



Doc. No.: SD-8674	Rev. No.: 02	Page: 1 of 43	Product Code: MAE675UV2	
Title: Hardware usage guide for Train set Bogie				
Prepared by	Checked by	Approved by	Initiated date	
G.Divakar	Srikanth.P	BOC Reddy	30.09.2022	

1. **Introduction** : Hardware usage guide for the following Assemblies in Train set Bogies,

- i. SD-8639 - Assembly Procedure For Traction Center Assembly
- ii. SD-8641 - Assembly Procedure Of Bogie Frame With Sub Assembly Arrangement
- iii. SD-8633 - Assembly Procedure For Primary Suspension
- iv. SD-8654 - Assembly Procedure Of Reaction Rod And Traction Motor Fixing
- v. SD-8667 - Assembly Procedure For Fixing Air Spring
- vi. SD-8487 - Procedure For Assembly Of Bogie ( All Types) To Car Body

2. **Bolt Joints With Alternate Combinations** :


Bolt Joint	Description
<a href="#">Joint No.01</a>	Traction Rod – Traction Center side
<a href="#">Joint No.02</a>	Lateral Bump stop (Side Bumper)
<a href="#">Joint No.03</a>	Traction Rod – Bogie Frame side
<a href="#">Joint No.04</a>	Lateral Damper Traction center side
<a href="#">Joint No.05</a>	Lateral Damper frame side
<a href="#">Joint No.06</a>	Stabilizer Link assembly – Bogie frame
<a href="#">Joint No.07</a>	Control arm Upper - Lower
<a href="#">Joint No.08</a>	Lift Stop
<a href="#">Joint No.09</a>	Primary damper top
<a href="#">Joint No.10</a>	Reaction Rod Top
<a href="#">Joint No.11</a>	Gear Box Safety Catch
<a href="#">Joint No.12</a>	Motor Top
<a href="#">Joint No.13</a>	Motor Bottom
<a href="#">Joint No.14</a>	Motor Safety Catch
<a href="#">Joint No.15</a>	Air spring Bottom side
<a href="#">Joint No.16</a>	Stabilizer Link top
<a href="#">Joint No.17</a>	Stabilizer Link bottom
<a href="#">Joint No.18</a>	Secondary Vertical Damper top
<a href="#">Joint No.19</a>	Secondary Vertical Damper bottom
<a href="#">Joint No.20</a>	Yaw Damper bogie side
<a href="#">Joint No.21</a>	Yaw Damper coach side
<a href="#">Joint No.22</a>	Air spring top side
<a href="#">Joint No.23</a>	Antennas Beam

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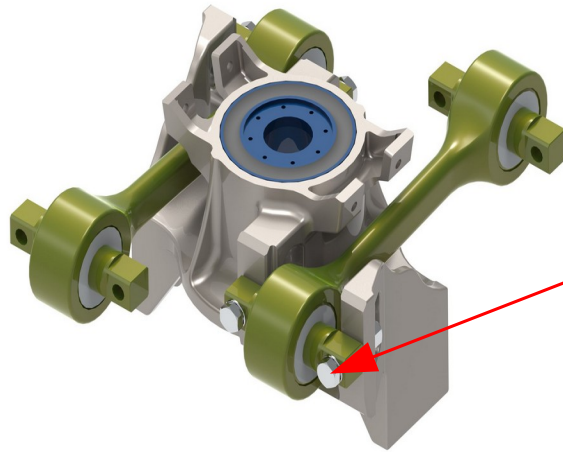
<a href="#">Joint No.24</a>	Antennas Bracket
<a href="#">Joint No.25</a>	Steps
<a href="#">Joint No.26</a>	Spring pad with Bump stop

### 3. Bolt Joints With Same Combinations :

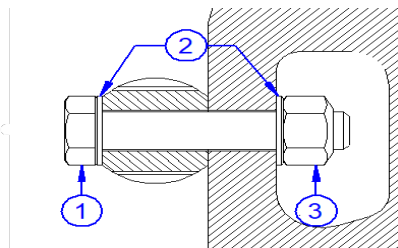
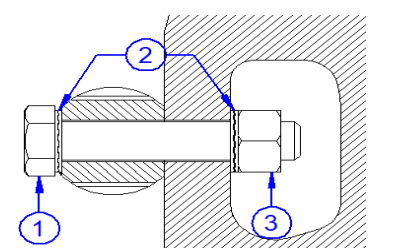
Bolt Joint	Description
<a href="#">Joint No.27</a>	Bump stops
<a href="#">Joint No.28</a>	Control arm closing plate
<a href="#">Joint No.29</a>	Reaction rod bottom
<a href="#">Joint No.30</a>	Center pivot closing plate side
<a href="#">Joint No.31</a>	Center pivot carbody side
<a href="#">Joint No.32</a>	Stabilizer link assembly cover
<a href="#">Joint No.33</a>	Axle Bearing end pad without Phonic wheel
<a href="#">Joint No.34</a>	Axle Bearing end pad with Phonic wheel
<a href="#">Joint No.35</a>	ERCU contact Disc
<a href="#">Joint No.36</a>	Axle Bearing Rear cover
<a href="#">Joint No.37</a>	Axle Bearing End cover
<a href="#">Joint No.38</a>	ERCU unit
<a href="#">Joint No.39</a>	Primary damper bottom


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**Bolt Joint 01 : Traction Rod – Traction Center side**

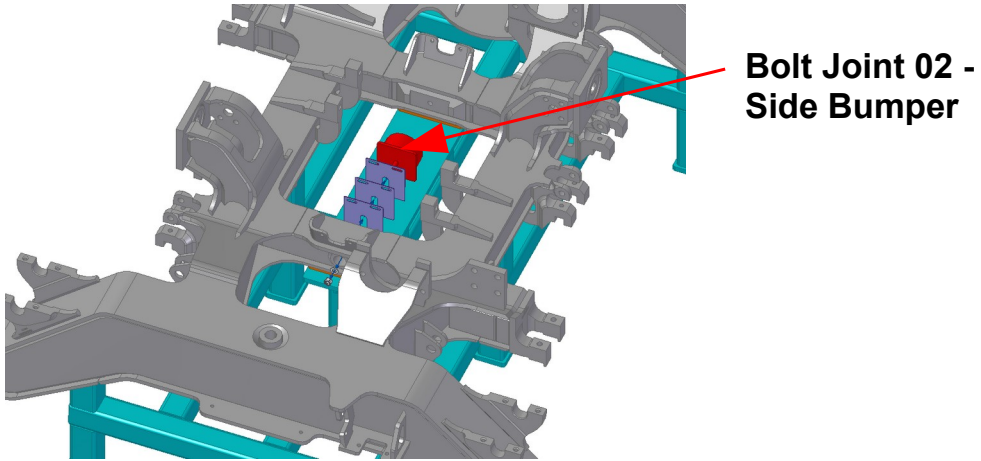


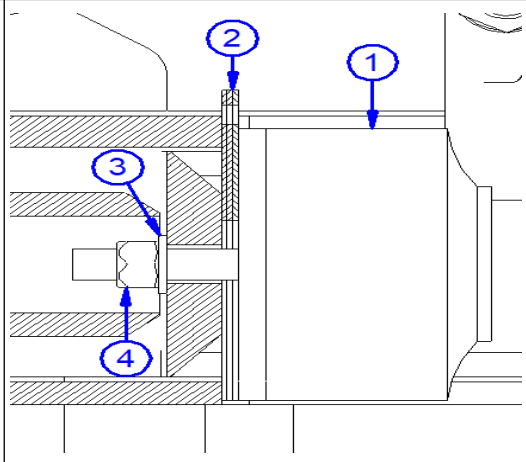
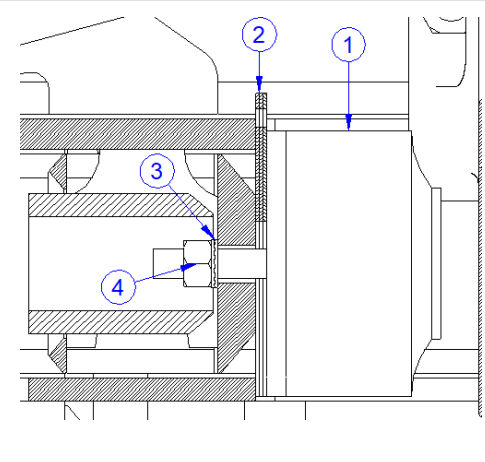
**Bolt Joint 01-  
Traction Rod –  
Traction Center side**

Bolt Joint 01 : Traction Rod – Traction Center side		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1. Screw	61012001368 - HEXA HD SCREW ISO 4017-M22x110- 10.9,GEO SILVER	61012001368 - HEXA HD SCREW ISO 4017-M22x110- 10.9,GEO SILVER
2. Washer	61012001386 - WASHER ISO_7089_22-300_HV,GEO SILVER	61012001910 - NORDLOCK_NL22,GEO SILVER
3. Nut	61012001343 - NUT_FS-M22-10, GEO SILVER	61012001918 - NUT ISO 4032_M22-10,GEO SILVER
Tightening Torque	717 Nm	744 Nm

