

BEML - TATRA 815

26RR36 22 255 6x6.1R/50T, 51T

Workshop manual

Part 11 – WHEEL & TYRES

Publication numer: 03-0254-ENG/00





11 WHEELS & TYRES

11.1 Description and Main Technical Specifications

The vehicles BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T feature wheels with split disc wheels with the size designation 11,25 - 21 for tubeless tyres with the size designation 15,00 - 21 MP 913/12PR.

The **vehicle wheel** consists of tyre **1**, air tube with extension **2**, bead lock **12** and disc wheel **9**. The vehicle wheel is attached to the axle by means of elastic rings **11** and nuts **10**.

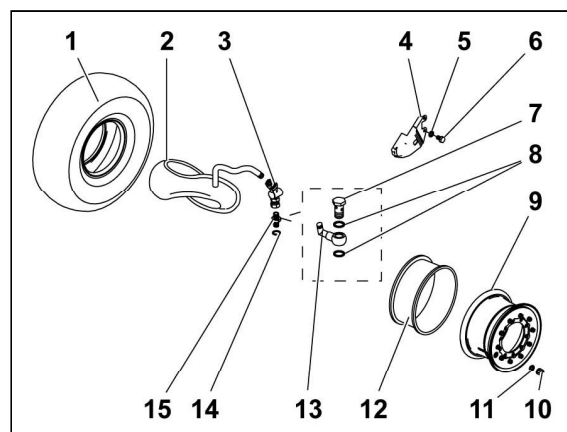


Fig. 11.1 Vehicle wheel

The vehicles BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T use the Central Tyre Inflation System (C.T.I.S.), which allows to change the tyres inflation pressures.

On the steered wheel, the air tube extension **2** (See Fig. 11.1) is interconnected by means of shut-off valve **3**, neck **15** and sealing ring **14**, and on the non-steered wheel by means of shut-off valve **3**, connection **13**, hollow screw **7** and sealing rings **8**, with the inflation manifolds in the axle shaft. Using the shut-off valve **3** the air pressure supply to the tyre can be closed. The shut-off valve is protected against damage by the cover **4**, which is attached by bolts **6** c/w spring washers **5** to the axle shaft (to wheel reduction gear cover).

Main vehicle wheels specifications are mentioned in the below-mentioned table (See Tab. 11.2).

Tab. 11.1 Main specifications of vehicle wheels

Data		Unit	BEML - TATRA T 815 - 22RR36 22 255 6x6.1R
Kind			Disc wheels
Number of wheels			6 + 1
Disc wheels:	- type		split
	- size		10,25 - 21
Tyres:	- type		tube type
	- size		15,00 - 21 MP 913/12PR
Total wheel weight		(kg)	220



11 Wheel & Tyres



The tyres pressures can be controlled within the range of **100 kPa - 475 kPa (1.00 - 4.75 kg/sq.cm)** in relation to driving conditions for Barum/Matador tyres. Top driving speeds related to tires inflation pressures are mentioned in the table below (See Tab. 11.2).

Tab. 11.2 Driving speeds related to tyres inflation pressures (Barum/Matador tyres)

Overpressure in tyres	Maximum speed
100 kPa (1 kg/sq.cm) – in terrain	20 km/hr
up to 150 kPa (1.5 kg/sq.cm) – in terrain	30 km/hr
up to 300 kPa (3 kg/sq.cm) – in terrain	60 km/hr
475 kPa (4.75 kg/sq.cm)	90 km/hr

The tyres pressures can be controlled within the range of **170 kPa - 415 kPa (1.70 - 4.15 kg/sq.cm)** in relation to driving conditions for MRF - tyres. Top driving speeds related to tires inflation pressures are mentioned in the table below (See Tab. 11.3).

Tab. 11.3 Driving speeds related to tyres inflation pressures (MRF tyres)

Overpressure in tyres	Maximum speed
170 kPa (1.7 kg/sq.cm) – in terrain	15 km/hr
up to 275 kPa (2.75 kg/sq.cm) – in terrain	48 km/hr
up to 415 kPa (4.15 kg/sq.cm) – in terrain	64 km/hr
415 kPa (4.15 kg/sq.cm)	90 km/hr



11.2 Faults Causes and Troubleshooting

Fault	Cause	Remedy	Mentioned in
Air leaks from the tyre	Tyre and air tube puncture	Remove the vehicle wheel and repair or replace the damaged part	(See Subchapter 11.5.3)



11.3 List of Special Tools

No special tools have been prescribed for the mentioned technological procedures related to the wheels and tyres installed on vehicles BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T.



