O.M.A.R. TECHNOLOGY S.R.L.

USE AND MAINTENANCE MANUAL		
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UNI EN ISO 14001:2015 N°50736

HELICOPTER AW 139 TOW BAR

O.M.A.R. P/N: 02210
LEONARDO HELICOPTERS P/N: 3G0910G00331

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INDEX

OPERATIVE INSTRUCTION AND MAINTENANCE

1. INTRODUCTION

1.1 Purpose

The purpose of this manual is to provide detailed instructions for use, maintenance and repair of **3G0910G00331** towing bar.

1.2 Reference

Information and data included in this manual are applicable to the tow bar P/N 3G0910G00331 for to the helicopter AW 139.

2. USER MANUAL MODIFICATIONS

O.M.A.R Technology S.r.l. is the owner of this manual. This manual has been developed upon Leonardo Helicopters Division (Here in mentioned as LHD) request. Information, drawings and technical data included herein may not be reproduced, disclosed to third parties or used for competition purposes without O.M.A.R.'s and LHD approval.

O.M.A.R Technology S.r.l. and LHD reserves the right to change any information and description herein contained and carry out all technical modifications necessary to improve the product concerned without notice.

CERTIFICATION FOR CE COMPLIANCE

In compliance with the Annex II B of the 2006/42/EC Directive referred to machinery or machinery components to be assembled or installed as they cannot operate independently.

The Company

O.M.A.R. TECHNOLOGY S.R.L. at via Civesio, 14 - 20097 San Donato Milanese (MI) Italy

DECLARES

that the tow bar

Make	**O.M.A.R. TECHNOLOGY S.r.l.**
MODEL	**BT139Z**
MASS (kg)	**28**
MAX TOWABLE MASS (kg)	**6500**
SERIAL NO.	_____
YEAR OF CONSTRUCTION	_____

The tow bar is intended for towing helicopters and is compliant with safety and accident prevention regulations as per Annex I of the 2006/42/EC Machinery Directive.

The tow bar may not be operated as long as the machinery into which shall be installed or assembled is compliant with the above mentioned Directive.

Before putting the tow bar into operation, any additional risk connected with the towing shall be declared “compliant with” the provision of the a.m. Directive.

Any unauthorized modification, addition or alteration of the tow bar are forbidden due to safety reasons; the manufacturer shall not be liable for any damage or loss as a result thereof.

The final user shall be fully responsible for any incorrect use of the tow bar or any use under operating conditions other than those specified in the user handbook provided with the product that is an integral part of this declaration.

The technical file relating to this tow bar is kept with **O.M.A.R. TECHNOLOGY S.R.L.** records.

The factory acceptance tests performed in compliance with the Machinery Directive were positive.

