SERVICE MANUAL

T9.435 / T9.480 / T9.530 / T9.565
T9.600 / T9.645 / T9.700
Tier 4B (final)
Tractor

PIN JEEZ00000FF405001 and above

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NEW HOLLAND AGRICULTURE

SERVICE MANUAL

T9.435 CVT, TIER 4B [JEEZ00000FF405001 -], T9.435 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.480 CVT, TIER 4B [JEEZ00000FF405001 -], T9.480 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.565 CVT, TIER 4B [JEEZ00000FF405001 -], T9.565 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, factory SmartTrax™, Tier 4B [JEEZ00000FF405001 -], T9.700 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]

Link Product / Engine

Product	Market Product	Engine
T9.435 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F2CFE614A*B
T9.435 CVT, TIER 4B [JEEZ00000FF405001 -]	North America	F2CFE614A*B
T9.480 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613G*B001
T9.480 CVT, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613G*B001
T9.530 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.530 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.530 CVT, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.530 CVT, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.565 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.565 CVT, TIER 4B [JEEZ00000FF405001 -]	North America	F3HFE613B*B001
T9.600 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.600 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.600 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.600 CVT, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.600 CVT, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.600 CVT, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613J*B001
T9.645 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613G*B001
T9.645 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613G*B001
T9.645 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613G*B001
T9.700 Powershift, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613F*B001
T9.700 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]	North America	F3DFE613F*B001
T9.700 Powershift, factory SmartTrax™, Tier 4B [JEEZ00000FF405001 -]	North America	F3DFE613F*B001

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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 NEW HOLLAND Sales and Service Networks.

Safety rules - Personal safety

⚠ General safety rules ⚠

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

Stay off slopes too steep for safe operation. Shift down before you start up or down a hill with a heavy load. Avoid “free wheeling.”

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

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

While driving on the road, the seat swivel position must always be straight forward and locked in position with no rotation. The seat swivel should only be rotated for in field operation.

Do not drive on roads, or at high speed anywhere, with the differential lock engaged. Difficult steering will occur, and can result in an accident. In field operation, use the differential lock for traction improvement, but release for turning at row ends.

Do not exceed implement transport speed or the speed rating on the implement tires. Review the implements Operator’s Manual for specifications. Failure to comply could result in death or serious injury.

For speeds up to **16 km/h** (**10 mph**), make sure that the weight of a trailed vehicle that is not equipped with brakes does NOT EXCEED 1.5 times the Tractor weight. For speeds up to **40 km/h** (**25 mph**), make sure that the weight of the trailed vehicle that is not equipped with brakes, does NOT EXCEED the weight of the Tractor. Stopping distance increases with increasing speed as the weight of the towed load increases, especially on hills and slopes.

Rear upset can result if pulling from wrong location on tractor. Hitch only to the drawbar. Use three-point hitch only with the implements designed for its use – not as a drawbar.

Modifications made to this machine may increase the likelihood or potential for debris accumulations that would normally not be present. Modifications include frame-mounted attachments, plates, screens, or other aftermarket equipment. Operators of modified machines must be aware of accumulations of organic debris and/or material and overall machine cleanliness.

Modified machines require additional and more frequent inspection and cleaning during usage. The machine may require inspection and cleaning multiple times per day during usage. Operators must be aware of the operating environment and conditions. Operators must take appropriate actions to maintain the machines during use. In particular, pay attention to the following machine areas:

- In and around the engine compartment
- Hot exhaust components
- Moving, turning, or rotating machine components

Operators that operate the machine in atypical applications and/or conditions must be aware of accumulations of organic debris and/or material and overall machine cleanliness. Pay particular attention where material accumulations are possible or may result.

Machines that operate in atypical applications or conditions require additional and more frequent inspection and cleaning during usage. The machine may require inspection and cleaning multiple times per day during usage. Operators must be aware of the operating environment and conditions. Operators must take appropriate actions to maintain the machines during use. In particular, pay attention to the following machine areas:

- In and around the engine compartment
- Hot exhaust components
- Moving, turning, or rotating machine components

Do not look directly into the front or rear work lamps. Eye damage can occur.

Do not tamper with the ballast on the front or rear High Intensity Discharge (HID) lamp since it uses high voltage. Personal injury or death can occur.

To avoid possible eye damage from microwave signals emitted by the radar sensor, do not look directly into the sensor face.

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.

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 machine 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 machine. Never operate the machine with shields removed. Always close access doors or panels before operating the machine.

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 machine can be struck or crushed by the machine 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.

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

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 machine.

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

Before leaving the machine:

1. Park machine on a firm level surface.
2. Put all controls in neutral or park lock position.
3. Engage park brake. Use wheel chocks if required.
4. Lower all hydraulic equipment — Implements, header, etc.

5. Turn off engine and remove key.

When, due to exceptional circumstances, you would decide to keep the engine running after leaving the operator's station, then the following precautions must be followed:

1. Bring the engine to low idle speed.
2. Disengage all drive systems.
3. **⚠ WARNING**

   Some components may continue to run down after you disengage drive systems.
   Make sure all drive systems are fully disengaged.
   Failure to comply could result in death or serious injury.

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   Shift the transmission into park.
4. Apply the parking brake.

⚠ General maintenance safety ⚠

Keep area used for servicing the machine clean and dry. Clean up spilled fluids.

Service machine on a firm level surface.

Install guards and shields after servicing the machine.

Close all access doors and install all panels after servicing the machine.

Do not attempt to clean, lubricate, clear obstructions or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless securely supported.

Jack or lift the machine only at jack or lift points indicated in this manual.

Incorrect towing procedures can cause accidents. When towing a disabled machine follow the procedure in this manual. Use only rigid tow bars.

Stop the engine, remove key and relieve pressure before disconnecting or connecting fluid lines.

Stop the engine and remove key before disconnecting or connecting electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling system operates under pressure. Hot coolant can spray out if a cap is removed while the system is hot. Allow system to cool before removing cap. When removing a cap turn it slowly to allow pressure to escape before completely removing the cap.

Replace damaged or worn tubes, hoses, electrical wiring, etc.

Engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when servicing such components. Allow surfaces to cool before handling or disconnecting hot components. Wear protective equipment when appropriate.

When welding, follow the instructions in the manual. Always disconnect the battery before welding on the machine. Always wash your hands after handling battery components.

⚠ Wheels and tires ⚠

Make sure tires are correctly inflated. Do not exceed recommended load or pressure. Follow instructions in the manual for proper tire inflation.

Tires are heavy. Handling tires without proper equipment could cause death or serious injury.

Always have a qualified tire technician service the tires and wheels. If a tire has lost all pressure, take the tire and wheel to a tire shop or your dealer for service. Explosive separation of the tire can cause serious injury.

DO NOT weld on a wheel or rim until the tire is completely removed. Inflated tires can generate a gas mixture with the air that can be ignited by high temperatures from welding procedures performed on the wheel or rim. Removing the air or loosening the tire on the rim (breaking the bead) will NOT eliminate the hazard. This condition can exist whether tires are inflated or deflated. The tire MUST be completely removed from the wheel or rim prior to welding the wheel or rim.

⚠ Driving on public roads and general transportation safety ⚠

Comply with local laws and regulations.

Use appropriate lighting to meet local regulations.

Make sure Slow Moving Vehicle (SMV) emblem is visible.

Use safety chains for trailed equipment when provided with machine or equipment.

Lift implements and attachments high enough above ground to prevent accidental contact with road.

When transporting equipment or machine on a transport trailer, make sure it is properly secured. Be sure the Slow Moving Vehicle (SMV) on the equipment or machine is covered while being transported on a trailer.

Be aware of overhead structures or power lines and make sure the machine and/or attachments can pass safely under.

Travel speed should be such that complete control and machine stability is maintained at all times.

Slow down and signal before turning.

Pull over to allow faster traffic to pass.

Follow correct towing procedure for equipment with or without brakes.

⚠ Fire and explosion prevention ⚠

Fuel or oil leaked or spilled on hot surfaces or electrical components can cause a fire.

Crop materials, trash, debris, bird nests, or flammable material can ignite on hot surfaces.

Always have a fire extinguisher on or near the machine.

Make sure the fire extinguisher(s) is maintained and serviced according to the manufacturer’s instructions.

At least once each day and at the end of the day remove all trash and debris from the machine especially around hot components such as engine, transmission, exhaust, battery, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

At least once each day, remove debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fan, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

Inspect the electrical system for loose connections or frayed insulation. Repair or replace loose or damaged parts.

Do not store oily rags or other flammable material on the machine.

Do not weld or flame cut any items that contain flammable material. Clean items thoroughly with non-flammable solvents before welding or flame-cutting.

Do not expose the machine to flames, burning brush, or explosives.

Promptly investigate any unusual smells or odors that may occur during operation of the machine.

⚠ General battery safety ⚠

Always wear eye protection when working with batteries.

Do not create sparks or have open flame near battery.

Ventilate when charging or using in an enclosed area.

Disconnect negative (-) first and reconnect negative (-) last.

When welding on the machine, disconnect both terminals of the battery.

Do not weld, grind, or smoke near a battery.

When using auxiliary batteries or connecting jumper cables to start the engine, use the procedure shown in the operator's manual. Do not short across terminals.

Follow manufacturer's instructions when storing and handling batteries.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling. This is a California Proposition 65 warning.

Battery acid causes burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Keep out of reach of children and other unauthorized persons.

⚠ Instructional seat safety ⚠

Passengers are not permitted to ride on the machine.

The instructional seat is to be used only when training a new operator or when a service technician is diagnosing a problem.

When required for the purposes of training or diagnostics, only one person may accompany the operator and that person must be seated in the instructional seat.

When the instructional seat is occupied, the following precautions must be followed:

- Machine should be driven only at slow speeds and over level ground.
- Avoid driving on highways or public roads.
- Avoid quick starts or stops.
- Avoid sharp turns.
- Always wear correctly adjusted seat belts.
- Keep door closed at all times.

⚠ Operator presence system ⚠

Your machine is equipped with an operator presence system to prevent the use of some features while the operator is not in the operator's seat.

The operator presence system should never be disconnected or bypassed.

If the system is inoperable, the system must be repaired.

⚠ Power Take-Off (PTO) ⚠

PTO-driven machinery can cause death or serious injury. Before working on or near the PTO shaft or servicing or clearing the driven machine, put the PTO lever in the disengage position, stop the engine, and remove the key.

Whenever a PTO is in operation, a guard must be in place to prevent death or injury to the operator or bystanders.

When doing stationary PTO work, keep clear of all moving parts and make sure appropriate guards are in place.

Where attachments such as pumps are installed on the PTO shaft (especially if the tractor PTO guard is moved upward or removed), extended shielding equivalent to the PTO guard must be installed with the attachment. Return the PTO guard to its original position immediately when the attachment is removed.

High-inertia implements do not become stationary immediately when the PTO is disengaged. Allow sufficient time for the implement to “coast down” to a halt before cleaning or adjusting PTO components.

As soon as the drive shaft is removed, install the guard over PTO shaft.

Whenever doing stationary PTO work always install the articulation cylinder locking blocks to prevent damage or injury.

The use of PTO adapters is not allowed. PTO adapters do not allow proper guarding of the PTO shaft and have operational hazards. Attach only the primary PTO drive shaft coupling to the tractor PTO output shaft.

Never use a spline adapter:

- Match the right tractor PTO spline and speed with the PTO driveshaft provided with an implement. This will assure proper geometry and operating speed.
- Never operate 540 RPM implements at 1000 RPM.
- Never operate 1000 RPM implements at 540 RPM.
- Use of PTO adapters will void the warranty of the drive shaft, and the PTO drive train of the machine and implement.
- For correct hitch geometry, refer to operator’s manual for each implement you connect.

⚠ Reflectors and warning lights ⚠

Flashing amber warning lights must be used when operating on public roads. Refer to **Operating the tractor warning lamps (55.404)** for proper operating instructions.

⚠ Seat belts ⚠

Seat belts must be worn at all times.

Seat belt inspection and maintenance:

- Keep seat belts in good condition.
- Keep sharp edges and items than can cause damage away from the belts.
- Periodically check belts, buckles, retractors, tethers, slack take-up system, and mounting bolts for damage and wear.
- Replace all parts that have damage or wear.
- Replace belts that have cuts that can make the belt weak.
- Check that bolts are tight on the seat bracket or mounting.
- If belt is attached to seat, make sure seat or seat brackets are mounted securely.
- Keep seat belts clean and dry.
- Clean belts only with soap solution and warm water.
- Do not use bleach or dye on the belts because this can make the belts weak.

⚠ Operator protective structure ⚠

Your machine is equipped with an operator protective structure, such as: a Roll Over Protective Structure (ROPS), Falling Object Protective Structure (FOPS), or a cab with ROPS. A ROPS may be a cab frame or a two-posted or four-posted structure used for the protection of the operator to minimize the possibility of serious injury. The mounting structure and fasteners forming the mounting connection with the machine are part of the ROPS.

The protective structure is a special safety component of your machine.

DO NOT attach any device to the protective structure for pulling purposes. DO NOT drill holes to the protective structure.

The protective structure and interconnecting components are a certified system. Any damage, fire, corrosion, or modification will weaken the structure and reduce your protection. If this occurs, THE PROTECTIVE STRUCTURE MUST BE REPLACED so that it will provide the same protection as a new protective structure. Contact your dealer for protective structure inspection and replacement.

After an accident, fire, tip or roll over, the following MUST be performed by a qualified technician before returning the machine to field or job-site operations:

- The protective structure MUST BE REPLACED.
- The mounting or suspension for the protective structure, operator seat and suspension, seat belts and mounting components, and wiring within the operator's protective system MUST be carefully inspected for damage.
- All damaged parts MUST BE REPLACED.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN, OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE, WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP, ROLL OVER, COLLISION, OR ACCIDENT.

Seat belts are part of your protective system and must be worn at all times. The operator must be held to the seat inside the frame in order for the protective system to work.

⚠ Air-conditioning system ⚠

The air-conditioning system is under high pressure. Do not disconnect any lines. The release of high pressure can cause serious injury.

The air-conditioning system contains gases that are harmful to the environment when released into the atmosphere. Do not attempt to service or repair the system.

Service, repair, or recharging must be performed only by a trained service technician.

⚠ Personal Protective Equipment (PPE) ⚠

Wear Personal Protective Equipment (PPE) such as hard hat, eye protection, heavy gloves, hearing protection, protective clothing, etc.

⚠ Do Not Operate tag ⚠

Before you start servicing the machine, attach a 'Do Not Operate' warning tag to the machine in an area that will be visible.

⚠ Hazardous chemicals ⚠

If you are exposed to or come in contact with hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolant, etc. required for the function of your machine can be hazardous. They may be attractive and harmful to domestic animals as well as humans.

Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe handling and storage procedures, first aid measures and procedures to be taken in the event of a spill or accidental release. MSDS are available from your dealer.

Before you service your machine check the MSDS for each lubricant, fluid, etc. used in this machine. This information indicates the associated risks and will help you service the machine safely. Follow the information in the MSDS, on manufacturer containers, as well as the information in this manual when servicing the machine.

Dispose of all fluids, filters, and containers in an environmentally safe manner according to local laws and regulations. Check with local environmental and recycling centers or your dealer for correct disposal information.

Store fluids and filters in accordance with local laws and regulations. Use only appropriate containers for the storage of chemicals or petrochemical substances.

Keep out of reach or children or other unauthorized persons.

Additional precautions are required for applied chemicals. Obtain complete information from the manufacturer or distributor of the chemicals before using them.

⚠ Utility safety ⚠

When digging or using ground-engaging equipment, be aware of buried cables and other services. Contact your local utilities or authorities, as appropriate to determine the locations of services.

Make sure the machine has sufficient clearance to pass in all directions. Pay special attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines.

Retract raised or extended components, if necessary. Remove or lower radio antennas or other accessories. Should a contact between the machine and an electric power source occur, the following precautions must be taken:

- Stop the machine movement immediately.
- Apply the park brake, stop the engine, and remove the key.
- Check if you can safely leave the cab or your actual position without contact with electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure you do not make contact with the ground and the machine at the same time.
- Do not permit anyone to touch the machine until power has been shut off to the power lines.

⚠ Electrical storm safety ⚠

Do not operate machine during an electrical storm.

If you are on the ground during an electrical storm, stay away from machinery and equipment. Seek shelter in a permanent, protected structure.

If an electrical storm should strike during operation, remain in the cab. Do not leave the cab or operator’s platform. Do not make contact with the ground or objects outside the machine.

⚠ Mounting and dismounting ⚠

Mount and dismount the machine only at designated locations that have handholds, steps, or ladders.

Do not jump off the machine.

Make sure steps, ladders, and platforms remain clean and clear of debris and foreign substances. Injury may result from slippery surfaces.

Face the machine when mounting and dismounting.

Maintain a three-point contact with steps, ladders, and handholds.

Never mount or dismount from a moving machine.

Do not use the steering wheel or other controls or accessories as handholds when entering or exiting the cab or operator's platform.

⚠ Working at heights ⚠

When the normal use and maintenance of the machine requires working at heights:

- Correctly use installed steps, ladders, and railings.
- Never use ladders, steps, or railings while the machine is moving.
- Do not stand on surfaces which are not designated as steps or platforms.

Do not use the machine as a lift, ladder, or platform for working at heights.

⚠ Implements, tools and trailers⚠

Attach trailers, tools and/or implements correctly. The operating, steering and braking behavior of the vehicle are affected by implements, trailers and ballast weights. Therefore ensure adequate steering and braking power.

Stay clear of the area between the vehicle and the trailed implement.

Follow the manufacturer's instructions when connecting or mounting an implement to the vehicle.

Always use the required or recommended drawbar or hitch to connect an implement to the tractor.

Use only recommended hardware for hitch connections. Verify the integrity of the connection.

Always adapt your ground speed to the ground conditions. Avoid making sharp turns when driving up or down slopes or when driving across the slope. Do not attempt to turn the machine with the differential lock engaged. When driving down slopes, never depress the clutch and change gear.

Observe maximum permissible axle loads and total weights.

When making turns with towed or mounted implements, always take into consideration the width and inertia of the implement.

Prevent a trailer or implement from moving when detached from the tractor.

Properly connect the auxiliary brake system.

Properly connect the auxiliary lighting harness to the implement.

Do not exceed implement transport speed or the speed rating on the implement tires. Review the implement's Operators Manual for specifications.

Objects ejected by some implements or tools – for example, a rotary mower – may harm bystanders outside the field. Stones may be thrown further than the discharged crop. Projectiles can be thrown outside the field and strike unprotected individuals – for example, bikers, pedestrians or pets. Wait till the area is clear before proceeding.

⚠ Roll over and tip over ⚠

Travel speed should be such that complete control and machine stability is maintained at all times. Where possible, avoid operating near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.

Do not operate the tractor on terrain outside its grade and stability limits. Operating the tractor outside its limits may result in a roll over or tip over. Observe the guidelines in this manual when going down steep hills with a load.

Operating the tractor on steep grades may result in a machine overturn. It is the operator's responsibility to make a judgment if weather, road or ground conditions permit safe operation on a hillside, ramp, ditch or rough ground.

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

Do not operate the tractor near or on the soft shoulders of canals, brooks, other waterways or banks which are undermined by rodents. The tractor may sink sideways and roll over.

Do not operate the tractor on poorly constructed or underrated ramps. The ramps may collapse and cause the tractor to roll over. Always check the condition and rating of ramps before use.

Do not operate the tractor without using the seat restraint. In the event of a roll over or tip over, the ROPS cab or ROPS structure is only fully effective if the driver remains attached to the seat.

Do not operate the tractor beyond its limits of dynamic stability. High speed, abrupt maneuvers or fast and sharp cornering increase the risk of roll over.

Do not use the tractor for pulling where the load may not yield – for example, when pulling tree stumps. The tractor may flip over backwards if the load (stump) does not yield.

Be extremely cautious when operating the tractor on forage silos without lateral concrete walls. Equip the tractor with dual wheels or use a wide track setting to improve the lateral stability of the tractor.

When the load on a front-end loader or three-point hitch is raised, the tractor center of gravity may shift. The tractor may roll over more easily under these conditions.

The instructional seat is used only when training a new operator or when a service technician is diagnosing a mechanical problem. In all other circumstances, do not allow anyone to occupy the seat when roading to or from the field or when operating in the field. The operator's view is seriously obstructed to the left. In the event of a roll over, the ROPS cab or structure may not provide adequate protection for the occupant of the instructional seat.

⚠ Hydraulic system safety ⚠

Hydraulic oil leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury:

- Relieve all pressure before disconnecting fluid lines.
- 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, seek medical attention immediately.

The hydraulic hoses and fittings on your machine meet engineering specifications for the particular function. When replacing damaged, blown or worn hoses or fittings, use only manufacturer authorized service parts.

Care in hydraulic hose installation is a must:

- Make sure pressure is relieved before starting installation procedure.
- DO NOT kink or twist a hose, failure may occur.
- Properly route the hose.
- Have a certified hydraulic technician install the hose.
- Remove air from the hydraulic system after installing any hydraulic component.

