Workshop Service Manual

# FENDT 800 Vario S4

## FENDT 822 Vario S4
839 .. 1001-

## FENDT 824 Vario S4
840 .. 1001-

## FENDT 826 Vario S4
841 .. 1001-

## FENDT 828 Vario S4
842 .. 1001-

Marktoberdorf
AGCO GmbH - Johann-Georg-Fendt-Str. 4 - D-87616 Marktoberdorf
FENDT is a worldwide brand of AGCO


September 2017
X990.005.530.013
5205
English

# Subject to changes and additions

**IMPORTANT:**
*This document is valid from the chassis number noted. The last valid chassis number could not be determined at the time of creation. Use AGCONET or contact FENDT technical service to make sure whether a current wiring diagram set is available with an updated chassis number range.*

Due to further developments to the vehicle, the content of this document is subject to change.

The relevant accident prevention regulations must be observed, as must as any generally acknowledged safety, industrial medicine and traffic regulations. The manufacturer does not accept liability for damage resulting from unauthorized modifications to the machine.

# FENDT 800 Vario S4

# 1. Overall system/tractor

# 1.1 General

## 1.1.1 Notes on documentation

To ensure that the information is structured in a user-friendly manner, the service documentation is divided into the operator's manual and the workshop manual.

The operator's manual includes a general description as well as instructions for all necessary maintenance work.

Knowledge of the owner's manual is essential to understand the workshop manual. This is particularly important for safety instructions. The workshop manual describes repairs to assemblies and components that will require more effort and suitably qualified specialists to carry out.

**Note**

This workshop manual provides notes for trained technicians to maintain our tractors. Read and observe the information in this documentation. This will help you prevent accidents and safeguard the manufacturer's warranty.

The respective accident prevention rules as well as other generally recognized safety and occupational health rules must be observed.

The tractor is built solely for the purpose defined by the implement manufacturer. Any other type of use is considered unauthorized. The manufacturer bears no liability for any damage resulting from improper use. The user bears this risk alone. Intended use includes maintaining operating, service and maintenance conditions as specified by the manufacturer.

Operation, maintenance and repair of the tractor may only be carried out by people who are familiar with this equipment and aware of the associated dangers. Ensure that this documentation is available to and understood by everyone involved in operation, maintenance and repair. Not observing this documentation can lead to faults, damage and personal injury, for which the manufacturer assumes no liability. The prerequisite for the tractor being correctly serviced and maintained is the perfect condition and availability of all necessary equipment, standard tools and general workshop equipment as well as special tools. Special tools must only be used where absolutely necessary. The tools are displayed where they need to be used in each case.

The machine must be maintained according to its proper use. Always replace parts with genuine FENDT spare parts! When ordering parts, please provide the chassis number as per the most up-to-date spare parts documentation.

Only parts approved by the manufacturer for that specific purpose may be used for any alterations. The manufacturer will not accept liability for any damage resulting from unauthorized modifications to the tractor. Non-compliance invalidates the warranty!

Workshops should also refer to documentation on maintenance work and technical data. Once maintenance is complete, take a test drive to ensure the vehicle's correct operation and road safety.

We reserve the right to make design changes in light of technical developments.

**Notes on repairs**

The assembly/disassembly instructions shown correspond to the design status at the time the workshop manual was drawn up.

Further technical development of the product and additions related to different versions may require alternative working processes that do not pose too many difficulties to trained and qualified specialists.

These assembly/disassembly instructions shall be invalidated upon issue of the next version of this document.

## 1.1.2 Safety instructions and measures

**Important notes on work safety**

The statutory accident prevention regulations (available from professional associations or specialist shops) must be observed. These depend on the operating site, operating mode and fuels and lubricants used. Special protective measures dependent on the respective procedures are specified in the corresponding repair guidelines and highlighted.

**This handbook uses the following safety tips**

**DANGER: Indicates an impending dangerous situation that will lead to serious injury or death if not avoided.**

**WARNING: Indicates a potentially dangerous situation that could lead to serious injury or death if not avoided.**

**CAUTION: Indicates a potentially dangerous situation that could lead to minor injury if not avoided.**

**Please observe the following when carrying out maintenance or service work to the tractor:**

Only the documentation associated with the vehicle (workshop manual and operator's manual) must be used to complete any pending work.

**1. General**

- Only briefed personnel may operate the tractor or carry out maintenance work.
- Only use qualified specialists to carry out repairs or service work.
- Nobody may be in the cab while work is being carried out under the jacked-up tractor.
- Relieve pressure from implement lines, e.g. to the front loader.
- All people should keep clear of a lifted, unsecured load (e.g. tilted cab etc.).
- Never open or remove any safety devices while the engine is running.
- Pressurized fluids (fuel or hydraulic oil) escaping under high pressure can penetrate the skin and cause severe injuries. If this should occur, seek medical advice immediately to avoid the risk of serious infection.
- Keep at a safe distance from hot areas.
- Pressure accumulator and connected pipes are highly pressurized. Only remove and repair in accordance with instructions provided in the workshop manual.
- To avoid eye injury, do not look directly at the surface of the activated radar sensor.
- Dispose of oil, fuel and filters properly!
- Specialist knowledge and special fitting tools are required to fit tires.
- Run the tractor for a short time, then retighten all wheel nuts and bolts and check them regularly.

  For correct torque values refer to TECHNICAL DATA.
- Before working on the electrical system, always remove the earth strap from the battery. Observe the following when carrying out electric welding. Before carrying out welding work on tractor or mounted implements, ensure that both battery terminals are disconnected. Attach the welding appliance's earth terminal as close to the welding spot as possible.
- Caution is required when dealing with brake fluid and battery acid as these are toxic and corrosive!
- Only use genuine FENDT spare parts.

**2. Working on the front-axle suspension**

- The front axle suspension pressure lines between the central control block (ZSB) and the suspension cylinders, and

- the cased ASPL, ASPR and ZSP pressure accumulators

**DANGER: are under 200 bar pressure, even when the engine is switched off and the suspension is lowered (= locked).**

**Safety measures:**

**Prior to each repair and after releasing or opening in this area, the pressure must be released manually.**

**NOTE:**
*The "Lock suspension/lower suspension" command has no effect!*
*Even externally energizing the solenoid valves **Y013** - lower suspension solenoid valve and **Y065** - suspension raising solenoid valve has no effect!*
*(There are hydraulic pilot-operated non-return valves built in)*

**To release pressure:**

- Screw in the knurled-head screw on the **MVFS [Y013]** - Suspension lowering solenoid valve;

  the chassis may be lowered
- Screw in the knurled-head screw on the **MVFH [Y065]** - Suspension raising solenoid valve;

  the rebound accumulator will be relieved

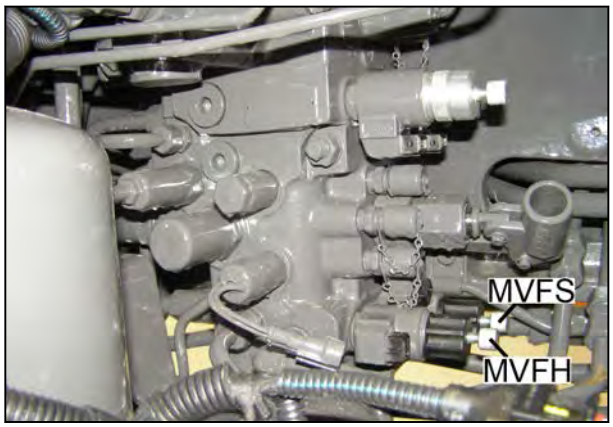

*Fig. 1*

**Check:**

As the oil temperature rises, the emptying accumulator will make a flowing sound

(barely audible in winter).

**3. Working on the brake system**

**DANGER: The brake system hydraulic lines remain under pressure even when the engine has been switched off!**

**Safety measures:**

**Before each repair to the brake system or when removing the cab, the pressure must be relieved manually.**

*Fig. 2*

**To release pressure:**

1. Engine must be off
2. Secure the tractor to prevent it from rolling away.
3. With the hand brake applied, press the foot brake 50 times
4. Apply the hand brake 20 times

**General notes**:

- Always check the brakes before driving.
- Adjustments and repairs to the brake system must be carried out in specialist workshops or by approved brake repair technicians.
- It must not be possible to brake individual wheels when driving (lock pedals)!

