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# **TS100A, TS110A, TS115A, TS125A, TS130A AND TS135A REPAIR AND T6010, T6020, T6030, T6050, T6070 REPAIR**

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The following pages are the collation of the contents pages from each section and chapter of the TS100A, TS110A, TS115A, TS125A, TS130A, TS135A and T6010, T6020, T6030, T6050, T6070 Repair manual. Complete Repair part # 87693272.

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the TSA Series and T6000 Series Tractors.

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Some sections of this Repair Manual have been revised to include the New T6000 Delta and Plus Series Models T6010, T6020, T6030, T6050, and T6070.

Please note the following to locate new T6000 Tractor Model Repair information:

**For complete engine repair information for the new T6000 Series Tractors use Engine Repair Manual # 87661796.**

Most all repairs can be carried out by following the Tractor's systems and specific product configurations in the repair manual. Example; 16 x16 Transmission, Air Conditioning and TSA Standard Series Closed Center Hydraulic System.

"TSA Standard" Repair Information also applies to the New T6000 Delta Series Models.

Where specific T6000 Tractor Models are not identified use the following TSA to T6000 cross reference:

<b>T6000 Tractor Models</b>	<b>Use TSA tractor Model</b>
T6010	TS100A
T6020	TS110A
T6030	TS115A
T6050	TS125A
T6070	TS135A

# INFORMATION

With the introduction of the T6000 Series Tractors, controller identifications codes have changed. Also, the location of the diagnostic connector has changed. The updated Repair Manual # 87693272 does not contain the new controller ID's or the new location of the diagnostic connector. This page shows the T6000 Series controller identification codes and the diagnostic connector location.

**NOTE:** Please insert a copy of this page in the front of each Repair Manual Volume for your reference.

Models covered are:

T6000 DELTA TRACTORS  
T6020, T6030, T6050

T6000 PLUS SERIES TRACTORS  
T6010, T6020, T6030, T6050, T6070

## CONTROLLER IDENTIFICATION CODES

The controller identifiers change with the introduction of the T6000 range of tractors, eg., Controller DA for TS-A will become Controller DR for T6000 range. This is required to be remembered throughout this Repair Manual. See table below:

Identifier	Identifier	Controller Function(s)
<b>TS-A</b>	<b>T6000</b>	
<b>DA</b>	<b>DR</b>	24x24 Transmission, Electronic Draft Control, Rear PTO, Differential Lock, Four Wheel Drive
<b>DB</b>	<b>DS</b>	16x16 Transmission, Electronic Draft Control, Rear PTO, Differential Lock, Four Wheel Drive
<b>DD</b>	<b>DU</b>	(Options) Front PTO, Front Hitch, Front Axle Suspension, Electronic Hydraulic Remotes
<b>EDC7</b>	<b>EDC16</b>	Engine Control (Engine Side)
<b>HA</b>	<b>HJ</b>	Enhanced Analogue Digital Instrument Cluster (ADIC)
<b>HB</b>	<b>HK</b>	Basic ADIC
<b>GA</b>		12x12 PTO Controller - Rear PTO, Differential Lock, Four Wheel Drive
<b>JA</b>		Keypad

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## CONTROLLER FUNCTIONS

Model/Type	Electronic Module				
	24x24	16x16	24x24 16x16	12x12	24x24 16x16
Function	DA(DR)	DB(DS)	DD(DU)	GA	EDC7 (EDC16)
Rear PTO	✓	✓		✓	
Differential Lock	✓	✓		✓	
Four Wheel Drive	✓	✓		✓	
Engine Control (vehicle side)	✓	✓			
Auto Headland Turn Sequence (HTS)	✓	✓			
Electronic Draft Control	✓	✓			
Front Suspension			✓		
Front PTO			✓		
Front Lift			✓		
Electro-Hydraulic Remotes			✓		
Transmission 24x24	✓				
Transmission 16x16		✓			
Engine Control (engine side)					✓

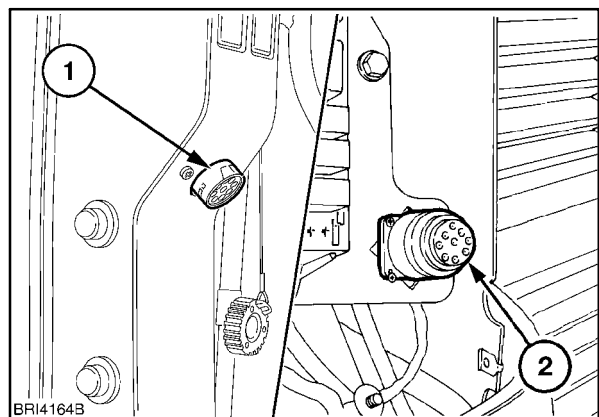
The controller type is identified by a code which is attached to each module. The code, for example, 'DB/DS' identifies it as the module used on a tractor with a 16x16 transmission controlling those functions highlighted in the table above.

All the modules on the tractor are linked by the CAN harness and this also links in the instrument cluster, gear display (16x16 only) and diagnostic connector.

Refer to the system diagrams in Section 55, Chapter 1 of this repair manual for full controller details and inter connectivity.

