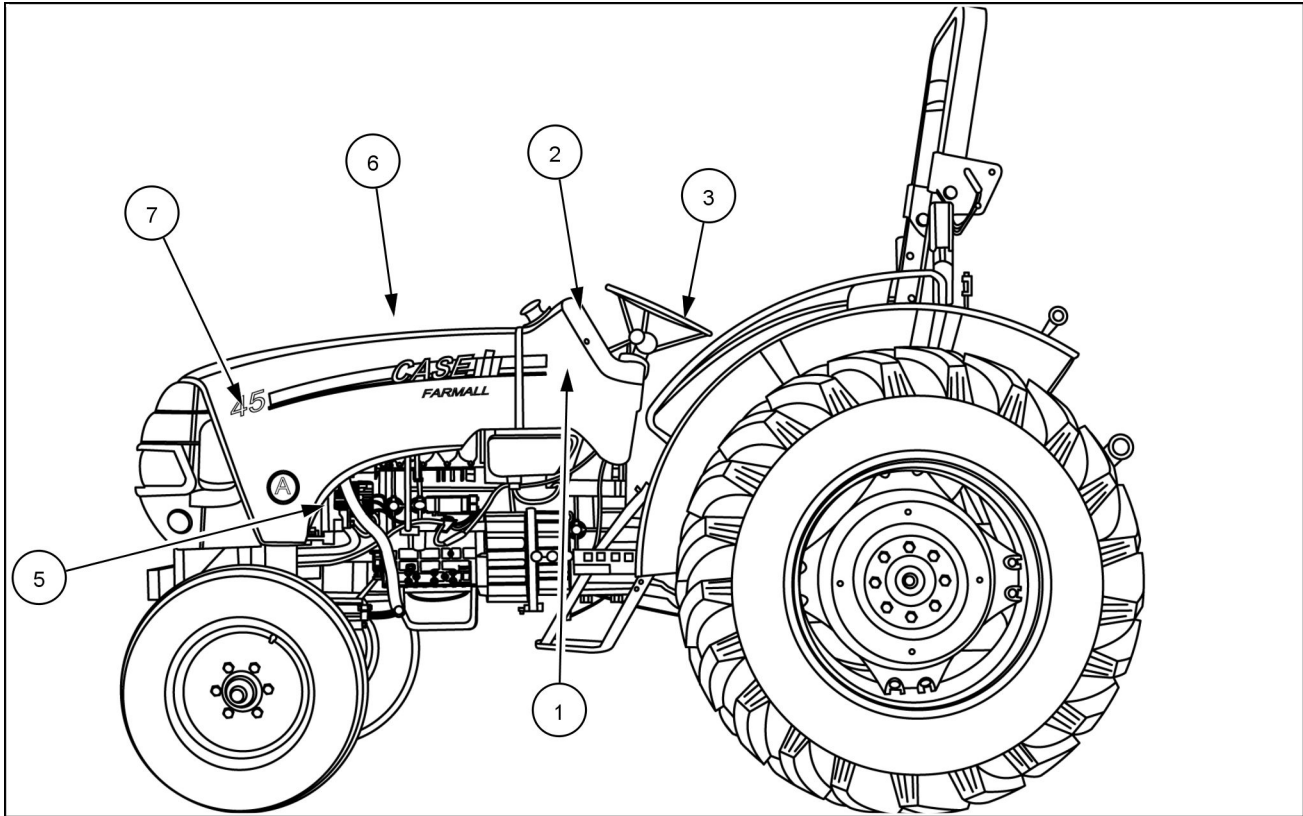


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8. Reconnect all hydraulic tubes, (1), to the hydraulic pump, (2).
9. Reattach the firewall, (3), to the tractor.
10. Reattach the fuel tank, (4), to the firewall. Reconnect fuel lines to the fuel shut-off valve and tank vent.
11. Reattach the throttle cable to the foot control pedal, (5).
12. Reattach the throttle cable to the dash mounted throttle control lever, (6).