**4. Working on the engine**

- After switching the engine off, wait 30 seconds before carrying out any work on the fuel system.
- Only start the engine once all safety guards have been attached and nobody is standing in the danger area.
- Never let the engine run in enclosed spaces with no exhaust gas suction system.
- Cleaning, maintenance and repair work may only be carried out once the engine is switched off and secured to prevent it starting.
- Injection pipes and high-pressures lines must not be deformed.
- Any damaged injection pipe or high-pressure line must be replaced.
- Do not loosen any injection pipes for high-pressure fuel lines while the engine is running.
- Before carrying out checks to the running engine, always perform a visual check of all high-pressure components. Suitable protective clothing (e.g. protective goggles) should be worn while doing this. Leaks indicate potential sources of danger for workshop personnel.
- In the event of leaks to the high-pressure fuel system, always remain out of range of any possible fuel spray to avoid serious injury.
- Even when no leaks to the high-pressure fuel system can be detected, workshop personnel should avoid the immediate danger area and wear suitable protective clothing (such as protective goggles) when carrying out checks to the running engine and during the first test run.
- Smoking is forbidden while carrying out work to the fuel system.
- Do not work in the proximity of sparks or naked flames.
- Never disconnect an injector while the engine is running.

**5. Working on the PTO**

- Always switch off the engine before fitting or removing the drive shaft. PTO in "0" position!
- When working on the PTO, allow no-one in the vicinity of the rotating PTO or drive shaft.
- Make sure drive shaft and PTO are equipped with shield pipes and protective funnels.
- After deactivating the PTO, it is possible that parts on the mounted implement may continue to run. In this case, do not get too close to the implement. Work may only be carried out to the implement when nothing is moving!
- When the drive shaft is removed, cover the PTO shaft with its protective cap.
- Nobody should be in the cab when installing and removing the drive shaft.

  Operation of controls for the tractor and mounted implements by people in the cab, especially children, may result in severe or fatal injury.

**6. Working on the front loader**

- Before undertaking maintenance work, lower the front loader to the ground, switch off the engine and remove the ignition key.
- In the event of a collapsed pipe rupture feature, support the load before starting repair work, and slowly retract the cylinder.
- Check hydraulic hoses and pipes for signs of damage and aging regularly and replace with genuine spare parts in good time.
- Following installation and repairs, operate the tractor for a short time, then retighten all nuts and bolts and check them regularly.
- Retighten eccentric bolt for front loader attachment, if necessary.

**Disposal**

The work described in the operator's manual and workshop manual includes replacing parts, fuel and lubricants. These renewed parts/fuel/lubricants must be stored, transported and disposed of in accordance

with regulations. The repairing workshop bears responsibility for this. The disposal encompasses the recycling and final disposal of parts, fuel and lubricants with recycling having the higher priority. Details about disposal and monitoring are specified in regional, national and international laws and directives, the observation of which is the sole responsibility of the repairing workshops.

### 1.1.3 Importance of and position of the safety decals

The position and importance of the safety decals on the vehicle are explained below:

**Position:** Left C-pillar, cab interior

743.810.090.050

**WARNING:**
**Serious injury or death caused by inadequate compliance with the Operator's Manual**
**Inadequate compliance with the Operator's Manual can cause damage, injuries and in serious cases death.**
**Before operation, make sure that this Operator's Manual is available on the vehicle in legible form. The owner is responsible for providing adequate training to those personnel who are entrusted with the vehicle and for ensuring they are familiar with the instructions in the Operator's Manual and, where applicable, the service manual. The same applies to those persons who are both owner and operator.**
**Observe all safety notes and instructions, and execute all measures correctly and completely at all times.**


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**Position:** Left B-pillar, cab interior

743.810.090.100

**WARNING:**
**Serious injury or death caused by being ejected from the cab**
**When driving, an improperly closed door can open. Vehicle occupants not strapped in or not properly strapped in can be ejected from the vehicle and run over. This can cause serious injury and even death.**
**Make sure that, during travel, all vehicle passengers are properly strapped in at all times.**


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**Position:** Left C-pillar, cab interior

743.810.090.060

**WARNING:**
**Serious injury or death caused by being ejected from the cab**
**If the vehicle tips over, the door can open. Vehicle occupants not strapped in or not properly strapped in can be ejected from the vehicle. This can cause serious injury and even death.**
**Make sure that, during travel, all vehicle passengers are properly strapped in at all times.**


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**Position:** Left C-pillar, cab interior

842.810.090.040


**WARNING:**
**Unusual driving behavior in reverse drive mode can cause serious injury and even death**
**In reverse drive mode, steering the vehicle backwards can cause it to veer out at the rear and alter the driving behavior. This can cause serious injury and even death.**
**Reverse drive mode is prohibited on public roads. When not on public roads, travel in reverse drive mode with the utmost caution.**
**The Operator's Manual contains all important information.**

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**Position:** Left B-pillar, cab interior

743.810.090.130


**WARNING:**
**Serious injury or even death caused by critical driving situations due to the operator's seat lateral suspension being activated**
**When the lateral suspension is activated, critical driving situations can occur during road travel if the vehicle becomes difficult to operate. This can cause serious injury and even death.**
**Deactivate the lateral suspension when travelling on public roads. When not on public roads, do not drive too fast when the lateral suspension is activated.**

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**Position:** Left B-pillar, cab interior

743.810.090.090


**WARNING:**
**Serious injury or death caused by running over persons when leaving the vehicle**
**The vehicle can start rolling due to non-activation of the parking brake before leaving the vehicle, in which persons in the area of the vehicle can be caught and run over.**
**Activate the parking brake before leaving the vehicle and remove the vehicle key.**

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**Position:** Left B-pillar, cab interior

743.810.090.150

**DANGER:**
**Danger of inhaling hazardous substances. Refer to Operator's Manual for safety instructions and the correct settings for the ventilation system.**


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**Position:** Under the engine cover, next to the coolant expansion tank

743.500.410.080

**DANGER:**
**Scalding caused by hot coolant vapor**
**After the vehicle has been operated, the cooling circuit contains pressurized, hot coolant. When the coolant reservoir or circuit is opened, the coolant escapes in the form of hot vapor and can cause scalding if allowed to come into direct contact with the skin.**
**Before opening the coolant reservoir or circuit, switch off the engine and allow sufficient time for the coolant to cool down.**
**The maintenance manual contains all important information.**


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**Position:** Right-hand side of engine cover, also on the right and left of the radiator

743.500.410.060

**Position:** Battery box, right side of vehicle

743.500.410.030

**WARNING:**
**Burns caused by explosive flames and chemical burns caused by battery electrolite**
**Direct contact with escaping battery electrolite causes chemical burns to the eyes. Escaping battery electrolite can react with the ambient air to form an explosive mixture.**
**Avoid direct contact with battery electrolite and always wear gloves and goggles when working with an open battery. During such work, do not use naked flames and avoid spark formation.**
**The Operator's Manual contains all important information.**


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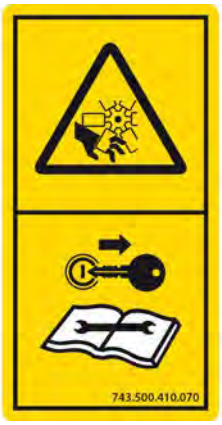
**Position:** Right and left at radiator

743.500.410.070

**DANGER:**
**Danger of body parts being torn off! Switch the engine off and remove the ignition key before maintenance and repair work.**

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**Position:** Right and left at radiator

743.500.410.050

**DANGER:**
**Danger of body parts being crushed or pulled into the machine! Switch the engine off and remove the ignition key before maintenance and repair work.**


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**Position:** On the hydraulic pressure accumulators

X655.505.700.000


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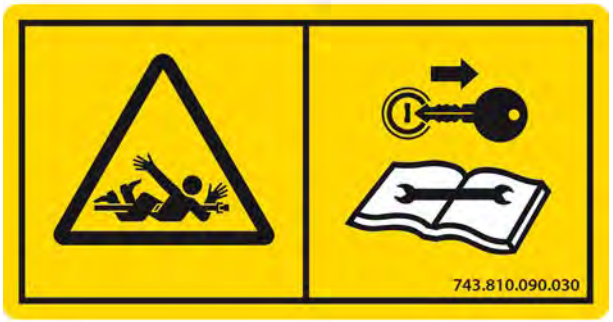
**Position:** Left side of engine, at the front above the front axle

743.810.090.030

**WARNING:**
**Serious injuries or death during incorrect work on the PTO.**
**When working on the PTO, a rotating PTO can cause crushing, shearing and impact injuries.**
**Before removing safety devices and performing other work on the PTO, remove the ignition key and make sure that the PTO cannot be reactivated until a safe state has been restored.**
**The maintenance manual contains all important information.**

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**Position:** Left side of engine, at the front above the front axle

737.500.410.030

**WARNING:**
**Serious injury caused by incorrect power lift actuation**
**When the rear power lift is actuated via the external pressure switch, any persons standing between the vehicle and the implement can be crushed as the implement is raised and positioned.**
**Make sure, when actuating the external pressure switch of the rear power lift, that nobody is standing between the vehicle and the implement.**