## DIAGNOSTIC CONNECTORS (ADDITIONAL "C" PILLAR LOCATION)

A single diagnostic port, 2, located behind the trim under the transmission control levers, or on the right hand "C" pillar, 1, to interrogate all of the controllers is incorporated into the wiring harness. With the aid of special service tool **380000843**, the port can be used to gain access to the on-board H-menu diagnostics, see Section 55, Chapter 1 of this Repair Manual for full details, to download software or to connect in more specialized diagnostic equipment such as the E.S.T. (Electronic Service Tool).



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**SECTION 00 - GENERAL****Chapter 1 - General Information****CONTENT**

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## GENERAL INSTRUCTIONS

### IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by authorised workshops. All instructions should be carefully observed and special equipment where indicated should be used. Anyone who carries out service operations described without carefully observing these instructions will be directly responsible for any damage caused.

### NOTES FOR EQUIPMENT

Equipment shown in this manual is:

- designed expressly for use on these tractors;
- necessary to make a reliable repair;
- accurately built and strictly tested to offer efficient and long-lasting working life.

### NOTICES

The words “front”, “rear”, “right hand”, and “left hand” refer to the different parts as seen from the operator’s seat oriented to the normal direction of movement of the tractor.

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# PRECAUTIONARY STATEMENTS

## PERSONAL SAFETY

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

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 **DANGER** 

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

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 **WARNING** 

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

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 **CAUTION** 

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

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

## MACHINE SAFETY

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

**IMPORTANT: IMPORTANT:** *The word “IMPORTANT” is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

## INFORMATION

**NOTE: NOTE:** *Instructions used to identify and present supplementary information.*

**IMPORTANT WARNINGS**

The machine is designed and produced exclusively for agricultural use.

All other use will be considered to be contrary to the use specified by CNH AMERICA LLC, who cannot be held liable for damage to property or the machine, or for personal injuries which may result.

Persons who risk improper use will therefore assume the responsibility for any consequences arising from such use.

Compliance with the instructions for use, maintenance and repairs described in this manual, are the essential preconditions for use specified by CNH AMERICA LLC.

The machine must only be used, serviced or repaired by personnel trained in the relevant working methods and safety regulations and who have been authorized to work on the machine.

The user must also observe the rules concerning general safety and accident prevention, including the Highway Code when driving on public highways.

Any arbitrary modifications made to this machine will release CNH AMERICA LLC from any liability resulting from damage or injury.

CNH AMERICA LLC and all its distribution organizations, inclusive of, but not restrict to,

national, regional or local distributors, cannot be held liable for damage resulting from the malfunction of parts and/or components not approved by CNH AMERICA LLC.

Under no circumstances will a guarantee be issued for products made or sold by CNH AMERICA LLC that are damaged as a result of the malfunction of parts and/or components not approved by CNH AMERICA LLC.

**TO PREVENT ACCIDENTS**

Most accidents and personal injuries taking place in workshops are due from non-observance of some essential rules and safety precautions.

The possibility that an accident might occur with any type of machines should not be disregarded, no matter how well the machine in question was designed and built.

A wise and careful service technician is the best precautions against accidents.

Careful observance of this basic precaution would be enough to avoid many severe accidents.

—————  **DANGER**  —————

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

---

**SAFETY RULES****Generalities**

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get caught on moving parts. Use approved safety clothing such as anti-slipping footwear, gloves, safety goggles, helmets, etc.
- Wear safety glasses with side guards when cleaning parts using compressed air.
- Damaged or frayed wires and chains are unreliable. Do not use them for lifting or towing.
- Wear suitable protection such as approved eye protection, helmets, special clothing, gloves and footwear whenever welding. All persons standing in the vicinity of the welding process should wear approved eye protection. **NEVER LOOK AT THE WELDING ARC IF YOUR EYES ARE NOT SUITABLY PROTECTED.**
- Never carry out any repair on the machine if someone is sitting on the operator's seat, except if they are qualified operators assisting in the operation to be carried out.
- Never operate the machine or use attachments from a place other than sitting at the operator's seat or at the side of the machine when operating the fender switches.
- Never carry out any operation on the machine when the engine is running, except when 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 should be carried out with the greatest care and attention.
- Disconnect the batteries and label all controls to warn that the tractor is being serviced. Block the machine and all equipment which should be raised.
- Never check or fill fuel tanks or batteries, nor use starting liquid if you are smoking or near open flames as such fluids are flammable.
- The fuel filling gun should always remain in contact with the filler neck. Maintain this contact until the fuel stops flowing into the tank to avoid possible sparks due to static electricity build-up.
- To transfer a failed tractor, use a trailer or a low loading platform trolley if available.
- To load and unload the machine from the transportation means, select a flat area providing a firm support to the trailer or truck wheels. Firmly tie the machine to the truck or trailer platform and block wheels as required by the transporter.
- Always use lifting equipment of appropriate capacity to lift or move heavy components.
- Chains should always be safely fastened. Ensure that fastening device is strong enough to hold the load foreseen. No persons should stand near the fastening point.
- The working area should be always kept CLEAN and DRY. Immediately clean any spillage of water or oil.
- Never use gasoline, diesel oil or other flammable liquids as cleaning agents. Use non-flammable non-toxic proprietary solvents.
- Do not pile up grease or oil soaked rags, as they constitute a great fire hazard. Always place them into a metal container.

