

# SERVICE MANUAL

**T5.90 / T5.100 / T5.110 / T5.120**

**Tier 4B (final)**

**Tractor**

*PIN HLRT5120AJLE00620 and above*

**Part number 51543579**

1<sup>st</sup> edition English  
November 2018



## Link Product / Engine

| Product                                                                       | Market Product | Engine         |
|-------------------------------------------------------------------------------|----------------|----------------|
| T5.100 Without cab, with Dual Command™ transmission<br>[HLRT5100JJLE03967 - ] | North America  | F5GFL413H*C005 |
| T5.100 With cab, with Dual Command™ transmission<br>[HLRT5100CJLE03039 - ]    | North America  | F5GFL413H*C005 |
| T5.110 Without cab, with Dual Command™ transmission<br>[HLRT5110CJLE04139 - ] | North America  | F5GFL413G*C005 |
| T5.110 With cab, with Dual Command™ transmission<br>[HLRT5110CJLE04173 - ]    | North America  | F5GFL413G*C005 |
| T5.120 Without cab, with Dual Command™ transmission<br>[HLRT5120EJLE00119 - ] | North America  | F5GFL413F*C010 |
| T5.120 With cab, with Dual Command™ transmission<br>[HLRT5120AJLE00620 - ]    | North America  | F5GFL413F*C010 |
| T5.90 Without cab, with Dual Command™ transmission<br>[HLRT5090PJLE03963 - ]  | North America  | F5GFL413J*C005 |
| T5.90 With cab, with Dual Command™ transmission<br>[HLRT5090AJLE03730 - ]     | North America  | F5GFL413J*C005 |

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# **INTRODUCTION**

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## Safety rules

### ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of non-observance of simple and fundamental safety regulations.

For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED: by foreseeing possible causes and consequently acting with the necessary caution and care.

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

A careful and prudent mechanic is the best insurance against any accident.

Precise observance of the most basic safety rule is normally sufficient to avoid many serious accidents.

**DANGER:** Never carry out any cleaning, lubrication or maintenance operations when the engine is running.

### GENERALITIES

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewellery, unbuttoned or loose articles of clothing such as: ties, torn clothing, scarves, open jackets or shirts with open zips that may remain entangled in moving parts.  
It is advised to wear approved safety clothing, e.g: non-slip footwear, gloves, safety goggles, helmets, etc.
- Do not carry out repair operations with someone sitting in the driver's seat, unless the person is a trained technician who is assisting with the operation in question.
- Operate the vehicle and use the implements exclusively from the driver's seat.
- Do not carry out operations on the vehicle with the engine running, unless specifically indicated.
- Stop the engine and ensure that all pressure is relieved from hydraulic circuits before removing caps, covers, valves, etc.
- All repair and maintenance operations must be carried out with the greatest care and attention.
- Service stairs and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.
- Disconnect the batteries and label all controls to indicate that the vehicle is being serviced. Block the machine and all equipment which should be raised.
- Do not check or fill fuel tanks, accumulator batteries, nor use starting liquid when smoking or near naked flames, as these fluids are inflammable.
- Brakes are inoperative if manually released for repair or maintenance purposes.  
In such cases, the machine should be kept constantly under control using blocks or similar devices.
- The fuel nozzle should always be in contact with the filling aperture. Maintain this position until filling operations are completed in order to avoid possible sparks caused by the accumulation of static electricity.
- Only use specified towing points for towing the tractor. Connect the parts carefully and make sure that all pins and/or locks are secured in position before applying traction.  
Never remain near the towing bars, cables or chains that are operating under load
- To move a disabled machine, use a trailer or a low-boy, if available.
- When loading or unloading the vehicle from the trailer, or other means of transport, select a flat area capable of sustaining the trailer or truck wheels, firmly secure the tractor to the truck or trailer and lock the wheels in the position.
- For electrical heaters, battery-chargers and similar equipment use exclusive auxiliary power supplies with a efficient ground to avoid electrical shock hazard.
- Always use lifting equipment and similar of appropriate capacity to lift or move heavy components.
- Take extra care if bystanders are present.
- Never pour gasoline or diesel oil into open, wide and low containers.
- Never use gasoline, diesel oil or other inflammable liquids as cleaning agents. Use non-flammable non-toxic proprietary solvents.
- Wear safety goggles with side guards when cleaning parts with compressed air.