96097007 4

13. Reconnect all electrical connectors to the dash housing, **(1)**.
14. Reattach the dash housing, **(1)**, to the firewall.
15. Reconnect all electrical connectors to the instrument panel, **(2)**, and insert the instrument panel into the dash housing, **(1)**.
16. Reinstall the steering wheel, **(3)**.
17. Reinstall the left-hand, right-hand and center rear hood panels, **(4)**.
18. Reinstall the left-hand and right-hand engine side covers, **(5)**.
19. Reinstall the hood, **(6)**, and reconnect headlight wiring harness, **(7)**.
20. Install the remote loader control valve, and all connecting hydraulic tubes to the right side loader tower.

21. Reconnect the positive (+) battery cable and negative (-) battery cable to the battery, (8).



WARNING



Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To Prevent Personal Injury: Relieve all pressure, before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately. Failure to comply could result in death or serious injury.

M149D

22. Start the tractor and check for leaks.
23. Make any necessary adjustments needed for proper operation of the tractor.

Next operation:

Engine - Disassemble (10.001).

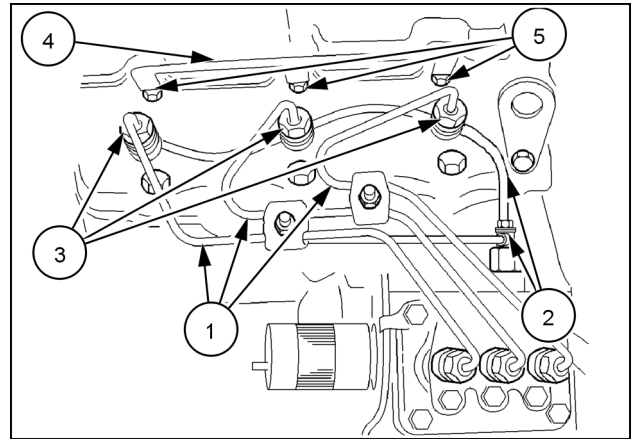
Engine - Disassemble

Prior operation:

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

1. Fuel Injector and Glow Plug - Removal

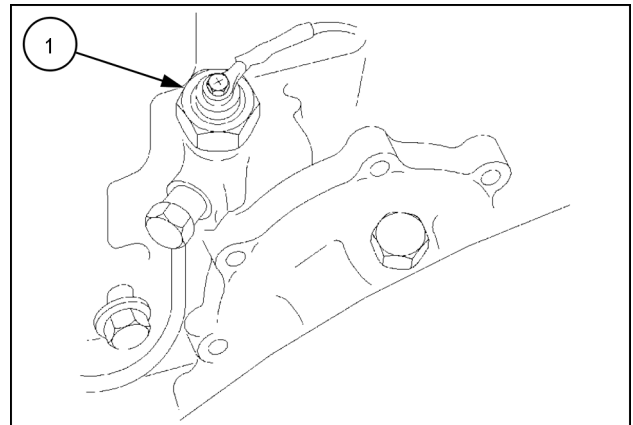
1. Clean all dirt and oil from the injectors and surrounding areas.
2. Disconnect the fuel lines, **(1)**, from the injectors and cap all openings.
3. Remove the injector fuel leak-off line, **(2)**.
4. Remove the injector assemblies, **(3)**.
5. Remove the glow plug bus connector, **(4)**, and remove the glow plugs, **(5)**.



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2. Oil Pressure Switch

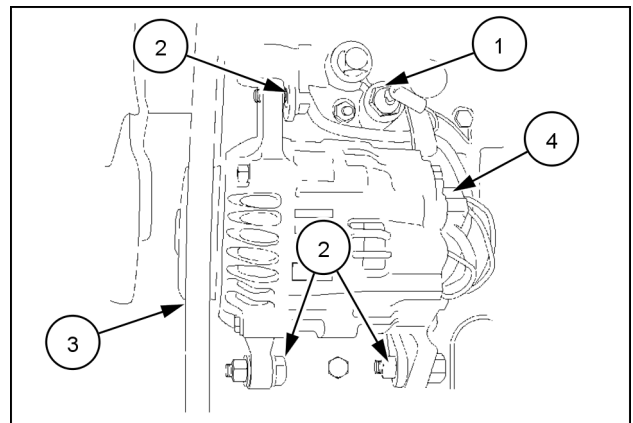
1. Remove the oil pressure switch, **(1)**.