San Donato Milanese,___/___/_____ **O.M.A.R. TECHNOLOGY S.r.l.**

General Manager

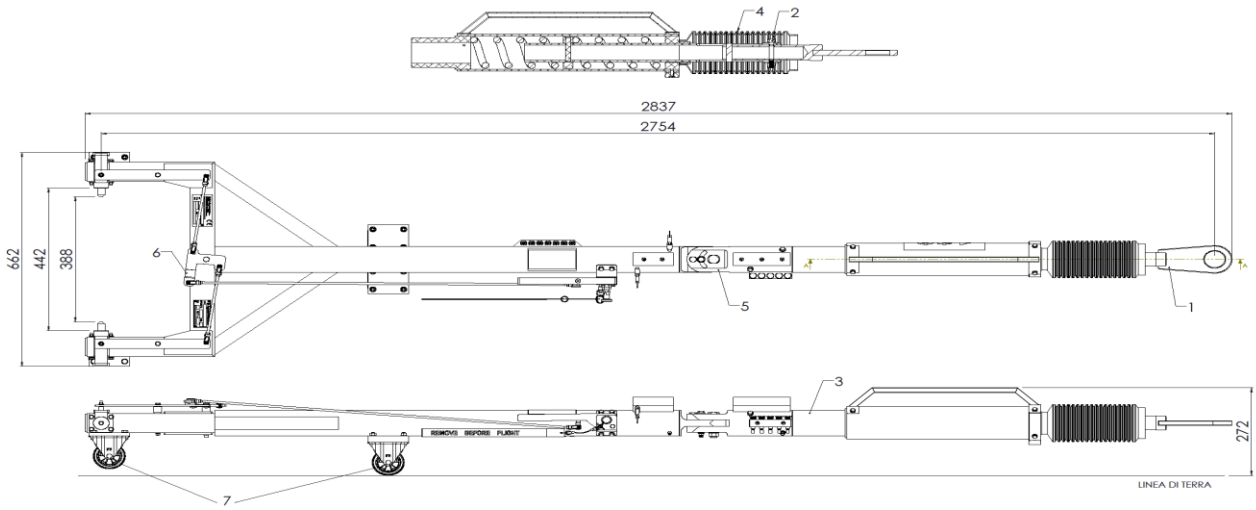
FIRST PART

DESCRIPTION AND FEATURES

3. ITEM DESCRIPTION

Towing bar cannot be operated autonomously, yet they have to be used in connection with any tow truck suitable for towing the helicopter.

FIGURE 1



3.1 Construction

The construction of a towing bar consists of the following parts:

1 Towing eye
2 Safety pin
3 Shock absorber unit
4 Protective rubber boot
5 Safety central joint
6 Coupling device
7 Driving wheels

3.1.1 Towing eye

Towing eye is made in stainless steel and have a coupling hole of 51 mm dia.; they are to be used in connection with a tow truck (trolley, industrial vehicle, etc.). Endusers shall provide a suitable coupling pin or any other similar device.

3.1.2 Safety pin

The purpose of this safety pin is to make the towing eye's shank integral with the shock absorber stem. This safety pin has been designed to stand a max stress of 1,500 kgs; beyond such value the safety pin will break.

A rubber boot protective (4) is provided to shield operators from any fragment accidentally thrown and due to the braking of the safety pin.

Rubber boot's material and size do not prevent operators from easily inspecting the safety pin before using the tow bar.
Should any anomaly of the pin be detected, this has to be replaced immediately.

3.1.3 Shock absorber unit

This unit includes two springs designed to cushion any impact or stress that might arise during towing.
Springs have been designed and manufactured to absorb a maximum stress of 1,500 kgs; a higher stress may deform springs permanently.
Before using the tow bar, the operator shall check that the safety pin (2) and springs are not damaged by pulling or pushing the towing eye and at the same time making sure that the connection pin inside the slot located on the shock absorber stem does not move; should this occurs, both safety pin and springs shall be replaced, if damaged.

3.1.4 Protection rubber boot

Protection rubber boot is a safety device to shield people or objects from bursting out of metallic splinters due to the sudden breaking of the safety pin.

3.1.5 Safety central joint

The safety central joint may be used on the tow bar BT 139 when a further protection for the towing helicopter is required, when an unexpected block of the front wheel may occurs or when the operator forget to unlock it.

3.1.6 Coupling device

This device enables coupling of the bar to the helicopter's nose wheels. The operators shall observe the following sequence:

- Set the bar next to the helicopter's nose wheels.
- Release the steering gear of the helicopter's wheels.
- Pull out the safety pin blocking the tow bar's handle and introduce it in the relevant slot located on the nose landing gear helicopter's (please refer to the helicopter's technical documentation)
- Couple the tow bar to the helicopter's wheels
- Hook the tow bar to the truck
- Release the helicopter wheels brake (please refer to the helicopter's technical documentation)

3.1.7 Driving wheels

The tow bar is fitted with two pairs of wheels to approach the helicopter's coupling area. Periodically inspect them for any sign of wear and tear and replace, if necessary.

3.1.8 Identification plate

The identification of each individual tow bar is made with a metal label, represented in the figure below, on which the unique data of the same are engraved, for its traceability over time. Upon request, the **O.M.A.R. Technology S.r.l.** can add a second label supplied by the customer to the label mentioned above.

SECOND PART

USE

4. INSTRUCTIONS FOR USE

4.1 Foreword

This user manual must be kept at all times with the tow bar and within operator's reach for reference and to keep records of any repair or maintenance activity.

This manual was compiled to provide operators and authorized personnel any information related to tow bar features and operation, information and safety provisions, as well as recommendations to avoid or reduce the dangers connected with use and operation of tow bar.