- Limit the air pressure to a maximum of **2.1 bar (30.5 psi)**, according to local regulations.
- Do not run the engine in confined spaces without suitable ventilation.
- Do not smoke, use naked flames, or cause sparks in the area when fuel filling or handling highly inflammable liquids.
- Never use naked flames for lighting when working on the machine or checking for leaks.
- All movements must be carried out carefully when working under, on or near the vehicle and wear protective equipment: helmets, goggles and special footwear.
- When carrying out checks with the engine running, request the assistance of an operator in the driver's seat. The operator must maintain visual contact with the service technician at all times.
- If operating outside the workshop, position the machine on a flat surface and lock in position. If working on a slope, lock the vehicle in position and move to a flat area as soon as possible in order to ensure a safety position.
- Damaged or bent chains or cables are unreliable. Do not use them for lifting or trailing.  
Always use suitable protective gloves when handling chains or cables.
- Chains should always be safely secured. Ensure that the connection is strong enough to hold the expected load. No persons should stop near the fastening point, trailing chains or cables.
- Maintenance and repair operations must be carried out in a CLEAN and DRY area, eliminate any water or oil spillage immediately.
- Do not create piles of oil or grease--soaked rags as they represent a serious fire hazard; store them in a closed metal container.  
Before starting the vehicle or implements, make sure that the driver's seat is locked in position and always check that the area is free of persons or obstacles.
- Empty pockets of all objects that may unintentionally fall into the vehicle parts when disassembled.
- In the presence of protruding metal parts, use protective goggles or goggles with side guards, helmets, special footwear and gloves.
- Handle all parts carefully, do not put your hands or fingers between moving parts, wear suitable safety clothing -- safety goggles, gloves and shoes.

## WELDING OPERATIONS

- When welding, use protective safety devices: tinted safety goggles, helmets, special overalls, gloves and footwear. All persons present in the area where welding is taking place must wear tinted goggles.  
**DO NOT LOOK AT ARC WITHOUT PROPER EYE PROTECTION.**
- Where possible, remove the part or tool that requires arc welding from the tractor.
- Disconnect both cables from the battery. Isolate the cable ends to avoid contact with each other and the tractor.
- Position the welder ground clamp as near as possible to the area where welding is taking place.
- Remove the electronic control units located on the tractor if welding is to be carried out near these control units.
- Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.
- Metal cables tend to fray with repeated use. Always use suitable protective devices (gloves, goggles, etc.) when handling cables.

## START UP

- Never start the engine in confined spaces that are not equipped with adequate ventilation for exhaust gas extraction.
- Never bring your head, body, arms, legs, feet, hands, fingers near fans or rotating belts.

## MOTOR

- Always loosen the radiator cap slowly before removing it to allow any remaining pressure in the system to be discharged. Coolant should be topped up only when the engine is stopped or idle if hot.
- Never fill up with fuel when the engine is running, especially if hot, in order to prevent the outbreak of fire as a result of fuel spillage
- Never check or adjust fan belt tension when the engine is running.

- Never adjust the fuel injection pump when the vehicle is moving.
- Never lubricate the vehicle when the engine is running.

### **ELECTRICAL SYSTEMS**

- If it is necessary to use auxiliary batteries, the cables must be connected at both sides as follows: (+) with (+) and (-) with (-).
- Avoid short-circuiting the terminals. GAS RELEASED FROM BATTERIES IS HIGHLY INFLAMMABLE.
- During charging, leave the battery compartment uncovered to improve ventilation.
- Do not check charge by placing metal articles across battery terminals.
- Avoid sparks or flames near the battery zone to prevent explosion hazards.
- Before servicing operations, check for fuel or current leaks. Eliminate any eventual leaks before starting work.
- Never charge batteries in confined spaces. Make sure that there is adequate ventilation in order to prevent accidental explosion hazards as a result of the accumulation of gases released during charging operations.
- Always disconnect the battery before performing any kind of servicing on the electrical system.

### **HYDRAULIC SYSTEMS**

- Some fluid slowly coming out from a very small port can be almost invisible and be strong enough to penetrate the skin. Check for leaks using a piece of cardboard, NEVER USE HANDS.
- If any liquid penetrates skin tissue, call for medical aid immediately
- Serious skin infections may result if medical attention is not given.
- Use the specific tools when checking pressure values on the hydraulic system.