11.4 Survey of Torque Specifications

Survey of torque specifications related to vehicle wheels mounted on vehicles BEML - TATRA **T 815 - 26RR36 22 255 6x6.1R/50T** and BEML - TATRA **T 815 - 26RR36 22 255 6x6.1R/51T** is mentioned in the table below.

Tab. 11.4 Torque specifications of vehicle wheels

Data	Unit	Value
Nuts of bolts fixing the wheels to wheel hubs	Nm	500 ± 50
Nuts of disc wheels fastening bolts		350 - 400



11.5 Working Procedures

11.5.1 Removal and Installation of the Steered Vehicle Wheel

a) Reasons for Removal

1. Tire or air tube wear, puncture or other tire damage.
2. The air leaks from air tube.
3. Damaged disc wheel.
4. Damaged bead lock.
5. Replacement of some assembly group.

b) Technical Conditions

1. If possible, stand the vehicle on level ground, set the parking brake and chock the wheels.
2. To achieve a stable position of the hydraulic jack, place a wooden board from the vehicle equipment under jack.
3. Carefully raise the half-axle with regard to small contact areas between the axle shaft and upper part of the hydraulic jack.
4. Inflate the tires to pressures mentioned in (See Tab. 11.2), (See Tab. 11.3).

c) Removal Procedure

1. Place the hydraulic jack under the lower surface of the axle shaft yoke area. If it is not possible to place the jack under the axle shaft yoke (due to big flattening of punctured tire or in terrain), place the jack under holder of the suspension shock absorber.

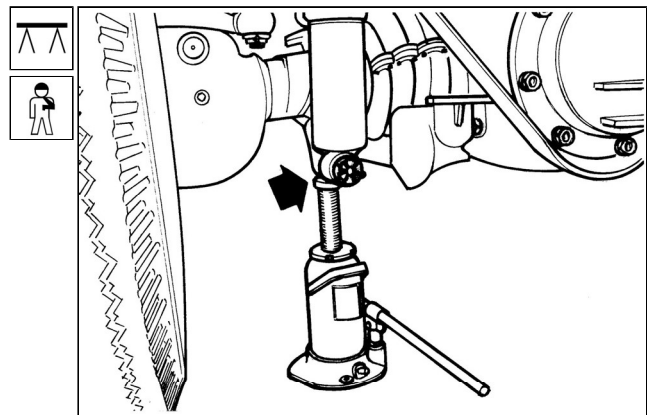


Fig. 11.2 Location of jack under the front axle shaft

2. In case that the jack cannot be placed under the axle shaft, roll with the defective wheel on a suitable support plate.
3. Use a hydraulic jack to partially lift the half-axle so that the tire still remains in contact with ground.

11 Wheel & Tyres



4. Dismount bolts **1** c/w spring washers.
5. Withdraw the valve cover **2** from the wheel reduction gear cover.

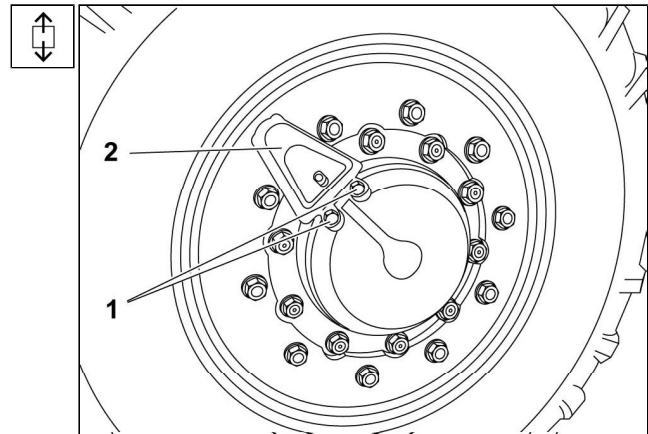


Fig. 11.3 Valve cover - removal

6. Close shut-off valve **5**.
7. Loosen union nuts **6** and **4**.
8. Raise shut-off valve **5**, withdraw it from neck **7** and turn so that the fastening nut **1** of wheel **2** is easy accessible.
9. Tighten union nut **4**.
10. Unscrew neck **7** c/w sealing ring **8** from the wheel reduction gear housing **9**.
11. Slacken fastening nuts **1** of wheel **2**. (The outer wheel bolts connect the split disc wheel, while the inner ones attach the wheel to the axle shaft.)
12. Use the jack to partially raise the axle shaft so that the wheel is not in contact with ground.
13. Unscrew nuts **1** and remove elastic rings.
14. Use suitable lever **2** to withdraw the wheel from the axle shaft.