DO NOT stand on or use a hose as a step. DO NOT pull or apply external forces to the hose. The hose may fail and cause injury.

Keep all persons away from the working area. Mechanisms controlled by fluid power can become hazardous if a hose fails. Lifted mechanisms can fall to the ground, machine steering may fail, etc.

Stay clear of a pressurized hose assembly that has blown apart. Hose fittings can be thrown off at high speed and a loose hose can whip around with great force.

Hydraulic fluid can reach high temperatures. Allow fluid to cool before servicing the system.

Escaping fluid under pressure may form a mist or fine spray which can flash or explode upon contact with an ignition source.

Vibration can reduce hose service life. Make sure all retaining clamps and/or devices are secured.

Environmental conditions can cause hose and fittings to deteriorate. Inspect hydraulic hoses periodically. Replace worn or damaged hoses and fittings.

Periodically check hydraulic system for leaks or damage. Check for:

- Leaks at hose fittings or in hose.
- Damaged hoses and/or fittings.
- Kinked, crushed, flattened, hard blistered, heat cracked, charred, twisted, soft or loose covered hoses.
- Corroded or damaged fittings.
- Leaking ports.
- Excessive dirt and debris around hoses and/or fittings.
- Damaged or missing hose retaining clamps, guards, shields, etc.

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. NEW HOLLAND strongly recommends that you return all used batteries to a NEW HOLLAND 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

Torque - Minimum tightening torques for normal assembly

Decimal hardware

Grade 5 bolts, nuts and studs

Size	Nm	lb in/lb ft
1/4 in	12 – 15 Nm	108 – 132 lb in
5/16 in	23 – 28 Nm	204 – 252 lb in
3/8 in	48 – 57 Nm	420 – 504 lb in
7/16 in	73 – 87 Nm	54 – 64 lb ft
1/2 in	109 – 130 Nm	80 – 96 lb ft
9/16 in	149 – 179 Nm	110 – 132 lb ft
5/8 in	203 – 244 Nm	150 – 180 lb ft
3/4 in	366 – 439 Nm	270 – 324 lb ft
7/8 in	542 – 651 Nm	400 – 480 lb ft
1 in	787 – 944 Nm	580 – 696 lb ft
1-1/8 in	1085 – 1193 Nm	800 – 880 lb ft
1-1/4 in	1519 – 1681 Nm	1120 – 1240 lb ft
1-3/8 in	1980 – 2278 Nm	1460 – 1680 lb ft
1-1/2 in	2631 – 2983 Nm	1940 – 2200 lb ft

Grade 8 bolts, nuts and studs

Size	Nm	lb in/lb ft
1/4 in	16 – 20 Nm	144 – 180 lb in
5/16 in	33 – 39 Nm	288 – 348 lb in
3/8 in	61 – 73 Nm	540 – 648 lb in
7/16 in	95 – 114 Nm	70 – 84 lb ft
1/2 in	149 – 179 Nm	110 – 132 lb ft
9/16 in	217 – 260 Nm	160 – 192 lb ft
5/8 in	298 – 358 Nm	220 – 264 lb ft
3/4 in	515 – 618 Nm	380 – 456 lb ft
7/8 in	814 – 976 Nm	600 – 720 lb ft
1 in	1220 – 1465 Nm	900 – 1080 lb ft
1-1/8 in	1736 – 1953 Nm	1280 – 1440 lb ft
1-1/4 in	2468 – 2712 Nm	1820 – 2000 lb ft
1-3/8 in	3227 – 3688 Nm	2380 – 2720 lb ft
1-1/2 in	4285 – 4827 Nm	3160 – 3560 lb ft

NOTE: *Use thick nuts with Grade 8 bolts.*

Metric hardware

Grade 8.8 bolts, nuts and studs

Size	Nm	lb in/lb ft
4 mm	3 – 4 Nm	24 – 36 lb in
5 mm	7 – 8 Nm	60 – 72 lb in
6 mm	11 – 12 Nm	96 – 108 lb in
8 mm	26 – 31 Nm	228 – 276 lb in
10 mm	52 – 61 Nm	456 – 540 lb in
12 mm	90 – 107 Nm	66 – 79 lb ft
14 mm	144 – 172 Nm	106 – 127 lb ft
16 mm	217 – 271 Nm	160 – 200 lb ft
20 mm	434 – 515 Nm	320 – 380 lb ft
24 mm	675 – 815 Nm	500 – 600 lb ft
30 mm	1250 – 1500 Nm	920 – 1100 lb ft
36 mm	2175 – 2600 Nm	1600 – 1950 lb ft

Grade 10.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
4 mm	4 – 5 Nm	36 – 48 lb in
5 mm	9 – 11 Nm	84 – 96 lb in
6 mm	15 – 18 Nm	132 – 156 lb in
8 mm	37 – 43 Nm	324 – 384 lb in
10 mm	73 – 87 Nm	54 – 64 lb ft
12 mm	125 – 150 Nm	93 – 112 lb ft
14 mm	200 – 245 Nm	149 – 179 lb ft
16 mm	310 – 380 Nm	230 – 280 lb ft
20 mm	610 – 730 Nm	450 – 540 lb ft
24 mm	1050 – 1275 Nm	780 – 940 lb ft
30 mm	2000 – 2400 Nm	1470 – 1770 lb ft
36 mm	3500 – 4200 Nm	2580 – 3090 lb ft

Grade 12.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
Typically the torque values specified for grade 10.9 hardware can be used satisfactorily on grade 12.9 hardware.		

Steel hydraulic fittings

37° flare fitting

Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
mm	inch			
6.4 mm	1/4 in	7/16-20 in	8 – 16 Nm	72 – 144 lb in
7.9 mm	5/16 in	1/2-20 in	11 – 22 Nm	96 – 192 lb in
9.5 mm	3/8 in	9/16-18 in	14 – 34 Nm	120 – 300 lb in
12.7 mm	1/2 in	3/4-16 in	20 – 57 Nm	180 – 504 lb in
15.9 mm	5/6 in	7/8-14 in	34 – 79 Nm	300 – 696 lb in
19.0 mm	3/4 in	1-1/16-12 in	54 – 108 Nm	40 – 80 lb ft
22.2 mm	7/8 in	1-3/16-12 in	81 – 135 Nm	60 – 100 lb ft
25.4 mm	1 in	1-5/16-12 in	102 – 158 Nm	75 – 117 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	169 – 223 Nm	125 – 165 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	285 – 338 Nm	210 – 250 lb ft

Straight threads with O-ring

Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
mm	inch			
6.4 mm	1/4 in	7/16-20 in	16 – 26 Nm	144 – 228 lb in
7.9 mm	5/16 in	1/2-20 in	22 – 34 Nm	192 – 300 lb in
9.5 mm	3/8 in	9/16-18 in	34 – 54 Nm	300 – 480 lb in
12.7 mm	1/2 in	3/4-16 in	57 – 91 Nm	540 – 804 lb in
15.9 mm	5/6 in	7/8-14 in	79 – 124 Nm	58 – 92 lb ft
19.0 mm	3/4 in	1-1/16-12 in	108 – 174 Nm	80 – 128 lb ft
22.2 mm	7/8 in	1-3/16-12 in	136 – 216 Nm	100 – 160 lb ft
25.4 mm	1 in	1-5/16-12 in	159 – 253 Nm	117 – 187 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	224 – 357 Nm	165 – 264 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	339 – 542 Nm	250 – 400 lb ft

Split flange mounting bolts

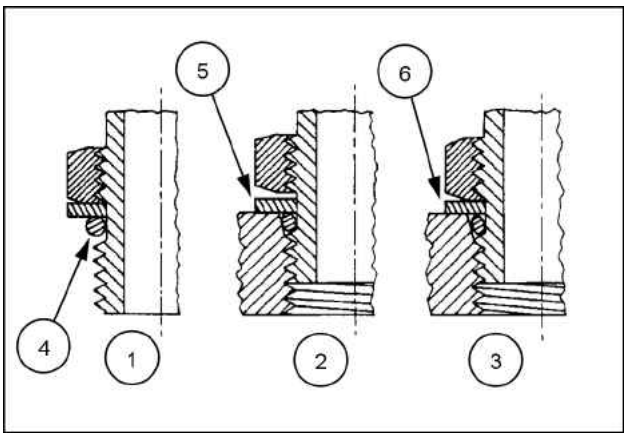
Size	Nm	lb in/lb ft
5/16-18 in	20 – 27 Nm	180 – 240 lb in
3/8-16 in	27 – 34 Nm	240 – 300 lb in
7/16-14 in	47 – 61 Nm	420 – 540 lb in
1/2-13 in	74 – 88 Nm	55 – 65 lb ft

Size	Nm	lb in/lb ft
5/8-11 in	**190 – 203 Nm**	**140 – 150 lb ft**

O-ring face seal end						O-ring boss end fitting or lock nut		
Nominal SAE dash size	Tube outside diameter		Thread size	Nm	lb in/lb ft	Thread size	Nm	lb in/lb ft
	mm	in						
-4	**6.4 mm**	**1/4 in**	**9/16-18 in**	**14 – 16 Nm**	**120 – 144 lb in**	**7/16-20 in**	**23 – 27 Nm**	**204 – 240 lb in**
-6	**9.5 mm**	**3/8 in**	**11/16-16 in**	**24 – 27 Nm**	**216 – 240 lb in**	**9/16-18 in**	**34 – 41 Nm**	**300 – 360 lb in**
-8	**12.7 mm**	**1/2 in**	**13/16-16 in**	**43 – 54 Nm**	**384 – 480 lb in**	**3/4-16 in**	**61 – 68 Nm**	**540 – 600 lb in**
-10	**15.9 mm**	**5/8 in**	**1-14 in**	**62 – 76 Nm**	**552 – 672 lb in**	**7/8-14 in**	**81 – 88 Nm**	**60 – 65 lb ft**
-12	**19.0 mm**	**3/4 in**	**1-3/ 16-12 in**	**90 – 110 Nm**	**65 – 80 lb ft**	**1-1/ 16-12 in**	**115 – 122 Nm**	**85 – 90 lb ft**
-14	**22.2 mm**	**7/8 in**	**1-3/ 16-12 in**	**90 – 110 Nm**	**65 – 80 lb ft**	**1-13/ 16-12 in**	**129 – 136 Nm**	**95 – 100 lb ft**
-16	**25.41 mm**	**1.0 in**	**1-7/ 16-12 in**	**125 – 140 Nm**	**92 – 105 lb ft**	**1-5/ 16-12 in**	**156 – 169 Nm**	**115 – 125 lb ft**
-20	**31.8 mm**	**1-1/4 in**	**1-11/ 16-12 in**	**170 – 190 Nm**	**125 – 140 lb ft**	**1`-5/ 6-12 in**	**201 – 217 Nm**	**150 – 160 lb ft**
-24	**38.1 mm**	**1-1/2 in**	**2-12 in**	**200 – 254 Nm**	**150 – 180 lb ft**	**1-7/8-12 in**	**258 – 271 Nm**	**190 – 200 lb ft**

Torque - Standard torque data for hydraulics

Installation of adjustable fittings in straight thread O-ring bosses



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1. Lubricate the O-ring by coating it with a light oil or petroleum. Install the O-ring in the groove adjacent to the metal backup washer which is assembled at the extreme end of the groove **(4)**.
2. Install the fitting into the SAE straight thread boss until the metal backup washer contacts the face of the boss **(5)**.

   NOTE: *Do not over tighten and distort the metal backup washer.*
3. Position the fitting by turning out (counterclockwise) up to a maximum of one turn. Holding the pad of the fitting with a wrench, tighten the locknut and washer against the face of the boss **(6)**.

Standard torque data for hydraulic tubes and fittings

Tube nuts for 37° flared fittings				O-ring boss plugs adjustable fitting locknuts, swivel JIC-37° seats
Size	**Tubing OD**	**Thread size**	**Torque**	**Torque**
4	**6.4 mm** (**1/4 in**)	7/16-20	**12 – 16 N·m** (**9 – 12 lb ft**)	**8 – 14 N·m** (**6 – 10 lb ft**)
5	**7.9 mm** (**5/16 in**)	1/2-20	**16 – 20 N·m** (**12 – 15 lb ft**)	**14 – 20 N·m** (**10 – 15 lb ft**)
6	**9.5 mm** (**3/8 in**)	9/16-18	**29 – 33 N·m** (**21 – 24 lb ft**)	**20 – 27 N·m** (**15 – 20 lb ft**)
8	**12.7 mm** (**1/2 in**)	3/4-16	**47 – 54 N·m** (**35 – 40 lb ft**)	**34 – 41 N·m** (**25 – 30 lb ft**)
10	**15.9 mm** (**5/8 in**)	7/8-14	**72 – 79 N·m** (**53 – 58 lb ft**)	**47 – 54 N·m** (**35 – 40 lb ft**)
12	**19.1 mm** (**3/4 in**)	1-1/16-12	**104 – 111 N·m** (**77 – 82 lb ft**)	**81 – 95 N·m** (**60 – 70 lb ft**)
14	**22.2 mm** (**7/8 in**)	1-3/16-12	**122 – 136 N·m** (**90 – 100 lb ft**)	**95 – 109 N·m** (**70 – 80 lb ft**)
16	**25.4 mm** (**1 in**)	1-5/16-12	**149 – 163 N·m** (**110 – 120 lb ft**)	**108 – 122 N·m** (**80 – 90 lb ft**)
20	**31.8 mm** (**1-1/4 in**)	1-5/8-12	**190 – 204 N·m** (**140 – 150 lb ft**)	**129 – 158 N·m** (**95 – 115 lb ft**)
24	**38.1 mm** (**1-1/2 in**)	1-7/8-12	**217 – 237 N·m** (**160 – 175 lb ft**)	**163 – 190 N·m** (**120 – 140 lb ft**)
32	**50.8 mm** (**2 in**)	2-1/2-12	**305 – 325 N·m** (**225 – 240 lb ft**)	**339 – 407 N·m** (**250 – 300 lb ft**)

These torques are not recommended for tubes of **12.7 mm** (**1/2 in**) OD and larger with wall thickness of **0.889 mm** (**0.035 in**) or less. The torque is specified for **0.889 mm** (**0.035 in**) wall tubes on each application individually.

Before installing and torquing **37°** flared fittings, clean the face of the flare and threads with a clean solvent or Loctite cleaner and apply hydraulic sealant **LOCTITE® 569™** to the **37°** flare and the threads.

Install fitting and torque to specified torque, loosen fitting and retorque to specifications.

Pipe thread fitting torque

Before installing and tightening pipe fittings, clean the threads with a clean solvent or Loctite cleaner and apply sealant **LOCTITE® 567™ PST PIPE SEALANT** for all fittings including stainless steel or **LOCTITE® 565™ PST** for most metal fittings. For high filtration/zero contamination systems use **LOCTITE® 545™**.

Thread size	Torque (maximum)
1/8-27	**13 N·m** (**10 lb ft**)
1/4-18	**16 N·m** (**12 lb ft**)
3/8-18	**22 N·m** (**16 lb ft**)
1/2-14	**41 N·m** (**30 lb ft**)
3/4-14	**54 N·m** (**40 lb ft**)

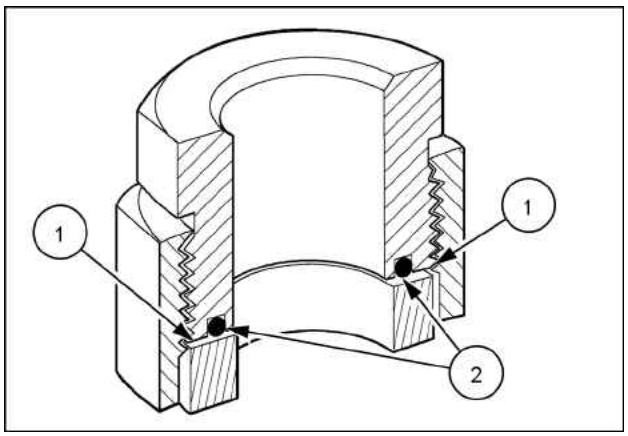
Installation of ORFS (O-Ring Flat Seal fittings)

When installing ORFS fittings thoroughly clean both flat surfaces of the fittings **(1)** and lubricate the O-ring **(2)** with light oil. Make sure both surfaces are aligned properly. Torque the fitting to specified torque listed throughout the repair manual.

NOTICE: *If the fitting surfaces are not properly cleaned, the O-ring will not seal properly. If the fitting surfaces are not properly aligned, the fittings may be damaged and will not seal properly.*

NOTICE: *Always use genuine factory replacement oils and filters to ensure proper lubrication and filtration of engine and hydraulic system oils.*

The use of proper oils, grease, and keeping the hydraulic system clean will extend machine and component life.



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Basic instructions - Shop and assembly

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

   NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*
4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or NEW HOLLAND Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or NEW HOLLAND Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
   - Position the welder ground clamp as close to the welding area as possible.
   - If you weld in close proximity to a computer module, then you should remove the module from the machine.
   - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

   NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*
5. Remove the battery ground cable. Reconnect the cable when you complete welding.

⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.
Failure to comply could result in death or serious injury.

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Special tools

The special tools that NEW HOLLAND suggests and illustrate in this manual have been specifically researched and designed for use with NEW HOLLAND machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Maintenance chart

Maintenance action	Cleaning	Replace	Check	Drain fluid	Adjust	Change fluid	Calibrate	Grease	Page no.
At warning message display									
Air cleaner	x								
Primary fuel filter		x							
Fuel supply restricted (13L engines only)			x						
Every 10 hours or daily									
Engine oil level			x						
Wheel bolt torque			x						
Wheel weight bolt torque			x						
Transmission oil level			x						
Hydraulic and axle oil level			x						
Engine coolant level			x						
Secondary cooling system level			x						
Fuel level			x						
Diesel Exhaust Fluid (DEF)/AdBlue® level			x						
General tractor inspection			x						
Every 50 hours									
Fuel tank and fuel filter				x					
Articulation hinge - upper front					x				
Oscillation hinge - rear					x				
Articulation hinge - lower					x				
Articulation cylinder - front, left-hand, right-hand					x				
Articulation cylinder - rear, left-hand and right-hand					x				
Hitch cylinder pin - upper (if equipped)					x				
Hitch cylinder pin - lower (if equipped)					x				
Hitch rockshaft - left-hand and right-hand					x				
Hitch lift links and top link					x				
Driveshaft carrier bearing					x				
First 100 hours									
Powershift transmission filter		x							
Powershift transmission clutches						x			
Auto Command™ transmission filters		x							
Auto Command™ transmission clutches						x			
Power Take-Off clutches on Auto Command™ transmission						x			
Engine fuel filter		x							
Hydraulic oil filters		x							
Every 600 hours									
Engine oil and filter		x							
Engine fuel filter		x							
Engine fuel pre-filter		x							
Fuel tank vent		x							
Cab air filter, outside	x								
Air tubing - engine			x						
Alternator - water pump belt			x						
Power Take Off (PTO) carrier bearing					x				
Power Take Off (PTO) slip joint					x				
Radiator and coolers	x								
Saddle tanks				x					
Cab recirculation filter	x								
Every 600 hours or yearly									

Maintenance action	Cleaning	Replace	Check	Drain fluid	Adjust	Change fluid	Calibrate	Grease	Page no.
Diesel Exhaust Fluid (DEF)/AdBlue® tank filter			x						
Battery electrolyte level				x					
Every 1000 hours or yearly									
Powershift transmission clutches							x		
Every 1200 hours									
Engine crankcase breather filter			x						
Engine crankcase breather filter			x						
Powershift transmission oil and filter			x						
Powershift transmission breather			x						
Auto Command™ transmission oil and filters			x						
Auto Command™ transmission clutches							x		
Auto Command™ transmission breather			x						
Engine air filters			x						
Diesel Exhaust Fluid (DEF)/AdBlue® supply module filter			x						
Door lock and hinges								x	
Every 1800 hours									
Hydraulic oil and filters			x						
Hydraulic reservoir breather			x						
Cab air filter, outside			x						
Engine air tubing				x					
Every 2400 hours									
Engine coolant drain and flush							x		
Secondary cooling system drain and flush							x		
Every 3000 hours									
Engine valve adjustment						x			
As required									
Diesel Exhaust Fluid (DEF)/AdBlue® suction circuit filter			x						
Power Take-Off clutches on Auto Command™ transmission							x		
Vehicle fire prevention	x								
Remote valve couplers	x								
Pressure cooling system hoses				x					
Hydraulic system hoses				x					
Tire pressure				x					
Serpentine belt				x					
Viscous fan drive				x					
Cab fabric and carpet	x								
Seat belt				x					
Battery removal and installation			x						
Hood lamps			x						
Flood and work lamps			x						
Fender tail light and warning light			x						
Fender tail light and warning light			x						
Amber roof warning light			x						
Rotating beacon light			x						
Exterior step light			x						
Interior lights			x						

Hydraulic contamination

Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil.

Contamination can enter the hydraulic system in several ways:

- When you drain the oil or disconnect any line
- When you disassemble a component
- From normal wear of the hydraulic components
- From damaged seals or worn seals
- From a damaged component in the hydraulic system

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination can cause problems in the hydraulic system.