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**Position:** Cover of PTO stub

743.500.410.110

**DANGER:**
**Danger of slipping and of serious injury. Do not use the PTO cover or rear linkage components as a step.**


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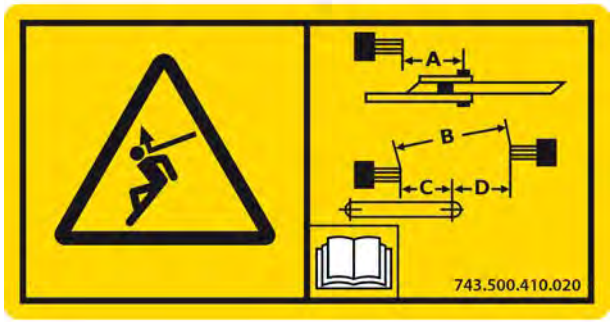
**Position:** Cover of PTO stub

743.500.410.020

**DANGER:**
**Danger due to parts being flung around if transmission shafts or implements are installed improperly. Observe the safety instructions in the Operator's Manual.**

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**Position:** Left and right at the front axle

743.500.410.040

**DANGER:**
**Danger of body parts being crushed. Switch the engine off and remove the ignition key before maintenance and repair work.**


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**Position:** Left / right rear left mudguard, rear

954,810,090,030

**WARNING:**
**Serious injuries or death during incorrect work on the PTO.**
**When working on the PTO, a rotating PTO can cause crushing, shearing and impact injuries.**
**Before removing safety devices and performing other work on the PTO, remove the ignition key and make sure that the PTO cannot be reactivated until a safe state has been restored.**
**The maintenance manual contains all important information.**

**WARNING:**
**Serious injury or death caused by the vehicle tipping over**
**Exceeding the maximum permissible hitch load on the towing hitch can result in critical driving conditions through the front wheels being raised. In the worst case, the vehicle can tip over. This can cause serious injury and even death.**
**Always respect the maximum hitch load indicated on the sign plate of your vehicle.**

**WARNING:**
**Serious injury caused by incorrect power lift actuation**
**When the rear power lift is actuated via the external pressure switch, any persons standing between the vehicle and the implement can be crushed as the implement is raised and positioned.**
**Make sure, when actuating the external pressure switch of the rear power lift, that nobody is standing between the vehicle and the implement.**

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**Position:** Left/right bottom link lift rod, rear

835.870.030.060

**CAUTION:**
**Damage to the bottom link lift rod due to incorrect bottom link floatation**
**If the lift rod bolt is incorrectly set to floatation, the lift rod can become damaged.**
**Always set the lift rod bolt to the "top" position if a bottom link floatation is not required to operate the implement.**


835.870.030.060

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**Position:** Below the rear window and on the roof hatch, cab interior

530.811.090.040

**NOTE:**
*Emergency exit from the cab when the cab door will not open*
*If the cab door will not open, use the roof hatch or the rear window as an emergency exit.*

530.811.090.040

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**Position:** Right C-pillar, cab interior

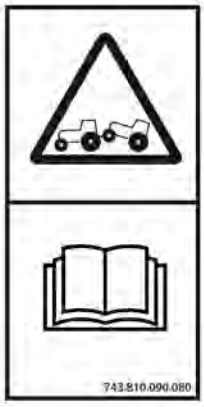
743.810.090.110

**CAUTION:**
**Damage caused by incorrect electric welding**
**Improper welding can damage electronic components and interfere with their operation.**
**Always disconnect the battery before welding. Position the welder ground clamp as close as possible to the welding point. Pay attention to temperature-sensitive parts.**
**The maintenance manual contains all important information.**


**Position:** Right C-pillar, cab interior

743.810.090.080

**CAUTION:**
**Damage caused by incorrect towing**
**Towing in a gear position other than the towing position will damage the gearbox.**
**Before towing, ensure that the gearbox is in the towing position.**
**The Operator's Manual contains all important information.**




**Position:** Front of vehicle, on air-conditioning condenser

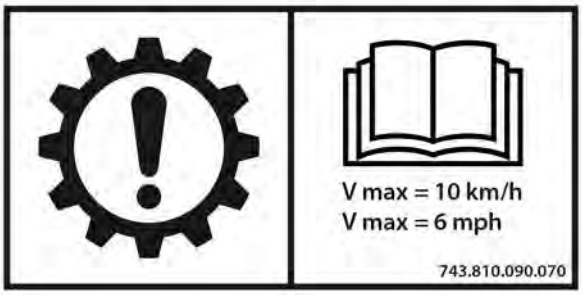
650,503,410,360

**NOTE:**
*System contains the prescribed air conditioning medium R134a*
*Use only the legally prescribed air conditioning medium R134a (1,1,1,2-Tetrafluorethane).*

**Position:** Right mudguard, cab interior

743.810.090.070

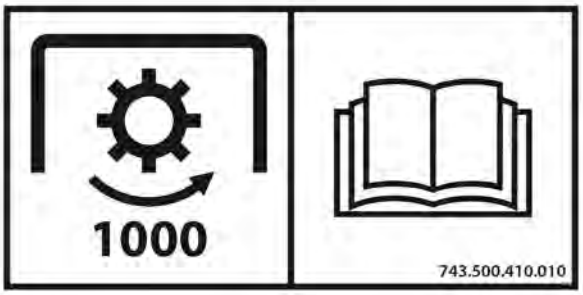
**CAUTION:**
**Damage caused by incorrect towing**
**To prevent transmission damage being caused by incorrect towing, always observe all important information in the towing instructions in the Operator's Manual.**
**Specifically, the vehicle should be towed only over a limited distance and at a speed of below 10 km/h or 6 mph.**




**Position:** PTO stub shaft protection

743,500,410,010

**NOTE:** *Note the speed and rotational direction of the PTO. Refer to the Operator's Manual when mounting or connecting implements.*




**Position:** Roof lining, centre right

743.810.090.120

**NOTE:**
*Recalibration of the tachograph after a tire change*
*Always calibrate the tachograph after a rear tire change. Failure to do so can cause incorrect tachograph recordings.*
*The Operator's Manual contains all important information.*


**Position:** Rear of vehicle, left-hand side of ball holder

743,500,410,130

**NOTE:** *Refer to the Operator's Manual when mounting implements on the rear power lift.*

**Position:** Engine block

411.201.010.010

**NOTE:**
*Do not re-tighten the cylinder head bolts*
*During initial setup and after repair work, the cylinder head bolts are tightened in accordance with the relevant instruction sheet and must not be re-tightened.*

411.201.010.010

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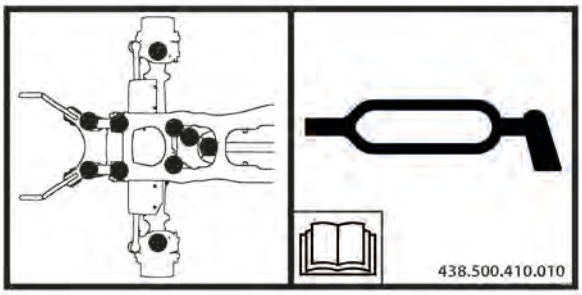
**Position:** Left side of engine, at the front above the front axle

438,500,410,010

Front lubrication points, see maintenance instructions

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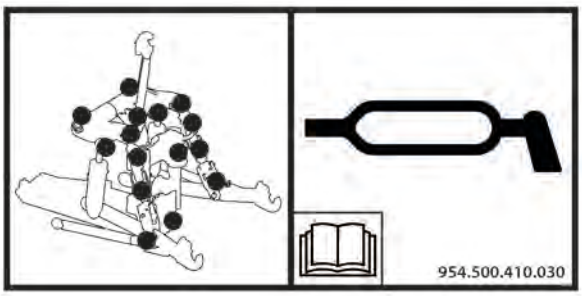
**Position:** On the right at the back on inside of mudguard

954,500,410,030

Rear lubrication points, see maintenance instructions

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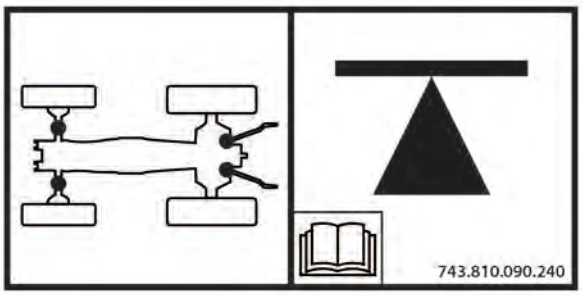
**Position:** Left entrance step

743,810,090,240

Jack points, see maintenance instructions



## 1.1.4 Note on hydraulics

If work has been carried out on the hydraulic system on the vehicle, in particular the steering, the hydraulic system must be checked in line with the test report.