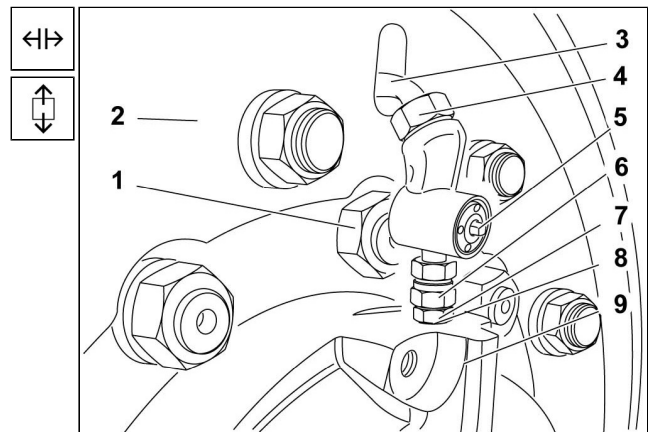


Fig. 11.4 Steered vehicle wheel - removal

Note:

If there is not a full air overpressure in the tire during removal (defective air tube), you can dismount the shut-off valve **5** so that you slacken union nuts **4** and **6** and withdraw the shut-off valve **5** from neck **8** and air tube extension **3**.



d) Installation Procedure

1. Fit the wheel **2** on half-axle.

CAUTION:

The tire tread pattern arrows must point forwards!

2. Fit elastic rings and mount nuts **1**.
3. Use the jack to lower the axle shaft so that the wheel **2** touches the ground.
4. Tighten the nuts **1** to **500 ± 50 Nm**. Tighten the nuts "crosswise".
5. Screw the neck **7** c/w sealing ring **8** into the wheel reduction gear housing **9**.
6. Slacken the union nut **4**, turn the shut-off valve **5** and fit on the neck **7**.
7. Tighten union nuts **4** and **6**.
8. Open shut-off valve **5**.
9. Completely lower the half-axle on ground using a jack, remove jack and wooden board.
10. Start the engine, inflate the tire to the specified pressure and check the inflation manifold for leaks.
11. Fit the valve cover **2** to the wheel reduction gear cover and fix it with bolts **1** and spring washers.

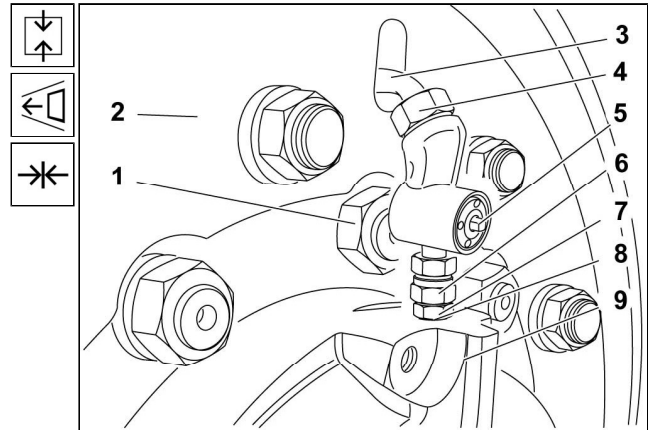


Fig. 11.5 Steered vehicle wheel - installation

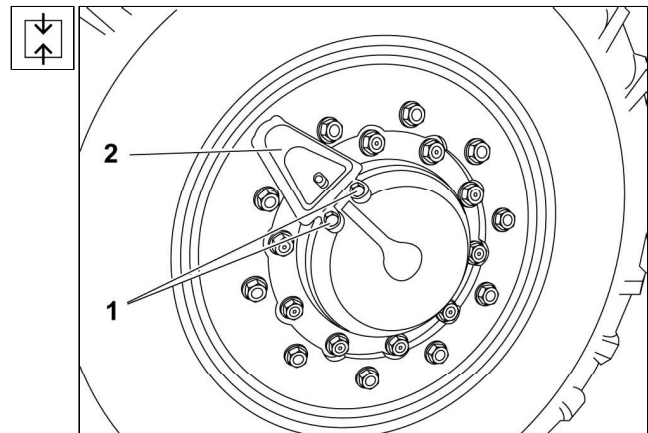


Fig. 11.6 Valve cover - installation

12. Remove wheel chocks.

CAUTION:

Remember to retighten the wheel nuts after covering about 50 km after every wheel replacement. Since the manufacturer prescribes to tighten the vehicle wheels nuts to the torque of **500 ± 50 Nm**, it is necessary to loosen the nuts and retighten them using a torque wrench to the specified torque on the first occasion after emergency wheel replacement.