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**Bolt Joint 02 : Lateral Bump stop (Side Bumper)**



Bolt Joint 02 : Lateral Bump stop (Side Bumper)		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Side bumper	61010000020- SIDE BUMPER(LATERAL BUMP STOP) FOR BOGIE	61010000020- SIDE BUMPER(LATERAL BUMP STOP) FOR BOGIE
2.Shims	54071320001 - SHIM FOR SIDE BUMPER -2MM	54071320001 - SHIM FOR SIDE BUMPER -2MM
3. Washer	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
4. Nut	61012001340- NUT_FS-M16-8, GEO SILVER	61012001920 - NUT ISO 4032_M16-8,GEO SILVER
Tightening Torque	188 Nm	190 Nm

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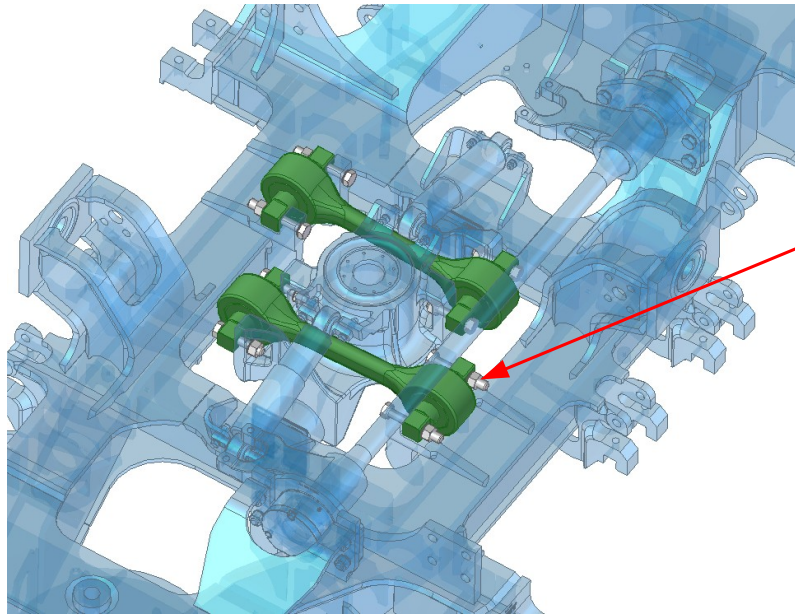
G.Divakar

Srikanth.P

BOC Reddy

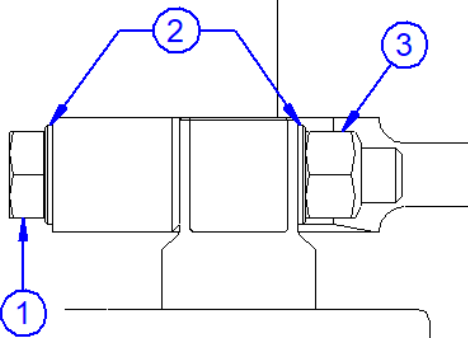
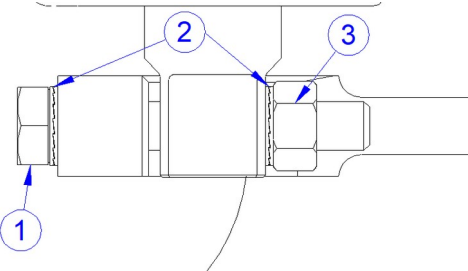
30.09.2022


**Bolt Joint 03 : Traction Rod – Bogie Frame side**



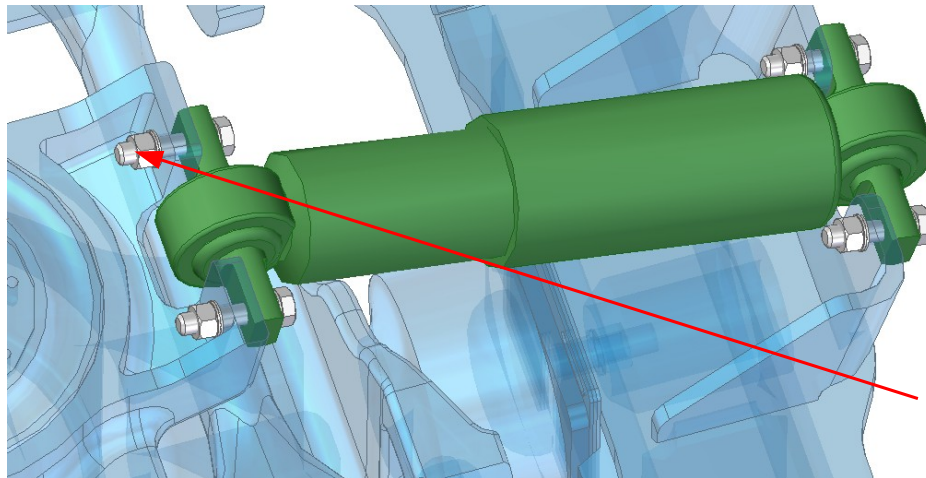
**Bolt Joint 03 -  
Traction Rod –  
Bogie Frame side**

**Bolt Joint 03 : Traction Rod – Bogie Frame side**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001369 - HEXA HD SCREW ISO 4017-M22x140- 10.9,GEO SILVER	61012001369 - HEXA HD SCREW ISO 4017-M22x140- 10.9,GEO SILVER
2. Washer	61012001386 - WASHER ISO_7089_22-300_HV,GEO SILVER	61012001910 - NORDLOCK_NL22,GEO SILVER
3. Nut	61012001343 - NUT_FS-M22-10, GEO SILVER	61012001918 - NUT ISO 4032_M22-10,GEO SILVER
Tightening Torque	717 Nm	744 Nm

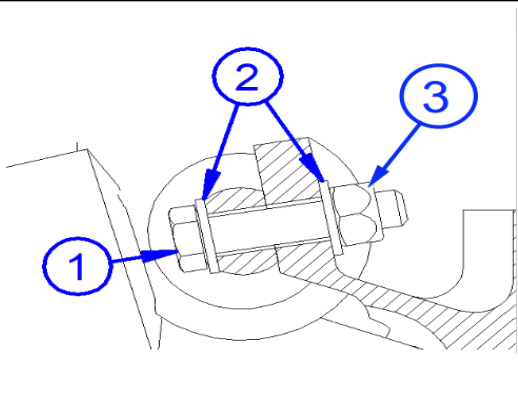
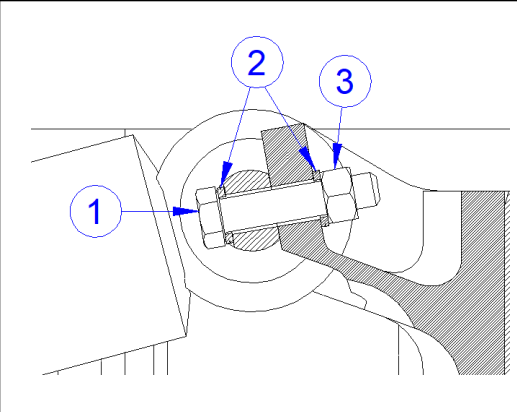
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**Bolt Joint 04 : Lateral Damper – Traction center side**



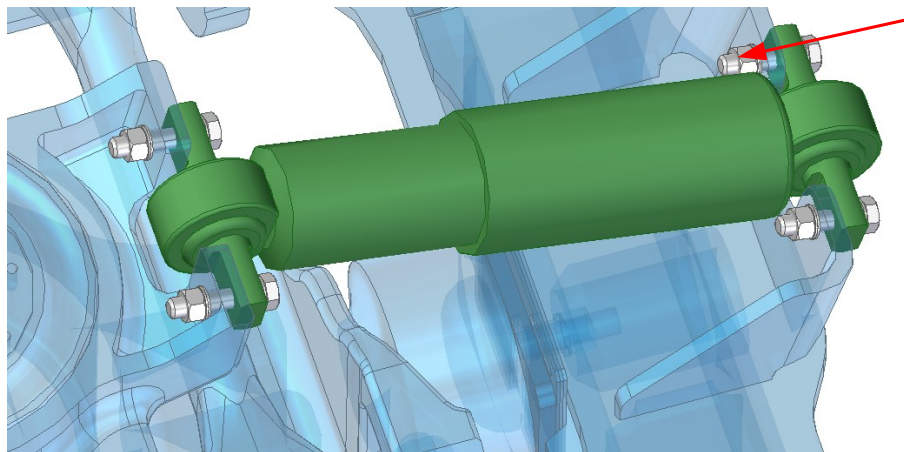
**Bolt Joint 04 -  
Lateral Damper  
Traction center  
side**