The following list includes some of these problems:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- Movement of control valve spools is difficult
- Hydraulic oil that becomes too hot
- Pump gears, housing, and other parts that wear rapidly
- Relief valves or check valves held open by dirt
- Quick failure of components that have been repaired
- Slow cycle times are slow. The machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination.

There are two types of contamination: microscopic and visible.

Microscopic contamination occurs when very fine particles of foreign material are suspended in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory.

Examples of problems caused by microscopic contamination:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- The hydraulic system has a high operating temperature

Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of components.

Examples of problems caused by visible contamination:

- Particles of metal or dirt in the oil
- Air in the oil
- Dark or thick oil
- Oil with an odor of burned oil
- Water in the oil

If you find contamination, use a portable filter to clean the hydraulic system.

Capacities

Engine	
Oil exchange capacity with filter (approximate)	**NEW HOLLAND AMBRA MASTERGOLD™ HSP ENGINE OIL**, or **NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4**
T9.435 Only	**25 L** (**6.6 US gal**)
T9.480, T9.530, T9.565	**27.25 L** (**7.2 US gal**)
T9.600, T9.645 and T9.700	**36 L** (**9.5 US gal**)
Cooling system capacity	
Coolant	**NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**
T9.435	**14.75 L** (**3.9 US gal**)
T9.480, T9.530, T9.565	**60 L** (**15.85 US gal**)
T9.600, T9.645 and T9.700	
Main engine coolant system	**65 L** (**17 US gal**)
Secondary cooling system	**40 L** (**10.6 US gal**)
Powershift transmission	
Oil type	**NEW HOLLAND AMBRA MASTERTRAN® ULTRACTION**
T9.435, T9.480, T9.530, T9.565, and T9.600	**63 L** (**16.6 US gal**)
T9.600 Scraper and T9.645 and T9.700	**70 L** (**18.5 US gal**)
Auto Command™ transmission	
Oil type	**NEW HOLLAND AMBRA MASTERTRAN® ULTRACTION**
T9.435, T9.480, T9.530, and T9.565	**91.2 L** (**24.1 US gal**)
T9.600, T9.645, and T9.700	**93.9 L** (**24.8 US gal**)
Axle/hydraulic system	
Oil type	**NEW HOLLAND AMBRA MASTERTRAN® ULTRACTION**
Approximate total system capacity (See Note)	
All models	**250 L** (**66 US gal**)

NOTE: *Total system capacity includes filters, front and rear axle and reservoir. If three-point hitch equipped, add* ***19 L*** *(****5 US gal****).*

Power specification - Engine specifications

Diesel engine

Tractor model	T9.435	T9.480	T9.530	T9.565	T9.600	T9.645	T9.700
Engine make and model	New Holland Cursor						
Type	In-line, six-cylinder, four-stroke cycle						
Aspiration	Variable geometry turbo-charged (VGT), air-to-air after cooled	Wastegate turbo-charged, air-to-air after-cooled			Two-stage turbo-charged, air-to-water inter-cooled, air-to-water after-cooled		
Emission level	Tier 4B (final)						
Firing order	1-4-2-6-3-5						
Bore	**117 mm** (**4.4 in**)	**135 mm** (**5.3 in**)					
Stroke	**135 mm** (**5.3 in**)	**150 mm** (**5.9 in**)					
Displacement	**8.7 l** (**530 in³**)	**12.9 l** (**787 in³**)					
Compression ratio	15.9:1	16.5:1			15.3:1		
Cylinder sleeves	Wet-type, removable						
High idle (no load)	**2190 – 2350 RPM**	**2200 – 2350 RPM**					
Rated speed	**2000 RPM**	**2100 RPM**					
Idle speed	**900 RPM**	**850 RPM**					
Standard power rating	**276 kW** (**370 Hp**)	**313 kW** (**420 Hp**)	**350 kW** (**470 Hp**)	**373 kW** (**500 Hp**)	**399 kW** (**535 Hp**)	**433 kW** (**580 Hp**)	**462 kW** (**620 Hp**)
Peak torque at **1400 RPM**	**1832 N·m** (**1351 lb ft**)	**1992 N·m** (**1469 lb ft**)	**2229 N·m** (**1644 lb ft**)	**2374 N·m** (**1751 lb ft**)	**2540 N·m** (**1874 lb ft**)	**2757 N·m** (**2034 lb ft**)	**2941 N·m** (**2169 lb ft**)
Torque rise	**40%**						
Power boost	**41 kW** (**55 Hp**)	**31 kW** (**42 Hp**)	**35 kW** (**47 Hp**)	**37 kW** (**50 Hp**)	**51 kW** (**69 Hp**)	**43 kW** (**58 Hp**)	**46 kW** (**62 Hp**)

Lubrication system

All models

Oil pressure at idle speed (minimum)	**100 kPa** (**15 psi**)
Oil pressure at high idle (minimum)	**305 kPa** (**44 psi**)
Type of system	Pressure and spray

Air intake system

All models

Type	Dry-type, two-stage aspirator system with service indicator in instrument cluster

Cooling system

All models

Type	Pressure system, thermostat-controlled bypass, impeller-type pump
Radiator	Aluminum furnace brazed
Thermostat	Starts to open at approximately **84 °C** (**183 °F**) Fully open at **94 °C** (**201 °F**)
Pressure cap, deaeration tank	**103 kPa** (**15 psi**)
Fan drive type - powershift transmission	
T9.435, T9.480, T9.530, and T9.565	Electronically controlled viscous
T9.600, T9.645, and T9.700	Hydraulic
Fan drive - **Auto Command™** transmission	
T9.435	Electronically controlled viscous
All other models	Hydraulic

General specification - Power train and hydraulics

Transmission - Powershift (if equipped)

Type	Full powershift, 16 forward and 2 reverse speeds
Shift control	Electronically controlled, hydraulically operated

Transmission - Continuously Variable Transmission (CVT) (if equipped)

Type	Four range CVT planetary with hydrostat unit for smooth continuous power
Shift control	Electrically Controlled with a dedicated Vehicle Driveline Control Unit Hydraulically Actuated

Brakes

Service brake	Hydraulic, multiple disc wet brake integral with front and rear differentials
Park brake - T9.435, T9.480, T9.530 and T9.565	Electrically controlled spring applied and pressure released. Integral with rear differential
Park brake - T9.560, T9.600., T9.645 and T9.700	Electrically controlled spring applied and pressure released. Integral with front and rear differentials

Axle differential and final drives

Type	Bar type with integral wet brake. Spiral bevel ring/pinion gears. Pressure lubed and oil cooled
Final drive	
T9.435 through T9.565	4-Pinion planetary
T9.600, T9.645 and T9.700	3-Pinion compound planetary

	Total axle reduction
T9.435 through T9.565	25.396:1
T9.600, T9.645 and T9.700	25.194:1

Axle bar diameter	
T9.600, T9.645, and T9.700 factory **SmartTrax™**	**115 mm** (**4.5 in**)
T9.435, T9.480, T9.530 and T9.565	**127 mm** (**5.0 in**)
T9.600 (Scraper), T9.645, and T9.700	**140 mm** (**5.5 in**)

Axle bar length	
All models	**3048 mm** (**120.0 in**)

Power Take-Off (PTO) (If Equipped)

PTO type	Live Independent system integral with transmission ASABE Type 3 **45 mm** (**1.75 in**) **1000 RPM** 20 spline
Type clutch	Electro/hydraulically actuated
Rotation	Clockwise from rear of tractor
1000 RPM	20 Spines from rear of tractor
Engine speed for **1000 RPM**	**1810 RPM**

Park brake system

Park brake	Spring applied multiple disc actuated by transmission control lever

Hydraulic system

Type	Closed center, load sensing
Remote valve	Electro/ hydraulic controlled, closed center stack type with in-cab variable flow control for each section, with line locks on all lift ports
Standard system pump flow - (powershift only option)	
T9.435	**151 l/min** (**40 US gpm**)
T9.480 through T9.700	**159 l/min** (**42 US gpm**)
High output pump capacity (powershift option, CVT standard)	
T9.435	**208 l/min** (**55 US gpm**)
T9.480 through T9.700	**216 l/min** (**57 US gpm**)
Steering	Articulated, full priority, two double acting cylinders
Steering pressure	**193 – 200 bar** (**2800 – 2900 psi**)
Couplers	ISO standard couplers
System pressure	**205 – 215 bar** (**2970 – 3120 psi**)

MegaFlow™ hydraulics (if equipped)

Type system	PFC piston pump
T9.435 **MegaFlow™**	**200 l/min** (**53 US gpm**)
T9.435 Standard pump and **MegaFlow™** combined (powershift only option)	**351 l/min** (**93 US gpm**)
T9.435 High flow pump and **MegaFlow™** combined (powershift option)	**408 l/min** (**108 US gpm**)
T9.480 through T9.700 **MegaFlow™**	**212 l/min** (**56 US gpm**)
T9.480 through T9.700 Stand pump and **MegaFlow™** combined (powershift option)	**371 l/min** (**98 US gpm**)
T9.435 through T9.700 High flow pump and **MegaFlow™** combined (powershift option, standard CVT)	**427 l/min** (**113 US gpm**)

Hitch system (if equipped)

Type control	Electronic
Type valve	Three position - lift, hold and lower
Type draft arms	Rigid, swing type with manual float adjustment
Type hitch	Three point category IV-N
Hitch coupler (adjustment)	Category IV-N
Lift capacity (OECD Static) **610 mm** (**24.0 in**) behind ball ends through full range (OECD Static)	
T9.435, T9.480, T9.530 and T9.565	**9071 kg** (**20,000 lb**)
T9.600, T9.645 and T9.700	**8900 kg** (**19,620 lb**)

Drawbar

Type	Solid bar with drop pin hammerstrap
Pin diameter (category 4)	**51 mm** (**2.0 in**)
Pin diameter (category 5)	**70 mm** (**2.75 in**)
Pin length	**220 mm** (**8.7 in**)
Maximum permissible tongue weight	
Standard	**2400 kg** (**5,300 lb**)
Optional heavy duty - all models (category 4)	**4983 kg** (**11,000 lb**)
Optional heavy duty - T9.600, T9.645 and T9.700 only (category 5)	**6804 kg** (**15,000 lb**)

Scraper drawbar

Maximum permissible tongue weight	**9072 kg** (**20,000 lb**)

Product identification

Tractor model and product identification number

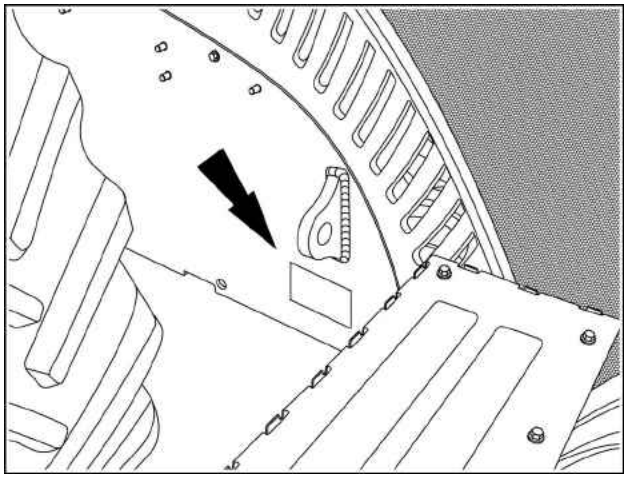
Write your model number, Product Identification Number (PIN), and serial number of major components on the lines provided. If needed, give these numbers to your dealer when you need parts or information for your machine.

RAIL17TR00736EA 1

Model :

PIN:

NOTE: *Located on the front right-hand side plate in front of front axle.*



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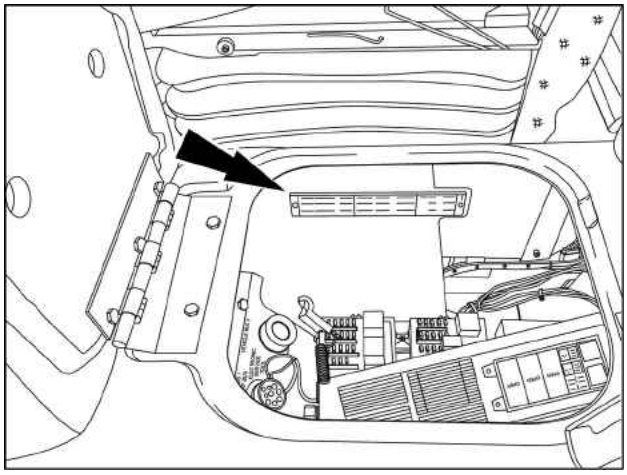
Roll Over Protective Structure (ROPS) serial number

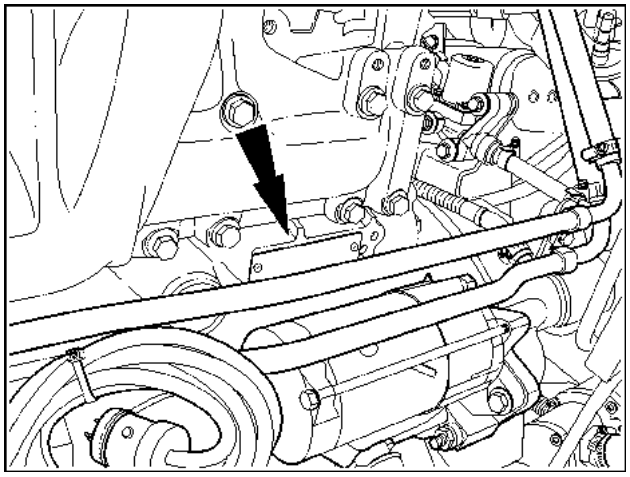
NOTE: *Located under the instructional seat.*



RAIL13TR04833AA 3

Engine serial number (T9.435)

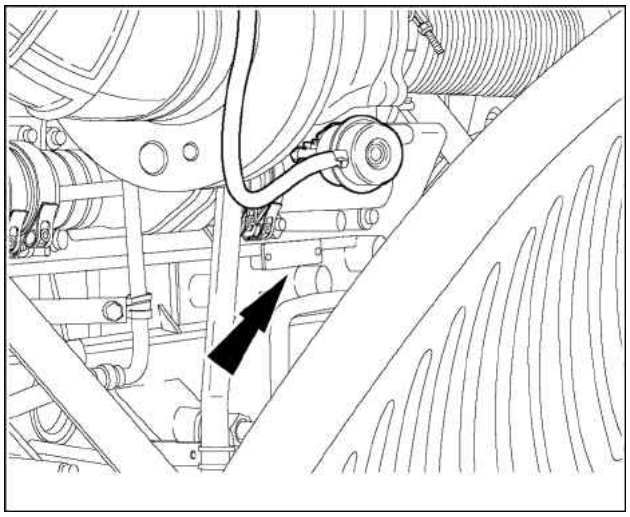
NOTE: *Located on the rear left-hand side of the engine.*



RCPH10FWD681BAM 4

Engine serial number (T9.480, T9.530, and T9.565)

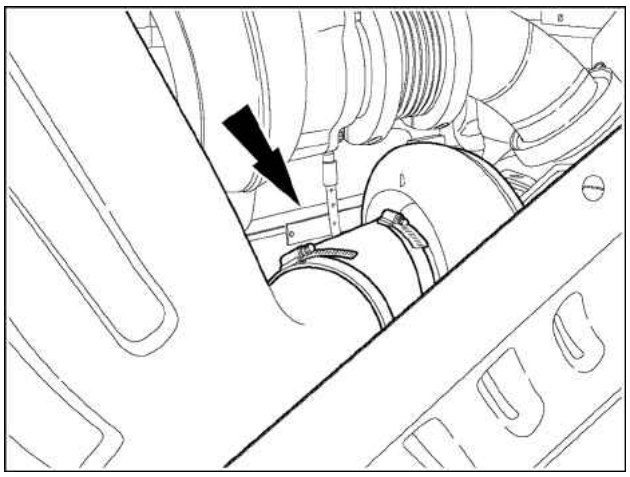
NOTE: *Located on the rear left-hand side of the engine.*



RCPH10FWD684BAM 5

Engine serial number (T9.600, T9.645, and T9.700)

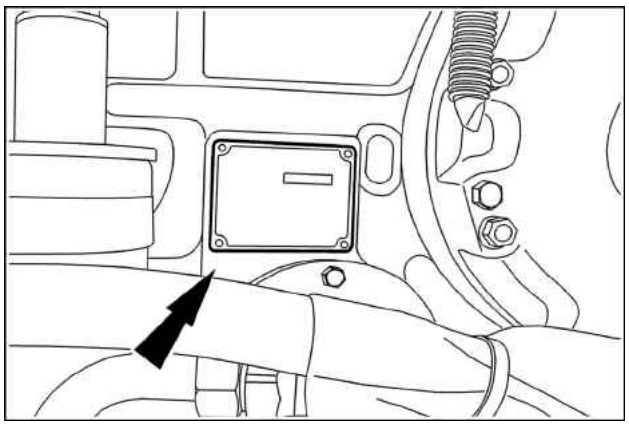
NOTE: *Located on the rear left-hand side of the engine.*



RCPH10FWD683BAM 6

Powershift transmission serial number

NOTE: *Located on the rear left-hand side of the transmission.*



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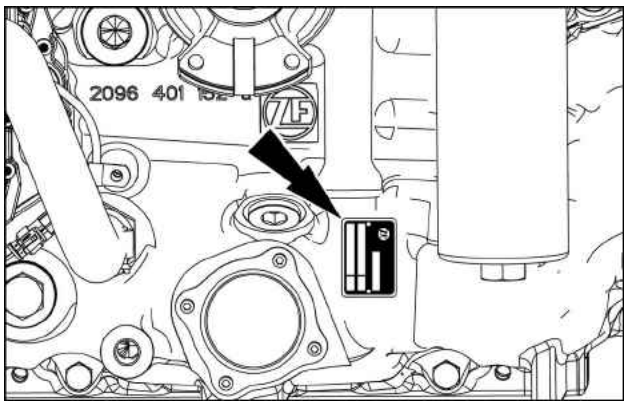
Auto Command™ transmission serial number

NOTE: *Located on the rear bottom center of the transmission.*



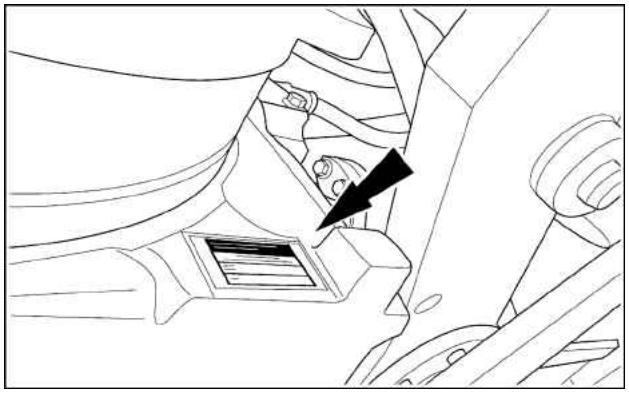
RAIL17TR00947AA 8

Axle serial number (T9.435, T9.480, T9.530, T9.565)

Front

Rear

NOTE: *Located on the side of the axle center housing.*



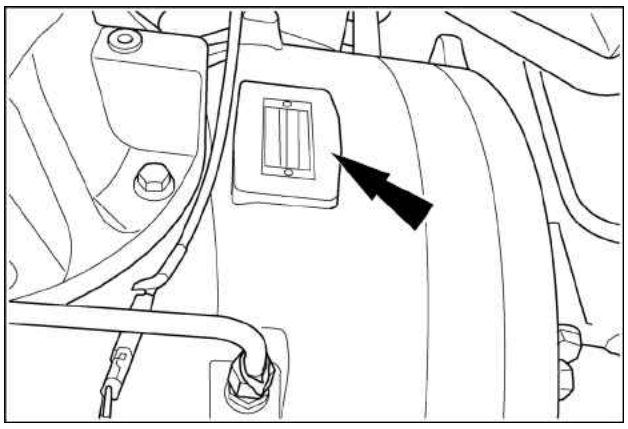
RCPH09FWD007FAM 9

Axle serial number (T9.600, T9.645, and T9.700)