11.5.2 Removal and Installation of the Unsteered Vehicle Wheel

a) Reasons for Removal

1. Tire or air tube wear, puncture or other tire damage.
2. The air leaks from air tube.
3. Damaged disc wheel.
4. Damaged bead lock.
5. Replacement of some assembly group.

b) Technical Conditions

1. If possible, stand the vehicle on level ground, set the parking brake and chock the wheels.
2. To achieve a stable position of the hydraulic jack, place a wooden board from the vehicle equipment under jack.
3. Carefully raise the half-axle with regard to small contact areas between the leaf spring hanger yoke and upper part of the hydraulic jack.
4. Inflate the tires to pressures mentioned in (See Tab. 11.2), (See Tab. 11.3).

c) Removal Procedure

1. Place the hydraulic jack under the leaf spring hanger yoke.

CAUTION:

When lifting the rear half-axle, do not locate the jack under the leaf spring. The leaf spring shackle could be slid out of its location and a serious accident could take place.

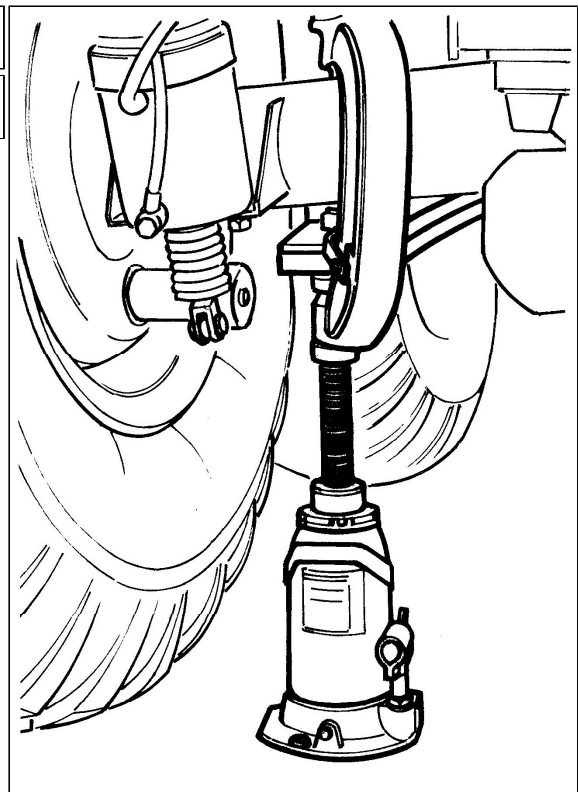


Fig. 11.7 Location of jack under the rear

11 Wheel & Tyres



2. In case that the jack cannot be placed under the half-axle, roll with the defective wheel on a suitable support plate.
3. Use a hydraulic jack to partially lift the half-axle so that the tire still remains in contact with ground.
4. Dismount bolts **1** c/w spring washers.
5. Withdraw the valve cover **2** from the wheel reduction gear cover.