**Bolt Joint 04 : Lateral Damper – Traction center side**

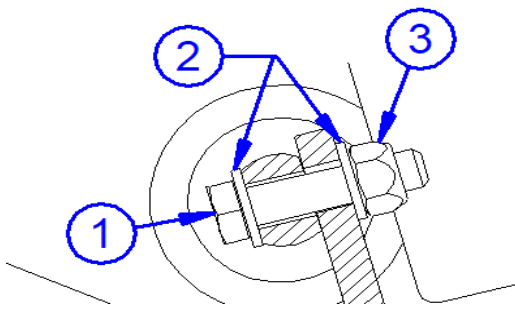
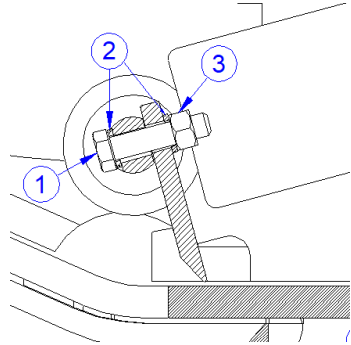
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	79 Nm	77 Nm


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**Bolt Joint 05 : Lateral Damper frame side**

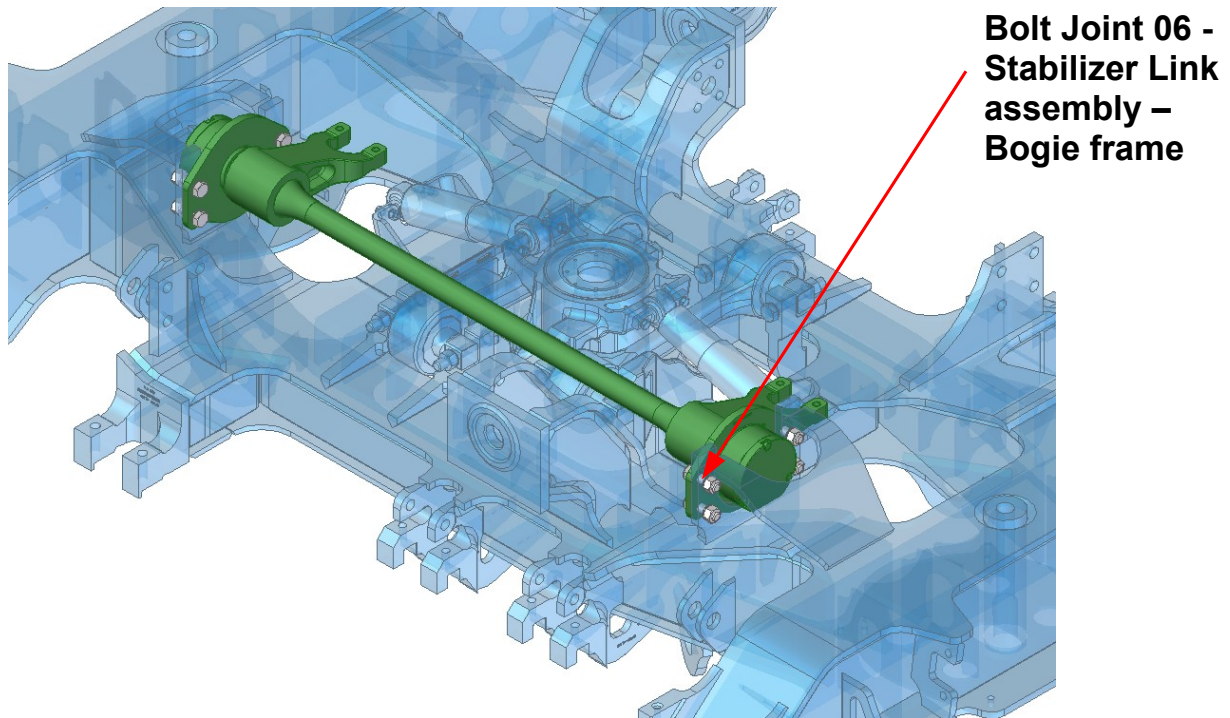


**Bolt Joint 05 - Lateral Damper frame side**

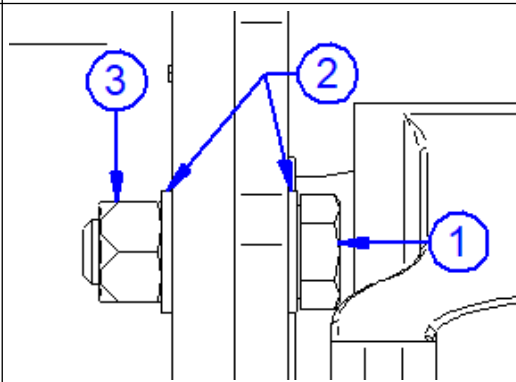
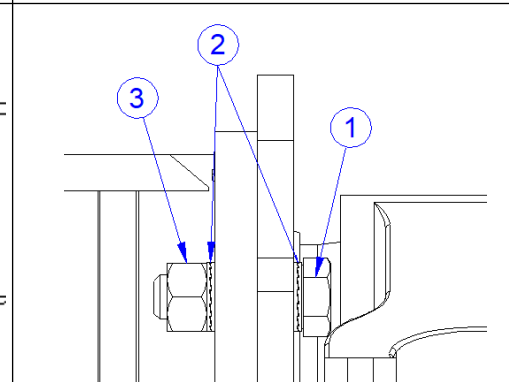
<b>Bolt Joint 05 : Lateral Damper frame side</b>		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001351 - HEXA HD SCREW ISO 4017-M12x50- 8.8,GEO SILVER	61012001351 - HEXA HD SCREW ISO 4017-M12x50- 8.8,GEO SILVER
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	79 Nm	77 Nm

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**Bolt Joint 06 : Stabilizer Link assembly – Bogie frame**



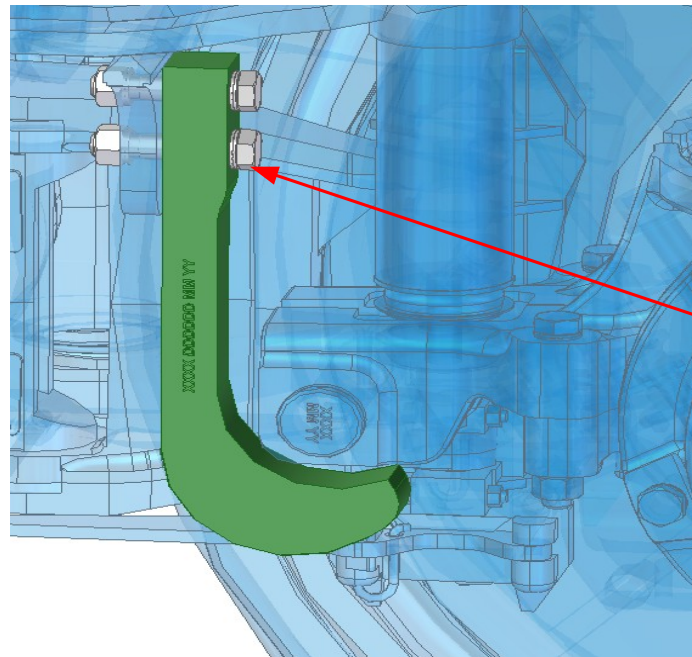
**Bolt Joint 06 : Stabilizer Link assembly – Bogie frame**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001361 - HEXA HD SCREW ISO 4017-M20x65- 10.9,GEO SILVER	61012001361 - HEXA HD SCREW ISO 4017-M20x65- 10.9,GEO SILVER
2. Washer	61012001383 - WASHER ISO 7089-20-300 HV,GEO SILVER	61012001909 - NORDLOCK_NL20,GEO SILVER
3. Nut	61012001342 - NUT_FS-M20-10, GEO SILVER	61012001917 - NUT ISO 4032_M20-10,GEO SILVER
Tightening Torque	530 Nm	546 Nm

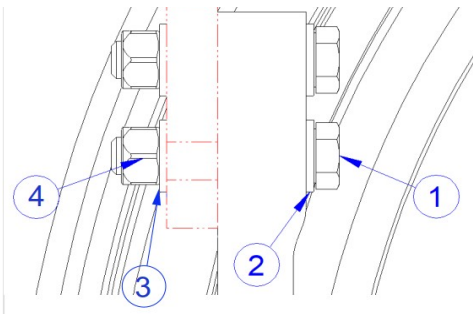
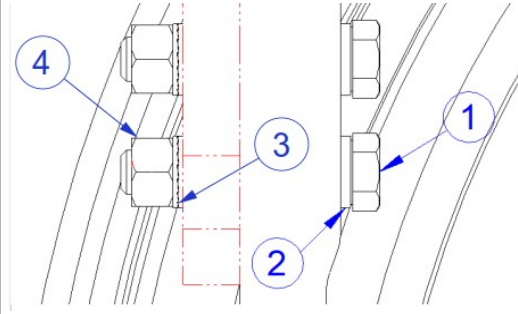


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### Bolt Joint 08 : Lift Stop



**Bolt Joint 08 -  
Lift Stop**

Bolt Joint 08 : Lift Stop		
Description	Plain Washer + FS Lock Nut	Plain Washer + NordLock Washer + Nut
Joint		
1.Screw	61012001349 - FIT BOLT DIN 609-M16x80-8.8,GEO SILVER	61012001349 - FIT BOLT DIN 609-M16x80-8.8,GEO SILVER
2. Washer _Bolt side	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER
3. Washer _Nut side	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
4. Nut	61012001340 - NUT_FS-M16-8, GEO SILVER	61012001920 - NUT ISO 4032_M16-8,GEO SILVER
Tightening Torque	188 Nm	190 Nm