Front

Rear

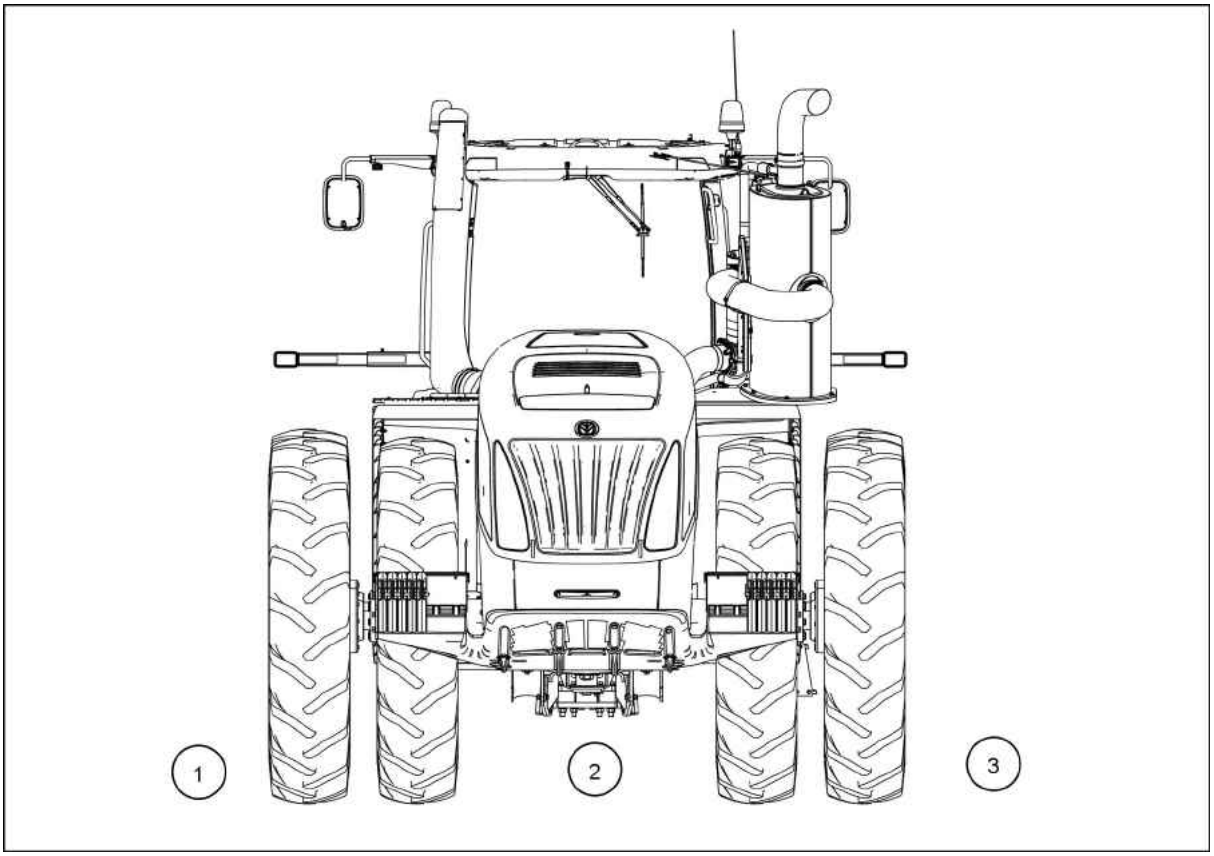
NOTE: *Located on the side of the axle center housing.*



RCPH09FWD008GAM 10

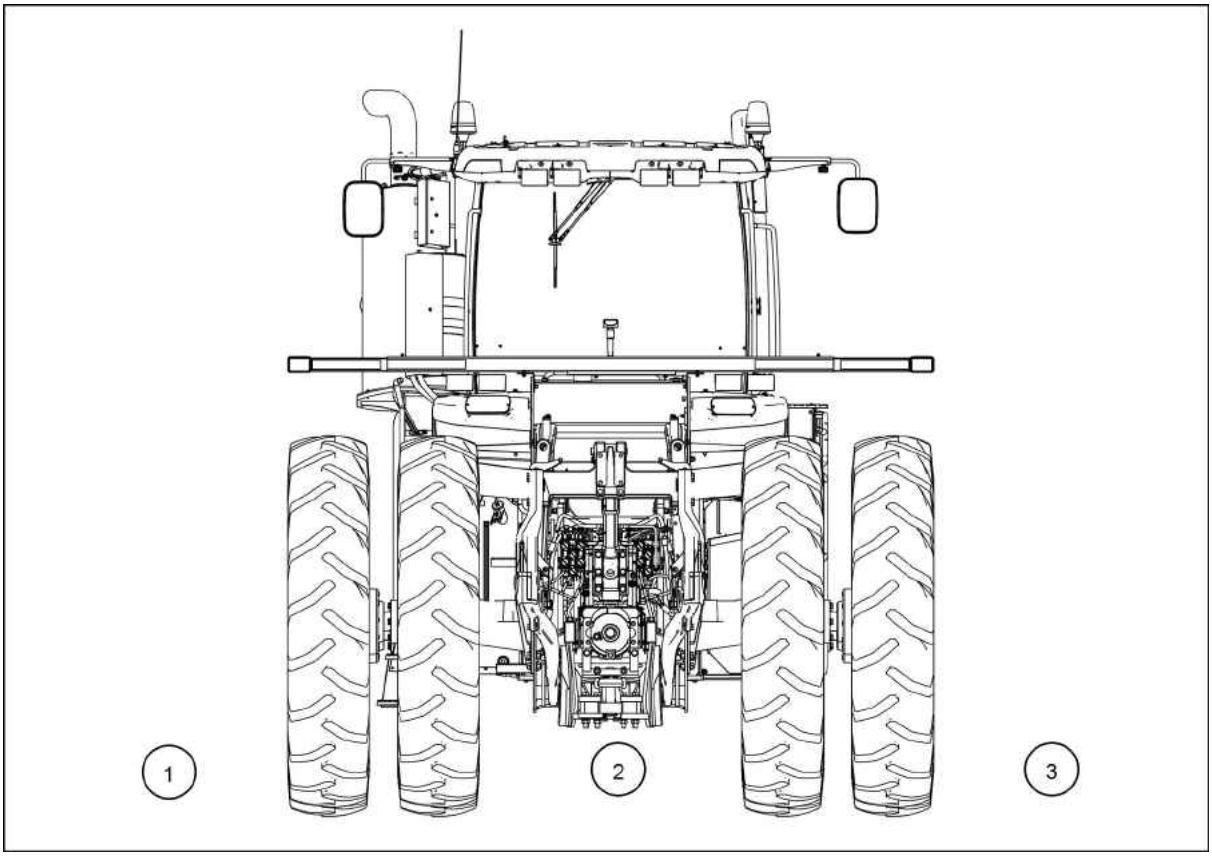
Product identification - Machine orientation

The right-hand and left-hand sides of the machine as used in this manual are the same as your right hand and your left hand when sitting in the operators seat looking forward.



RAIL13TR04797FA 1

1. Right-hand side	2. Front of unit	3. Left-hand side



RAIL13TR04980FA 2

1. Left-hand side	2. Rear of unit	3. Right-hand side

SERVICE MANUAL

Engine

T9.435 CVT, TIER 4B [JEEZ00000FF405001 -], T9.435 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.480 CVT, TIER 4B [JEEZ00000FF405001 -], T9.480 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.565 CVT, TIER 4B [JEEZ00000FF405001 -], T9.565 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, factory SmartTrax™, Tier 4B [JEEZ00000FF405001 -], T9.700 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]

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Engine and crankcase - 001

T9.435 CVT, TIER 4B [JEEZ00000FF405001 -], T9.435 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.480 CVT, TIER 4B [JEEZ00000FF405001 -], T9.480 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, TIER 4B [JEEZ00000FF405001 -], T9.530 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.530 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.565 CVT, TIER 4B [JEEZ00000FF405001 -], T9.565 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 CVT, scraper, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.600 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, factory SmartTrax™, TIER 4B [JEEZ00000FF405001 -], T9.645 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, TIER 4B [JEEZ00000FF405001 -], T9.700 Powershift, factory

SmartTrax™, Tier 4B [JEEZ00000FF405001 -], T9.700 Powershift, scraper, TIER 4B [JEEZ00000FF405001 -]

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Engine and crankcase - 001

SERVICE

Engine

(*) See content for specific models

Engine - Change fluid - Changing engine oil and filter

NOTE: *Reduce to 300 hours or less if* ***NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4*** *is not used.*

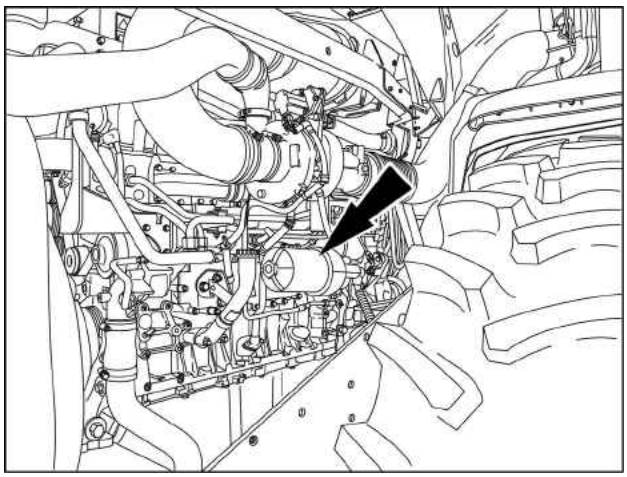
Change the engine oil and filter every 600 hours or once a year or before storage, whichever occurs first. Your dealer has approved oil and filters. Do not use other types of oil or filters.

NOTE: *For best results change the oil and filter while the engine is still warm to the touch from operation (not hot). The tractor must be on a level surface.*

Remove the engine side shields.

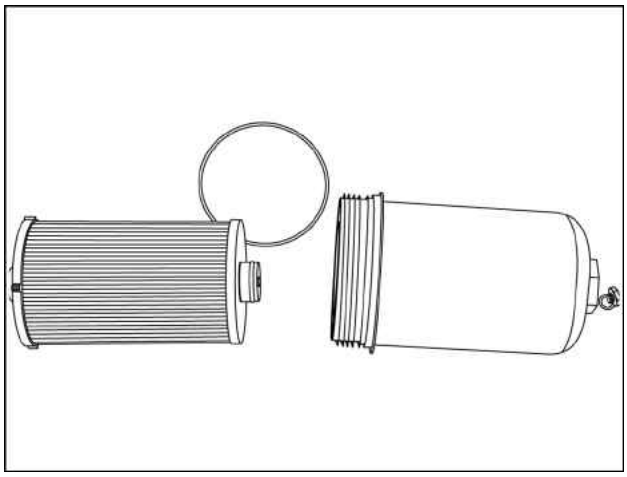
9L engine

1. Remove the oil pan drain plug and drain the oil from the engine into a container.
2. After all oil has drained, install new washer 98474302 on drain plug, center washer on plug and install drain plug. Torque drain plug to **30 N·m** (**22 lb ft**).
3. Clean the area around the filter head and housing on the left side of the engine. Place a container under the oil filter and turn the filter housing counterclockwise to loosen with a **51 mm** (**2 in**) wrench. After all oil has drained from the filter, remove the housing with filter.



RAIL13TR04406AA 1

4. Install the new filter cartridge and O-ring. Lightly oil new O-ring.
4. Reinstall the filter assembly onto the tractor. Do not over tighten or O-ring will leak.

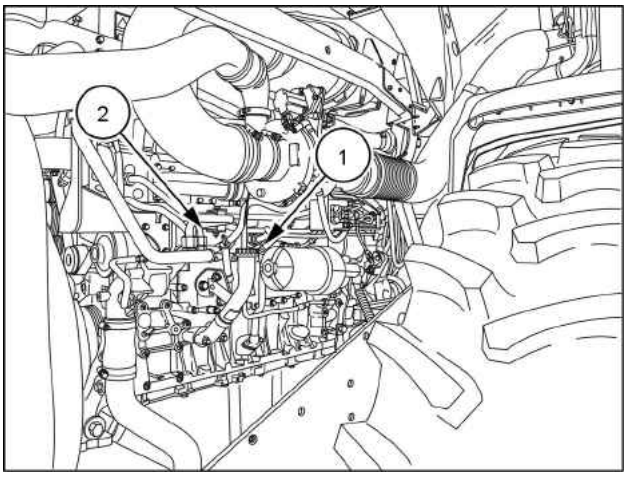


RCPH10FWD928BAM 2

5. Fill with new oil into the engine oil fill **(1)**.

NOTE: *Total oil refill capacity will be determined by how completely the crankcase drains. Do not fill above the high mark on the dipstick **(2)** when refilling.*

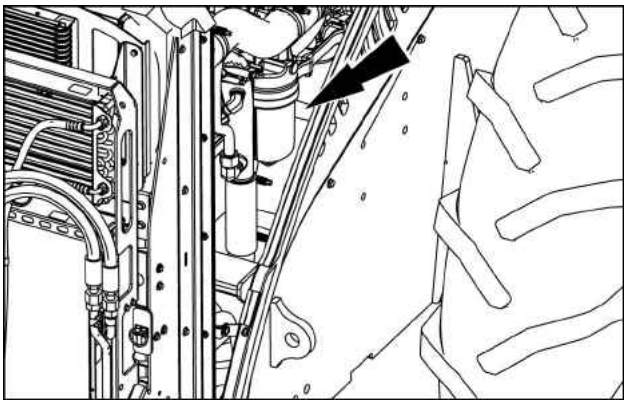
6. Operate the engine for five minutes at **1000 RPM**. Check for oil leaks at the filter base and drain plug.
7. Stop the engine. Wait approximately five minutes for the oil to return to the oil pan. Check the oil level on the dipstick **(2)** and add oil if needed.



RAIL13TR04406AA 3

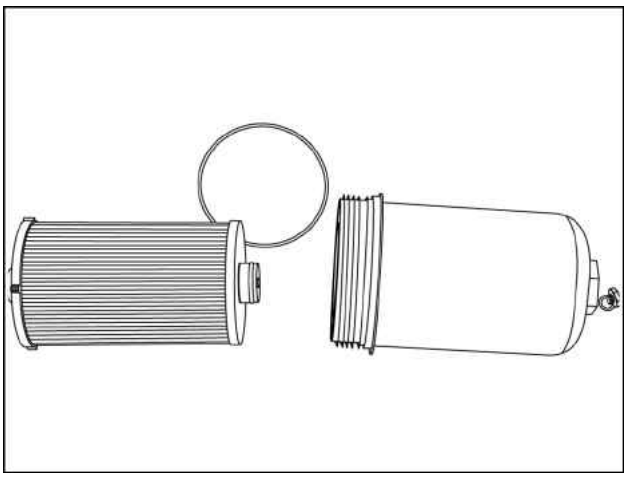
13L engines

1. Remove the oil pan drain plug and drain the oil from the engine into a container.
2. After all oil has drained, install new washer 98474302 on drain plug, center washer on plug and install drain plug. Torque drain plug to **30 N·m** (**22 lb ft**).
3. Place a container under the oil filter on the left side of the engine. Use a **19 mm** (**0.75 in**) socket to open drain on bottom of housing. This will allow oil to drain from the housing. After oil is drained, turn the filter housing counterclockwise to loosen with a **51 mm** (**2 in**) wrench and remove the filter housing.



RAIL14TR00085AA 4

4. Install the new filter cartridge and O-ring.
4. Reinstall the filter assembly. Do not over tighten or the O-ring will leak.

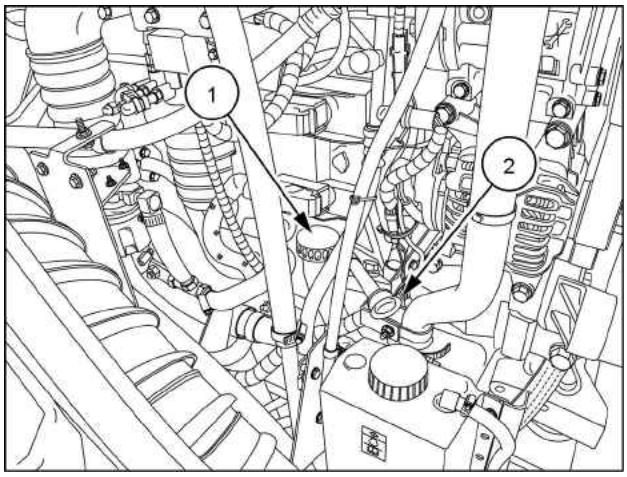


RCPH10FWD928BAM 5

5. Fill with new oil into the engine oil fill **(1)**.

NOTE: *Total oil refill capacity will be determined by how completely the crankcase drains. Do not fill above the high mark on the dipstick* ***(2)*** *when refilling.*

6. Operate the engine for five minutes at **1000 RPM**. Check for oil leaks at the filter base and drain plug.
7. Stop the engine. Wait approximately five minutes for the oil to return to the oil pan. Check the oil level on the dipstick **(2)** and add oil if needed.



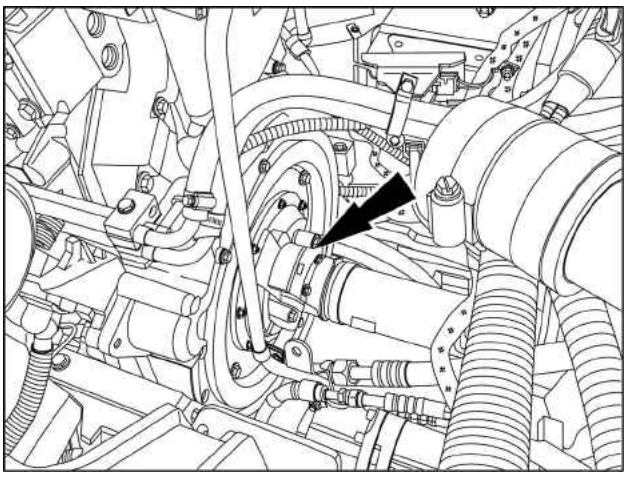
RAIL13TR01857AA 6

Engine - Remove - 9L

T9.435	NA

Prior operation:
Remove the hood support, refer to **Hood support - Remove - Row crop frame, 9L engine (90.102)**for procedure.

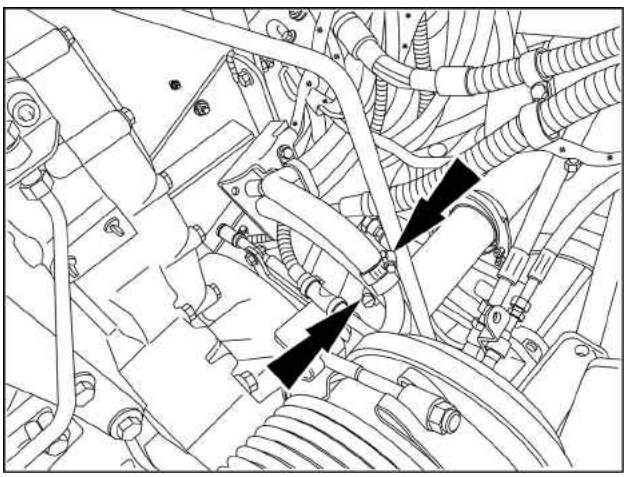
1. Disconnect the driveshaft from the engine.



RAIL13TR02967AA 1

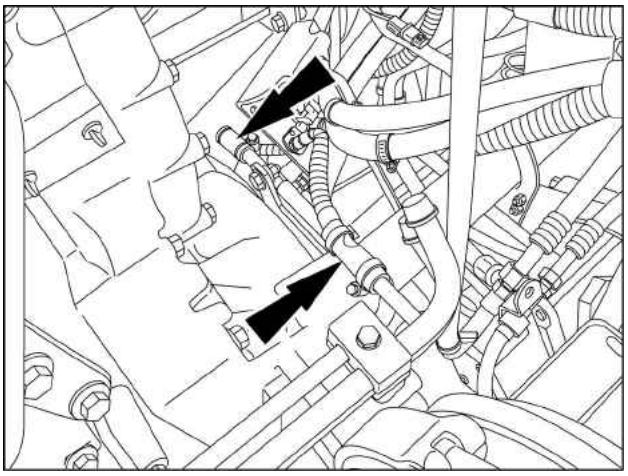
2. Label and disconnect the heater hoses from the tubes.

NOTE: *Plug and cap all disconnected hoses and tubes.*



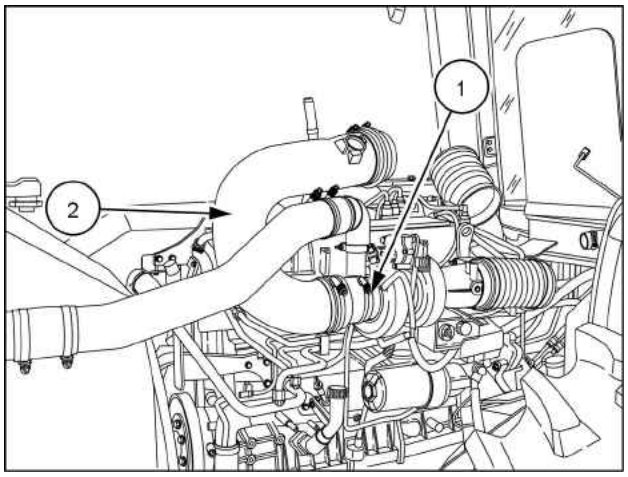
RAIL13TR02966AA 2

3. Label and disconnect the two hoses for the diesel emissions fluid tank solenoid.



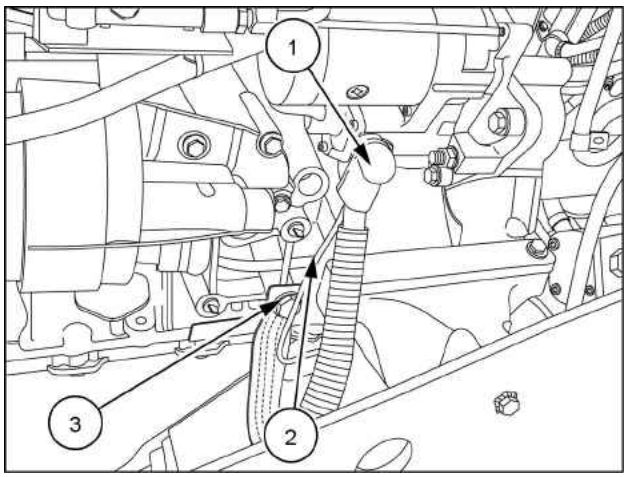
RAIL13TR02969AA 3

4. Loosen the hose clamp **(1)** at the turbo.
5. Remove the air intake tube **(2)** from the engine.



RAIL13TR03051AA 4

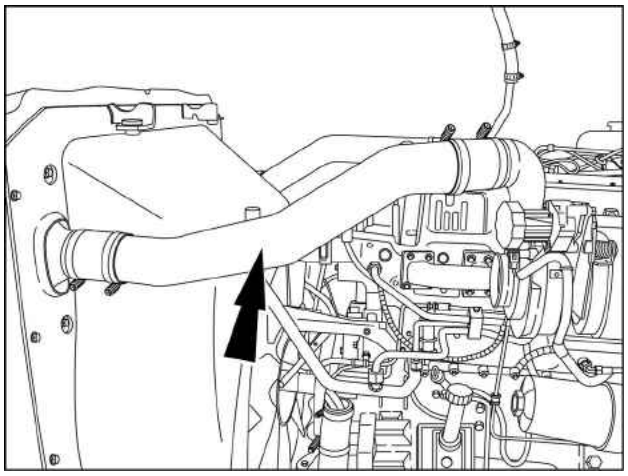
6. Disconnect the power cable **(1)** from the starter.
7. Disconnect the wire **(2)** from the starter.
8. Remove the bolt **(3)** and disconnect the ground strap from the engine block.