## 1.1.5 Assignment table FENDT T types to the EU Type Approval Number

The EU type approval number consists of the lower case letter "e" followed by the code letter or number of the member state granting the EU type approval. The FENDT T-type designation classifies the relevant series and forms part of the 17-digit vehicle identification number.

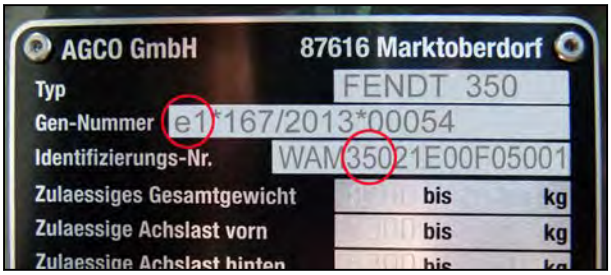



*Fig. 3 Exemplary illustration*

| Series | FENDT 200 Vario V/F/P | FENDT 200 Vario | FENDT 300 Vario |
|---|---|---|---|
| **Type approval number** | **e1*167/2013*00053** | | **e1*167/2013*00054** |
| **Chassis numbers** | T232 | T300 | T347 |
| | T233 | T301 | T348 |
| | T234 | T302 | T349 |
| | T235 | T303 | T350 |
| | T236 | T304 | |
| | T239 | | |
| | T240 | | |
| | T241 | | |
| | T242 | | |
| | T243 | | |
| | T251 | | |
| | T252 | | |
| | T253 | | |

| Series | FENDT 500 Vario | FENDT 700 Vario | FENDT 800 Vario |
|---|---|---|---|
| **Type approval number** | **e1*167/2013*00042** | **e1*167/2013*00049** | **e1*167/2013*00047** |
| **Chassis numbers** | T435 | T738 | T839 |
| | T436 | T739 | T840 |
| | T437 | T740 | T841 |
| | T438 | T741 | T842 |
| | | T742 | |
| | | T743 | |

| Series | FENDT 900 Vario | FENDT 1000 Vario |
|---|---|---|
| **Type approval number** | **e1*167/2013*00056** | **e1*167/2013*00055** |
| **Chassis numbers** | T950 | T527 |
| | T951 | T528 |
| | T952 | T529 |
| | T953 | T530 |
| | T954 | |

## 1.1.6 Support points for jack and support stands

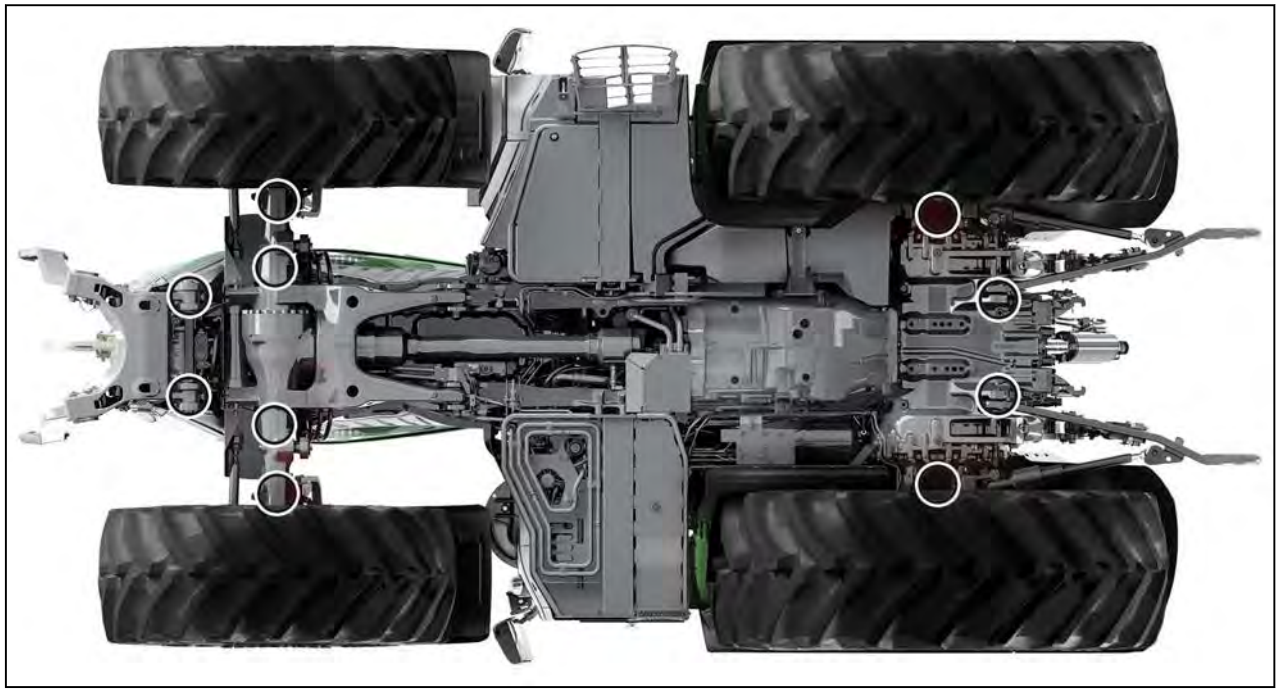


*Fig. 4*

In addition to the illustrated support points, support stands can also be placed under the rear axle trumpet housings.

**Marking on tractor**

Some of these suitable support points are marked on the tractor and are also indicated by this decal at the cab entrance.