**Note:** Torque should be applied on nut only (where nordlock washer is used).

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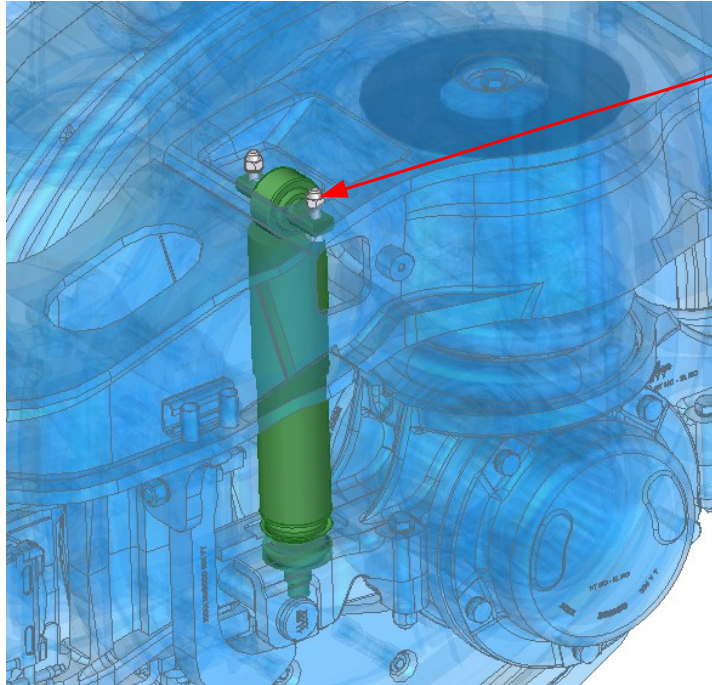
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BOC Reddy

30.09.2022


### Bolt Joint 09 : Primary damper top



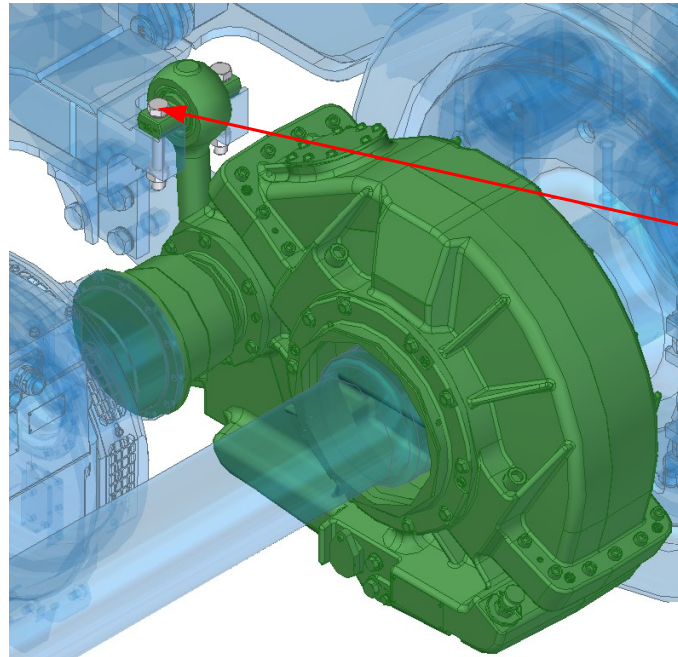
**Bolt Joint 09 -  
Primary damper top**

### Bolt Joint 9 : Primary damper top

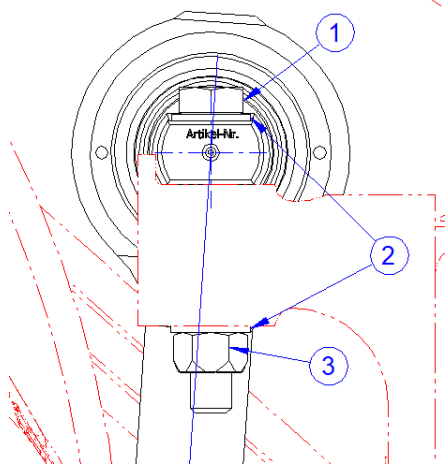
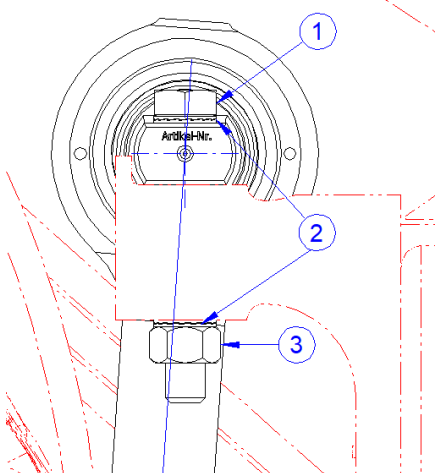
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001351- HEXA HD SCREW ISO 4017-M12x50- 8.8,GEO SILVER	61012001351- HEXA HD SCREW ISO 4017-M12x50- 8.8,GEO SILVER
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	79 Nm	77 Nm


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### Bolt Joint 10 : Reaction rod top

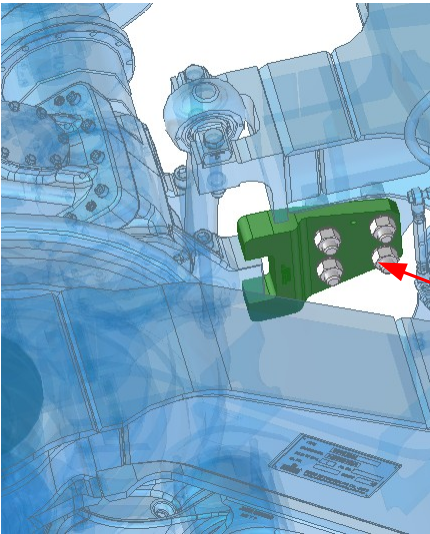


**Bolt Joint 10 -  
Reaction rod top**

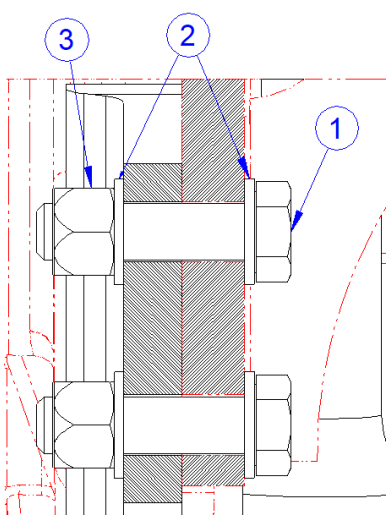
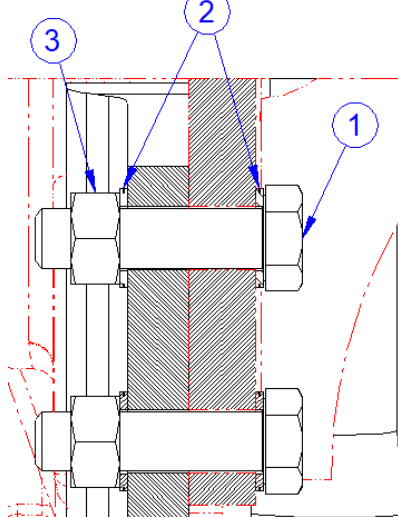
Bolt Joint 10 : Reaction rod top		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Area		
1.Screw	61012001360 - ISO 4017-M20x140-10.9,GEO SILVER	61012001360 - ISO 4017-M20x140-10.9,GEO SILVER
2. Washer	61012001383 - WASHER ISO 7089-20-300 HV,GEO SILVER	61012001909 - NORDLOCK_NL20,GEO SILVER
3. Nut	61012001342 - NUT_FS-M20-10, GEO SILVER	61012001917 - NUT ISO 4032_M20-10,GEO SILVER
Tightening Torque	530 Nm	546 Nm


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**Bolt Joint 11 : Gear Box safety catch**