### **WHEELS AND TYRES**

- Make certain that tires are correctly inflated to the pressure indicated by the Manufacturer. Periodically check possible damages to the rims and tires.
- Stand away from (at the side of) the tyre when checking inflation pressure.
- Only check pressure when the vehicle is unloaded and the tyres are cold, to avoid incorrect readings as a result of over-pressure.
- Do not re-use parts of recovered wheels as incorrect welding or brazing may heat the material, causing it to weaken and eventually damage or break the wheel.
- Never cut, nor weld a rim with the inflated tire assembled.
- When removing the wheels, lock both the front and rear vehicle wheels.
- Always position support stands when raising the vehicle, in order to conform to current safety regulations.
- Deflate the tyre before removing any object caught into the tyre tread.
- Never inflate tyres using inflammable gases; this could cause an explosion and put operator safety at risk.

### **REMOVAL AND RE-FITTING**

- Lift and handle all heavy parts using suitable lifting equipment and make sure that all slings and hooks are correctly secured.
- Handle all parts carefully during lifting operations, be careful to personnel working near the load to be lifted. Never insert hands or fingers between parts, always wear approved accident prevention clothing (goggles, gloves and work boots).
- Avoid twisting chains or metal cables and always wear safety gloves when handling cables or chains.

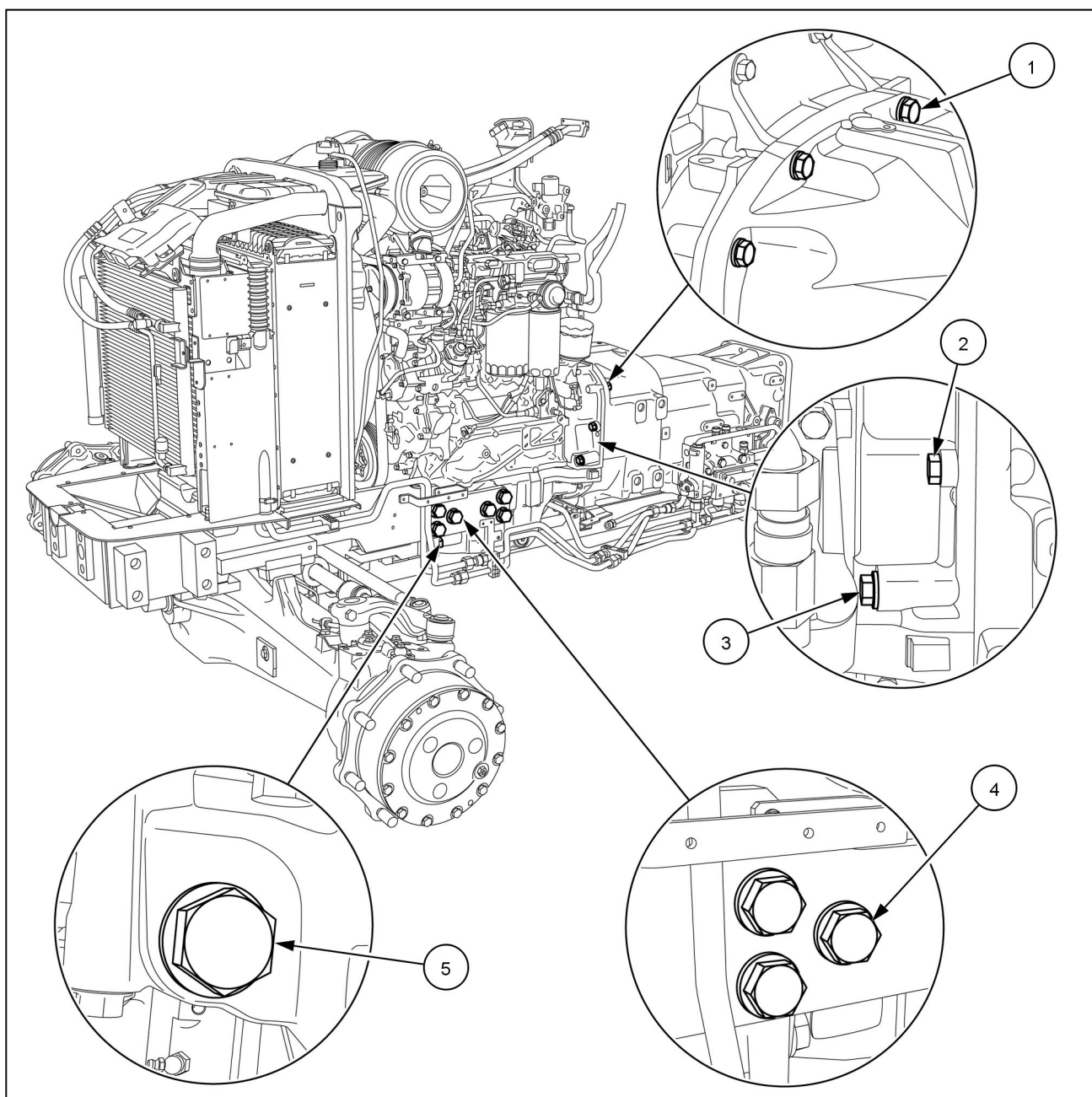