**START UP**

- Never run the engine in confined spaces which 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.

**ENGINE**

- Always loosen the radiator cap very slowly before removing it to allow pressure in the system to dissipate. Coolant should be topped up only when the engine is stopped.
- Do not fill up fuel tank when the engine is running.
- Never adjust the fuel injection pump when the tractor is moving.
- Never lubricate the tractor when the engine is running.

**ELECTRICAL SYSTEMS**

- If it is necessary to use auxiliary batteries, cables must be connected at both sides as follows: (+) to (+) and (-) to (-). Avoid short-circuiting the terminals. **GAS RELEASED FROM BATTERIES IS HIGHLY FLAMMABLE.** During charging, leave the battery compartment uncovered to improve ventilation. Avoid sparks or flames near the battery area. Do no smoke.
- Do not charge batteries in confined spaces.
- Always disconnect the batteries before performing any type of service on the electrical system.

**HYDRAULIC SYSTEMS**

- Some fluid coming out from a very small port can be almost invisible and be strong enough to penetrate the skin. For this reason, **NEVER USE**

**YOUR HANDS TO CHECK FOR LEAKS**, but use a piece of cardboard or a piece of wood for this purpose. If any fluid is injected into the skin, seek medical aid immediately. Lack of immediate medical attention may result in serious infections or dermatitis.

- Always take system pressure readings using the appropriate gauges.

**WHEELS AND TYRES**

- Check that the tyres are correctly inflated at the pressure specified by the manufacturer. Periodically check for possible damage to the rims and tyres.
- Stay at the tyre side when inflating.
- Check the pressure only when the tractor is unloaded and tyres are cold to avoid wrong readings due to over-pressure.
- Never cut, nor weld a rim with the inflated tyre assembled.
- To remove the wheels, block both front and rear tractor wheels. Raise the tractor and install safe and stable supports under the tractor in accordance with regulations in force.
- Deflate the tyre before removing any object caught into the tyre tread.
- Never inflate tyres using flammable gases as they may originate explosions and cause injuries to bystanders.

**REMOVAL AND INSTALLATION**

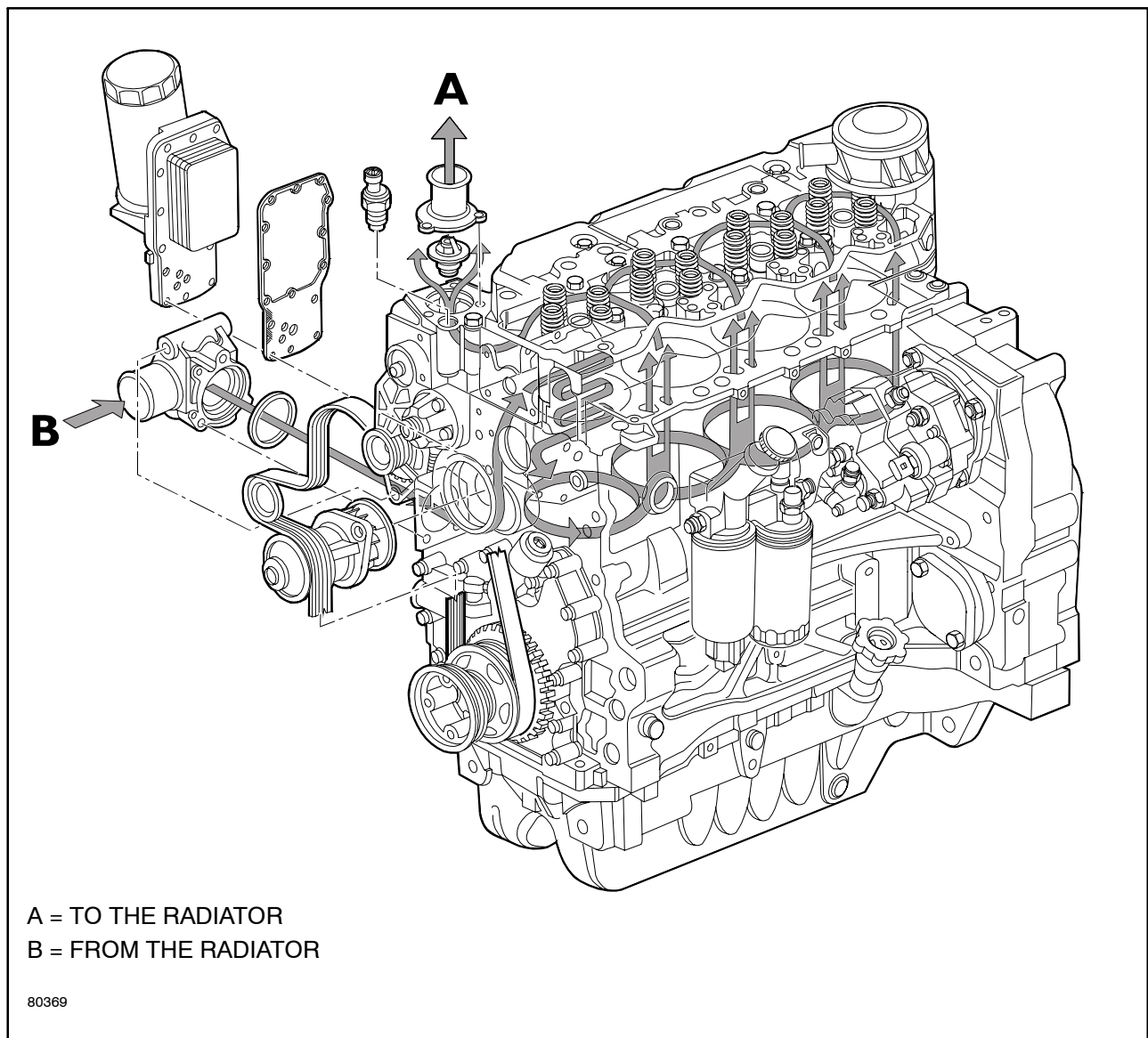
- Lift and handle all heavy components using lifting equipment of adequate capacity. Ensure that parts are supported by appropriate slings and hooks. Use lifting eyes provided to this purpose. Take care of the persons near the loads to be lifted.