Thorough and careful reading of this manual is strongly recommended; any warning and danger indications must be thoroughly comprehended and kept well in mind. Should any section not be clear or complete, please do not hesitate to ask for clarification before using the tow bar; our technical staff is always at your disposal.

THIS MANUAL IS MEANT TO PROVIDE OPERATING PERSONNEL WITH INFORMATION TO OPERATE THE TOW BAR. IT IS THEREFORE NECESSARY TO READ THIS MANUAL THOROUGHLY AND MAKE SURE THAT OPERATORS HAVE A CLEAR UNDERSTANDING OF IT BEFORE OPERATING THE TOW BAR.

This manual is an integral part of the tow bar and must be kept in good condition for future references and updated as far as register entries are concerned until the tow bar is demolished.

Should this manual get damaged or lost, please request another copy directly from **O.M.A.R. Technology S.r.l.**

4.2 Warning before use

Only qualified and trained personnel, knowledgeable of any use-related issue both for people, equipment and vehicles involved are allowed to operate the tow bar.

Tow bars are meant for helicopters handling only; all requirements and provisions provided for by the helicopter's manufacturer as well as the current regulations in this field shall be duly observed.

Operators must watch over that no person, animal, equipment or materials approach dangerous areas or obstruct the operation area of the tow bar and the relevant truck and helicopter.

WARNING

BEFORE OPERATING THE TOW BAR COUPLED TO AN HELICOPTER AND TRUCK (ASSEMBLED BAR), THE OPERATOR SHALL CHECK THAT NO DANGEROUS SITUATION ARISES.

IMPORTANT
BEFORE UNCOUPLING THE TOW BAR THE OPERATOR SHALL MAKE SURE THAT NO SUDDEN, ACCIDENTAL OR UNEXPECTED DISPLACEMENT OF THE HELICOPTER OCCURS AND THAT UNAUTHORIZED PERSONNEL MAY USE AND OPERATE THE TOW BAR

It is forbidden to trail helicopters whose weight exceed the **max. capacity load of the tow bar.**

It is strictly forbidden to alter or remove safety devices.

In the event of a problem, the operator must immediately stop the tow bar operation and have it checked before putting it back in operation.

Operators shall always check that operation area is free from people, animals or objects that may jeopardize safety.

Operators shall always make sure that the operation area they are working in is entirely visible. They have to stop towing each time they do not have a proper view.

WARNING
IT IS ABSOLUTELY FORBIDDEN TO STOP OR WALK BY IN THE RADIUS OF ACTION OF THE ASSEMBLED UNIT CONSISTING OF THE TOW BAR COUPLED TO A TRUCK AND OF TOWED HELICOPTER.

4.3 Requirements for use

Before using the tow bar the operator shall:

- Make sure that the safety pin and shock absorbing springs are in perfect conditions and replace them, if damaged.
- Check that the coupling device operates correctly and moving parts are not prevented from running in their seats.
- Check that pins to be coupled to the helicopter’s wheel are in perfect conditions.
- Make sure that truck is efficient and fit for the purpose and does not suddenly pull the towed unit (bar + helicopter).
- Check that the central joint is in good working condition

4.4 Accessories

Tow bars shall be used only with auxiliary equipment provided by the manufacturer.

In the event of a failure, the operator shall immediately stop using the tow bar and have it checked before putting it back in operation.

4.5 Operators' risks

When using the tow bar dangerous conditions may arise if operating instructions and warnings provided by this manual are not observed. Such failures will immediately invalidate any warranty and manufacturer's liability.

O.M.A.R. Technology S.r.l. will disclaim all responsibility for any damage or consequence due to:

- failure to comply with any provision set out in this manual
- wrongful use of the tow bar or use by unqualified personnel
- use not compliant with regulations in force in the country where the tow bar is being operated
- modification or repair not authorized in writing by the manufacturer
- total or partial non-observance of instructions
- any use of the tow bar different from its intended use
- out-of-the ordinary events.

4.6 Operator's provisions

ATTENTION

ONLY QUALIFIED AND TRAINED PERSONNEL THAT HAVE READ AND UNDERSTOOD THE INSTRUCTIONS PROVIDED FOR BY THIS MANUAL ARE ALLOWED TO SET UP AND OPERATE THE TOW BAR.