RAIL13TR02970AA 5

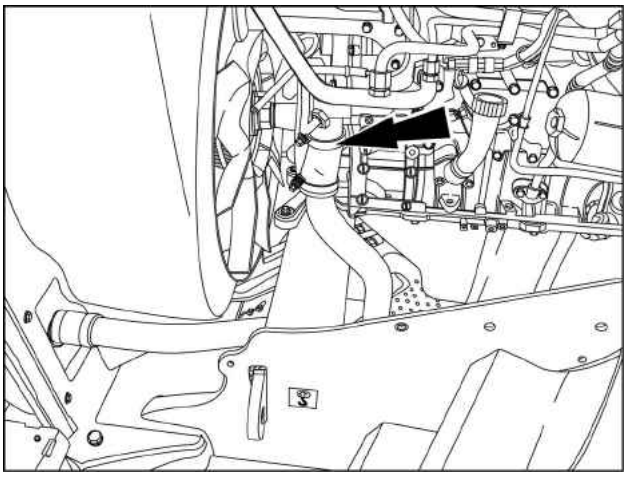
9. Remove the left hand charged air cooler tube.

NOTE: *Plug and cap disconnected tubes and ports.*



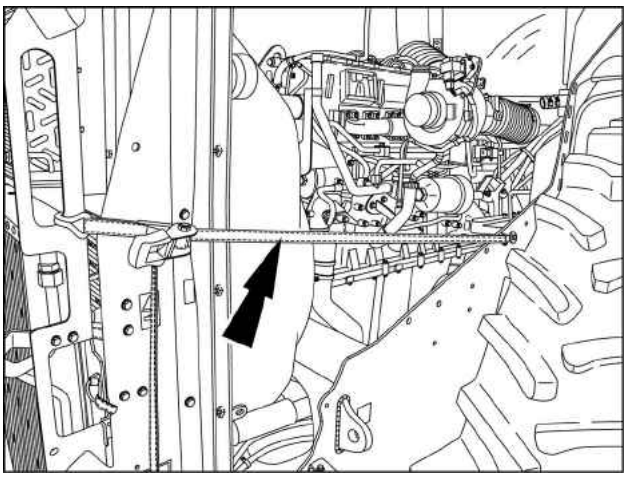
RAIL13TR02978AA 6

10. Disconnect the lower radiator hose at the engine.



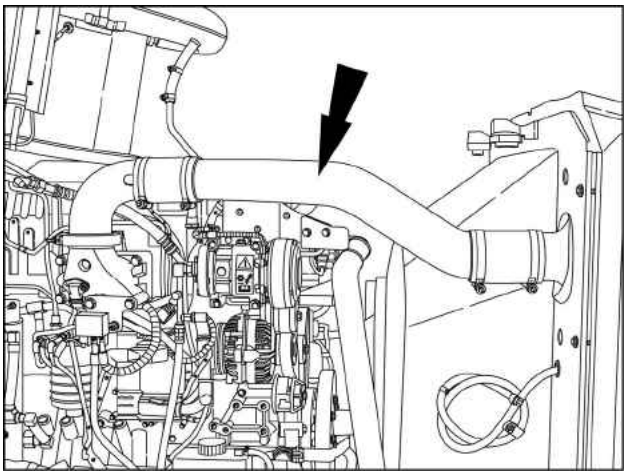
RAIL13TR02971AA 7

11. Attach a support strap to the cooling package frame and the chassis frame as shown to support the cooling package.



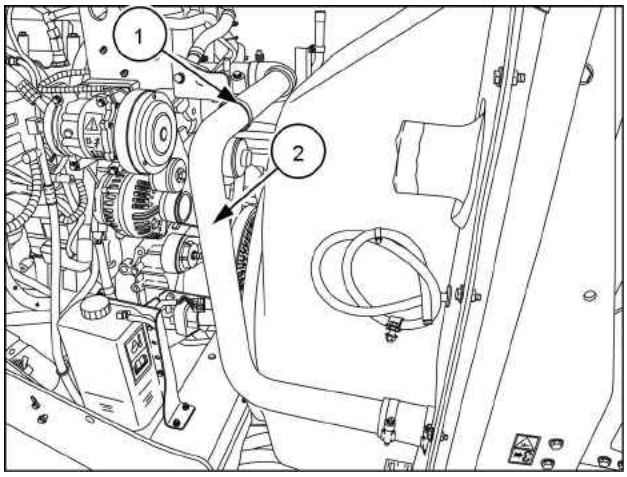
RAIL13TR02973AA 8

12. Remove the right hand charged air cooler tube.



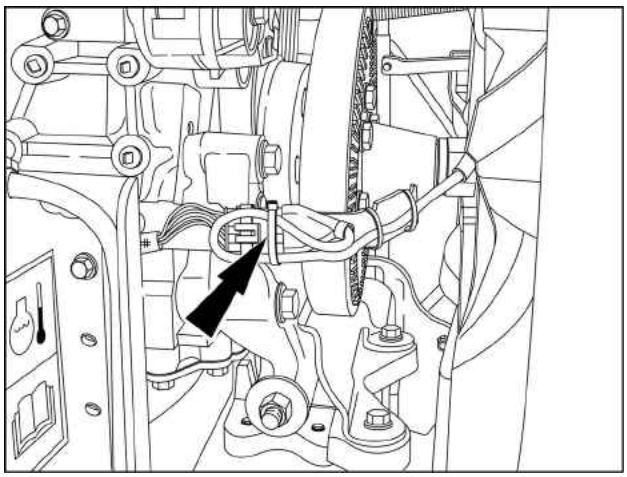
RAIL13TR02972AA 9

13. Remove the clamp **(1)** securing the upper radiator tube to the bracket on the engine.
14. Remove the upper radiator tube **(2)**.



RAIL13TR02974AA 10

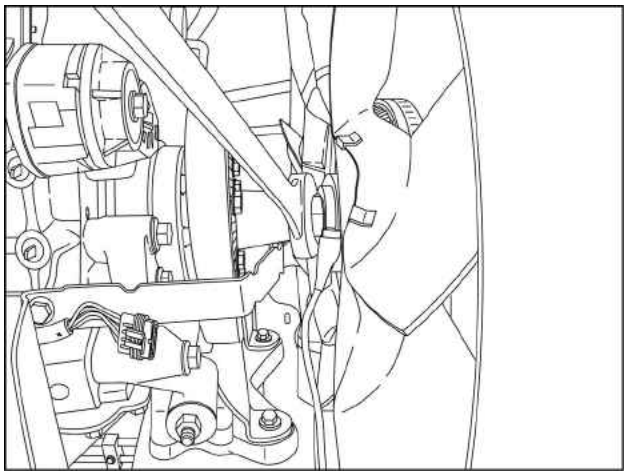
15. Cut the ties securing the harness and disconnect the harness.



RAIL13TR02976AA 11

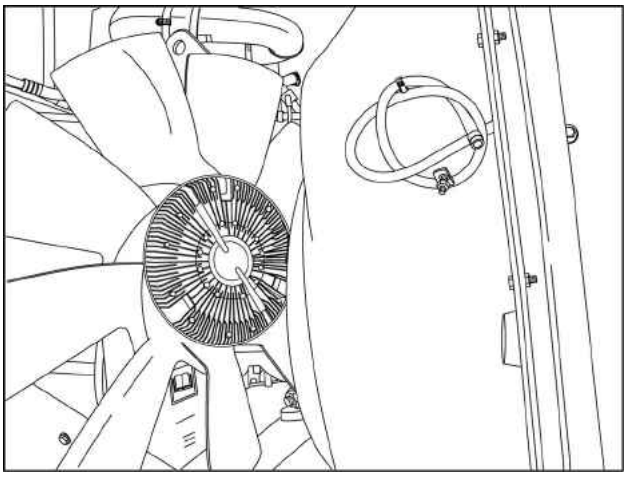
16. Loosen the viscous drive from the shaft.

NOTE: *The fan pulley hub is left handed threaded.*



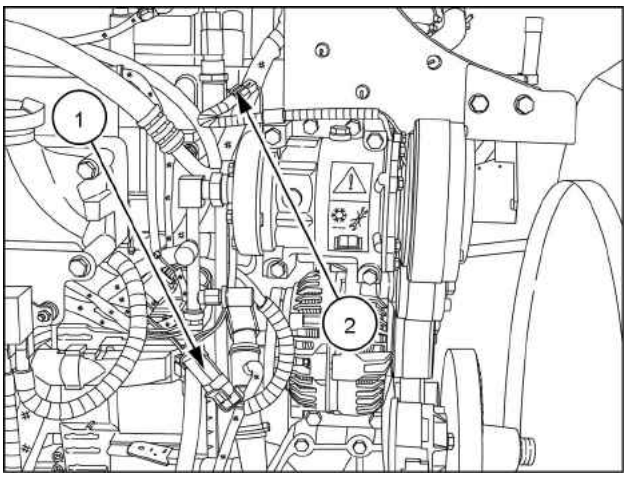
RAIL13TR02979AA 12

17. With the help of an assistant remove the fan out the right hand side of the machine.



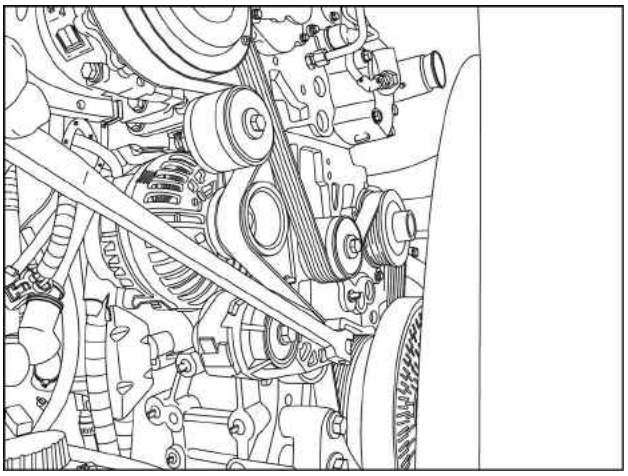
RAIL13TR02977AA 13

18. Disconnect the harness lead to the air conditioner high pressure switch **(1)** and the clutch activation lead **(2)** .



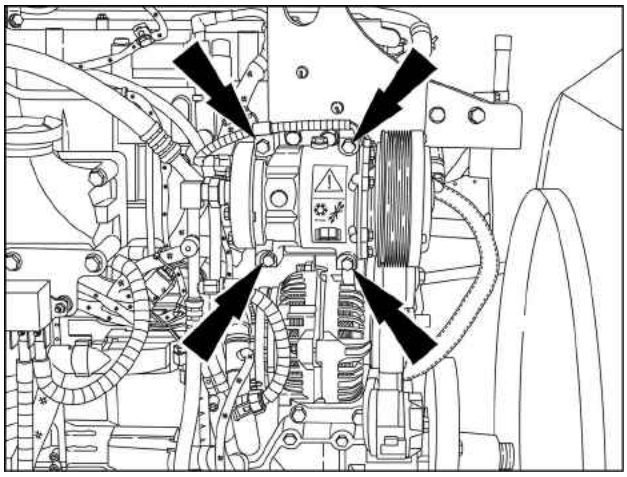
RAIL13TR02981AA 14

19. Use a breaker bar to relieve the tension on the serpentine belt and remove the belt from the air conditioner compressor pulley.



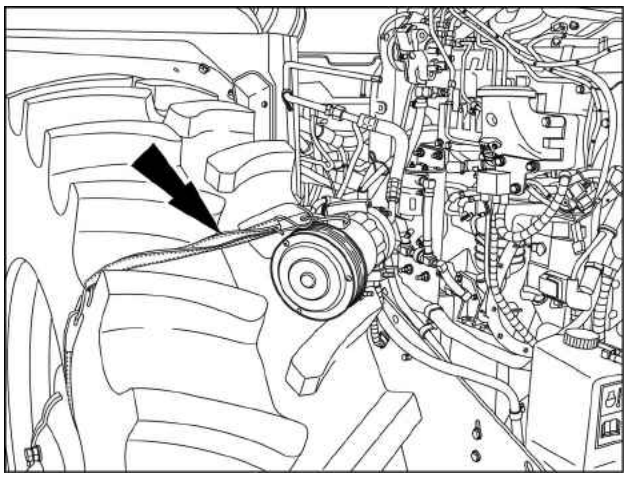
RAIL13TR02987AA 15

20. Support the compressor and remove the four mounting bolts.



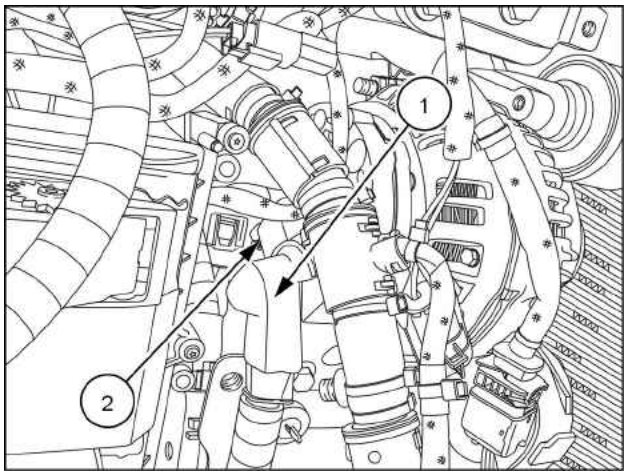
RAIL13TR02986AA 16

21. Set the compressor on the right hand front tire and secure with holding straps as shown.



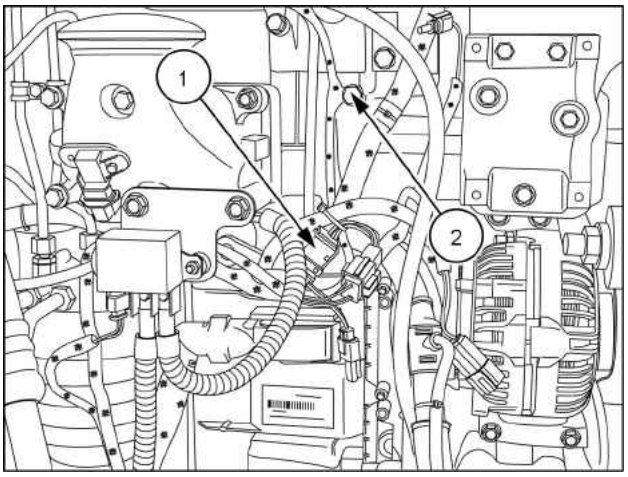
RAIL13TR02982AA 17

22. Disconnect the power cable **(1)** from the alternator.
23. Disconnect the exciter wire **(2)** from the alternator.



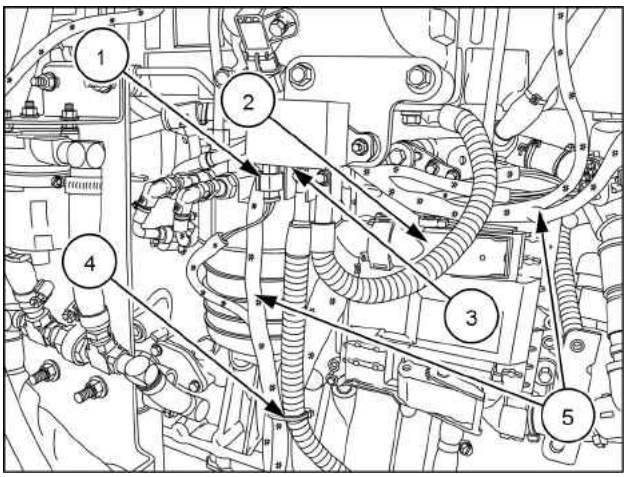
RAIL13TR02983AA 18

24. Disconnect the harness **(1)**.
25. Remove the bolt **(2)** securing the harness to the engine block.



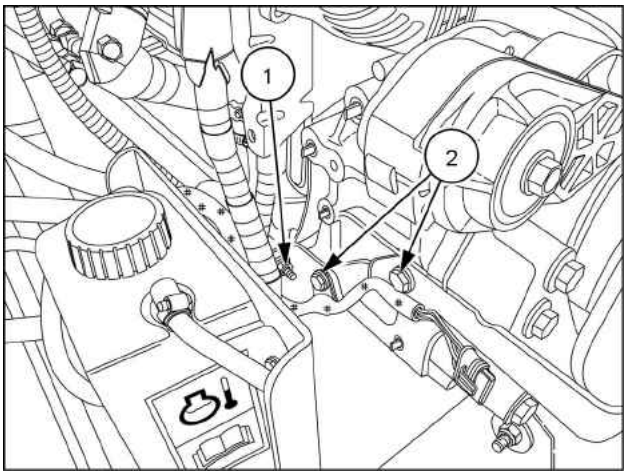
RAIL13TR02985AA 19

26. Unplug the connector **(1)**.
27. Disconnect the main harness **(2)** from the engine controller.
28. Disconnect the cable **(3)** from the junction box.
29. Cut the tie **(4)** securing the harness and cable together.
30. Move the harness **(5)** out from behind the junction box and the engine to stay with the chassis during the engine removal.



RAIL13TR02988AA 20

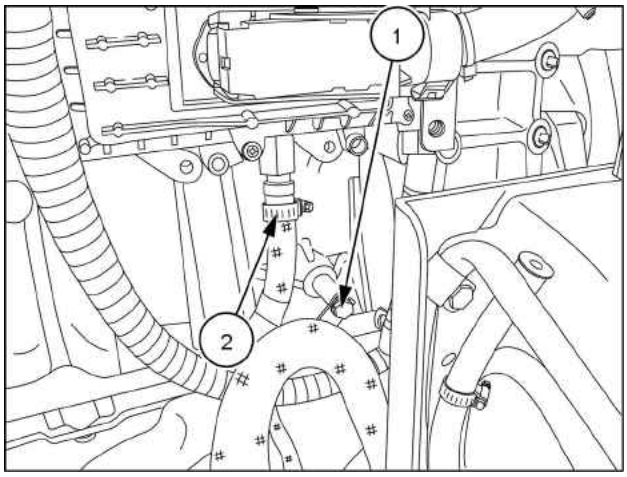
31. Remove the nut and bolt **(1)** securing the cable to the bracket.
32. Remove the bolts **(2)** securing the bracket to the engine block.



RAIL13TR02984AA 21

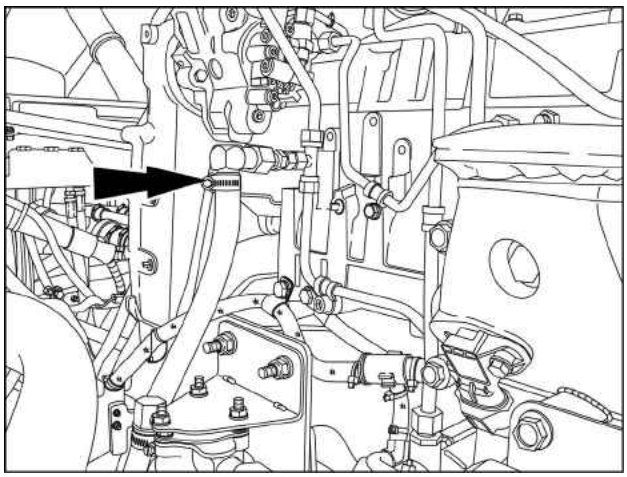
33. Remove the bolt **(1)** securing the harness to the engine block.
34. Disconnect the fuel inlet hose **(2)**.