## DESCRIPTION OF OPERATION

## COOLING

The forced circulation, closed-circuit engine cooling system is composed of the following components:

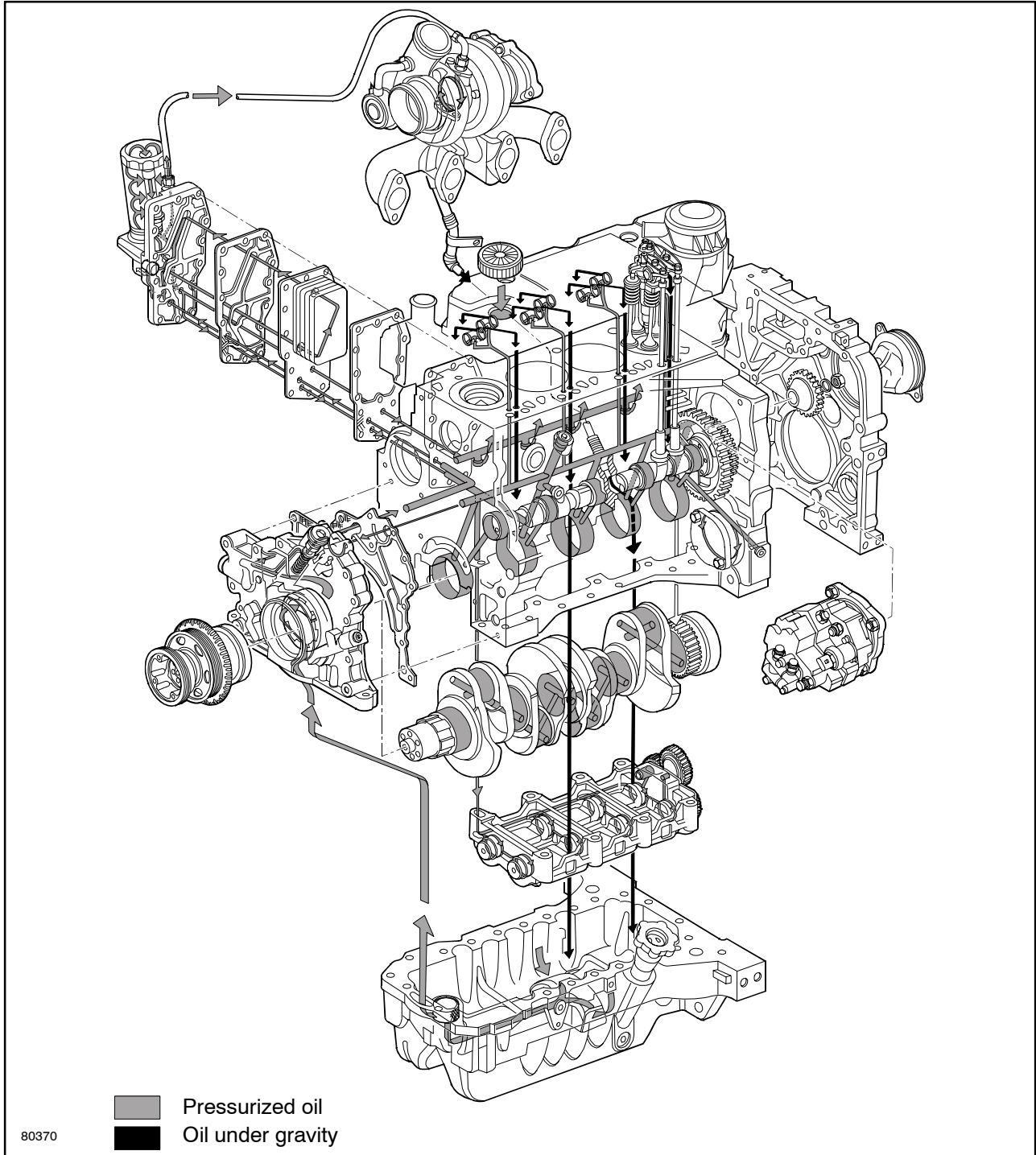
- Expansion tank: its location, shape and size may change depending on the engine version.
- Radiator, whose job is to dissipate the heat taken by the coolant from the engine. This component, too, is a feature of the version as regards both positioning and engine.
- Viscostatic fan, with the task of increasing the radiator's dissipating capacity: this, too, belongs to the specific engine version.
- A lubricating oil cooler: this, too, belongs to the specific engine version.
- A centrifugal coolant pump housed at the front of the crankcase.
- A thermostat governing coolant circulation.
- The circuit may also extend to the compressor if the version includes it.