Operators must always be alert and physically fit. They do not have to be under the influence of alcohol or drugs or having taken medicaments that could affect their hearing, sight, attention and reflexes.

Operators must avoid wearing loose-fitting clothes and jewelry, such as bracelets or necklaces as well as long hair as to avoid any risk of entangling or tearing off.

Before operating the tow bar, operators must check the relevant controls and safety devices daily and make sure they work properly and effectively.

Operators' priority must always be safety; operators must refuse to operate the tow bar when safety requirements are not fulfilled. In such instances they have to take advice from their supervisors.

Operators and anyone working with the tow bar must use all personal protective guards to reduce any accident risk connected with the tow bar activity.

THIRD PART MAINTENANCE

5. MAINTENANCE INSTRUCTIONS

Maintenance shall be performed only by qualified and skilled personnel.

With the assistance of the helicopter's manufacturer **O.M.A.R. Technology S.r.l.** will provide all information concerning maintenance and spare parts as well as additional assistance such as:

- training courses for operators and maintenance personnel
- spare parts
- service.

Tow bar components shall be disassembled in good order and following a proper sequence; personnel in charge shall perform any maintenance work under the best safety conditions.

Maintenance operations shall be performed with the tow bar at rest and springs locked.

Always look out for any fortuitous displacement of a component with respect to another: this might result in slashing and squashing injuries.

If the pin must be changed inside the shock absorber unit, move the protection rubber and insert a new one.

To change the pin on the central joint, proceed as follow:

- Unscrew the upside part of the pin
- Bend the two parts of the tow bar till to disengage the central part of the pin
- Pull-out the last part of the pin by means of a parallel-pin from the bottom hole
- Align the two parts of the tow bar and insert a new pin

For step-by-step instructions, see paragraph 19.

A deep knowledge of the tow bar operating standards and a careful behaviour help preventing any potential risk.

FOURTH PART
DOCUMENTATION

6. INSPECTION REGISTER

6.1 Reference to Directive

This inspection register is issued to the end user by **O.M.A.R. Technology S.r.l.** in compliance with Exhibit I of 2006/42/EC Directive.

6.2 Keeping of register

This register is an integral part of the tow bar and must be kept until the tow bar is dismantled.

6.3 Compilation of register

The following instructions comply with the provisions in force during the first market-release of the tow bar. New provisions may come into force and modify user's obligations.
This register is designed to record the following cases related to the life of the tow bar according to the patterns herewith suggested:

- Delivery of tow bar
- Transfer of property
- Replacement of structural components or devices
- Replacement of safety devices and components
- Recurring maintenance inspections
- Major breakdowns and repairs
- Checks and inspections

7. DELIVERY OF TOW BAR

The tow bar, **P/N 3G0910G00331**, manufactured by **O.M.A.R. Technology S.r.l.** with serial no_____ Year of manufacture _____ as per this inspection register was delivered on _____ by **O.M.A.R. Technology S.r.l.** to (Company's name):

_____

in compliance with the agreed terms and conditions, with technical, dimensional and operating specifications set out in the user manual.

O.M.A.R. Technology S.r.l.

8. SUBSEQUENT TRANSFER OF PROPERTY

On _____ the property of the above mentioned tow bar was transferred to the Company: _____

_____

_____

We herewith certify that technical, dimensional and operating specifications of the tow bar comply with those originally provided by the manufacturer; modifications to the tow bar, if any, were recorded in this register.

The Seller **The Buyer**

_____ _____

9. SUBSEQUENT TRANSFER OF PROPERTY

On _____ the property of the above mentioned tow bar was transferred to the Company: _____

_____

_____

We herewith certify that technical, dimensional and operating specifications of the tow bar comply with those originally provided by the manufacturer; modifications to the tow bar, if any, were recorded in this register.