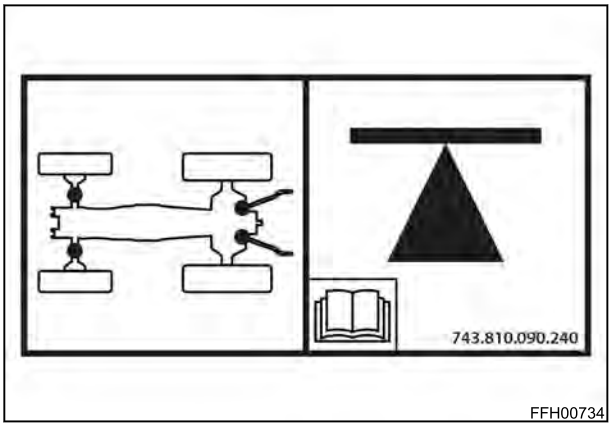



*Fig. 5*

## 1.1.7 Location of the identification plates

**Location of the identification plates**

**Vehicle rating plate**

**Stamped chassis number**

Right side, front, on frame

*Fig. 6*

**Front axle rating plate**

Right-hand side, on front axle

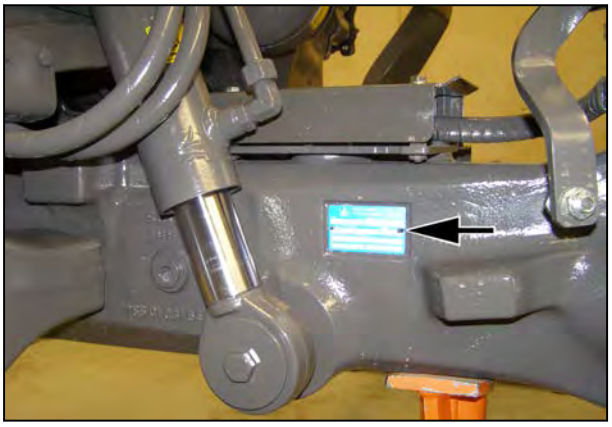


*Fig. 7*

**Diesel engine rating plate**

Top, on valve cover and
right side, on crankcase

*Fig. 8*

### Transmission rating plate

right side on transmission housing

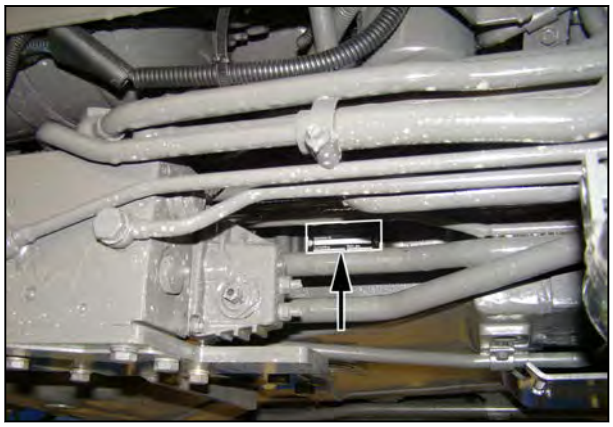


*Fig. 9*

### Vario transmission insert rating plate

on top of Vario transmission insert

Remove cab, remove transmission cover

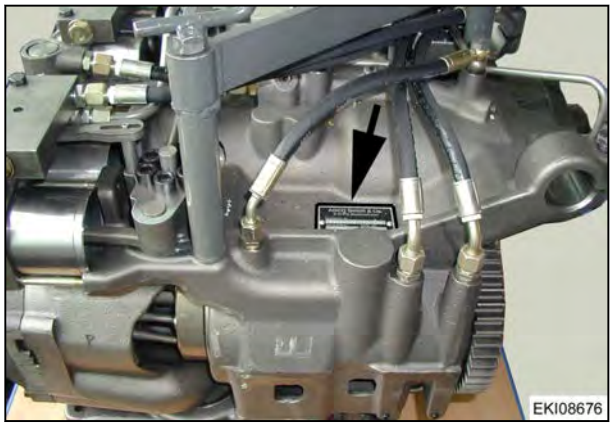



*Fig. 10*

### Cab rating plate

in rear of cab

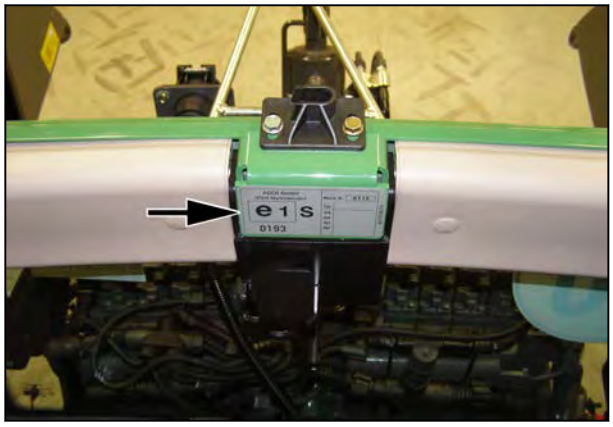



*Fig. 11*

### Trailer frame rating plate

**NOTE:**
*See also: Operating Manual*

right side, on trailer frame

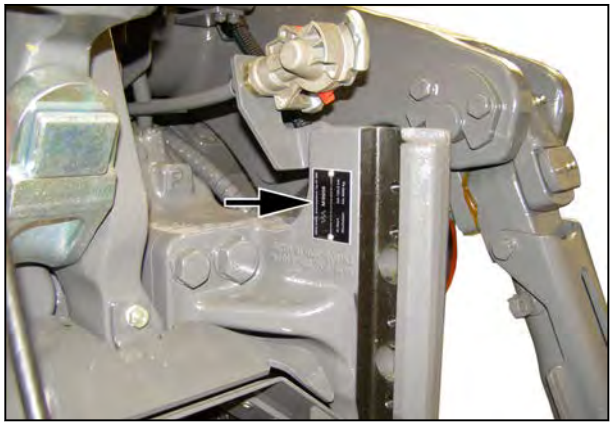


*Fig. 12*

### Automatic trailer hitch rating plate

**NOTE:**
*See also: Operating Manual*

on trailer hitch

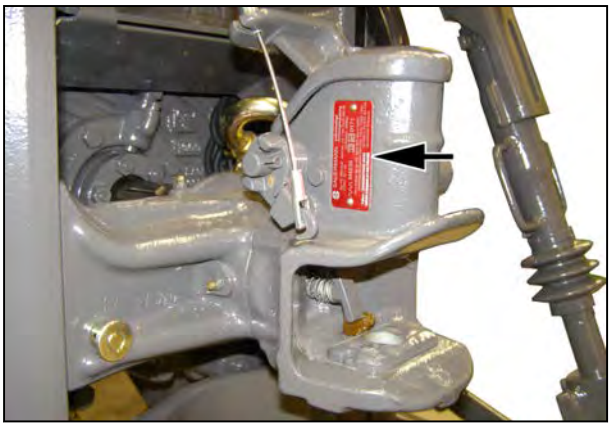


*Fig. 13*

### Ball-type coupling (height adjustable) rating plate

**NOTE:**
*See also: Operating Manual*

on ball-type coupling

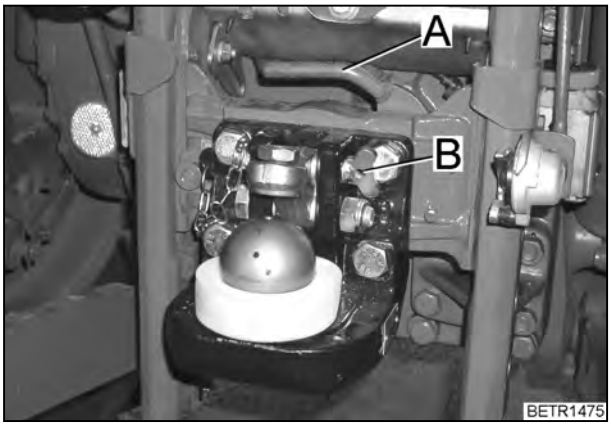



*Fig. 14*

### Ball-type coupling rating plate

**NOTE:**
*See also: Operating Manual*

on ball-type coupling


*Fig. 15*

### Draw bar rating plate

**NOTE:**
*See also: Operating Manual*

on draw bar

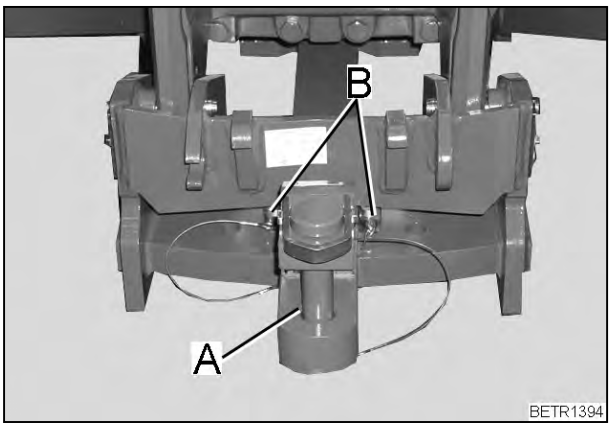



*Fig. 16*

**Piton Fix rating plate**

**NOTE:**
*See also: Operating Manual*

 on Piton Fix


*Fig. 17*

**Hydraulic hitch rating plate**

**NOTE:**
*See also: Operating Manual*

 on hydraulic hitch

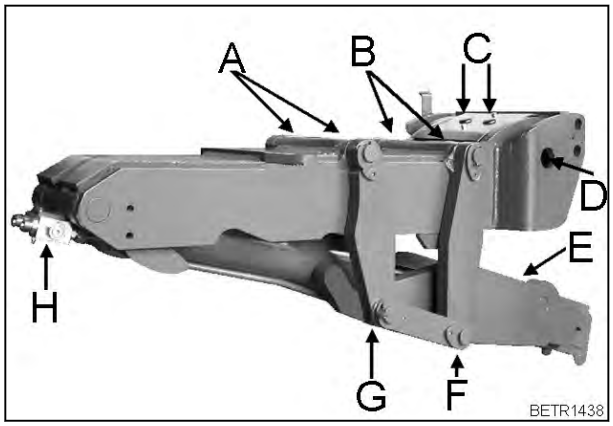



*Fig. 18*

## 1.1.8 Biodegradable hydraulic oil

### Oil quality

Use biodegradable hydraulic oil of type HEES with a rapeseed oil and synthetic base of viscosity ISO VG 32 or ISO VG 46.

**NOTE:**
*Polyglycol-based synthetic oils cannot be used.*

### Instructions for use

Biodegradable hydraulic oil is suitable for winter temperatures down to approx. -15 °C.

Vegetable-based hydraulic oil may thicken in ambient temperatures below -15 °C or if the machine is not used for long periods of time. After a cold start, allow a short warm-up time at medium engine speed to ensure safe operation of the hydraulic steering and linkage. In extremely low temperatures, it may be necessary to warm up the entire tractor.

Avoid mixing with mineral oils, such as with any oil remaining in the system or by connecting and operating an external implement. This may affect the positive environmental properties of the fluid, and will make it more difficult to dispose of; it should then be considered as hazardous waste.

Current legislation and the instructions of the oil manufacturer must be observed when disposing of oil.

A mixture containing more than 20% may result in alterations in viscosity and may lead to problems with the hydraulic valves.

### Maintenance intervals

The oil and oil filter need to be changed every 1000 running hours or every year, whichever occurs first.

When switching to biodegradable hydraulic oil, change the hydraulic oil filter after approx. 50 to 100 running hours. Since biodegradable hydraulic oil acts as a solvent, any oil residue may block the filter.

**Specific features**

Biodegradable hydraulic oil is more easily biodegradable and has less of an effect on the ground and groundwater in the event of accidental spills.