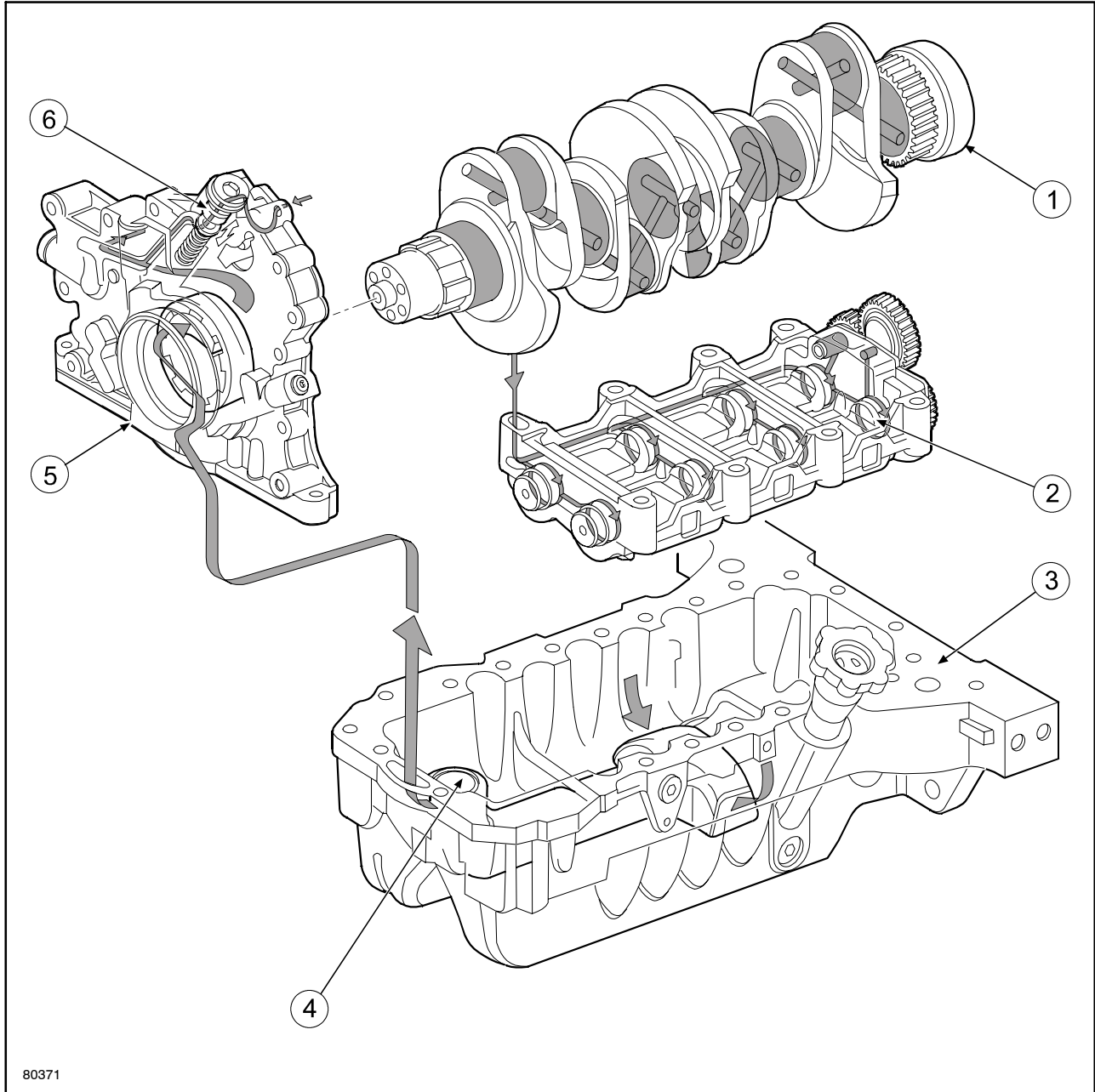
**LUBRICATION**

Forced-circulation lubrication is accomplished by the oil pump, housed at the front of the crankcase. The lubricating oil is sent from the oil sump to the crankshaft, camshaft and valve control.

Lubrication also includes the cooler, turbo-blower and compressor for the compressed air system if there is one. All these components often change according to use and will therefore be covered under the specific heading.



## LUBRICATION SYSTEM COMPONENTS



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1. Crankshaft – 2. Balancing weight – 3. Oil sump with suction rose – 4. Suction rose in oil sump –  
5. Oil pump – 6. Relief valve.