## **SERVICE MANUAL**

### **Engine**

**T5.100 With cab, with Dual Command™ transmission [HLRT5100CJLE03039 - ], T5.100 Without cab, with Dual Command™ transmission [HLRT5100JJLE03967 - ], T5.110 With cab, with Dual Command™ transmission [HLRT5110CJLE04173 - ], T5.110 Without cab, with Dual Command™ transmission [HLRT5110CJLE04139 - ], T5.120 With cab, with Dual Command™ transmission [HLRT5120AJLE00620 - ], T5.120 Without cab, with Dual Command™ transmission [HLRT5120EJLE00119 - ], T5.90 With cab, with Dual Command™ transmission [HLRT5090AJLE03730 - ], T5.90 Without cab, with Dual Command™ transmission [HLRT5090PJLE03963 - ]**

## Engine - Torque



MOIL17TR02997GA 1

| Part to tighten                                      | Thread          | Tighten torque         |
|------------------------------------------------------|-----------------|------------------------|
| Bolt (5) securing the front axle to the engine block | M20 x 1.5 x 130 | 587 N·m (432.95 lb ft) |
| Bolt (4) securing the engine block to the front axle | M20 x 1.5 x 110 | 587 N·m (432.95 lb ft) |
| Bolt (1) securing the gearbox to the engine block    | M12 x 1.25 x 50 | 121 N·m (89.25 lb ft)  |
| Bolt (2) securing the engine block to the gearbox    | M12 x 1.25 x 50 | 121 N·m (89.25 lb ft)  |
| Bolt (3) securing the engine block to the gearbox    | M12 x 1.25 x 90 | 121 N·m (89.25 lb ft)  |

## Engine - Remove

### ⚠ WARNING

#### Heavy objects!

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

W0398A

### ⚠ WARNING

#### Avoid injury!

Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.

Failure to comply could result in death or serious injury.

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#### Prior operation:

Hood - Remove (90.100)

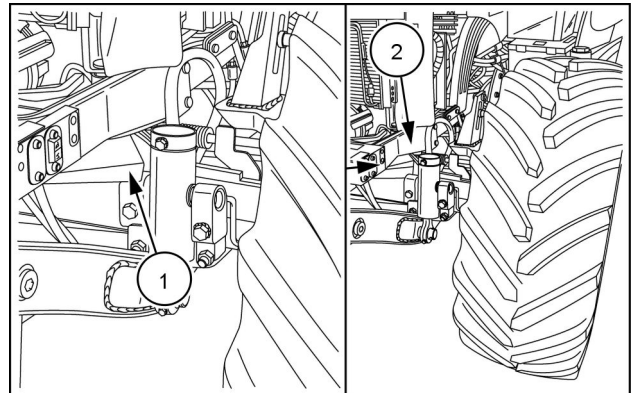
Side panels - Remove (90.100)

Fender - Remove - Front (90.116)

Selective Catalytic Reduction (SCR) muffler and catalyst - Remove (10.500)