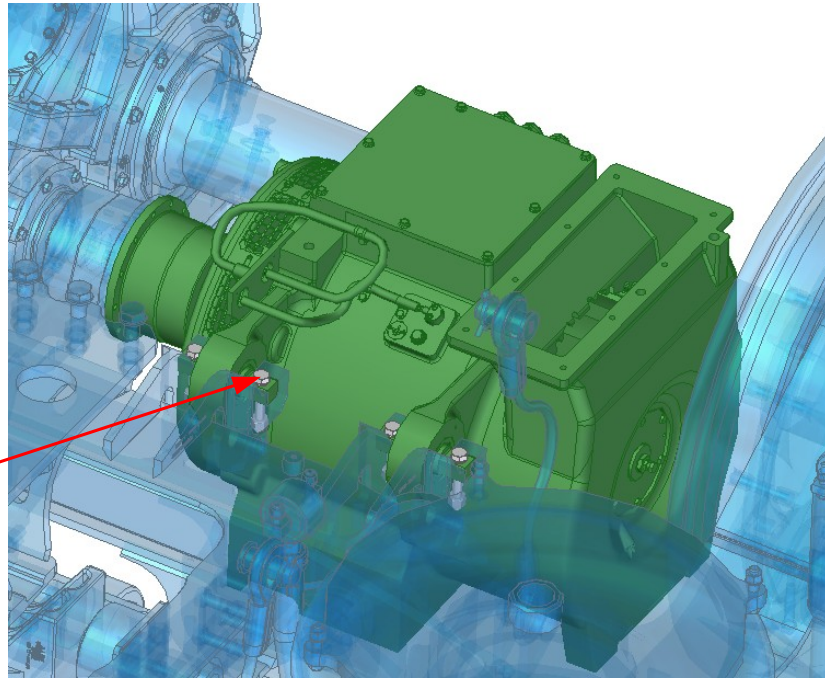
**Bolt Joint 11 - Gear Box safety catch**

Bolt Joint 11 : Gear Box safety catch		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001364 - ISO 4017-M24x90-10.9,GEO SILVER	61012001364 - ISO 4017-M24x90-10.9,GEO SILVER
2. Washer	61012001384 - WASHER ISO 7089-24-300 HV,GEO SILVER	61012001908 - NORDLOCK_NL24,GEO SILVER
3. Nut	61012001344 - NUT_FS-M24-10, GEO SILVER	61012001919 - NUT ISO 4032_M24-10,GEO SILVER
Tightening Torque	900 Nm	938 Nm

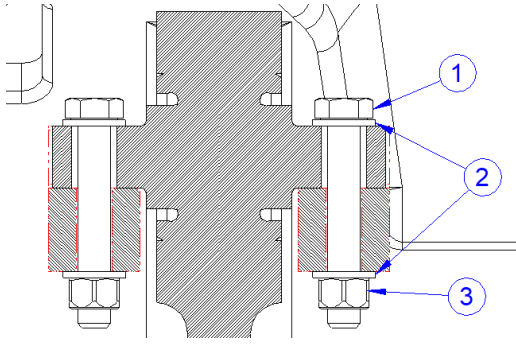
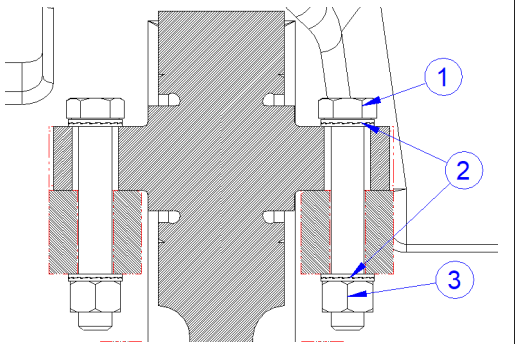
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**Bolt Joint 12 : Motor Top**

**Bolt Joint 12 -  
Motor Top**



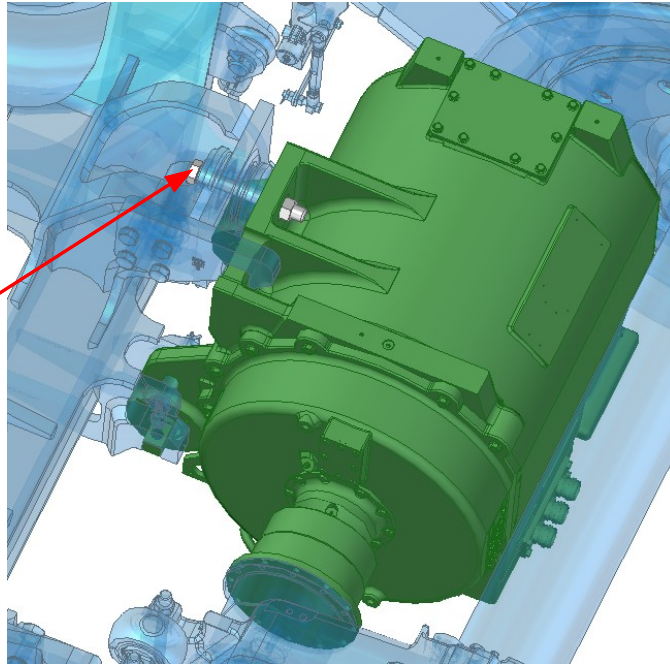
**Bolt Joint 12 : Motor Top**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001354 - HEXA HD SCREW ISO 4017-M16x100- 10.9,GEO SILVER	61012001354 - HEXA HD SCREW ISO 4017-M16x100- 10.9,GEO SILVER
2. Washer	61012001382- WASHER ISO 7089-16-300 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
3. Nut	61012001341 - NUT_FS-M16-10, GEO SILVER	61012001915 - NUT ISO 4032_M16-10,GEO SILVER
Tightening Torque	274 Nm	279 Nm

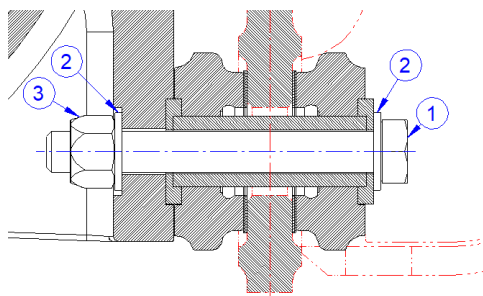
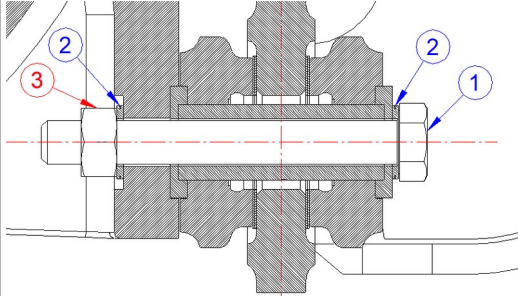
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**Bolt Joint 13 : Motor Bottom**

**Bolt Joint 13 -  
Motor Bottom**



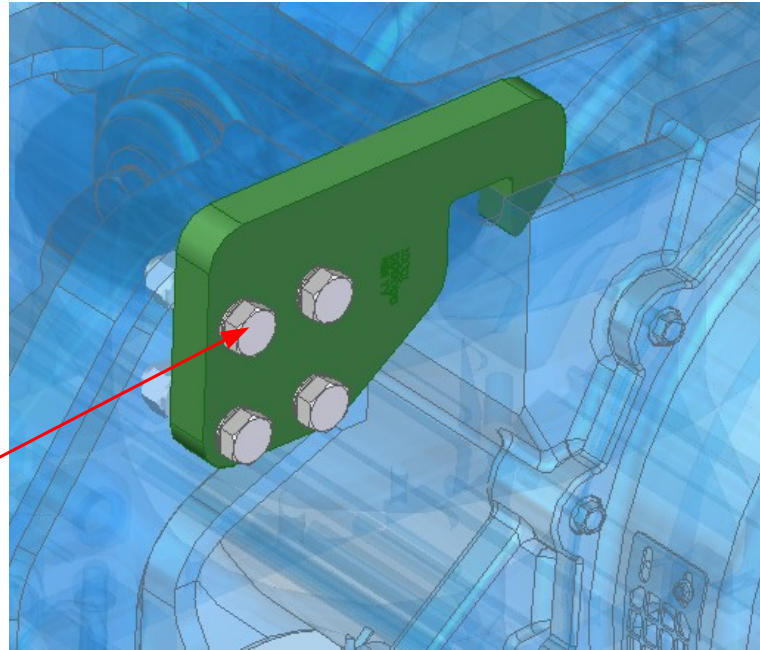
**Bolt Joint 13 : Motor Bottom**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001534 - HEXA HD SCREW ISO 4017-M24x190- 8.8,GS	61012001534 - HEXA HD SCREW ISO 4017-M24x190- 8.8,GS
2. Washer	61012001535 - WASHER ISO 7089-24-200 HV,GEO SILVER	61012001908 - NORDLOCK_NL24,GEO SILVER
3. Nut	61012001345 - NUT_FS-M24-8, GEO SILVER	61012001916 - NUT ISO 4032_M24-8,GEO SILVER
Tightening Torque	635 Nm	657 Nm

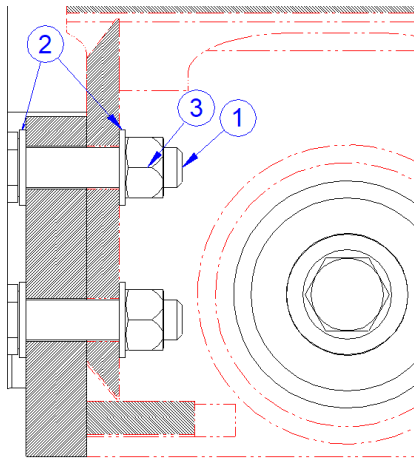
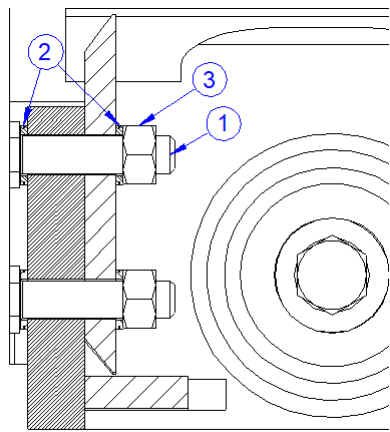
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Prepared by	Checked by	Approved by	Initiated date	
G.Divakar	Srikanth.P	BOC Reddy	30.09.2022	