**IMPORTANT:**

*In spite of the high environmental compatibility of biodegradable hydraulic oil, accidental spills must always be reported.*

## 1.1.9 Tightening torque for screws with a galvanized surface

**Choose the correct friction coefficient**

To ensure that the tightening torque and preload value can be accurately determined, it is essential to know the **friction coefficient ($\mu_{total}$)**. Varying surface properties and lubrication conditions give rise to a wide range of friction coefficients. If not otherwise specified, tightening torques can be calculated based on their friction coefficient using the table below.

**NOTE:**

*Locking screws with retaining ridges on the screw head contact surface have a greater friction coefficient.*

**Tightening torques in relation to the friction coefficient**

| Metric thread with a friction coefficient of $\mu_{total}$ = 0.14 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 6.9 | | 8.8 | | 10.9 | | 12.9 | |
| Size | Nm | kpm | Nm | kpm | Nm | kpm | Nm | kpm |
| M6 | 8.4 | 0.85 | 9.8 | 1 | 13.7 | 1.4 | 16.7 | 1.7 |
| M8 | 20.6 | 2.1 | 24.5 | 2.5 | 34.3 | 3.5 | 40.2 | 4.1 |
| M10 | 40.2 | 4.1 | 48.1 | 4.9 | 67.7 | 6.9 | 81.4 | 8.3 |
| M12 | 70.6 | 7.2 | 84.4 | 8.6 | 117.7 | 12 | 142.2 | 14.5 |
| M14 | 112.8 | 11.5 | 132.4 | 13.5 | 186.4 | 19 | 225.6 | 23 |
| M16 | 176.6 | 18 | 206 | 21 | 289.4 | 29.5 | 348.2 | 35.5 |
| M18 | 240.3 | 24.5 | 284.5 | 29 | 392.4 | 40 | 475.8 | 48.5 |
| M20 | 338.4 | 34.5 | 402.2 | 41 | 569 | 58 | 676.9 | 69 |
| M22 | 456.2 | 46.5 | 539.5 | 55 | 765.2 | 78 | 912.3 | 93 |
| M24 | 588.6 | 60 | 696.5 | 71 | 981 | 100 | 1177.2 | 120 |
| M27 | 873.1 | 89 | 1030 | 105 | 1471.5 | 150 | 1765.8 | 180 |
| M30 | 1177.2 | 120 | 1422.4 | 145 | 1962 | 200 | 2354.4 | 240 |

| Metric fine thread with a friction coefficient of $\mu_{total}$ = 0.14 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 6.9 | | 8.8 | | 10.9 | | 12.9 | |
| Size | Nm | kpm | Nm | kpm | Nm | kpm | Nm | kpm |
| M8x1 | 22.6 | 2.3 | 26.5 | 2.7 | 37.3 | 3.8 | 44.1 | 4.5 |
| M10x1,25 | 42.2 | 4.4 | 51 | 5.2 | 71.6 | 7.3 | 86.3 | 8.8 |
| M12x1,25 | 78.5 | 8 | 93.2 | 9.5 | 132.4 | 13.5 | 157 | 16 |
| M12x1,5 | 74.5 | 7.6 | 88.3 | 9 | 122.6 | 12.5 | 147.1 | 15 |
| M14x1,5 | 122.6 | 12.5 | 147.1 | 15 | 206 | 21 | 245.2 | 25 |
| M16x1,5 | 186.4 | 19 | 220.7 | 22.5 | 309 | 31.5 | 372.8 | 38 |
| M18x1,5 | 296.8 | 27.5 | 318.8 | 32.5 | 451.3 | 46 | 539.5 | 55 |
| M20x1,5 | 377.7 | 38.5 | 451.3 | 46 | 627.8 | 64 | 755.4 | 77 |
| M22x1,5 | 510.1 | 52 | 598.4 | 61 | 843.7 | 86 | 1030 | 105 |
| M24x2 | 637.6 | 65 | 765.2 | 78 | 1079.1 | 110 | 1275.3 | 130 |
| M27x2 | 951.6 | 97 | 1128.1 | 115 | 1569.6 | 160 | 1912.9 | 195 |
| M30x2 | 1324.4 | 135 | 1569.6 | 160 | 2207.2 | 225 | 2648.7 | 270 |

## 1.1.10 Tightening torque for screws and bolts with VDA coating

These tightening torques apply for threads with a VDA coating (VDA10, VDA30, VDA42).

**NOTE:** *For detailed information, please refer to Service Bulletin 51/2016 or spare parts information no. 63-2016*

| Friction coefficient of μ = 0.10 | Nominal torque by strength class | | |
|---|---|---|---|
| Size | 8.8 | 10.9 | 12.9 |
| **M4** | 2,6 Nm | 3,9 Nm | 4,5 Nm |
| **M5** | 5,2 Nm | 7,6 Nm | 8,9 Nm |
| **M6** | 9,0 Nm | 13,2 Nm | 15,4 Nm |
| **M8** | 21,6 Nm | 31,8 Nm | 37,2 Nm |
| **M10** | 43 Nm | 63 Nm | 73 Nm |
| **M12** | 73 Nm | 108 Nm | 126 Nm |
| **M14** | 117 Nm | 172 Nm | 201 Nm |
| **M16** | 180 Nm | 264 Nm | 309 Nm |
| **M18** | 259 Nm | 369 Nm | 432 Nm |
| **M20** | 363 Nm | 517 Nm | 605 Nm |
| **M22** | 495 Nm | 704 Nm | 824 Nm |

| Friction coefficient of μ = 0.10 | Nominal torque by strength class | | |
|---|---|---|---|
| **Size** | **8.8** | **10.9** | **12.9** |
| **M24** | 625 Nm | 890 Nm | 1041 Nm |
| **M27** | 915 Nm | 1304 Nm | 1526 Nm |
| **M30** | 1246 Nm | 1775 Nm | 2077 Nm |

# 1.2 Technical specification

## 1.2.1 Technical data: 0000 general

| Technical data: Dimensions and weights | | | | | |
|---|---|---|---|---|---|
| **Tractor type** | | **822 Vario** | **824 Vario** | **826 Vario** | **828 Vario** |
| **Chassis number** | | **839/../** | **840/../** | **841/../** | **842/../** |
| **Weights** | | | | | |
| Unladen weight | kg | 9890 | | 9980 | |
| Permissible overall weight | kg | 14,000 | | | |
| Permissible overall weight with dual-circuit brake system and max. 50 km/h | kg | 16,000 | | | |
| Max. permissible front axle load 40 km/h (vehicle licensing regulations) | kg | 6500 | | | |
| Max. permissible front axle load, 8 km/h | kg | 8500 | | | |
| Max. permissible rear axle load | kg | 10,500 | | | |
| Permissible vertical load on trailer coupling | kg | 2000 | | | |
| Permissible vertical drawbar load for a pick up hitch | kg | 3000 | | | |
| **Dimensions** | | | | | |
| Front tires | - | 540/65/R30 | | 540/65/R34 | |
| Rear tires | - | 650/65R42 | | 650/85R38 | |
| Overall length | mm | 5275 | | | |
| Overall width: | mm | 2550 | | | |
| Overall height with cab | mm | 3220 | | 3280 | |
| Ground clearance | mm | 517 | | 567 | |
| Wheelbase | mm | 2950 | | | |
| Turning radius without steering brake | mm | 5450 | | | 5700 |
| Front axle flange width | mm | 1955 | | | |
| Rear axle flange width | mm | 1888 | | | |

| Technical data: Dimensions and weights | | | | | |
|---|---|---|---|---|---|
| **Tractor type** | | **822 Vario** | **824 Vario** | **826 Vario** | **828 Vario** |
| **Chassis number** | | **839/../** | **840/../** | **841/../** | **842/../** |
| Standard track front | mm | 2000 | | | |
| Standard track rear | mm | 1970 | | | |
| Front bolt pitch-circle diameter | mm | 335 | | | |
| Front axle bolt and thread | - | 10 units M20x1.5 | | | |
| Rear bolt pitch-circle diameter | mm | 335 | | | |
| Rear axle bolt and thread | - | 10 units M22x1.5 | | | |
| Rear axle ratio | i | 29.0895 | | | |
| Front axle ratio | i | 15.149 | | | |
| **Tightening torques** | | | | | |
| Front wheel nut | Nm | 450 | | | |
| Rear wheel nuts | Nm | 580 | | | |