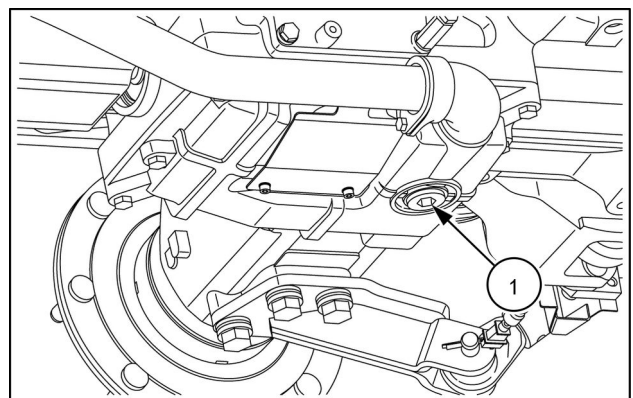
Cab and platform - Remove (90.150)

1. Position wooden wedges (1) between the front axle and the front axle support (2) to prevent articulation.



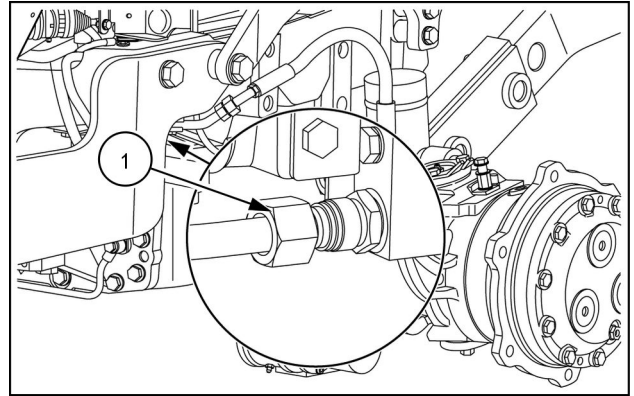
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2. Position a container for transmission oil recovery under the transmission casing near the drain plug (1).
3. Remove the plug (1) and drain the transmission oil.



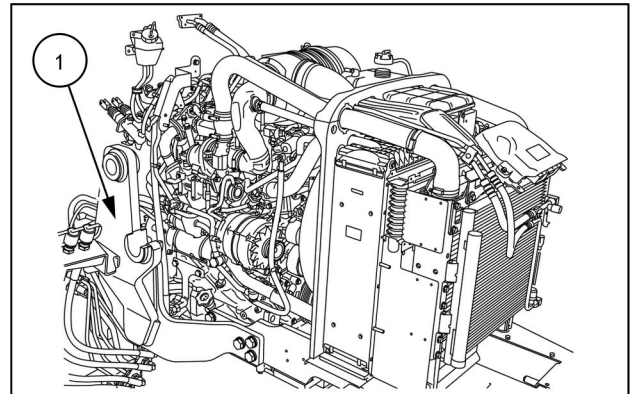
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4. Disconnect the front lift coupling (1), if present.



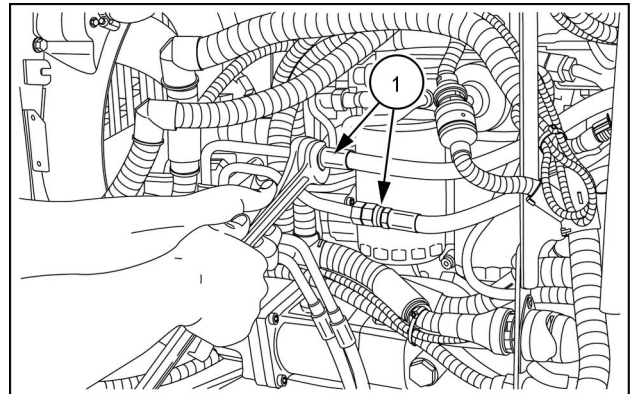
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5. Remove both side members (1) of the front loader as described in **Front loader side member - Remove (82.100)**.



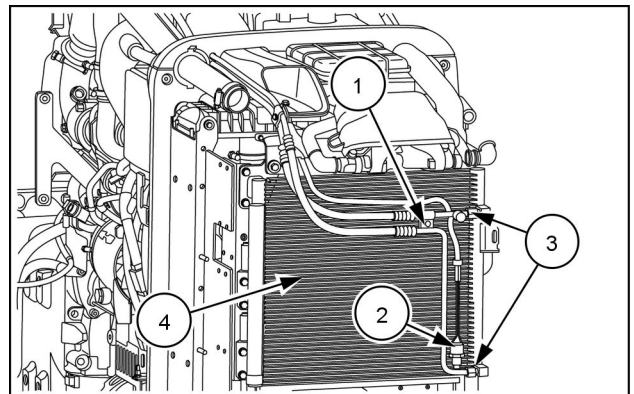
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6. On the left-hand side of the engine, disconnect the steering cylinder control lines (1).