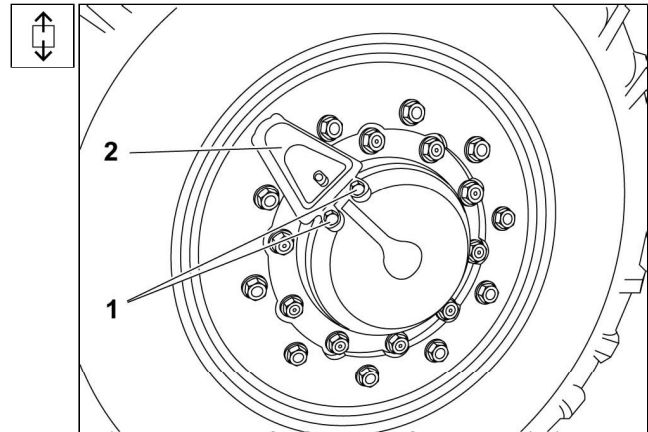


Fig. 11.8 Valve cover - removal

6. Close shut-off valve **5**.
7. Loosen union nuts **6** and **4**.
8. Raise shut-off valve **5**, withdraw it from neck **7** and turn so that the fastening nut **1** of wheel **2** is easy accessible.
9. Tighten union nut **4**.
10. Unscrew neck **7** c/w sealing ring **8** from the wheel reduction gear housing **11**.
11. Remove neck **9** c/w sealing ring **10** from the wheel reduction gear housing **11**.
12. Slacken fastening nuts **1** of wheel **2**. (The outer wheel bolts connect the split disc wheel, while the inner ones attach the wheel to the axle shaft.)
13. Use the jack to partially raise the axle shaft so that the wheel is not in contact with ground.
14. Unscrew nuts **1** and remove elastic rings.
15. Use suitable lever **2** to withdraw the wheel from the axle shaft.

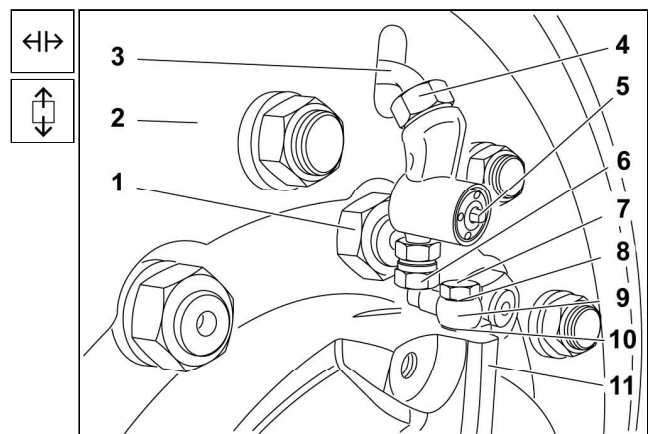


Fig. 11.9 Unsteered vehicle wheel - removal

Note:

If there is not a full air overpressure in the tire during removal (defective air tube), you can dismount the shut-off valve **5** so that you slacken union nuts **4** and **6** and withdraw the shut-off valve **5** from neck **8** and air tube extension **3**.



d) Installation Procedure

1. Fit the wheel **2** on half-axle.

CAUTION:

The tire tread pattern arrows must point forwards!

2. Fit elastic rings and mount nuts **1**.
3. Use the jack to lower the axle shaft so that the wheel **2** touches the ground.
4. Tighten the nuts **1** to **500 ± 50 Nm**. Tighten the nuts "crosswise".
5. Install attachment **9** c/w sealing ring **10** into the wheel reduction gear housing **11**.
6. Screw the neck **7** c/w sealing ring **8** into the wheel reduction gear housing **11**.
7. Slacken the union nut **4**, turn the shut-off valve **5** and fit on the neck **9**.
8. Tighten union nuts **4** and **6**.
9. Open shut-off valve **5**.
9. Completely lower the half-axle on ground using a jack, remove jack and wooden board.
10. Start the engine, inflate the tire to the specified pressure and check the inflation manifold for leaks.
11. Fit the valve cover **2** to the wheel reduction gear cover and fix it with bolts **1** and spring washers.
12. Remove wheel chocks.