### Bolt Joint 14 : Motor Safety Catch

**Bolt Joint 14 -  
Motor Safety  
catch**



### Bolt Joint 14 : Motor Safety Catch

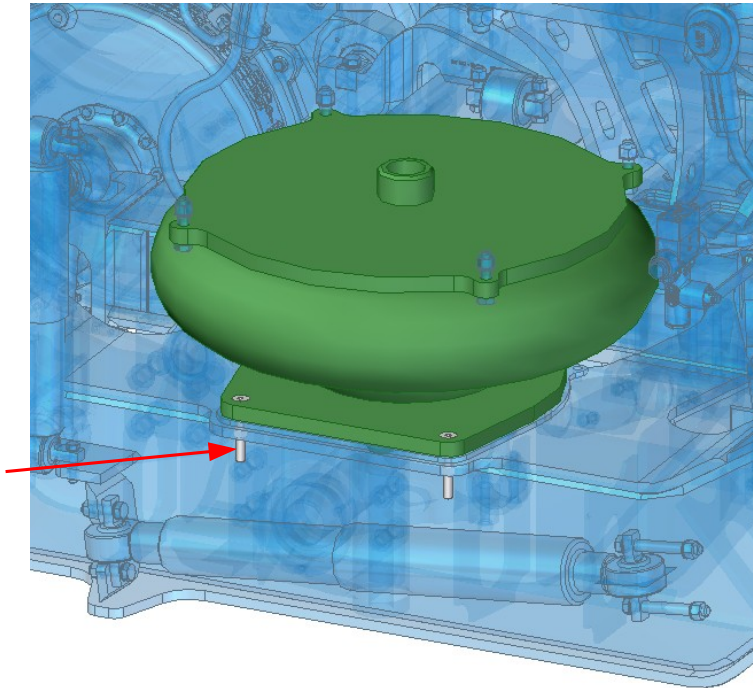
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001365 - HEXA HD SCREW ISO 4017-M20x80- 10.9,GEO SILVER	61012001365 - HEXA HD SCREW ISO 4017-M20x80- 10.9,GEO SILVER
2. Washer	61012001383 - WASHER ISO 7089-20-300 HV,GEO SILVER	61012001909 - NORDLOCK_NL20,GEO SILVER
3. Nut	61012001342 - NUT_FS-M20-10, GEO SILVER	61012001917 - NUT ISO 4032_M20-10,GEO SILVER
Tightening Torque	530 Nm	546 Nm

Title: Hardware usage guide for Train set Bogie

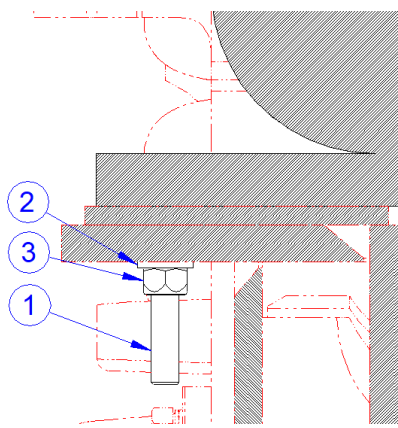
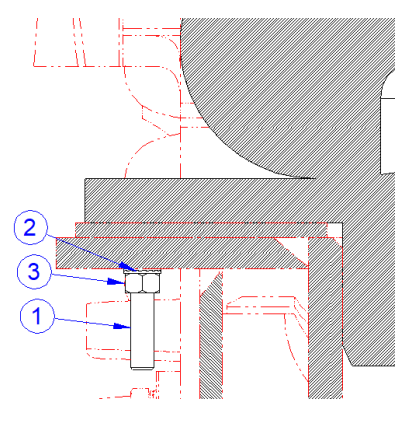
Prepared by	Checked by	Approved by	Initiated date
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**Bolt Joint 15 : Air Spring Bottom side**

**Bolt Joint 15 -  
Air Spring  
Bottom**

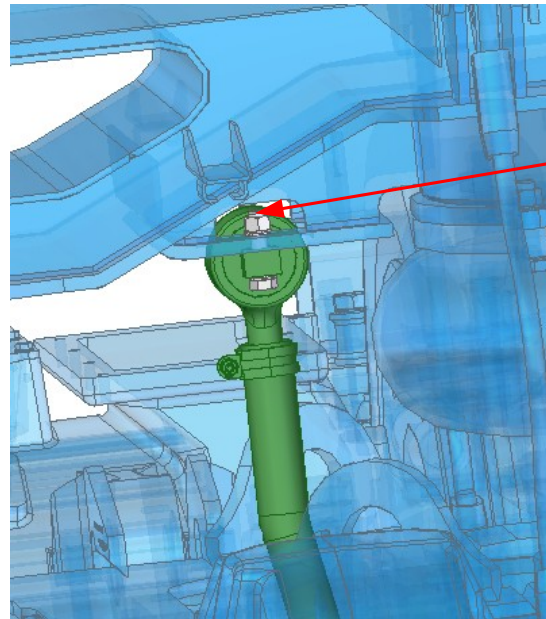


**Bolt Joint 15 : Air Spring Bottom side**

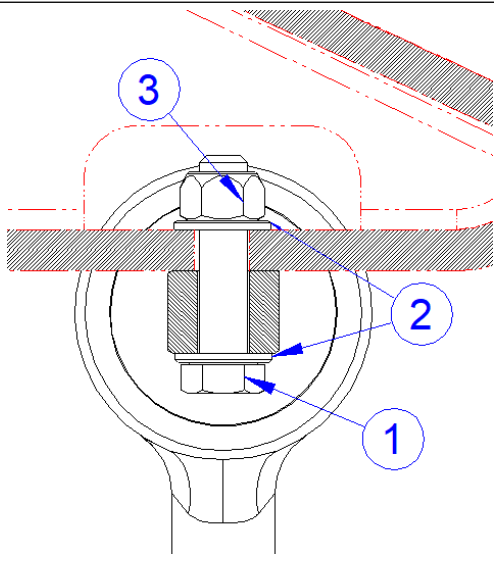
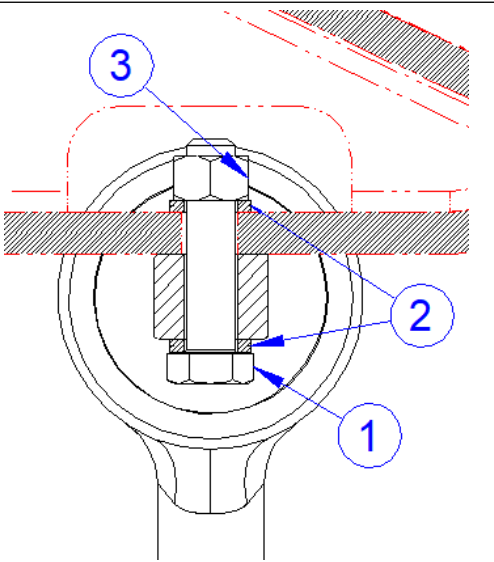
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001350 - HEXA SKT CSK HDSW ISO10642- M12X100-8.8GS	61012001350 - HEXA SKT CSK HDSW ISO10642- M12X100-8.8GS
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	64 Nm	60 Nm


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**Bolt Joint 16 : Stabilizer Link top**