20097780 2

3. Temperature Sending Switch and Alternator

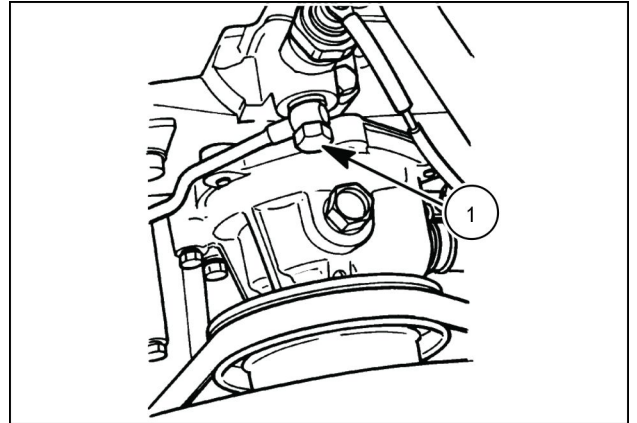
1. Remove the temperature sending switch, **(1)**, from the front of the cylinder head.
2. Loosen the alternator mounting bolts, **(2)**, and remove the V-belt, **(3)**, from the drive pulley
3. Disconnect the alternator wires from the back of alternator, **(4)**.
4. Remove the alternator mounting bolts, **(2)**, and remove the alternator.



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4. Fan, Water Pump, and External Oil Tube - Removal

1. Remove the fan and water pump assembly. See **Water pump - Remove (10.400)**, which includes fan removal also.
2. Remove the external oil transfer tube banjo bolt, **(1)**, from the front of the cylinder head.



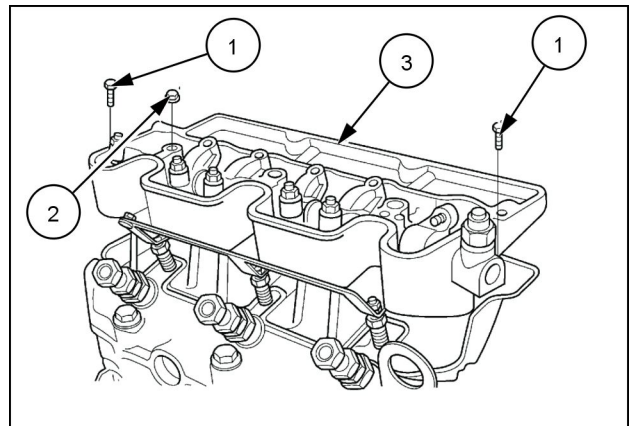
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5. Intake manifold - Remove (10.254).

6. Rocker Arm Shaft and Support Bracket - Removal

1. Remove the bolts, **(1)**, and nuts, **(2)**.
2. Remove the rocker arm shaft and support bracket as an assembly, **(3)**.

NOTE: Alternately loosen the rocker support bolts a turn at a time to prevent distorting the rocker shaft.

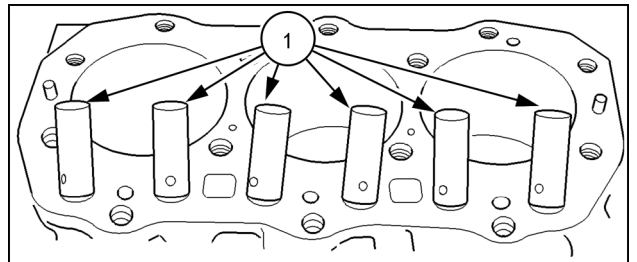


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7. Cylinder head - Remove (10.101).