NOTE: *Plug and cap all disconnected fuel hoses and fittings.*



RAIL13TR02993AA 22

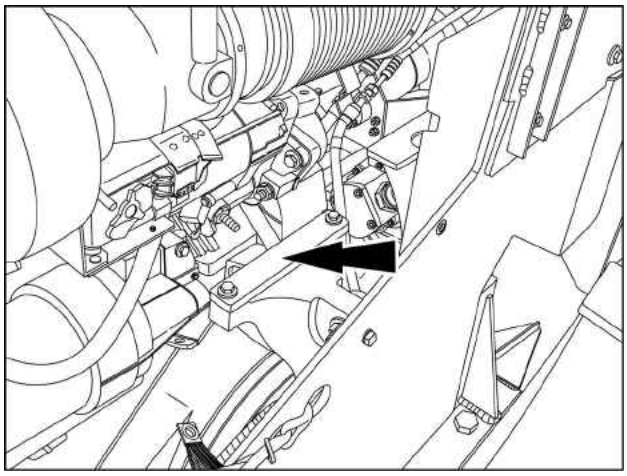
35. Disconnect the fuel return hose.



RAIL13TR02991AA 23

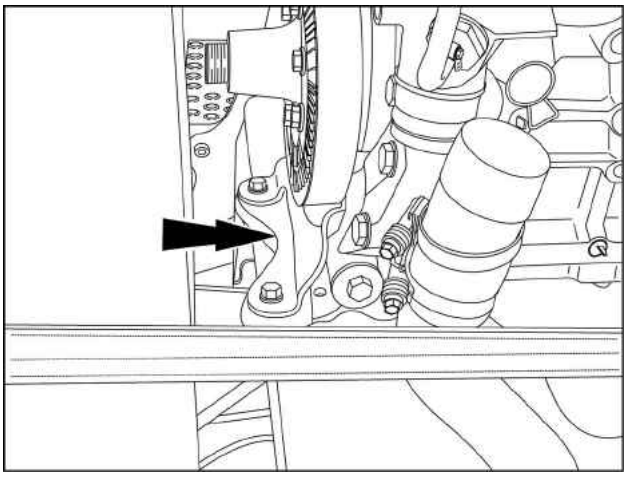
36. Remove the right and left hand hold down brackets.

NOTE: *Left hand side is shown. Remove both sides.*



RAIL13TR02989AA 24

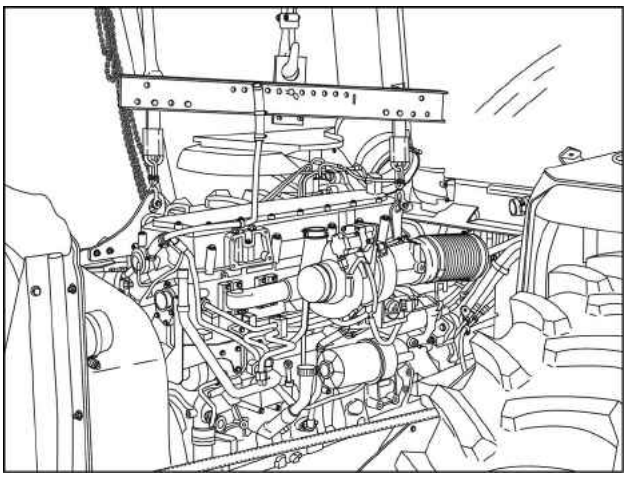
37. Remove the front hold down bracket.



RAIL13TR02994AA 25

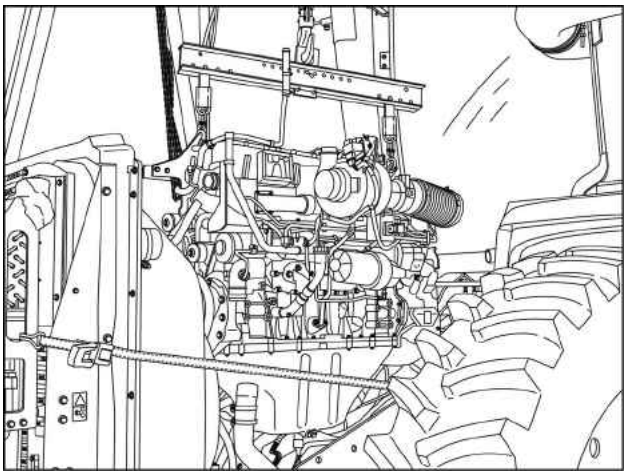
38. Attach the 4130 load rotor lifting bale or equivalent to overhead crane and engine lift brackets.

NOTE: *The engine lifting brackets are for vertical lifting only. Any lifting device that is not vertically in line with the lifting brackets can damage the engine rocker arm cover or cause bracket failure.*



RAIL13TR02992AA 26

39. Remove the engine.



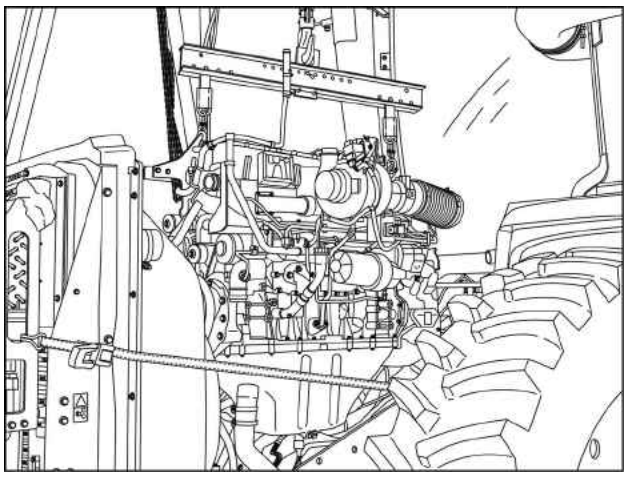
RAIL13TR02990AA 27

Engine - Install - 9L

T9.435	NA

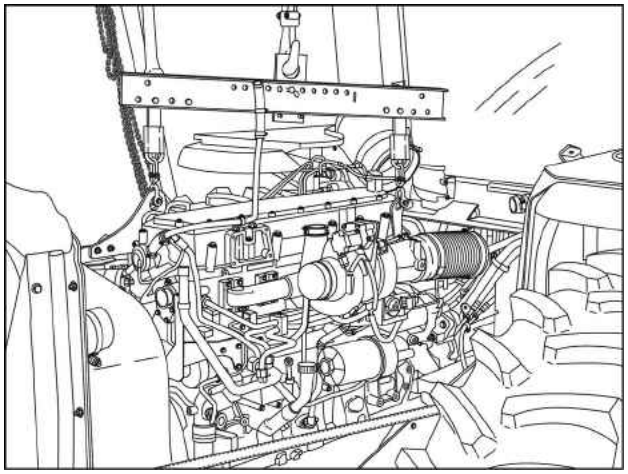
1. Set the engine in place on the chassis.

NOTE: *The engine lifting brackets are for vertical lifting only. Any lifting device that is not vertically in line with the lifting brackets can damage the engine rocker arm cover or cause bracket failure.*



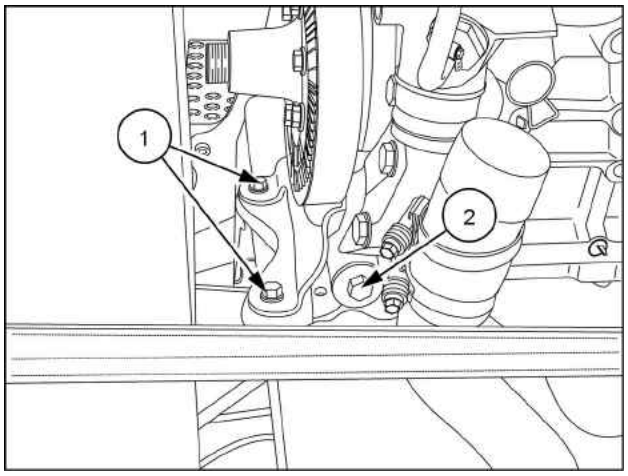
RAIL13TR02990AA 1

2. Remove the 4130 load rotor lifting bale or equivalent from the engine lift brackets.



RAIL13TR02992AA 2

3. Install the front hold down bracket.
4. Torque the lower engine mount to frame bolts **(1)** to **90 – 107 N·m** (**66 – 79 lb ft**).
5. Torque the ISO mount nut and bolt to **160 – 220 N·m** (**118 – 162 lb ft**).

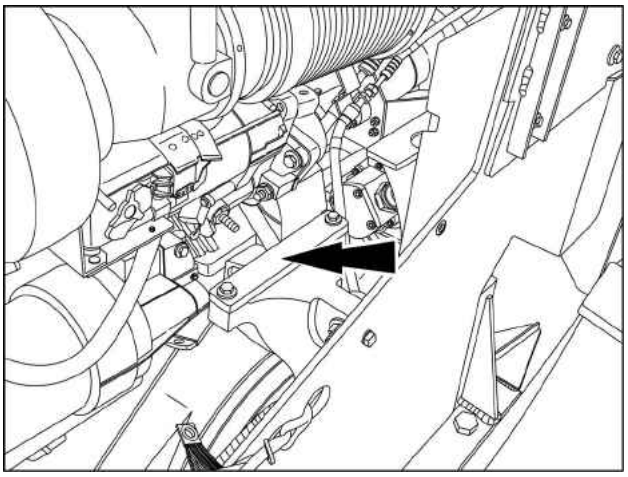


RAIL13TR02994AA 3

6. Install the right and left hand hold down brackets.

NOTE: *Left hand side is shown. Install both sides.*

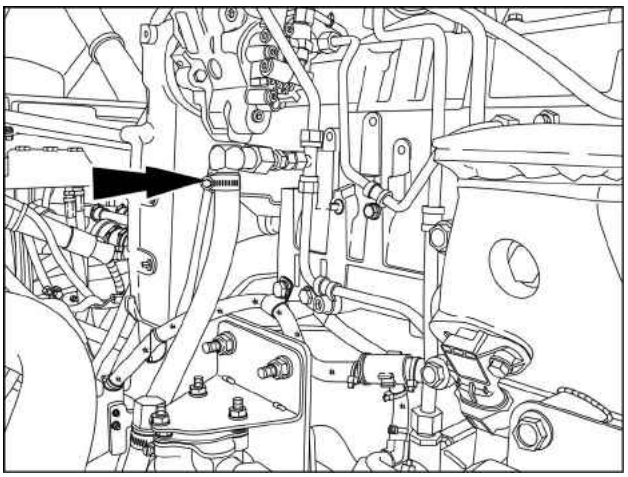
7. Torque the bolts to **125 – 150 N·m** (**92 – 111 lb ft**).



RAIL13TR02989AA 4

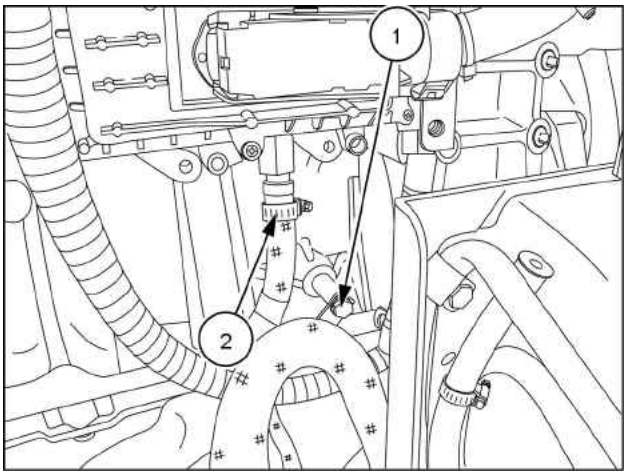
8. Connect the fuel return hose.

NOTE: *Remove the plugs and caps from the disconnected fuel hoses and fittings.*



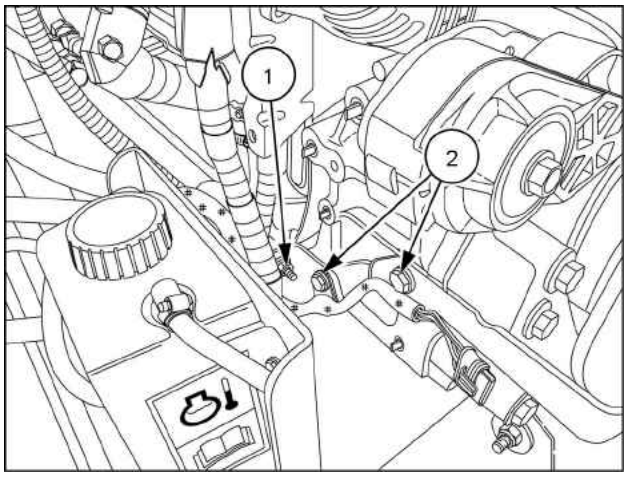
RAIL13TR02991AA 5

9. Route the harness and secure to the engine block with the original bolt **(1)**.
10. Connect the fuel inlet hose **(2)**.



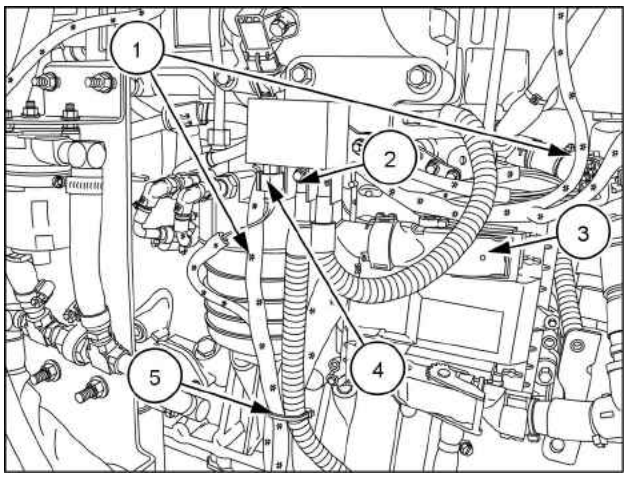
RAIL13TR02993AA 6

11. Secure the bracket to the engine block **(1)** with the original bolts.
12. Secure the cable to the bracket with the original nut and bolt **(2)**.



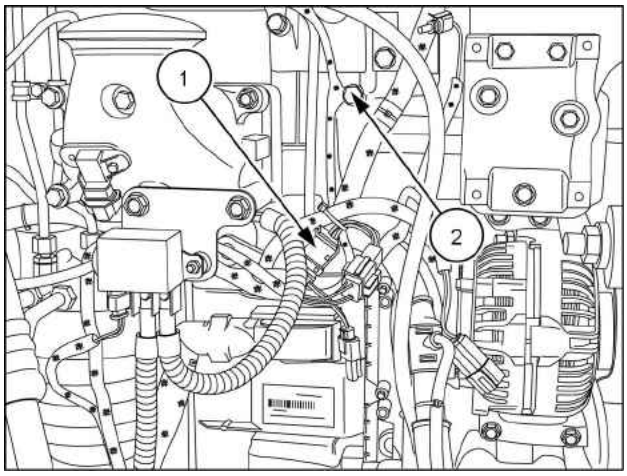
RAIL13TR02984AA 7

13. Route the harness **(1)** behind the junction box into it's original position.
14. Connect the cable **(2)** to the junction box as shown.
15. Connect the main harness **(3)** to the engine controller.
16. Plug in the connector **(4)** as shown.
17. Secure the harness and cable **(5)** together with a tie.



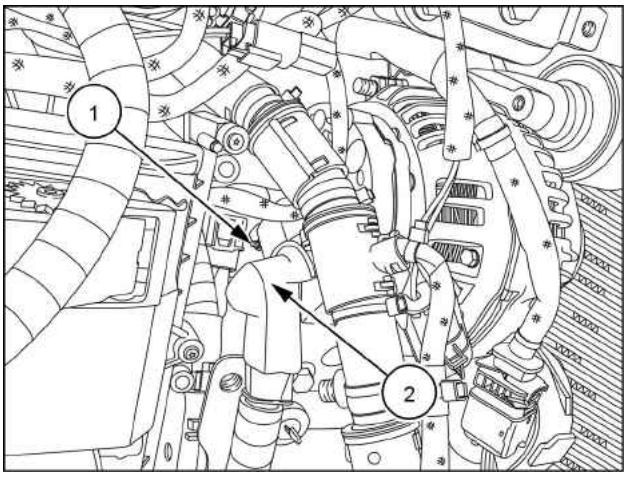
RAIL13TR02988AA 8

18. Connect the harness **(1)**.
19. Route the harness to the top of the engine and secure with the original bolt **(2)**.



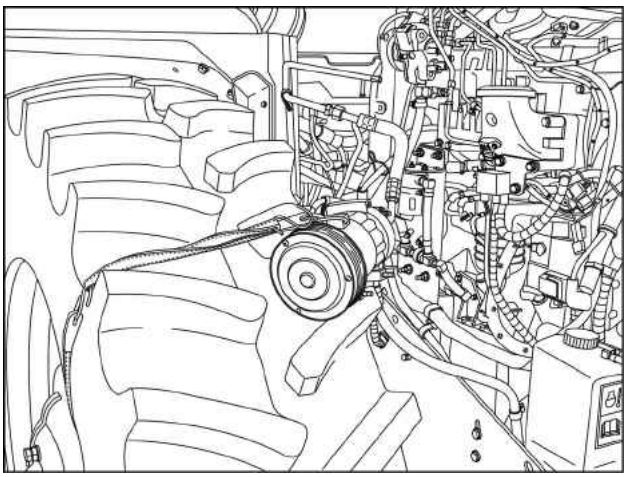
RAIL13TR02985AA 9

20. Connect the exciter wire **(1)** to the alternator.
21. Connect the power cable **(2)** to the alternator.



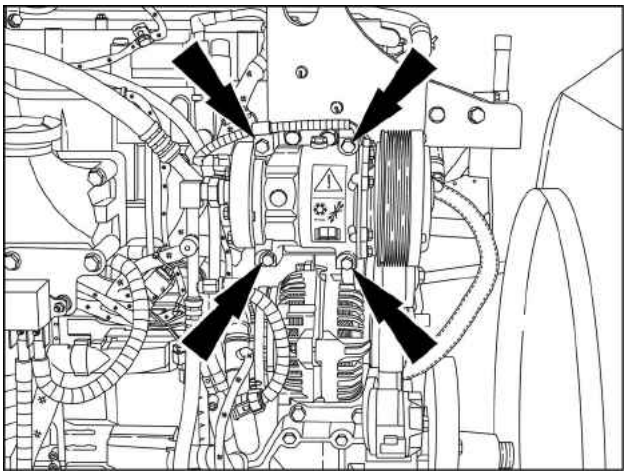
RAIL13TR02983AA 10

22. Remove the compressor from the right hand front tire and set in place on the engine.



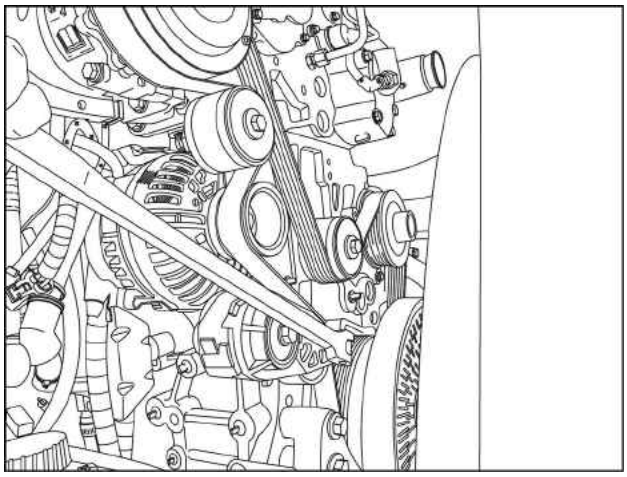
RAIL13TR02982AA 11

23. Support the compressor, install the four mounting bolts and tighten.



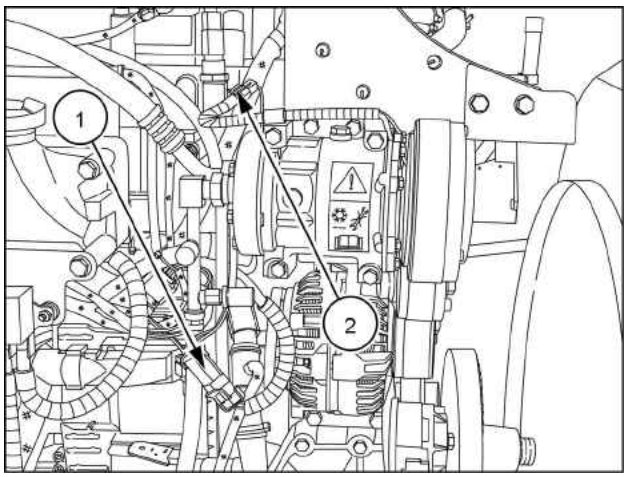
RAIL13TR02986AA 12

24. Use a breaker bar to move the belt tensioner and install serpentine belt on to the air conditioner compressor pulley.