The Seller **The Buyer**

_____ _____

10. REPLACEMENT PARTS OR MAJOR COMPONENTS

On _____ the following component _____ made by

_____

HAS BEEN REPLACED

by _____ serial no. _____

REMARKS: _____

_____

Replacement due to: _____

_____

_____

The service responsible for replacement **The user**

_____ _____

11. REPLACEMENT PARTS OR MAJOR COMPONENTS

On _____ the following component _____ made by

_____

HAS BEEN REPLACED

by _____ serial no. _____

REMARKS: _____

_____

Replacement due to: _____

_____

_____

The service responsible for replacement **The user**

_____ _____

12. REPLACEMENT OF SAFETY DEVICES AND COMPONENTS

On _____ Description of component _____

_____

Made by _____ supplied by

_____

REMARKS:_____

_____

Replacement due to: _____

_____

_____

The service responsible for replacement **The user**

_____ _____

13. REPLACEMENT OF SAFETY DEVICES AND COMPONENTS

On _____ Description of component _____

_____

Made by _____ supplied by

_____

REMARKS:_____

_____

Replacement due to: _____

_____

_____

The service responsible for replacement **The user**

_____ _____

14. MAJOR FAILURES AND REPAIRS

Description of failures _____

_____

Cause _____

_____

_____

Repair carried out _____

_____

_____

Signature of service **User signature**

_____ _____

Place _____ **Date _____**

15. MAJOR FAILURES AND REPAIRS

Description of failures _____

_____

Cause _____

_____

_____

Repair carried out _____

_____

_____

Signature of service **User signature**

_____ _____

Place _____ **Date _____**

16. INSPECTIONS AND ACCEPTANCE TESTS

On _____ **O.M.A.R. Technology S.r.l.** has carried out inspection and acceptance tests concerning the tow bar.

16.1Production process control

Tests carried out:

a) Conformity of the assembly with the applicable drawings
b) Conformity of the components to the applicable drawings

16.2Acceptance tests

Acceptance tests proved that:

a) The tow bar can perform all operations it is intended for
b) Construction undergoing any stress contemplated has passed the tests without showing any permanent deformation or damage
c) All safety devices performed flawless

O.M.A.R. Technology S.r.l. – The responsible for the tests:_____

17. RECURRING MAINTENANCE INSPECTIONS

17.1Inspection plan

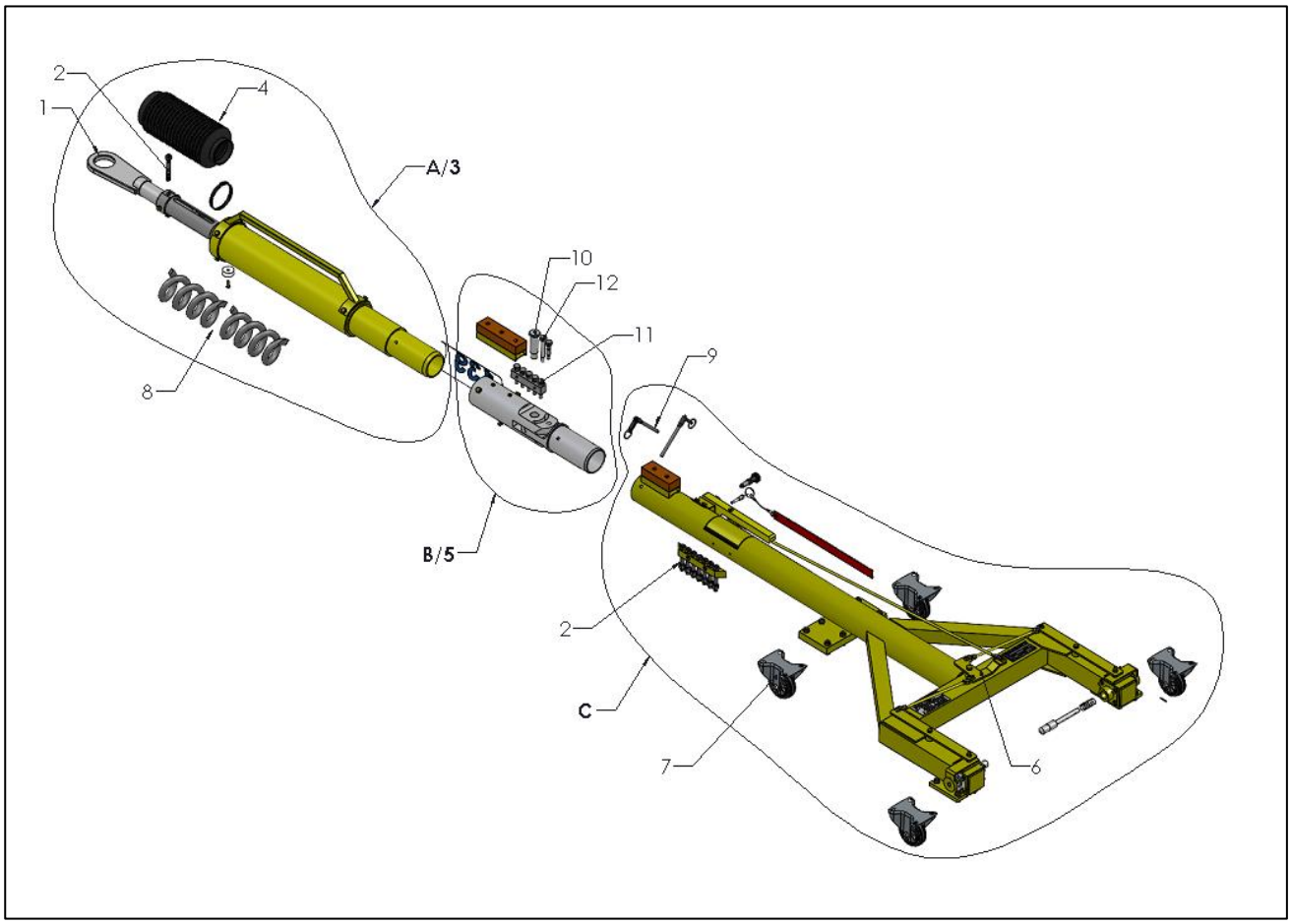
TYPE OF INSPECTION	RECURRENCE
Integrity of safety PIN	Each time it is used
Shock absorber backlash	Each time it is used
Swivel safety PIN	Each time it is used
Coupling mechanism to helicopter carriage	Weekly
Wheels wear / front	Monthly
Visual inspection of the structure	Monthly