## ENGINE OVERHAUL

### INTRODUCTION

#### Removal

To remove engine from tractor see Section 01 "Separating the Tractor."

#### DISASSEMBLY

Some of the operations described in this section can be carried out directly with the engine fitted on the vehicle, depending on access to the engine bay and on the version.

#### ⚠ CAUTION ⚠

The operations for removing the engine, as those for overhaul, must be performed by skilled personnel using specific tools.

#### Fuel System/Preparing Engine to Mount on Rotating Stand

To be able to fit the brackets **380001298** (for fixing the engine to the overhaul stand, **380000301**) to the crankcase, it is necessary to work from the left-hand side of the engine:

1. Remove the fuel filters (6) from the mounting (1);
2. Disconnect the electrical connection (2) from the mounting (1) and the one to the heater (again located on the filter mounting);
3. Disconnect the fuel pipes (3 - 4 - 5) from the mounting (1);
4. Remove the bracket supporting the mounting (1) from the crankcase.

#### ⚠ CAUTION ⚠

To disconnect the fuel pipes (3 - 4 - 5, Figure 11) from the relevant fittings, you need to press the clip (1) as shown in Figure 12, B.

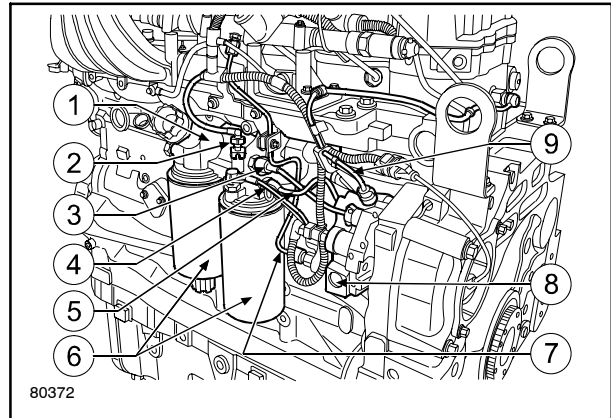
After disconnecting the piping, put the clip (1) back in its locking position (Figure 12, A) to prevent it getting buckled.

5. Disconnect the high-pressure fuel pipe (7, Figure 1) from the rail choke tube and from the high-pressure pump (8) and remove it from the crankcase by taking out the bracket.
6. Disconnect the pipe 9 from the high-pressure pump (8).

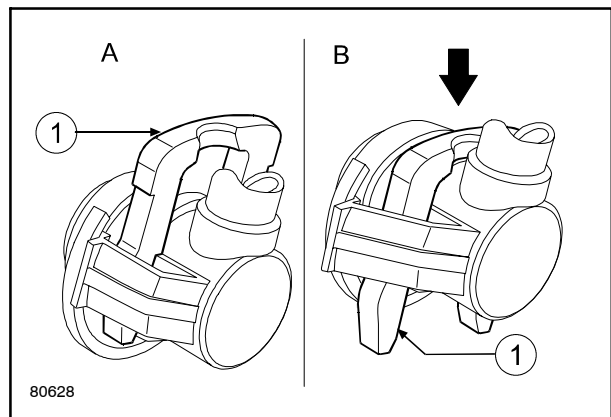
#### ⚠ CAUTION ⚠

Depending on the high pressure in the piping from the high-pressure pump to the rail and from here to the electro-injectors, **never**:

- disconnect the pipes with the engine running,
- reuse disconnected pipes.