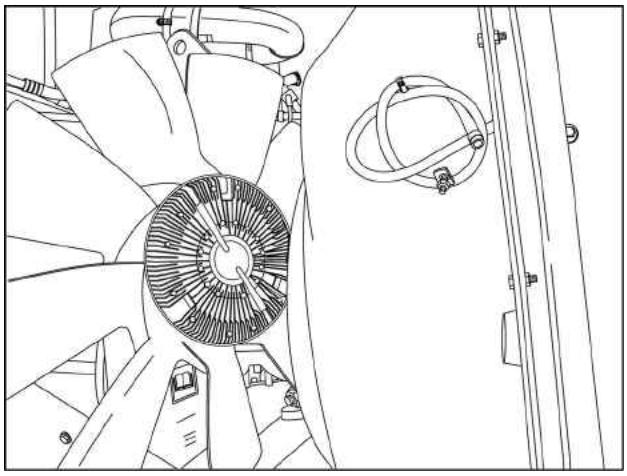
RAIL13TR02987AA 13

25. Connect the harness lead to the air conditioner high pressure switch **(1)** and the clutch activation lead **(2)** .



RAIL13TR02981AA 14

26. With the help from an assistant install the fan in place from the right hand side of the machine.

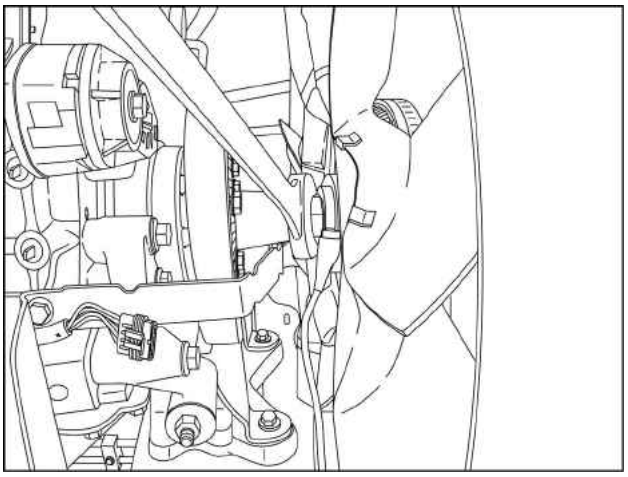


RAIL13TR02977AA 15

27. Thread the viscous drive on to the shaft.

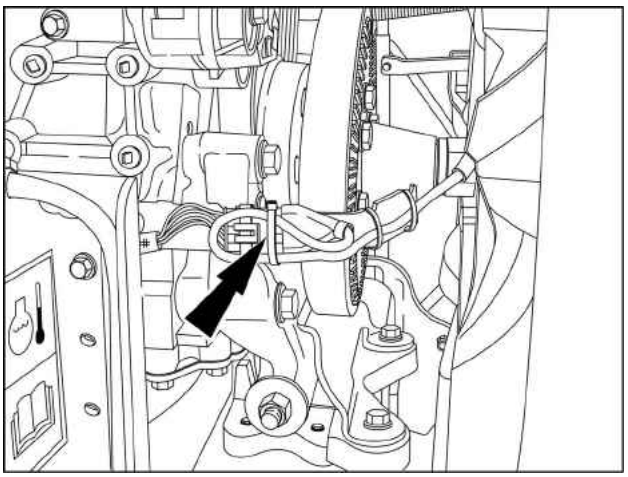
NOTE: *The fan pulley hub is left handed threaded.*

28. Tighten the viscous drive on to the shaft.



RAIL13TR02979AA 16

29. Connect the harness and secure to the bracket with ties.



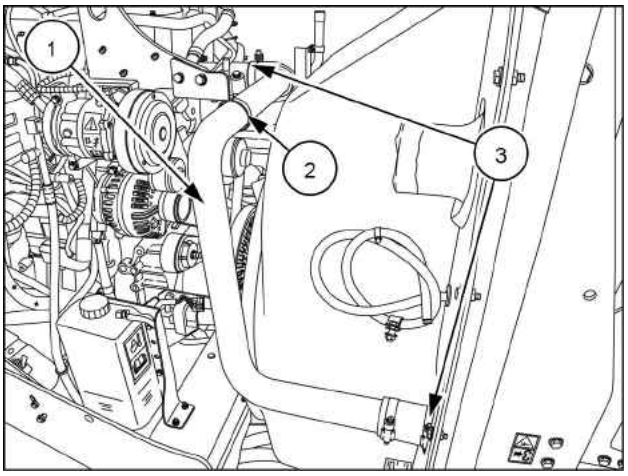
RAIL13TR02976AA 17

30. Set the upper radiator tube **(1)** in place.

NOTE: *Remove the plugs and caps from the disconnected tubes and ports.*

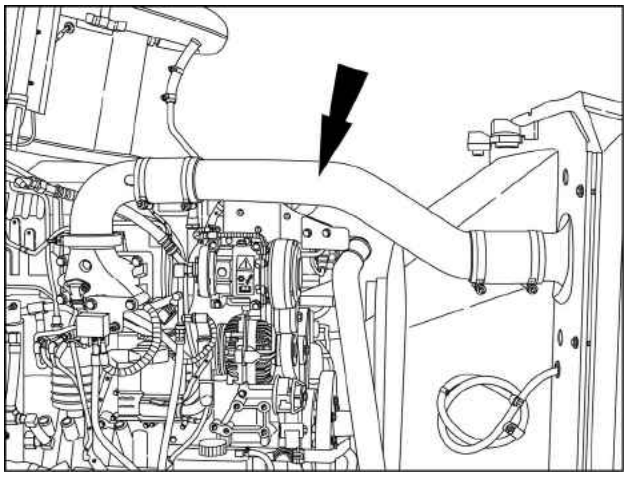
31. Install the clamp **(2)** securing the upper radiator tube to the bracket on the engine.

32. Tighten the clamps **(3)** at the radiator and the thermostat housing on the engine.



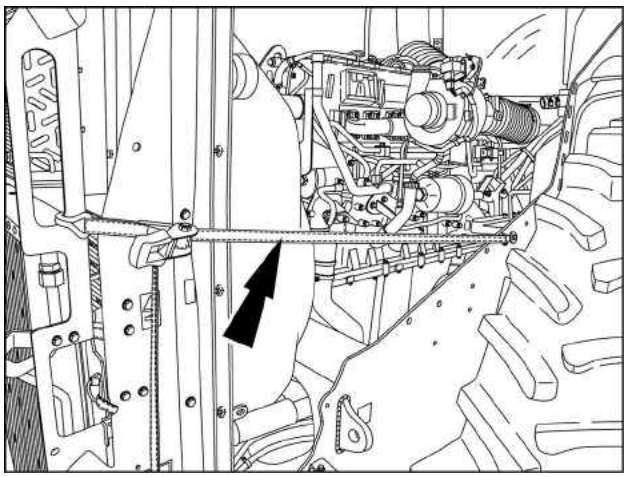
RAIL13TR02974AA 18

33. Assemble the right hand charged air cooler tube.



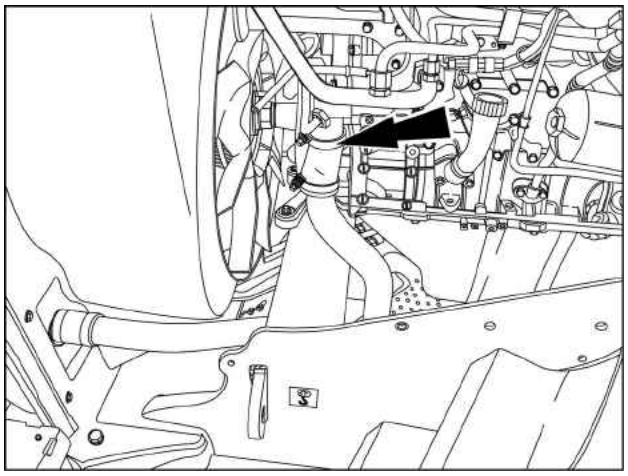
RAIL13TR02972AA 19

34. Remove the support strap.



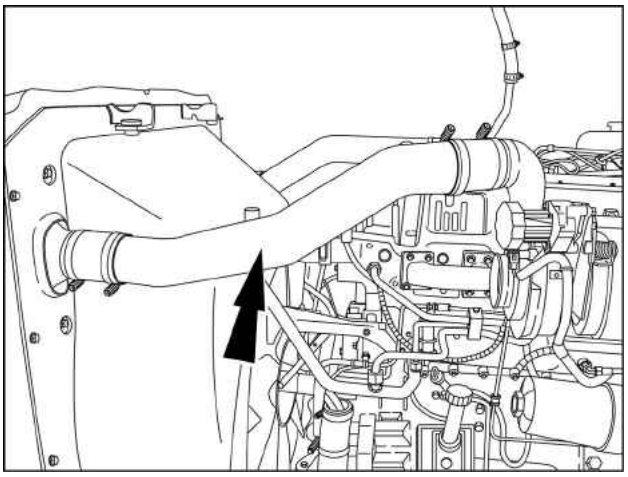
RAIL13TR02973AA 20

35. Connect the lower radiator hose at the engine and tighten the clamp.



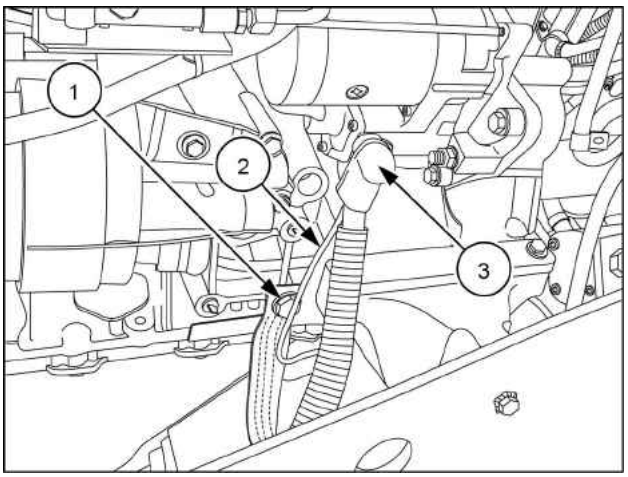
RAIL13TR02971AA 21

36. Assemble the left hand charged air cooler tube.



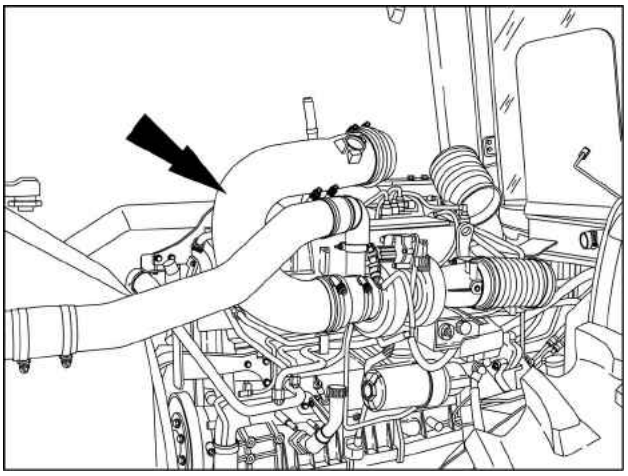
RAIL13TR02978AA 22

37. Connect the ground strap **(1)** to the engine block.
38. Connect the wire **(2)** to the starter.
39. Connect the power cable **(3)** to the starter.



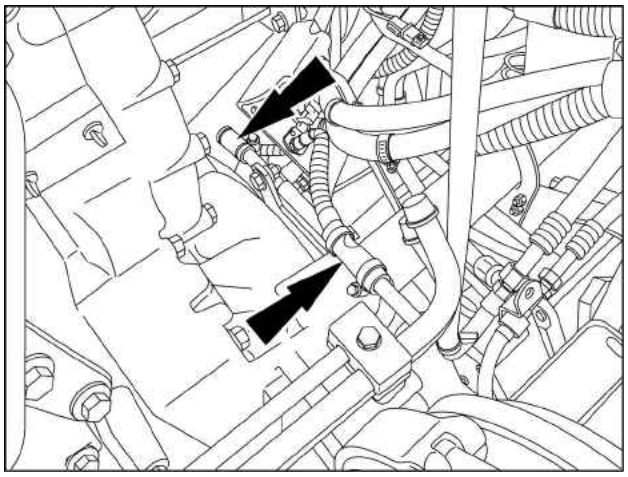
RAIL13TR02970AA 23

40. Assemble the air intake tube to the engine.



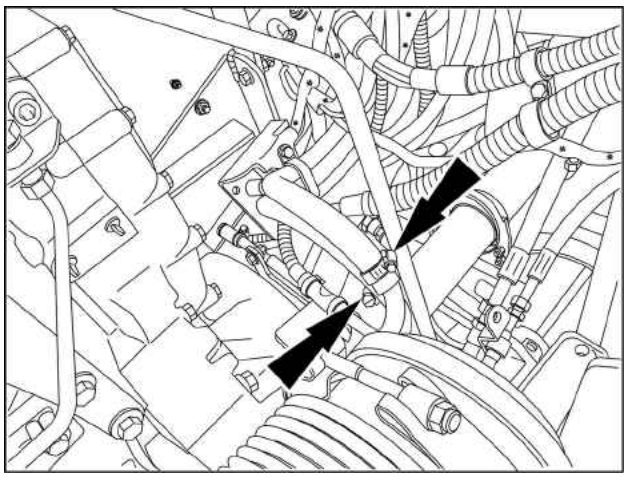
RAIL13TR03051AA 24

41. Connect the two hoses for the diesel emissions fluid tank solenoid as labeled during disassembly.



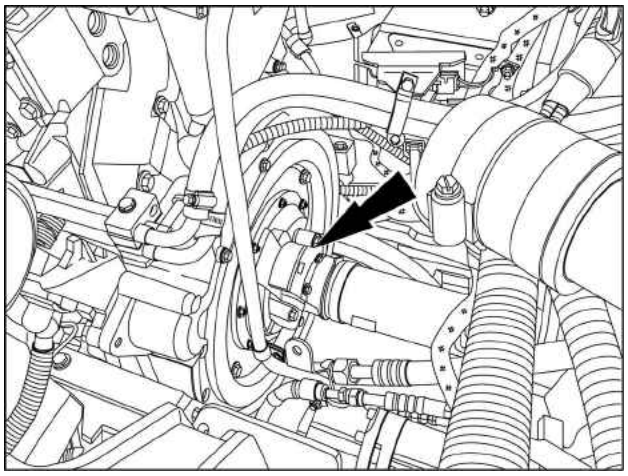
RAIL13TR02969AA 25

42. Connect the heater hoses to the tubes as labeled during disassembly.



RAIL13TR02966AA 26

43. Connect the driveshaft to the engine.
44. Torque the bolts to **95 – 108 N·m** (**70 – 80 lb ft**)



RAIL13TR02967AA 27

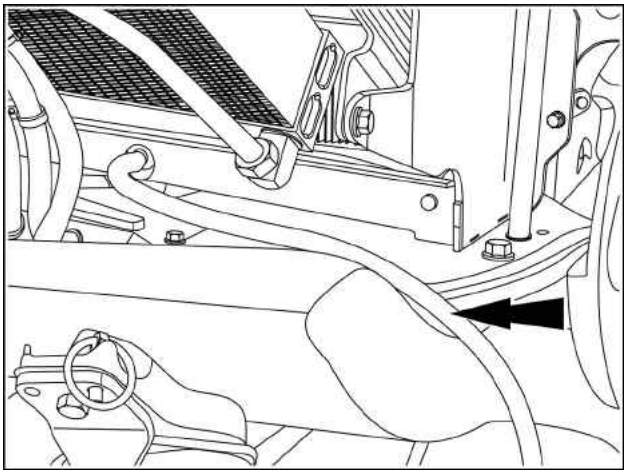
Next operation:
Install the hood support, refer to **Hood support - Install - Row crop frame, 9L engine (90.102)**.

Engine - Remove - 13L single turbo

T9.480	NA
T9.530	NA
T9.565	NA

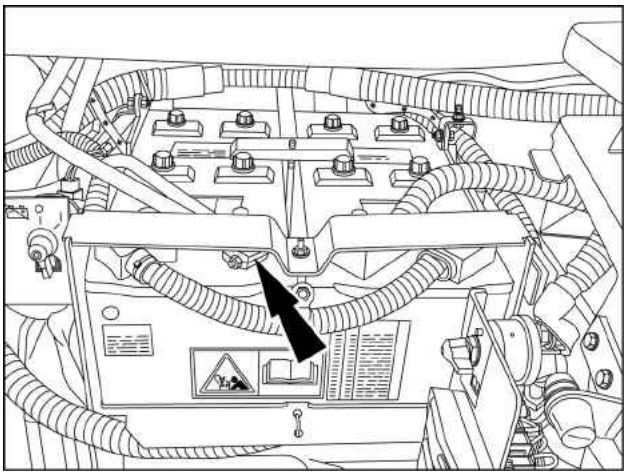
Prior operation:
Remove the hood support.

1. Drain the cooling system into a clean, suitable sized container.



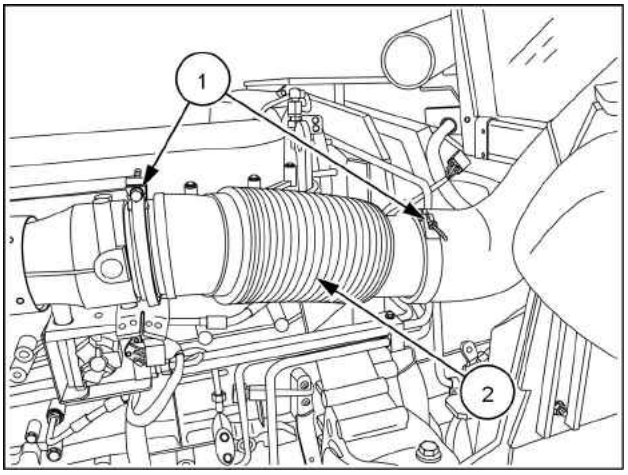
RCPH10FWD152BBC 1

2. Disconnect the ground cables from the batteries.



RAIL13TR02951AA 2

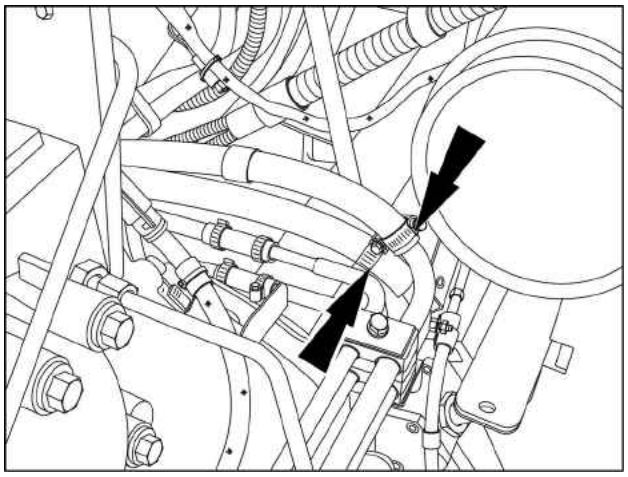
3. Move the clamps **(1)** and remove the section of exhaust flex pipe **(2)**.



RAIL13TR04716AA 3

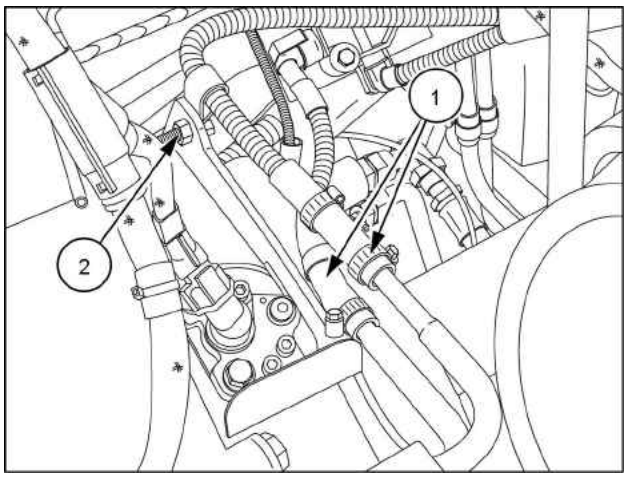
4. Label and disconnect the heater hoses.

NOTE: *Cap and plug all disconnected hoses and tubes.*



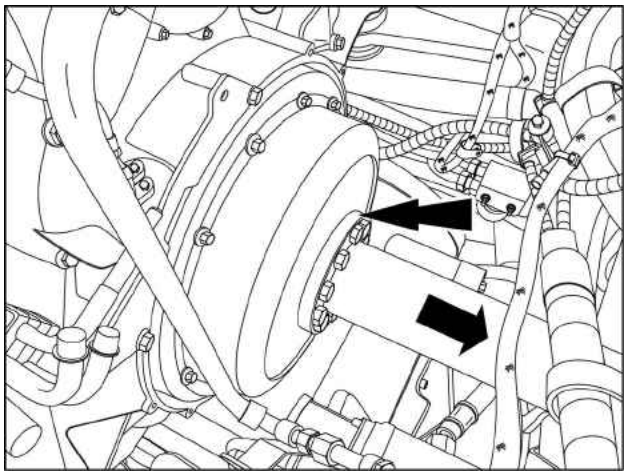
RAIL13TR04717AA 4

5. Label and disconnect the heater lines **(1)** to the Diesel Emission Fluid (DEF) tank.
6. Remove the nut and bolt **(2)** securing the heater line to the bracket.