8. Valve Tappet - Removal

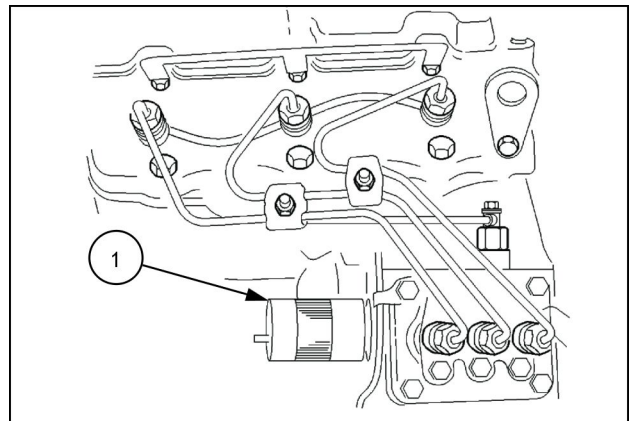
- Remove the valve tappets, **(1)**, from the machined bore in the cylinder block.



20093362 6

9. Fuel Shutoff Solenoid - Removal

- Remove the wire connector and unscrew the fuel shutoff solenoid, **(1)**.



SECT10C01PG42_1 7

10. Timing gear housing - Remove (10.102).



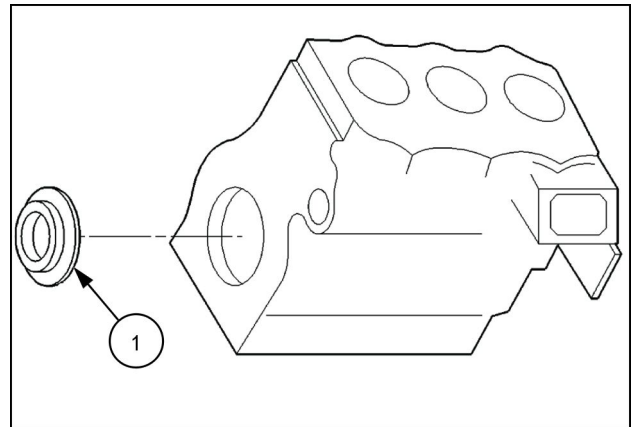
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11. **Crankcase gears - Remove - with camshaft (10.114).**
12. **Engine oil pan - Remove (10.102).**
13. **Engine oil pump - Remove - Suction pipe and strainer (10.304).**
14. **Balancer - Remove (10.110).**
15. **Connecting rod and piston - Remove (10.105).**
16. **Engine flywheel - Remove (10.103).**
17. **Backplate and Oil Seal - Removal**
 1. Remove the backplate retaining bolts and remove the backplate.
 2. Remove the rear oil seal, **(1)**.

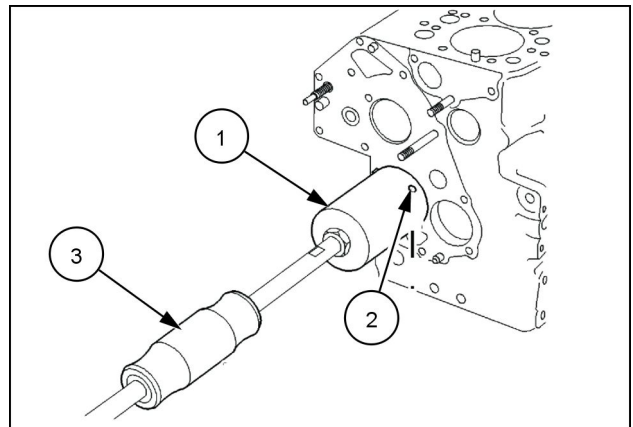


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18. **Crankshaft - Remove (10.103).**
19. **Port Block - Removal**
 1. Using special Tool No. 380002888, **(1)**, place the collars in the grooves of the port block assembly.
 2. Align the set screws, **(2)**, of the puller, **(1)**, with the counter bores in the collars and tighten.
 3. Using a sliding hammer, **(3)**, remove the port block.

NOTE: The oil pump shaft and port block assembly is a press fit in the block.

NOTE: The camshaft gear and the back plate have to be removed from the engine, to provide clearance for the port block removal tool installation.



SECT10C01PG65_2 9

Next operation:
Engine - Inspect (10.001).

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