## 1.2.2 Technical data: 1000 - Transmission

**NOTE:**
***Specification applies to: 839/../...to - 842/../....***

| Transmission oil (Vario transmission - rear axle) (combined oil supply) | | |
|---|---|---|
| Oil grade | - | FENDT Extra Trans 10W-40<br>or<br>STOU SAE 10W-40<br>STOU SAE 15W-40 |
| Transmission, initial fill | l | Approx. 145 |
| Transmission, subsequent fills | l | Approx. 123 |
| Oil quantity between Min. and Max. marks | l | approx. 3 |
| Oil change interval | Op. hrs / years | 2000 / 2 |

| Vario: continuously variable transmisssion | | |
|---|---|---|
| **Model** | - | ML 220 |
| Travel range | - | I (Field) |
| | | II (Road) |

| Vario: continuously variable transmisssion | | |
|---|---|---|
| **Speed (forwards)** | | |
| Speed range I (Field) | km/h | 0.02 ... 35 |
| Speed range II (Road) | km/h | 0.02 ... 60 |
| **Speed (backwards)** | | |
| Speed range I (field) | km/h | 0.02 ... 20 |
| Speed range II (road) | km/h | 0.02 ... 33 |
| Acceleration rate I (if the joystick is touched once at rated engine speed) | km/h | 0.02 ... 0.5 (adjustable) |
| Acceleration rate II (if the joystick is touched once at rated engine speed) | km/h | 0.5 |
| Acceleration rate III (if the joystick is touched once at rated engine speed) | km/h | 1.0 |
| Acceleration rate IV (if the joystick is touched once at rated engine speed) | km/h | 2.0 |
| **Transmission pressures** with transmission oil temperature greater than 40 °C<br>**NOTE:**<br>*See also Workshop Manual (Chapter 1005 Reg. E – Measuring transmission pressure)* | | |
| Servo pressure at 2000 rpm engine speed (measuring point PU) | bar | 28 +5 |
| System pressure at 2000 rpm engine speed (measuring point P) | bar | 27 +5 |
| Feed pressure at 2000 rpm engine speed (measuring point ES) | bar | 24 ± 2.5 |
| Outlet pressure at 2000 rpm engine speed (measuring point AS) | bar | 15.5 ±2.5 |
| Lubrication pressure at 2000 rpm engine speed (measuring point SM) | bar | 4.7 ± 0.5 |
| **Transmission pressures** with transmission oil temperature greater than 80 °C<br>**NOTE:**<br>*See also Workshop Manual (Chapter 1005 Reg. E – Measuring transmission pressure)* | | |
| Servo pressure at 2000 rpm engine speed (measuring point PU) | bar | 26 + 5 |
| System pressure at 2000 rpm engine speed (measuring point P) | bar | 25 + 5 |
| Feed pressure at 2000 rpm engine speed (measuring point ES) | bar | 15 ± 2.5 |

| Vario: continuously variable transmisssion | | |
|---|---|---|
| Outlet pressure at 2000 rpm engine speed (measuring point AS) | bar | 12 ± 2.5 |
| Lubrication pressure at 2000 rpm engine speed (measuring point SM) | bar | 3 ± 0.5 |
| **Tightening torques:** | | |
| "Forward" high-pressure valve (2V3) | Nm | 250 +20 |
| "Reverse" high-pressure valve (2V4) | Nm | 250 +20 |
| Flushing or "discharge" valve (2V5) | Nm | 250 +20 |
| Vario insert support shaft, M20 nuts (on both sides) | Nm | 250 |
| Securing bolts on the Vario insert support shaft | Nm | 86 |
| PTO drive fixing bolts<br>(cover on the planetary carrier) | Nm | 25 |
| Fixing bolts for the transmission control unit (A009) | Nm | 25 |
| Locating screw for the actuator shaft | Nm | 25 |
| Valve block for transmission control system (tighten the screws in the specified sequence) | Nm | 25 |

| Clutch | | |
|---|---|---|
| **Electrically actuated** | - | - |

| AWD | | |
|---|---|---|
| hitch | - | Wet multiple disc clutch |
| Clutch actuation | - | electro. / hydraulic |
| **Clutch pressure:**<br>Clutch disengaged | bar | 25 + 2.0 |
| Clutch engaged (Belleville spring force) | bar | 0 |

| Differential lock (rear) | | |
|---|---|---|
| hitch | - | Wet multiple disc clutch |
| Clutch actuation | - | electro. / hydraulic |
| **Clutch pressure:**<br>Differential lock disengaged | bar | 0 |
| Differential lock engaged | bar | 25 + 2.0 |

| Differential (rear axle) | | |
|---|---|---|
| System | - | Bevel pinion shaft/crown-wheel |
| Number of bevel gears | Qty | 4 |
| Bevel pinion shaft/crown-wheel backlash | mm | 0.2 +/-0.05 |
| Adjust the rolling resistance of the bevel pinion shaft bearing | Nm (Ncm) | 2.0 ... 4.0 (200 to 400) |
| Adjust the rolling resistance of the crown-wheel | Nm (Ncm) | 2.5 ... 3.5 (250 to 350) |
| **Tightening torques:** | | |
| Crown-wheel fixing bolts | Nm | 120 |
| Crown-wheel bearing flange | Nm | 86 |

| Rear wheel brake | | |
|---|---|---|
| Type | - | Ring piston brake |
| Disks on each side | Qty | 2 brake disks + 1 intermediate disk |
| Actuation | - | Hydraulic (transmission oil, servo pump) |
| Rear brake adjustment: | - | Self-adjusting brake return mechanism |

| Front axle service brake (Dual-circuit brakes only) | | |
|---|---|---|
| Type | - | Wet multiple disk brake on the 4WD shaft |
| Inner/outer toothed disks | Qty | 11/10 |
| Actuation | - | Hydraulic |

| Hand brake | | |
|---|---|---|
| Type | - | Integrated spring brake on the 4WD shaft |
| Inner/outer disks (single-circuit brake) | Qty | 6/5 |
| Inner/outer disks (dual-circuit brake) | Qty | 11/10 |
| Hand brake opening pressure | bar | 90 |

| Front PTO transmission<br>1000 - standard or 540 - optional | | |
|---|---|---|
| **Front PTO transmission oil**<br>Oil grade | | FENDT Extra Trans 10W-40 |
| | | or |
| | | **Universal tractor oil (STOU)** |
| | | SAE 10W - 40 |
| | | SAE 15W - 40 |
| | | acc. to API GL4 |
| Oil quantity: transmission oil inc. pressure filter<br>**Note:**<br>Oil level up to overflow at filler hole. | l | approx. 3.5 |
| PTO shaft profile | Inches | Splined shaft profile<br>1 3/8" x 6 splines |
| Rotational direction of the front PTO | - | Right (clockwise) viewed in the direction of travel |
| **Engine speed for PTO rpm:** | | |
| 1000 rpm (1000 PTO setting) | rpm | 1939 |
| 540 rpm (540 PTO otional setting ) | rpm | 1954 |
| **PTO speed at engine rated speed (2100 rpm)** | | |
| 1000 Setting | rpm | 1083 |
| 540 Setting | rpm | 580 |
| **Max. permissible torque in front PTO with** | | |
| 1000 Setting | Nm | 749 |
| 540 Setting | Nm | 1695 |

| Front PTO clutch | | |
|---|---|---|
| System | - | Oil supply of front PTO transmission |
| | | Appropriate oil pump for front PTO clutch |
| hitch | - | Wet multiple disk clutch with a brake disk |
| Clutch actuation | - | electr. / hydraulic |

| Front PTO clutch | | |
|---|---|---|
| **Front PTO disengaged** | | |
| System pressure | bar | approx. 3 |
| Clutch pressure | bar | 0 |
| **Front PTO engaged** | | |
| System pressure | bar | approx. 16 |
| Clutch pressure | bar | approx. 16 |

| Rear PTO transmission (540E/1000) or (1000/1000E) | | |
|---|---|---|
| PTO shaft profile | Inches | **Splined shaft profile* (standard)** 1 3/8" x 6 splines |
| Flange PTO (standard) | *** Only for implements with a max. power requirement of 103 kW / 140 HP** | **Involute profile*** 1 3/8" x 21 splines |
| | | **Splined shaft profile** 1 3/4" (6 splines) |
| | | **Involute profile** 1 3/4" x 20 splines |
| Rotational direction of the rear PTO | - | Right (clockwise) viewed in the direction of travel |
| **Engine speed for PTO rpm:** | | |
| 750 rpm (540E PTO setting) | rpm | 2190 |
| 540 rpm (540E PTO setting) | rpm | 1580 |
| 1000 rpm (1000 PTO setting) | rpm | 1882 |
| 1400 rpm (1000E PTO setting ) | rpm | 2210 |
| 1000 rpm (1000E PTO setting) | rpm | 1580 |
| **PTO speed at engine rated speed (2100 rpm)** | | |
| 540E setting | rpm | 719 |
| 1000 Setting | rpm | 1116 |

| Rear PTO transmission (540E/1000) or (1000/1000E) | | |
|---|---|---|
| 1000E setting | rpm | 1330 |
| **Max. permissible torque in rear PTO with** 540E setting | Nm | 2200 |
| 1000 Setting | Nm | 1650 |
| 1000E setting | Nm | 1200 |
| **Tightening torques:** | | |
| Rear PTO housing | Nm | 295 |
| PTO transmission housing (cover) | Nm | 49 |
| Fixing bolts for PTO flange | Nm | 69 |

| Rear PTO clutch | | |
|---|---|---|
| hitch | - | Wet multiple disk clutch with a brake disk |
| Clutch actuation | - | electr. / hydraulic |
| **Clutch pressure:** Rear PTO disengaged: | bar | 0 |
| Rear PTO engaged: | bar | 25 + 2.0 |
| **Tightening torques:** | | |
| Guide screws on the brake disk | Nm | 69 |
| Bearing flange for rear PTO clutch | Nm | 86 |