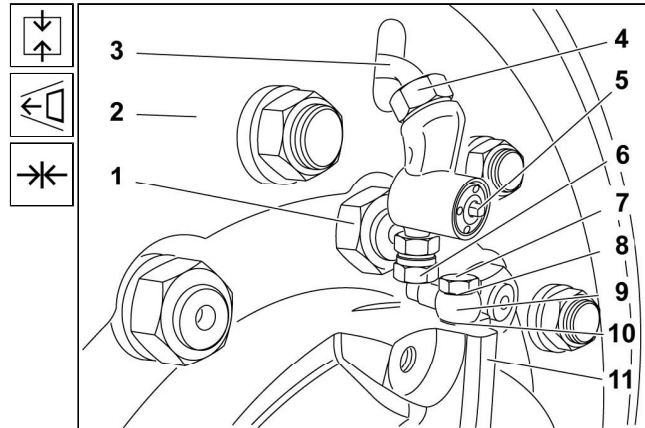


Fig. 11.10 Unsteered vehicle wheel - installation

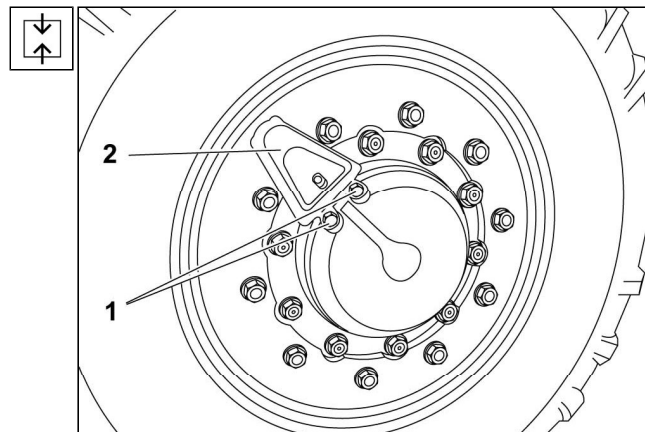


Fig. 11.11 Valve cover - installation

CAUTION:

Remember to retighten the wheel nuts after covering about 50 km after every wheel replacement. Since the manufacturer prescribes to tighten the vehicle wheels nuts to the torque of 500 ± 50 Nm, it is necessary to loosen the nuts and retighten them using a torque wrench to the specified torque on the first occasion after emergency wheel replacement.



11.5.3 Disassembly and Assembly of the Vehicle Wheel

a) Reasons for Disassembly

1. Worn tyre.
2. Tyre or air tube puncture.
3. Damaged bead lock.
4. Damaged disc wheel.

b) Technical Conditions

1. For safety reasons, it is allowed to dismount the tire from the disc wheel only when the air is released from the tyre.
2. Always mount tyres with the same kind of tread pattern and with approximately equal wear on one axle.
3. The tread depth must be in compliance with valid legislative regulations.
4. Inflate the tyres to pressure values mentioned in (See Tab. 11.2), (See Tab. 11.3).

c) Disassembly Procedure

1. Remove the vehicle wheel in accordance with the procedure mentioned in: (See Subchapter 11.5.1) and (See Subchapter 11.5.2).

CAUTION:

The disassembly is not allowed to be performed with the inflated tire!

2. Loosen and unscrew the nuts fixing the pressure plate and disconnect the disc wheel.

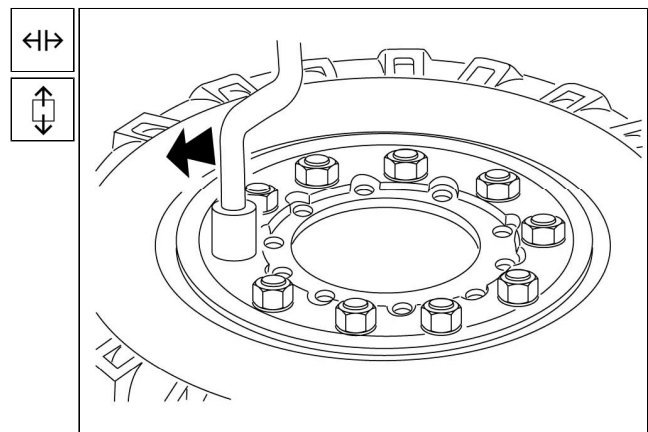


Fig. 11.12 Nuts of pressure plate - removal

11 Wheel & Tyres



3. Slacken the pressure plate and remove from tyre.

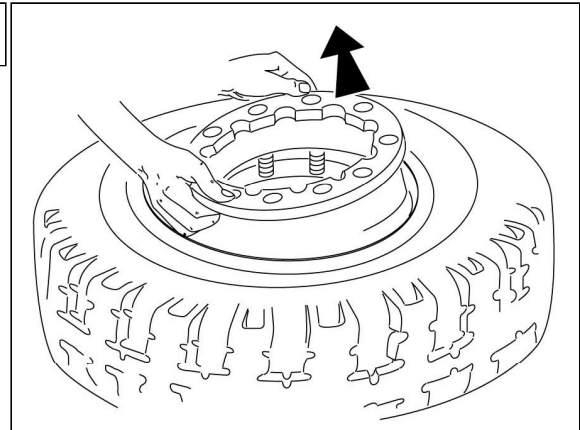


Fig. 11.13 Pressure plate - removal

4. Support the disc wheel on a suitable stand (best on a wooden block) and loosen the disc wheel.
5. Withdraw the tyre with bead lock and air tube from the disc wheel.