RAIL13TR04718AA 5

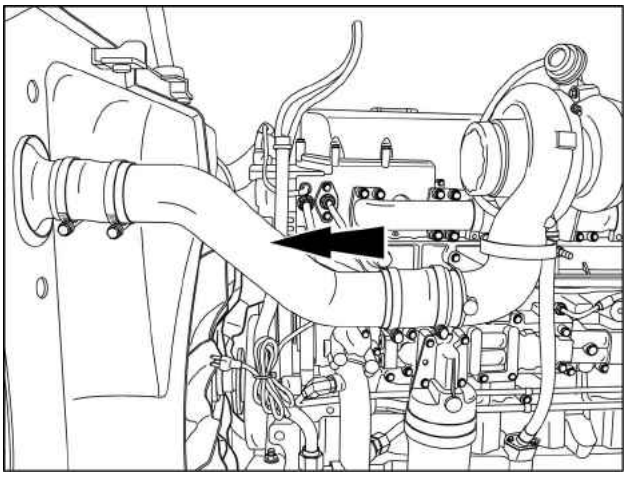
7. Mark the location of the driveshaft to coupler and remove the driveshaft to drive coupler mounting bolts.
8. Move the driveshaft back, away from the coupler.



RAIL13TR04727AA 6

9. Loosen clamps and remove left hand charged air cooler tube.

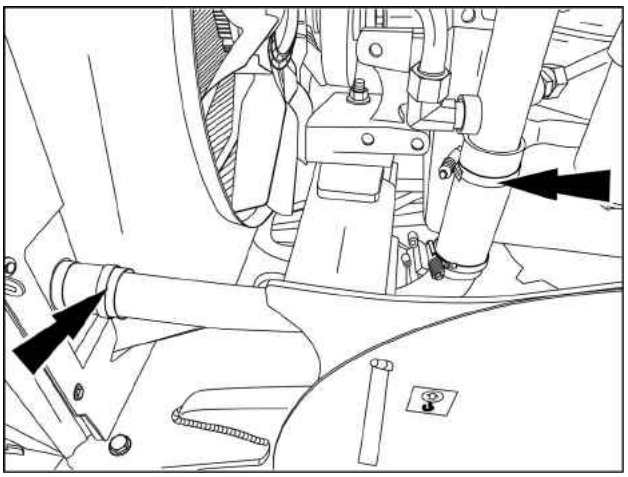
NOTE: *Plug and cap the inlets and the outlets on the engine and the cooling package.*



RAIL13TR04719AA 7

10. Loosen clamps on the hoses and remove lower radiator tube.

NOTE: *Plug and cap the inlets and the outlets on the engine and the cooling package.*

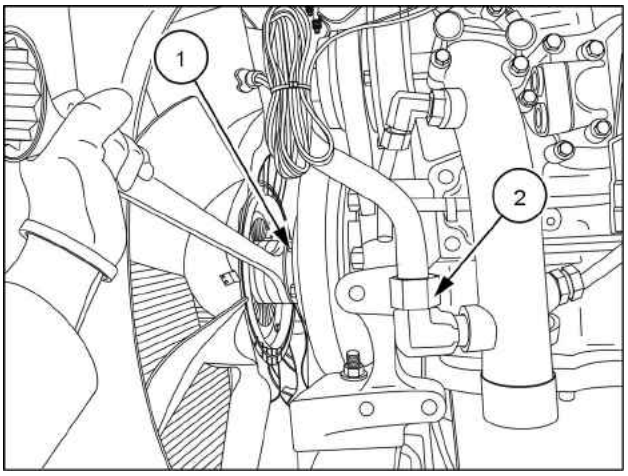


RAIL13TR04720AA 8

11. Loosen fan hub **(1)**.

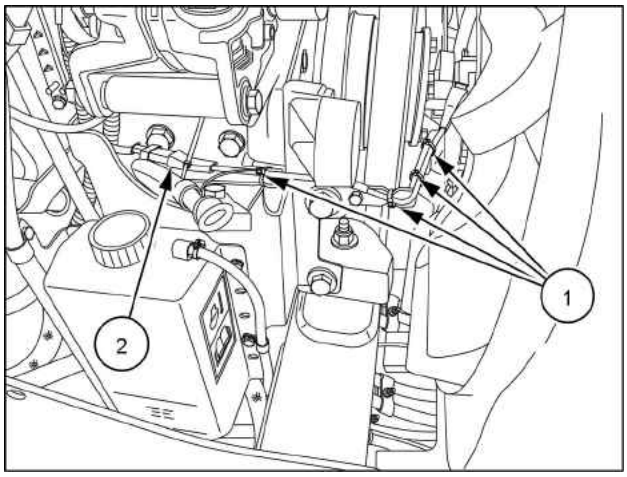
NOTE: *The fan and the hub are a left handed threaded.*

12. Loosen the vertical tube at the fitting **(2)**.



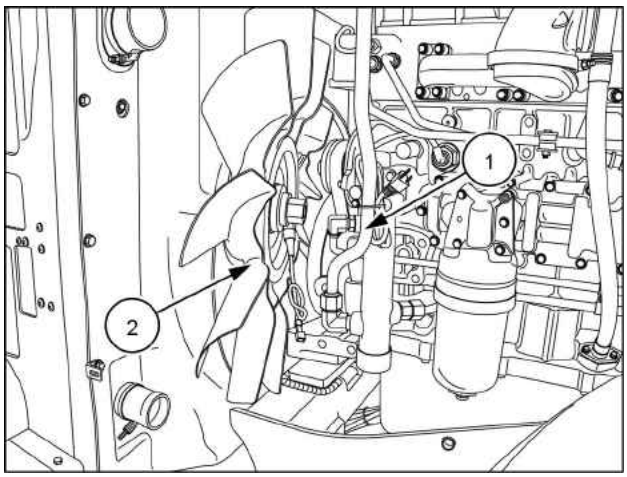
RAIL13TR04723AA 9

13. Cut the ties **(1)** securing the sensor lead to the bracket.
14. Disconnect the sensor from the harness **(2)**.



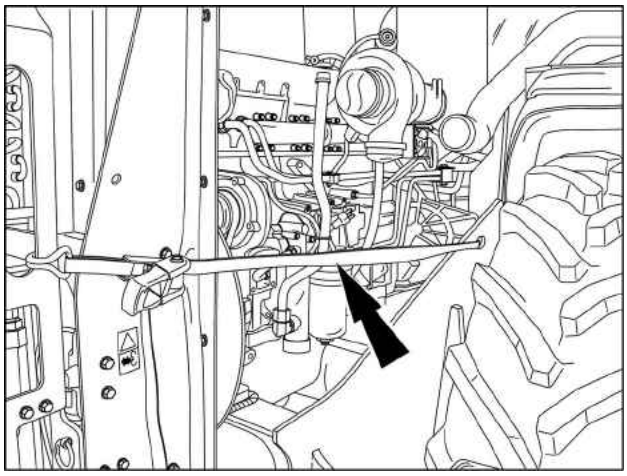
RAIL13TR04721AA 10

15. Rotate the vertical tube **(1)** to the rear of the machine out of the way.
16. With the help of an assistant, turn the fan **(2)** off of the drive pulley and remove the fan out of the left hand side of the machine.



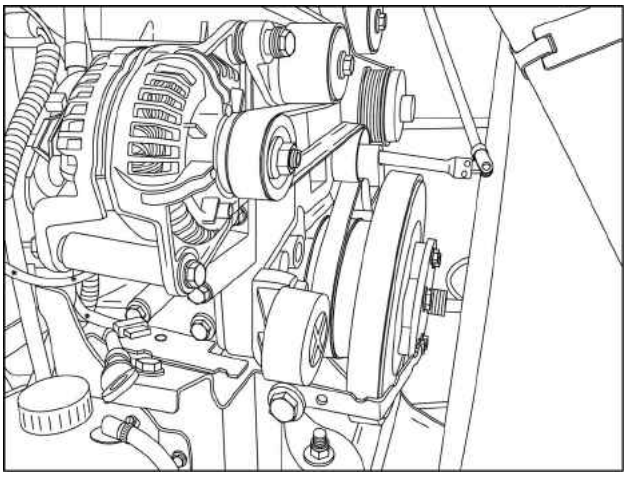
RAIL13TR04722AA 11

17. Attach a support to the cooling package frame and the chassis frame as shown to support the cooling package.



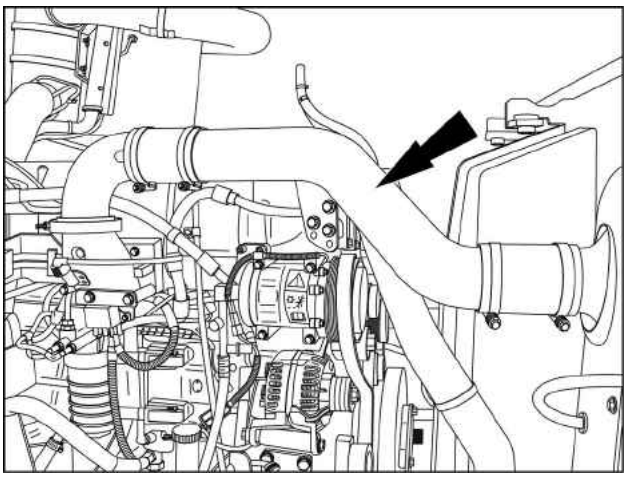
RAIL13TR04724AA 12

18. Use a breaker bar with an extension to move the belt tensioner to remove the belt off of the alternator pulley.



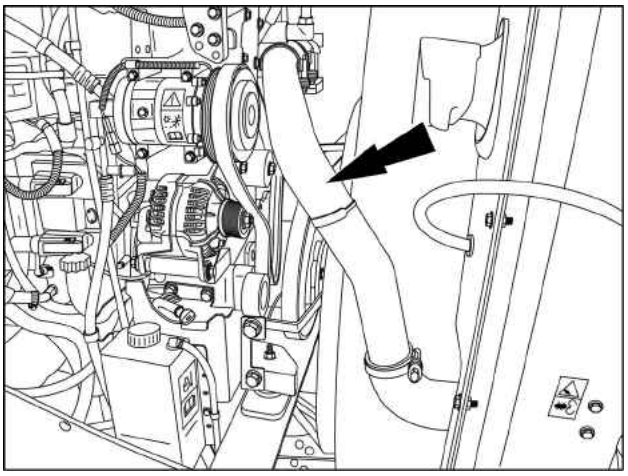
RAIL13TR04725AA 13

19. Loosen the clamps and remove the right hand charged air cooler tube.



RAIL13TR04726AA 14

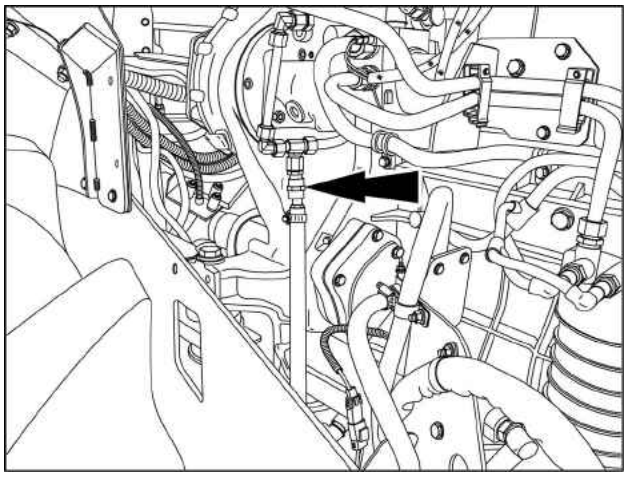
20. Loosen the clamps on the hoses and remove the upper radiator tube.



RAIL13TR04729AA 15

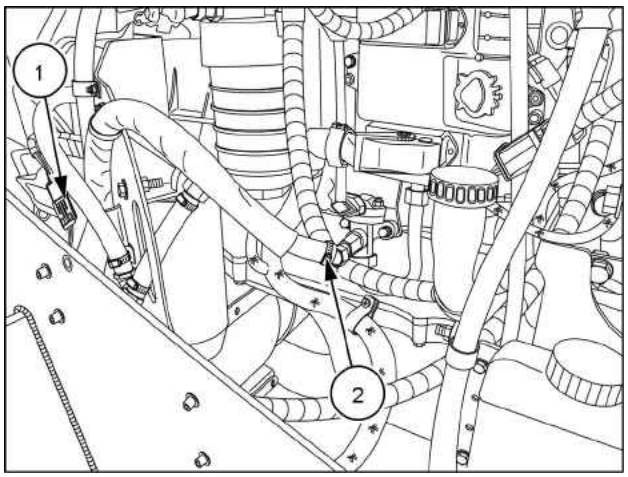
21. Disconnect the fuel return line.

NOTE: *Plug and cap all disconnected lines and fittings.*



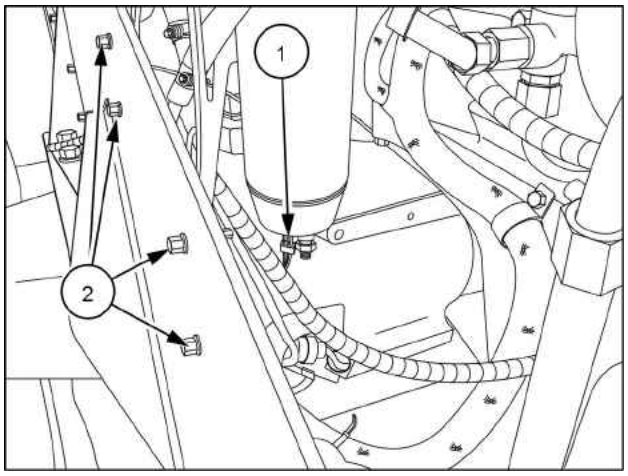
RAIL13TR04732AA 16

22. Disconnect the harness lead **(1)**.
23. Disconnect the fuel line **(2)** to the engine controller.



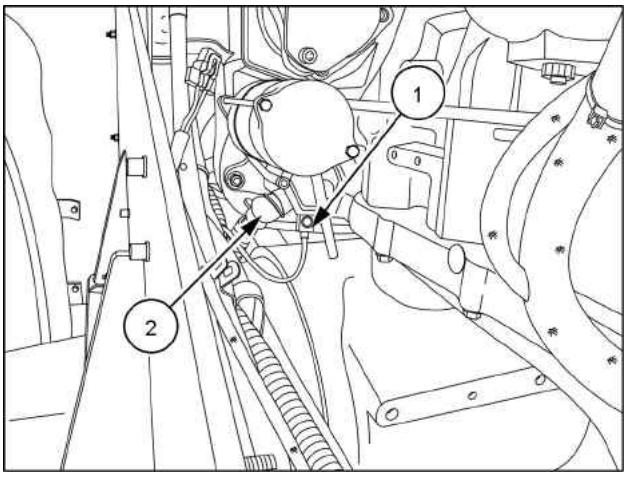
RAIL13TR04731AA 17

24. Disconnect the sensor lead **(1)** to the bottom of the fuel filter housing.
25. Remove the bolts **(2)** from the inside of the frame rail and remove the bracket with the assembly from the machine.



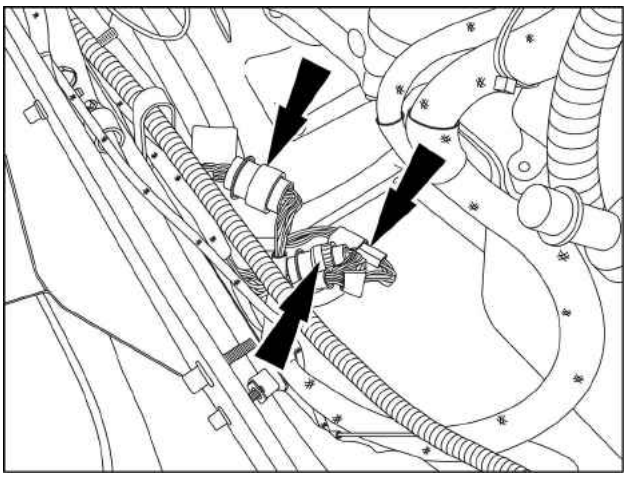
RAIL13TR04730AA 18

26. Disconnect the wire **(1)** from the starter.
27. Disconnect the cable **(2)** from the starter.



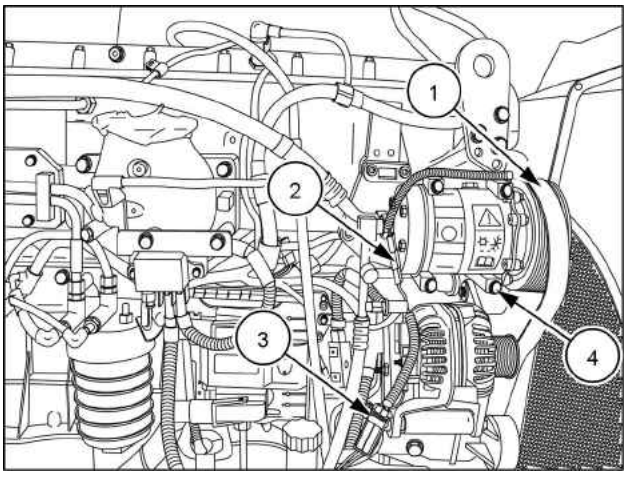
RAIL13TR04737AA 19

28. Disconnect the engine harness from the chassis harness.



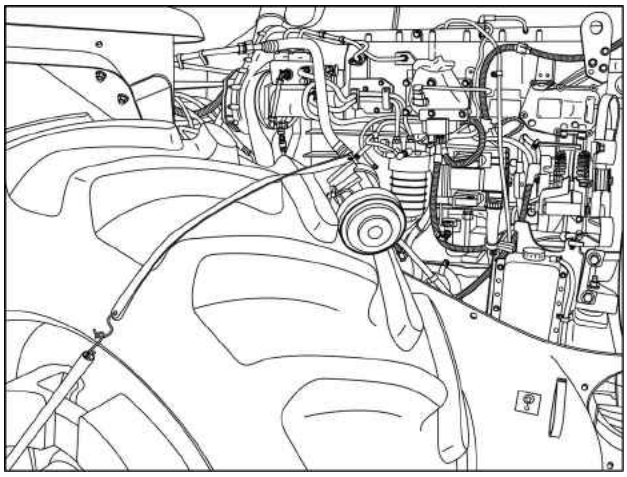
RAIL13TR04733AA 20

29. Move the serpentine belt **(1)** off of the air conditioning compressor pulley.
30. Disconnect the harness lead **(2)** to the air conditioning compressor clutch and the high pressure sending unit **(3)**.
31. Support the air conditioning compressor and remove the four mounting bolts **(4)**.



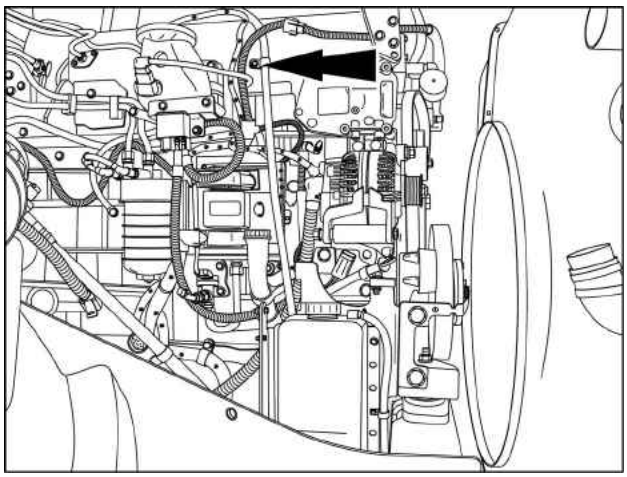
RAIL13TR04734AA 21

32. Set the air conditioning compressor on the tire as shown and secure with a strap.



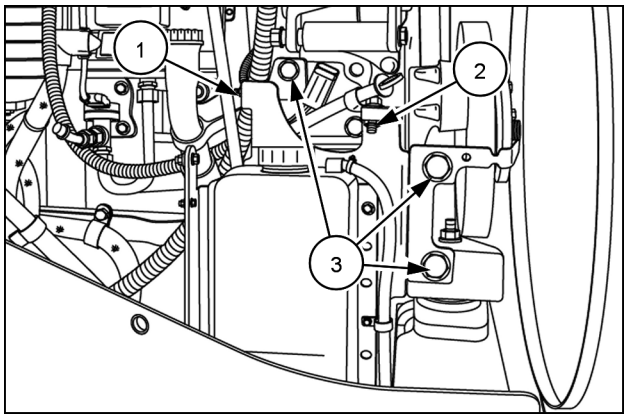
RAIL13TR04736AA 22

33. Remove the bolt securing the hose and clamp to the engine.



RAIL13TR04735AA 23

34. Remove the nut and bolt **(1)** securing the hoses and wiring harness.
35. Remove the nut and bolt **(2)** securing the dip stick tube.
36. Remove the mounting bracket bolts **(3)** and remove the overflow bottle with the bracket from the engine.



RAIL13TR00660AA 24