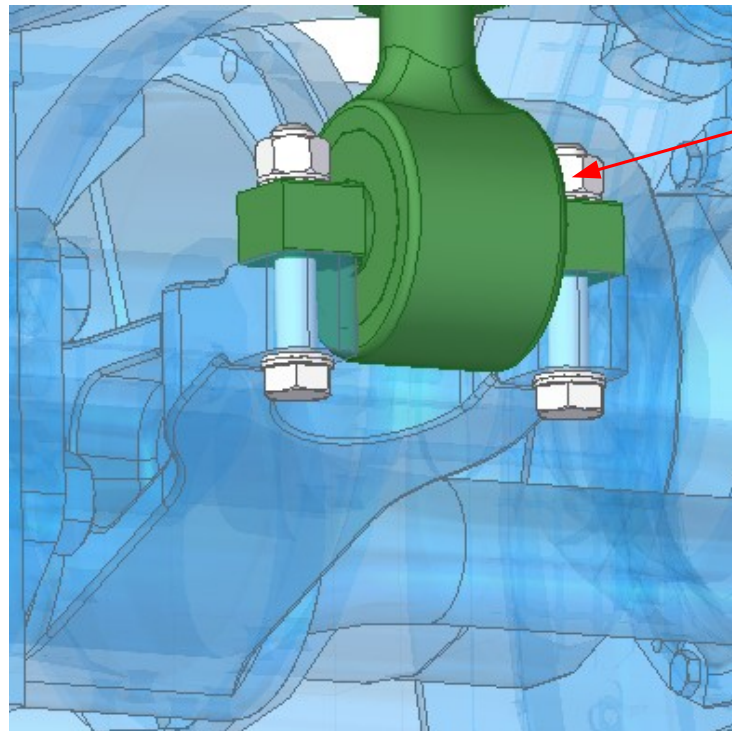


**Bolt Joint 16 - Stabilizer link top**

<b>Bolt Joint 16 : Stabilizer Link top</b>		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001366 - HEXA HD SCREW ISO 4017-M14x60- 10.9,GEO SILVER	61012001366 - HEXA HD SCREW ISO 4017-M14x60- 10.9,GEO SILVER
2. Washer	61012001387 - WASHER ISO_7089-14-300_HV,GEO SILVER	61012001912- NORDLOCK_NL14,GEO SILVER
3. Nut	61012001339 - NUT_FS-M14-10, GEO SILVER	61012001923 - NUT ISO 4032_M14-10,GEO SILVER
Tightening Torque	181 Nm	180 Nm

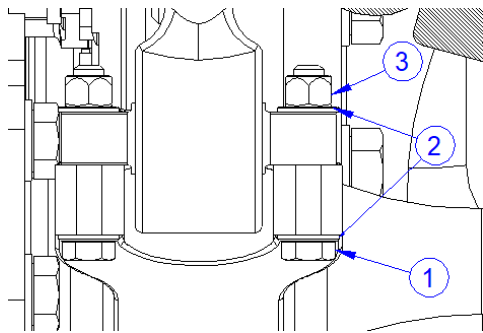
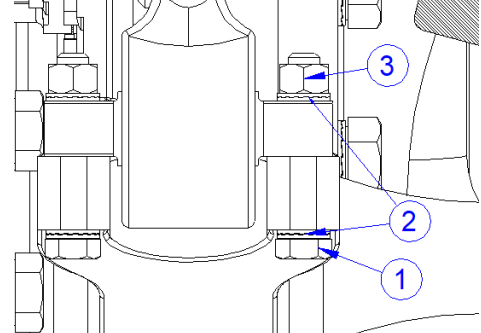
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**Bolt Joint 17 : Stabilizer Link bottom**



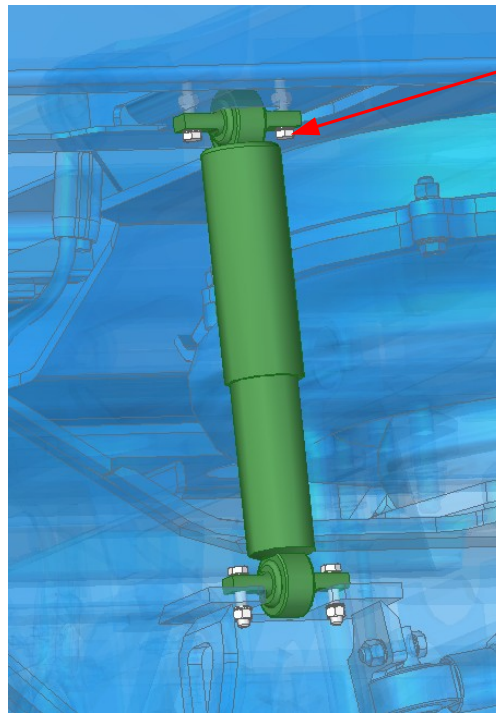
**Bolt Joint 17 -  
Stabilizer link  
bottom**

**Bolt Joint 17 : Stabilizer Link bottom**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001367 - HEXA HD SCREW ISO 4017-M14x80- 10.9,GEO SILVER	61012001367 - HEXA HD SCREW ISO 4017-M14x80- 10.9,GEO SILVER
2. Washer	61012001387 - WASHER ISO_7089-14-300_HV,GEO SILVER	61012001912- NORDLOCK_NL14,GEO SILVER
3. Nut	61012001339 - NUT_FS-M14-10, GEO SILVER	61012001923 - NUT ISO 4032_M14-10,GEO SILVER
Tightening Torque	181 Nm	180 Nm

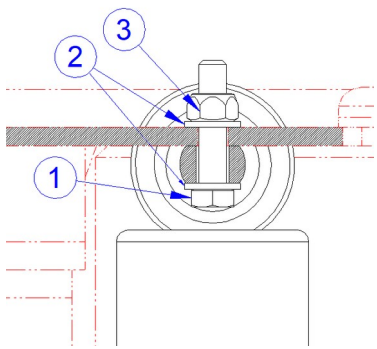
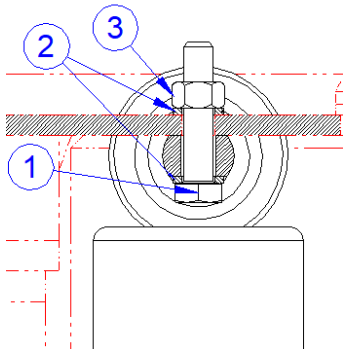
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**Bolt Joint 18 : Secondary Vertical damper top**



**Bolt Joint 18 -  
Secondary Vertical  
damper top**

**Bolt Joint 18 : Secondary Vertical damper top**

Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	79 Nm	77 Nm

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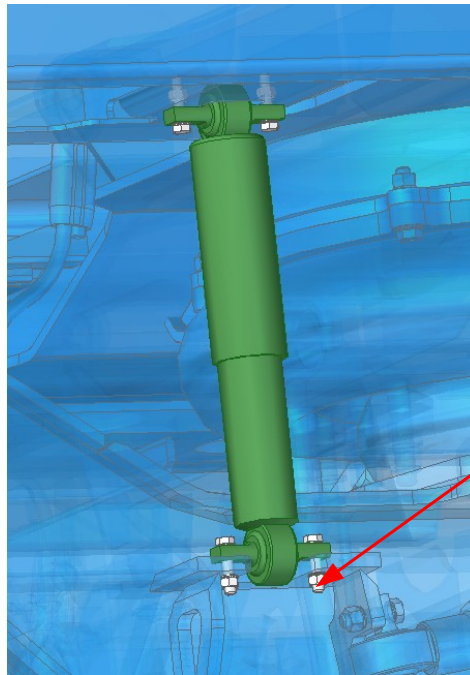
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**Bolt Joint 19 : Secondary Vertical damper bottom**



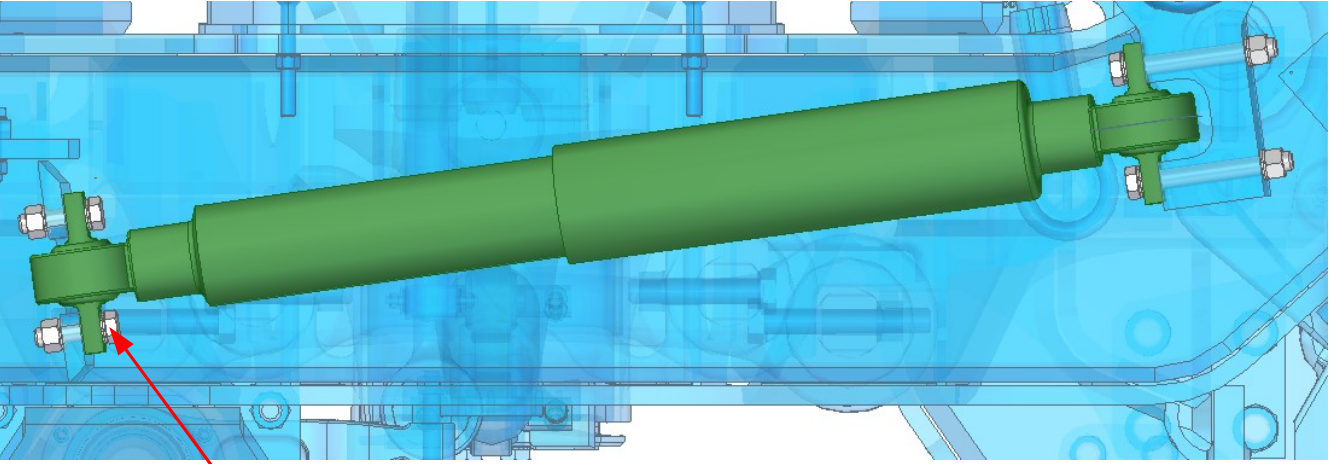
**Bolt Joint 19 -  
Secondary Vertical  
damper bottom**