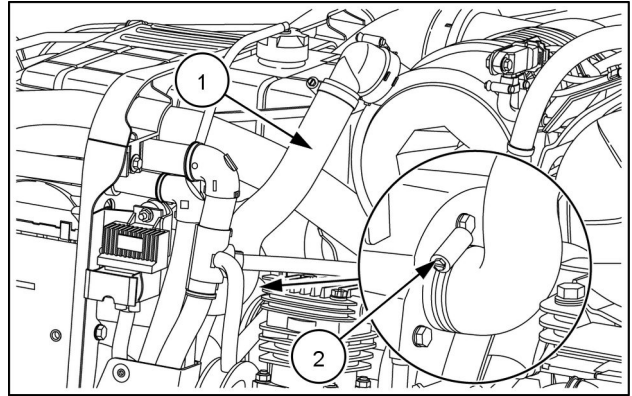
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7. Disconnect the hydraulic couplings (3) on the capacitor (4) and loosen the screw (1) on the retaining clamp.
8. Disconnect the sensor wiring (2).



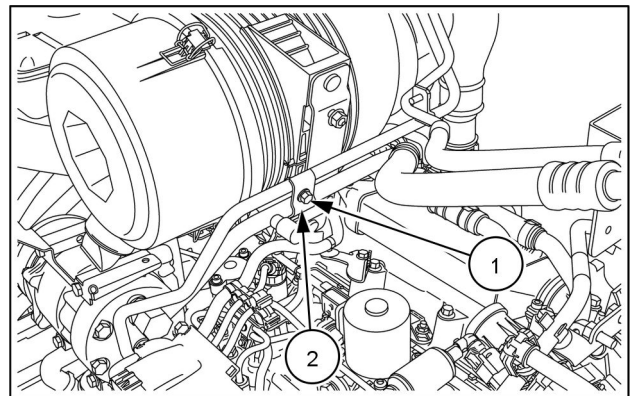
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9. If present, loosen the retaining clamps (2) on the tubing (1).
10. Remove the pipe (1).