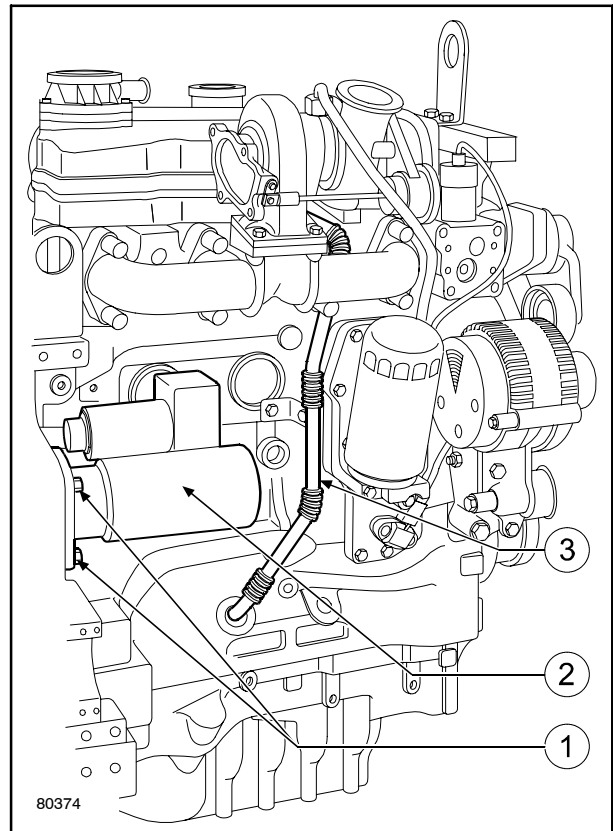


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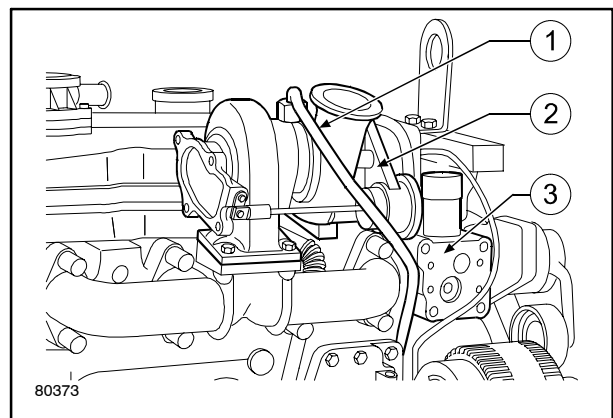
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7. Remove the oil filler pipe (3).
8. Unscrew the fixing screws (1) and remove the starter motor (2) from its seat.



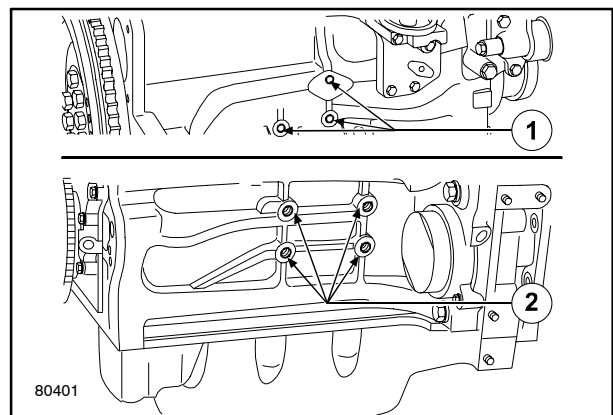
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9. Working from the right-hand side of the engine, disconnect the lubricating pipe (1) from the top of the cooler to the turbo-blower (2).
10. Remove the thermostat body (3) together with the seal.