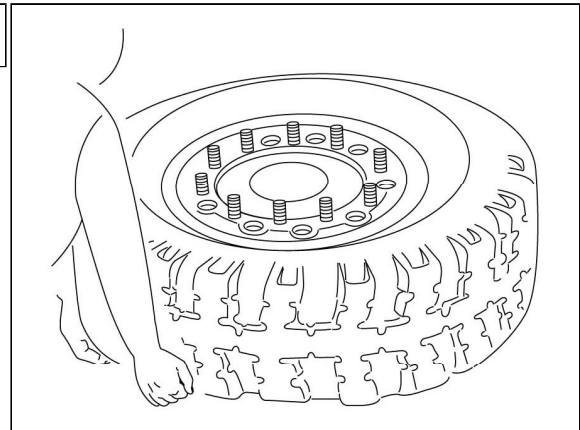


Fig. 11.14 Tyre - removal

6. Press the air tube extension through hole in the bead lock into tyre and remove the bead lock from tyre.

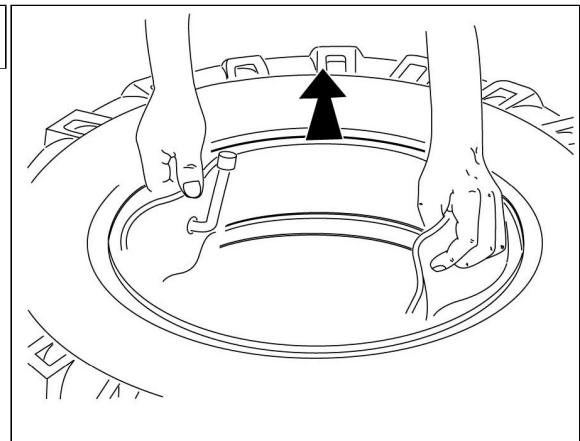


Fig. 11.15 Tire bead lock - removal



7. Remove the air tube with extension from tyre.

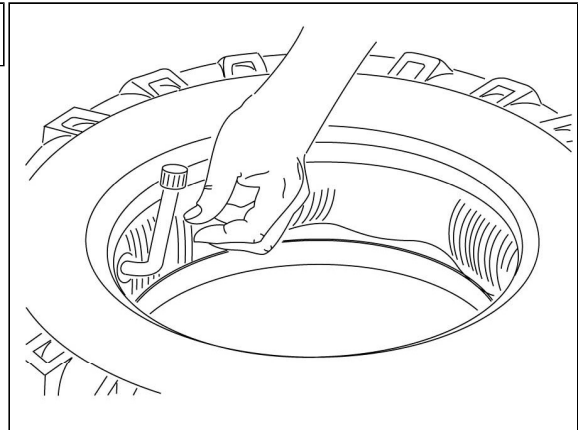


Fig. 11.16 Air tube with extension - removal

d) Assembly Procedure

1. Insert the air tube with extension into tyre.

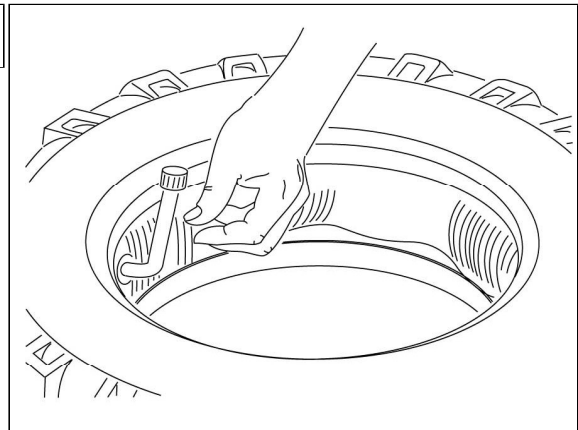


Fig. 11.17 Air tube with extension - installation

2. Slide the bead lock on air tube extension, fit into tyre and place correctly and evenly between tyre beads. Remember to carefully straighten the air tube in tyre so that it would not be jammed.