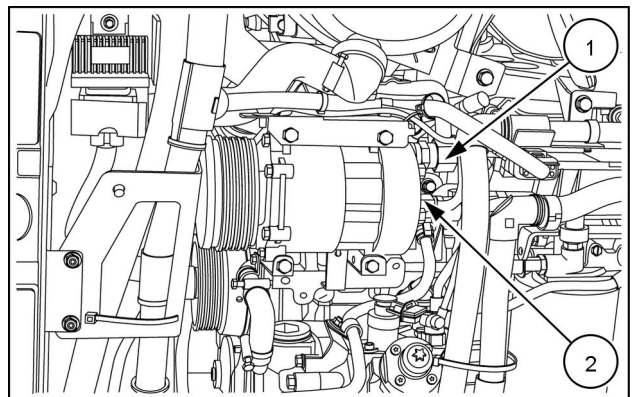
MOIL17TR00028AA 7

11. Loosen the retaining nut (1) on the locking bracket (2).
12. Remove the locking bracket (2).



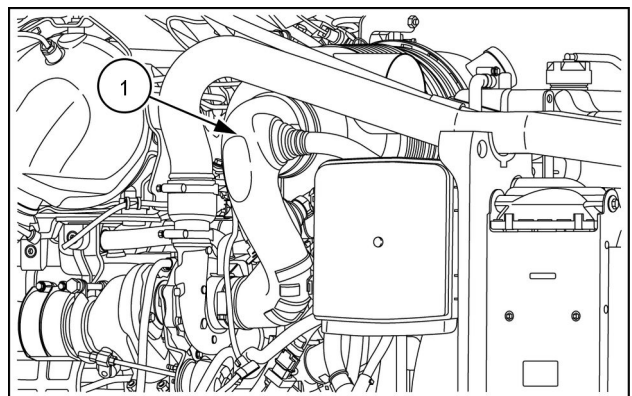
MOIL17TR02989AA 8

13. Disconnect couplings (1) and (2) of the air conditioning lines.



MOIL16TR02231AA 9

14. Remove the coupling (1) as described in **Air cleaner connection between filter and engine - Remove (10.202)**.



MOIL16TR03814AA 10

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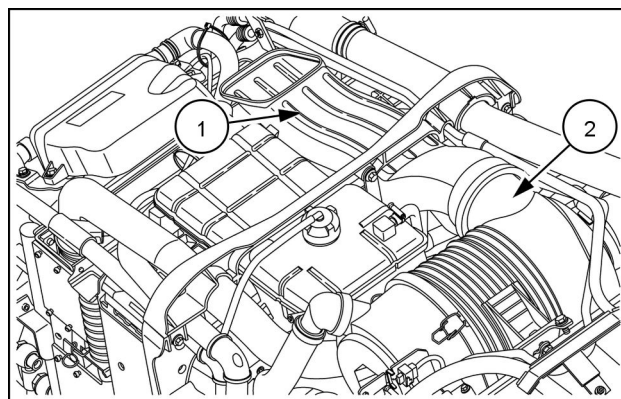


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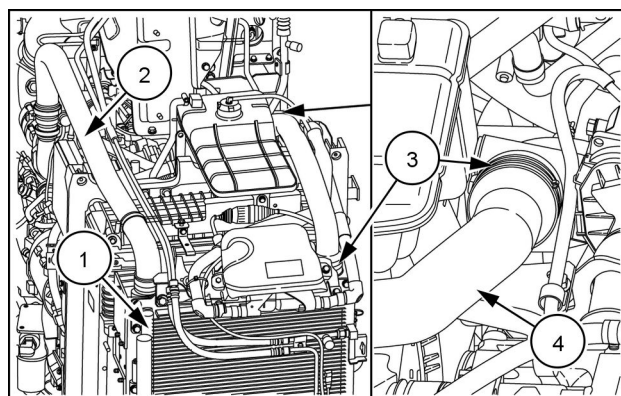
**Thank you so much for reading.**

15. Remove the air suction line (1) as described in **Air intake lines - Remove (10.202)**
16. Remove the air filter (2) as described in **Air cleaner - Remove (10.202)**



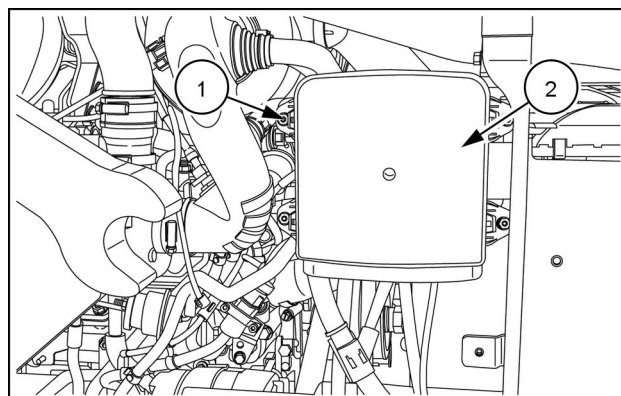
MOIL16TR03935AA 11

17. Loosen the retaining clamps (1) and disconnect the pipe from the turbine to the aftercooler radiator (2).
18. Loosen the retaining clamps (3) and remove the pipe (4) between the aftercooler radiator and the engine.



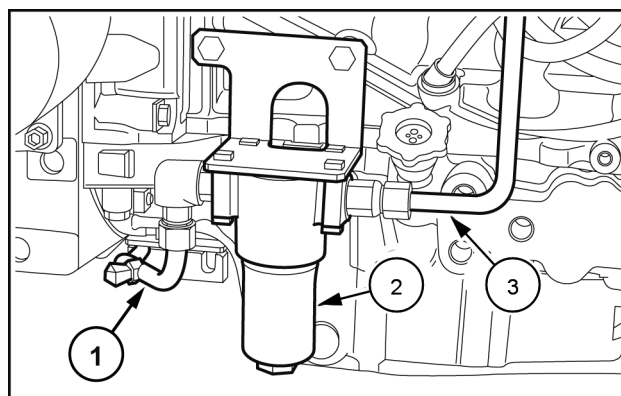
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19. Loosen the retaining nuts (1) from the power distribution box (2).
20. Move the distribution box and connected cables to the right-hand side of the radiator.



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21. Disconnect the drain line (3) of the hydrostatic steering control valve.
22. Disconnect the power supply line (1) of the transmission control valve.
23. Remove the filter (2), complete with support.



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