The user must observe the tow bar maintenance and inspection schedule as shown in this manual.

17.2Records of Service

No	Date	Description of service	SIGNATURE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FIGURE 2



18. SUGGESTED SPARE PARTS LIST AND RELEVANT P/N

Ref. Figure 1 page 8 and Figure 2 page 25

Ref.	DESCRIPTION	QTY	OMAR P/N
A/3	Shock Absorber Unit	1	00557
B/5	Safety Central Joint Unit	1	01690
C	Fork and Coupling Device Unit	1	02003
1	Towing Eye	1	
2	Safety pin Towing/pushing	8	00542
4	Protective Rubber Boot	1	00543
6	Coupling Device	1	
7	Front/Rear Wheels with Support	4	02002
8	Spring Shock Absorber	2	00552
9	Quick Pin	2	00563
10	Special Bolt	1	01702
11	Special Bolt	6	01691
12	Rotation safety pin	1	01692

19. HOW TO REPLACE THE SPARE PARTS

To replace some spare parts, proceed as described in the following paragraphs.

19.1 Wheel replacement

- ✓ Unscrew and remove the screws.
- ✓ Replace the wheels.
- ✓ Insert and tighten the screws.

19.2 Shock absorber replacement

- ✓ Unscrew and remove the screws
- ✓ Replace the shock absorber unit
- ✓ Insert the two screws for connect.
- ✓ Tighten the screws using the washers and the self-locking nut, with tightening torque between 20 and 25 Nm.

19.3 Safety central joint replacement

- ✓ Remove quick pins and unscrew and remove the screws.
- ✓ Replace the safety central joint.
- ✓ Insert the quick pins and the screw for connection.
- ✓ Tighten the screws using the washers and the self-locking nut, with tightening torque between 20 and 25 Nm.

19.4 Special bolt replacement

- ✓ Remove special bolt not usable.
- ✓ Replace the special bolt.
- ✓ Tighten the special bolt using the self-locking nut and for:
- ✓ P/N 01702 tightening torque of 7 Nm
- ✓ P/N 01692 tightening torque between 55 and 60 Nm.

19.5 Safety PIN replacement

- ✓ Remove safety PIN not usable.
- ✓ Replace the safety PIN.
- ✓ Tighten the safety PIN using the self-locking nut, with tightening torque of 8 Nm

19.6 Rotation safety PIN replacement

- ✓ Remove rotation safety PIN not usable.
- ✓ Replace the rotation safety PIN.
- ✓ Tighten as far as it will go

20. NOTES