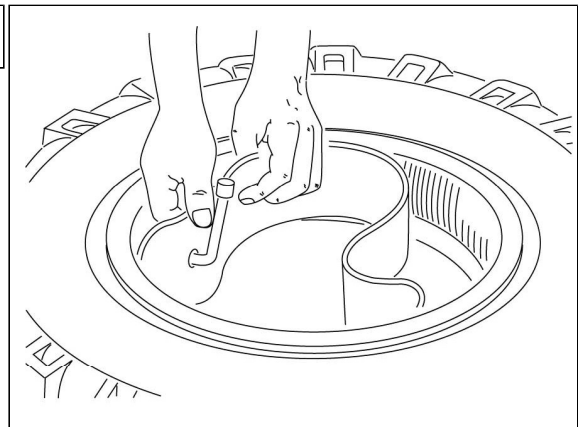
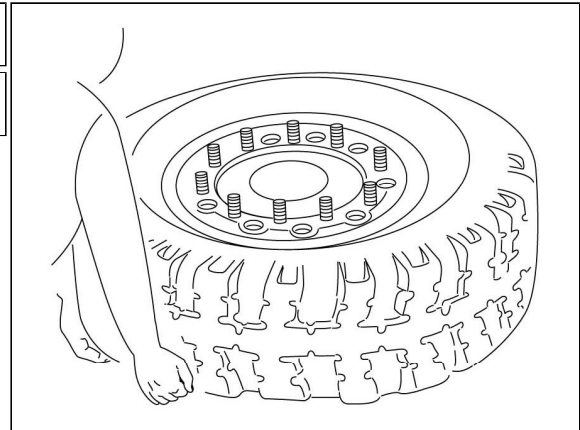


Fig. 11.18 Bead lock - installation

11 Wheel & Tyres



3. Place the disc wheel on a suitable support stand (block).
4. Slide the tyre with air tube and bead lock on the disc wheel so that the air tube extension goes through a cut-out in the disc wheel.



CAUTION:

Slide the tyre on the disc wheel so that the tyre treads pattern arrows would point forwards after installation of the assembled vehicle wheel!

Fig. 11.19 Tyre - installation

5. Fit the pressure plate on bolts of the disc wheel so that the air tube extension goes through a cut-out in the pressure plate.

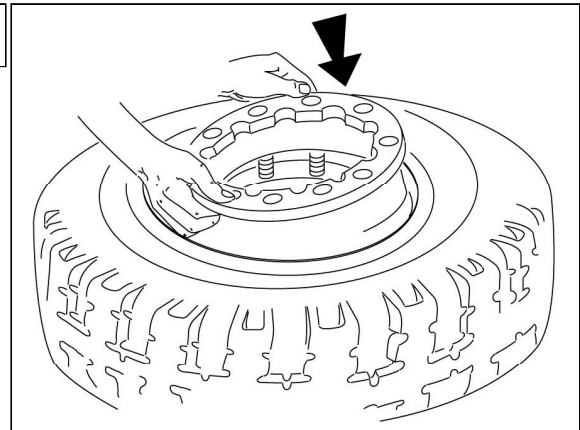


Fig. 11.20 Pressure plate - installation

6. Screw mounting nuts of pressure plate and tighten to **350 - 400 Nm**. Remember to tighten the nuts "crosswise".
7. Mount the valve elongation piece from the vehicle outfit on the air tube extension and partially inflate the tyre.

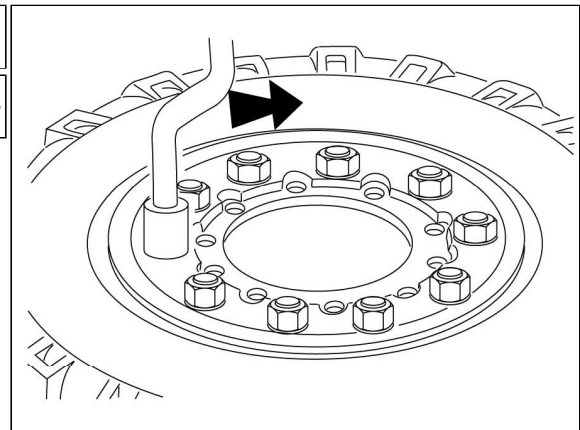


Fig. 11.21 Pressure plate nuts - installation

8. Mount the wheel assembled this way on the wheel hub (See Subchapter 11.5.1), (See Subchapter 11.5.2) so that the valve is located above the connecting hole in the wheel reduction gearing housing.
9. Screw on and tighten up the wheel fastening nuts to the torque of **500 ±50 Nm**. Carry out the tightening-up of nuts gradually.



11 Wheel & Tyres



10. Screw the pneumatic line c/w sealing into a hole in the wheel reduction gearing housing.
11. Unscrew the valve prolongation from the inner tube valve and mount quickly the closing valve on the inner tube valve and on the pneumatic line.
12. Start the engine and inflate the tyre to the prescribed air overpressure.
13. Mount cover of the closing valve.