## 1.2.3 Technical data: 2000 - Diesel engine

| Diesel engine (general specifications) | | | | | |
|---|---|---|---|---|---|
| **Tractor type** | | **822** | **824** | **826** | **828** |
| **Chassis number** | | **839/../** | **840/../** | **841/../** | **842/../** |
| Engine type | - | Deutz TTCD 6.1 L06 4V | | | |
| Operating type: | - | 4-stroke diesel - direct injection - water cooled | | | |
| Injection system | - | Deutz Common Rail (DCR) Electronic Engine Management EDC 17 | | | |
| Fuel consumption at full load (approx. value) **Consumption = (HP/10) x 2 l/hr** in accordance with ECE R 24) | l/hr | approx. 44 | approx. 48 | approx. 52 | approx. 56 |

| Diesel engine (general specifications) | | | | | |
|---|---|---|---|---|---|
| **Tractor type** | | **822** | **824** | **826** | **828** |
| **Chassis number** | | **839/../** | **840/../** | **841/../** | **842/../** |
| Pollutants — emission levels | - | 2005/13/EC Tier 4/EPA 4f | | | |
| Rotational direction when looking at the flywheel | - | rotation to left (counter-clockwise) | | | |
| Engine weight | approx. value without cooling system (kg) | 450 | | | |
| Rated power ECE R24 at 2100 rpm | kW/HP | 147/200 | 162 / 220 | 176 / 240 | 191/260 |
| Maximum power ECE R24 at 1900 rpm | kW/HP | 162 / 220 | 178/242 | 191/260 | 208/283 |
| Rated power EG 97/68 at 2100 rpm | kW/HP | 166/226 | 181/247 | 195/265 | 211/287 |
| Maximum power EG 97/68 at 1900 rpm | kW/HP | 166/226 | 181/247 | 195/265 | 211/287 |
| Maximum PTO power ECE R24 at 1800 rpm<br>(engine speed) | kW/HP | 144/196 | 159/216 | 172/235 | 187/255 |
| Maximum torque ECE R24 at 1450 rpm | Nm | 955 | 1040 | 1120 | 1210 |
| Idle speed | rpm | 780 ± 30 | 780 ± 30 | 780 ± 30 | 780 ± 30 |
| Rated speed | rpm | 2100 | 2100 | 2100 | 2100 |
| No-load engine speed | rpm | 2205 ± 30 | 2205 ± 30 | 2205 ± 30 | 2205 ± 30 |
| Engine inclination<br>**Note:** Ensure vehicle stability!<br>Lengthwise in direction of travel high/low | degrees | 25 | | | |
| Across left/right in direction of travel | degrees | 25 | | | |
| External exhaust gas recirculation (EGR ex) | - | Yes | | | |
| Electronically controlled wastegate turbocharger | - | Yes | | | |
| Turbocharger 2 (booster) | - | Yes | | | |
| Common Rail injection system | - | Yes | | | |

| Diesel engine (general specifications) | | | | | |
|---|---|---|---|---|---|
| **Tractor type** | | **822** | **824** | **826** | **828** |
| **Chassis number** | | **839/../** | **840/../** | **841/../** | **842/../** |
| Fuel supply | l | 505 | | | |
| Engine cooling | - | Water | | | |
| Intercooler | - | Air/water | | | |
| Engine oil cooler | - | Water | | | |
| Cylinder | - | 6 (in-line) | | | |
| Displacement | cc | 6056 | | | |
| Bore/stroke | mm | 101/126 | | | |
| Firing order (cylinder # 1 at flywheel) | - | 1 - 5 - 3 - 6 - 2 - 4 | | | |
| Number of valves | - | 2 (intake)/2 (exhaust) | | | |
| Compression ratio | - | 17 : 1 | | | |
| Compression pressure<br>**Note:**<br>The compression pressure is dependent on the starter speed during the measuring process.<br>The compression pressure is dependent on the height of the engine's installation location.<br>Limits cannot be set exactly.<br>The compression pressure measurement is recommended to serve only as a comparison of all the cylinders in an engine.<br>Where there is more than a 15% deviation, the cause should be determined by the removal of the appropriate cylinder unit. | bar | 43 | | | |

| Cooling system | | |
|---|---|---|
| Cooling type | - | Fan with Viscotronic coupling |
| Coolant quantity<br>(engine content only, without radiator) | l | 11.5 |
| Proportion of cooling system protective inhibitor min./max. | Vol. % | 35/45 |

| Cooling system | | |
|---|---|---|
| Permitted constant coolant temperature at engine outlet | °C | 110 |
| Cooling water pump | bar | |
| Delivery pressure | | 1.1 |
| Flow rate | l/min | 196 |
| Power consumption | kW/HP | 1.3/1.77 |
| Engine speed/(viscous fan) hub speed ratio | i | 1.76 |
| Slip with fully engaged viscous fan | % | 6 ... 8 |
| Max. viscous fan speed at rated speed (2100 rpm) | rpm | 3375 |

*Specification applies to: 839/../...to - 842/../....*

| engine lubrication | | |
|---|---|---|
| Oil quantity | l | 15 |
| Difference in oil volume between "Min" and "Max" marks on dipstick | l | approx. 3 |
| Oil grade | - | FENDT Premium Extra Grade 10W-40 |
| Max. oil temperature | °C | 118 |
| Minimum oil pressure at rated speed (2100 rpm) and oil temperature of 120°C | bar | 2 |
| Oil pump (oil pressure at engine speed) | | |
| n = 1000 rpm | bar | 3.5 +/- 0.4 |
| From 1900 rpm onwards | bar | 3.7 +/- 0.4 |

*Specification applies to: 839/../...to - 842/../....*

| Fuel system | | |
|---|---|---|
| Fuel | - | **Diesel**<br>in accordance with DIN EN 590 |
| **Note:**<br>When using diesel containing more than 0.5% sulfur, the oil change interval must be halved.<br>See also tractor's Operator's Manual. | | |
| Fuel tank capacity | l | 505 |
| Adblue filling capacity | l | 52 |

| Fuel system | | |
|---|---|---|
| **fuel delivery pump**<br>Fuel primary pressure "low pressure"<br>(overflow valve in the Y091 dispensing unit) | bar | Approx. 6 |
| Fuel delivery rate (at rated engine speed: 2100 rpm)<br>**Note:**<br>The delivery rate is dependent on:<br>- speed of the fuel delivery pump<br>- fuel temperature<br>- primary and counter pressure at the fuel delivery pump | l/min | 5 |

*Specification applies to: 839/../...to - 842/../....*

| Injection system | | |
|---|---|---|
| System | - | Deutz Common Rail (DCR) |
| Electronic engine management | - | Bosch EDC 17 |
| High-pressure pump | - | Bosch PF 45-20 |
| Injector | - | Bosch CRIN 3.3 |
| Mapping field of regulated rail pressure (min/max) | bar | 350 to 1950 |
| DBV - rail pressure limit (2-stage DBV) opening pressure/ holding pressure | bar | 2300/400 to 980 |
| Mapping field of regulated start of delivery (SD) | - | Bosch EDC 17 |
| Mapping of dependent pre-injection | - | Bosch EDC 17 |

*Specification applies to: 839/../...to - 842/../....*

| Valves | | |
|---|---|---|
| Number of inlet valves | Units | 2 |
| Number of exhaust valves | Units | 2 |
| Valve clearance: inlet valve / exhaust valve<br>with a cold engine (under 80°C) | degrees | 75/120 |
| Locknut on valve adjustment screw | Nm | 20 |
| Valve recess, inlet valve<br>(measured from the valve head to the cylinder head sealing surface) | mm | 0.9 +0.15/-0.1 |