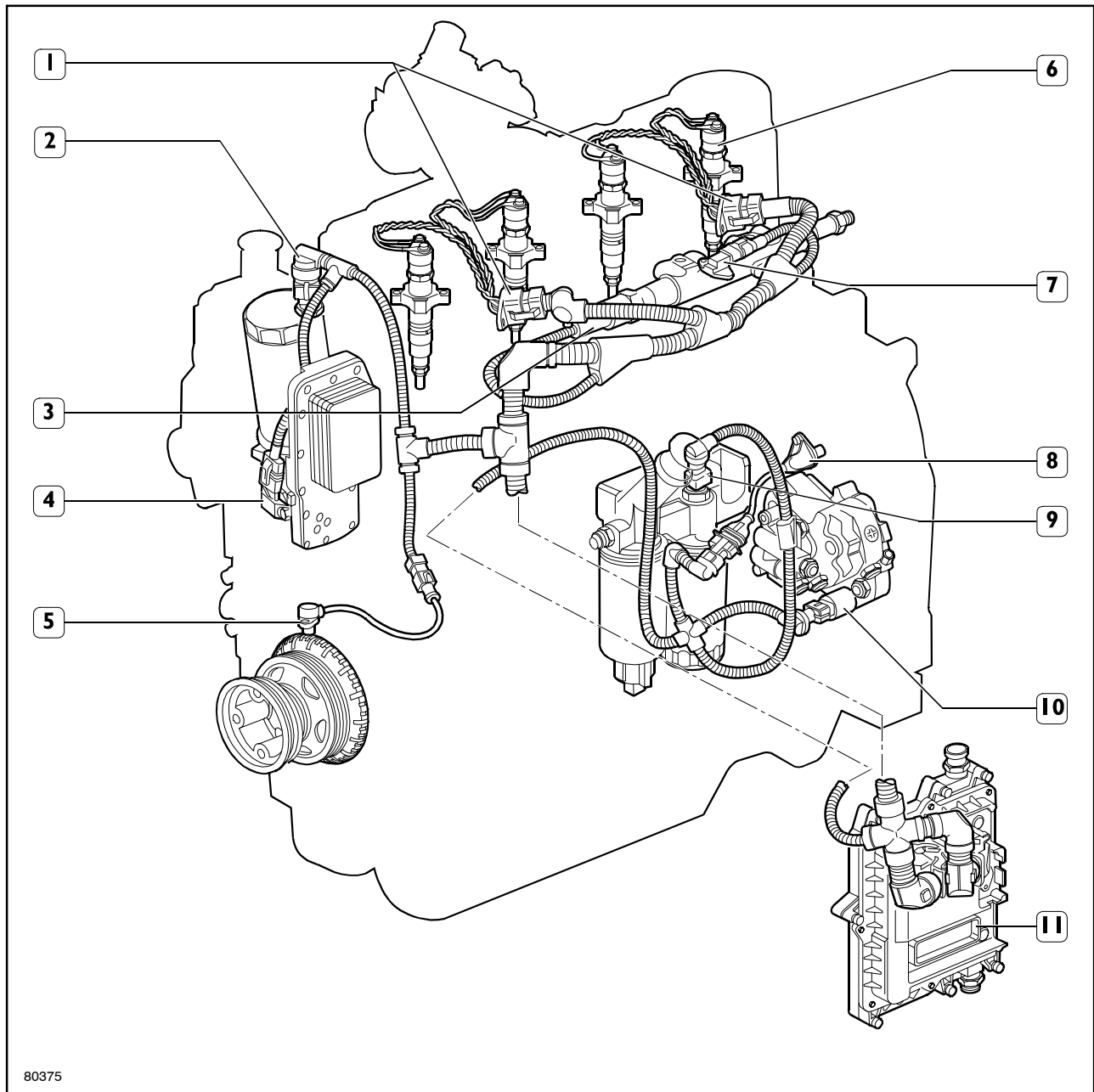


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11. Fit brackets **380001298** into the holes (1) and (2) in the crankcase on both sides and, using these brackets, secure the engine to the rotating stand **380000301**. Drain off the engine oil by removing the plug from the sump.



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### REMOVING COMPONENTS OF THE APPLICATION

1. Connection for electro-injectors - 2. Engine coolant temperature sensor -  
 3. Fuel pressure sensor cable - 4. Engine oil pressure and temperature sensor - 5. Crankshaft sensor -  
 6. Electro-injector - 7. Air pressure/temperature sensor - 8. Timing system phase sensor -  
 9. Fuel temperature sensor - 10. Pressure regulator wiring - 11. EDC7C control unit

### Electrical Connections

12. Disconnect the engine cable from the connectors: (1) electro-injector wiring (6); (7) air pressure/temperature sensor; (3) fuel pressure sensor; (11) EDC control unit; (10) high-pressure pump sensor; (8) timing system phase sensor; (2) engine coolant temperature sensor on thermostat; (5) crankshaft speed sensor.



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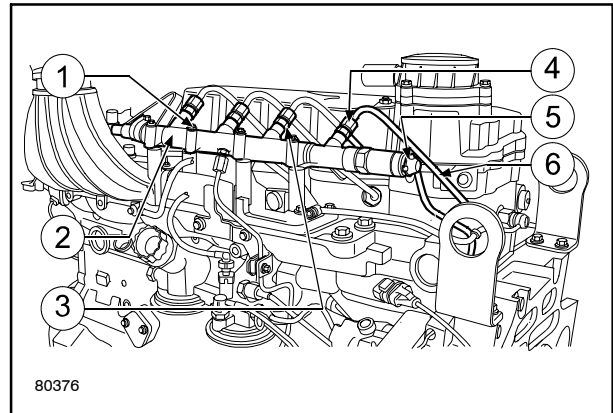
**Fuel Rail**

13. Take off the clamps fastening it to the crankcase and remove it completely.
14. Disconnect the fuel pipes (5) from the rail (2) and from the manifolds (6) for the electro-injectors.

! **CAUTION** !

When locking the fittings (4) securing the pipes (6) to the rail (2), using an appropriate wrench, you must prevent the flow limiters, if fitted, (3) from turning.

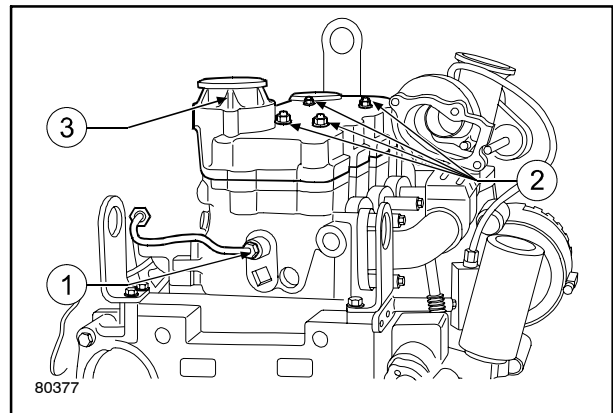
15. Remove the screws (1) and detach the rail (2).



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**Cylinder Head**

16. Disconnect the piping from the fuel return pressure limiter (1).
17. Undo the nuts (2) and take off the tappet cover (3).

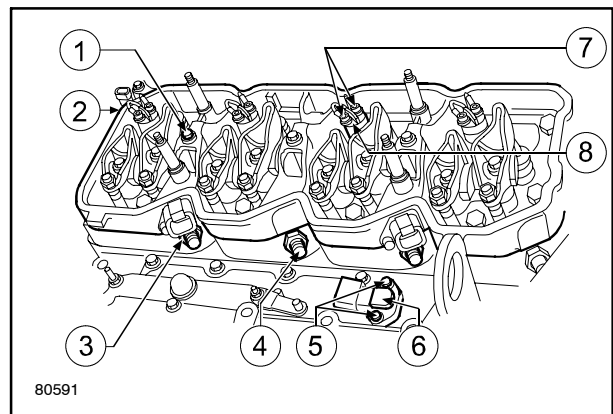


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18. Remove the nuts (7) and disconnect the electric cables from the electro-injectors (8).
19. Take out the screws (1) and remove the electro-injector wiring mounting (2) together with its seal.
20. Take out the screws (5), remove the air temperature/pressure sensor (6).
21. Remove the nuts (3) and extract the fuel manifolds (4).

! **CAUTION** !

Once removed, the fuel manifolds (4) must not be re-used; they must be replaced with new ones.



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