**Bolt Joint 19 : Secondary Vertical damper bottom**

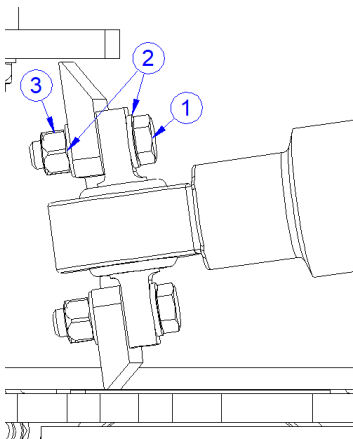
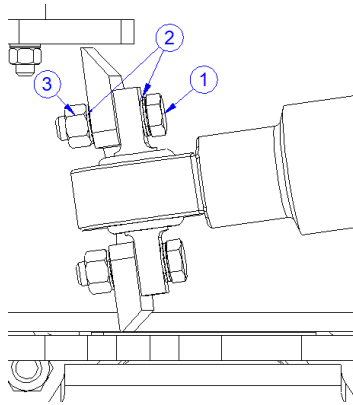
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER	61012001353 - HEXA HD SCREW ISO 4017-M12x55- 8.8,GEO SILVER
2. Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	79 Nm	77 Nm


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**Bolt Joint 20 : Yaw damper bogie frame side**

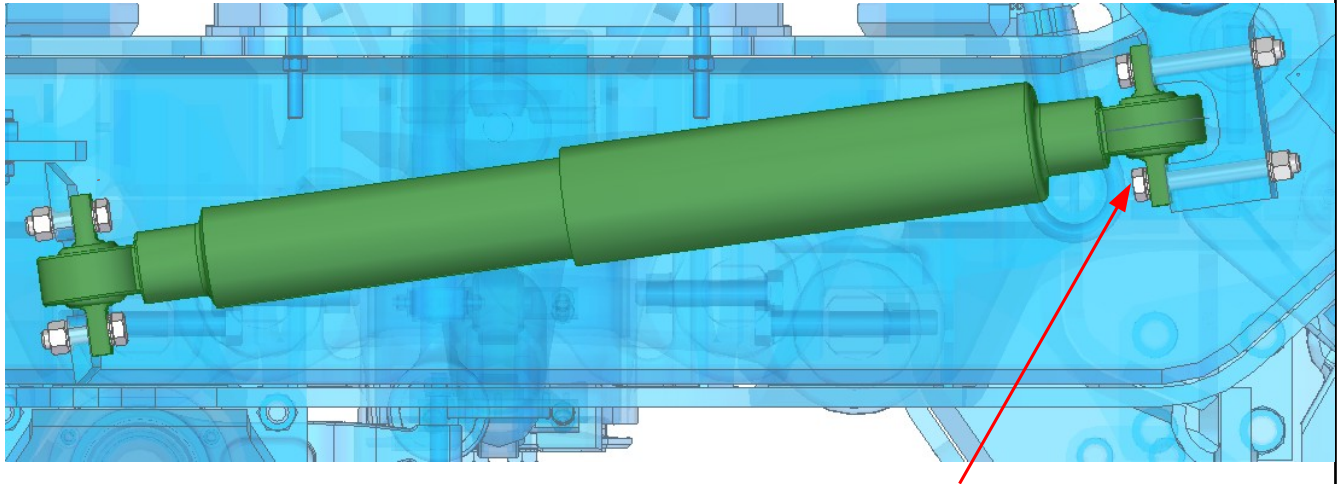


**Bolt Joint 20 -  
Yaw damper bogie  
frame side**

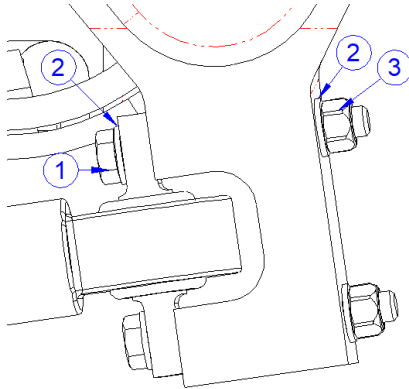
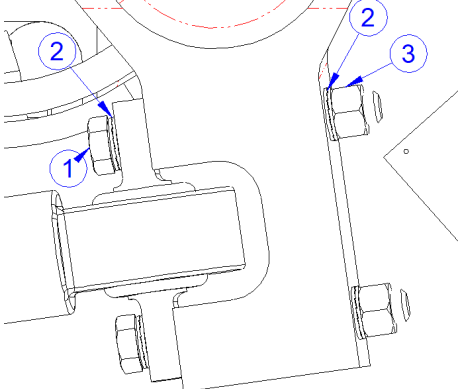
Bolt Joint 20 : Yaw damper bogie frame side		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001357 - HEXA HD SCREW ISO 4017-M16x60- 8.8,GEO SILVER	61012001357 - HEXA HD SCREW ISO 4017-M16x60- 8.8,GEO SILVER
2. Washer	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
3. Nut	61012001340 - NUT_FS-M16-8, GEO SILVER	61012001920 - NUT ISO 4032_M16-8,GEO SILVER
Tightening Torque	188 Nm	190 Nm


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**Bolt Joint 21 : Yaw damper Coach side**

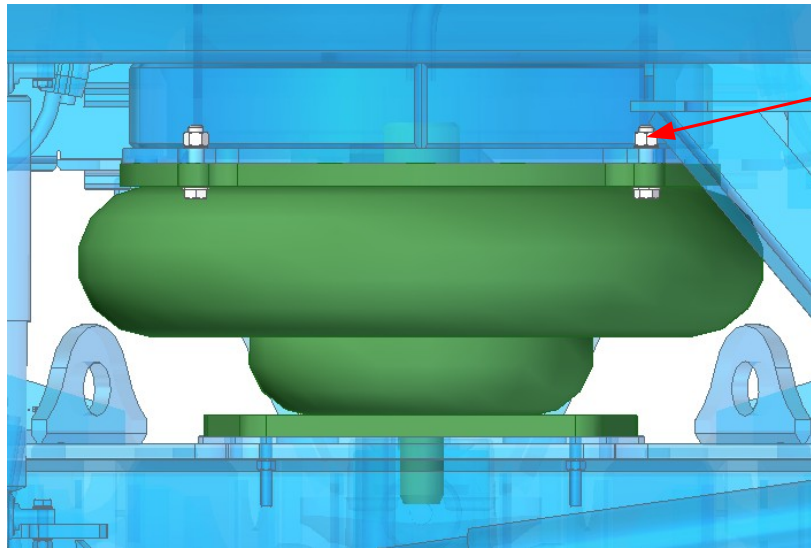


**Bolt Joint 21 -  
Yaw damper coach side**

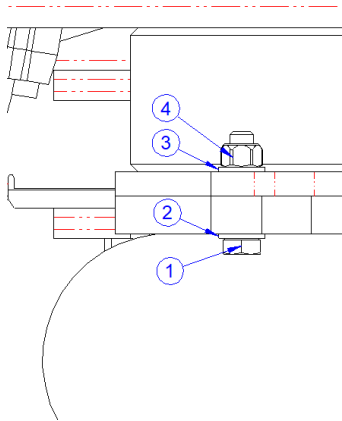
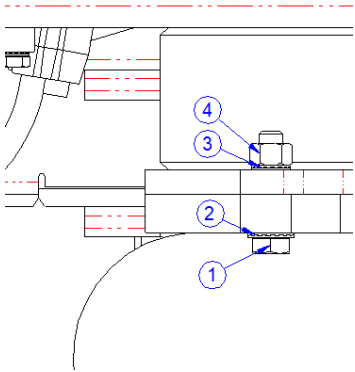
<b>Bolt Joint 21 : Yaw damper Coach side</b>		
<b>Description</b>	<b>Plain Washer + FS Lock Nut</b>	<b>Nord Lock Washer + Nut</b>
Joint		
1.Screw	61012001370 - HEXA HD SCREW ISO4017-M16x130-8.8- A2A,GEO SILVER	61012001370 - HEXA HD SCREW ISO4017-M16x130-8.8- A2A,GEO SILVER
2. Washer	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
3. Nut	61012001340 - NUT_FS-M16-8, GEO SILVER	61012001920 - NUT ISO 4032_M16-8,GEO SILVER
Tightening Torque	188 Nm	190 Nm


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**Bolt Joint 22 : Air spring top side**

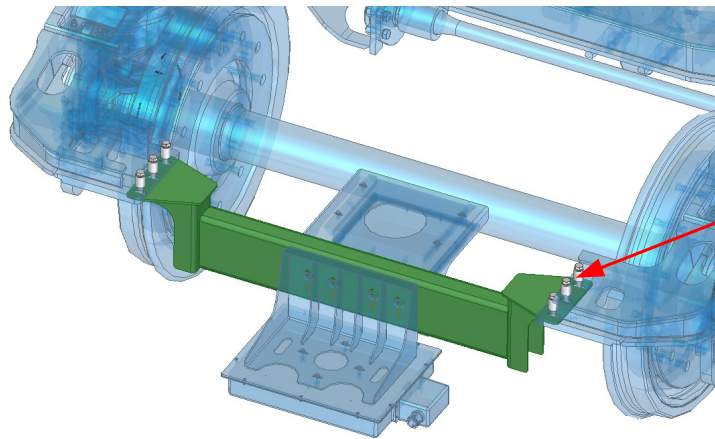


**Bolt Joint 22 -  
Air spring top  
side**

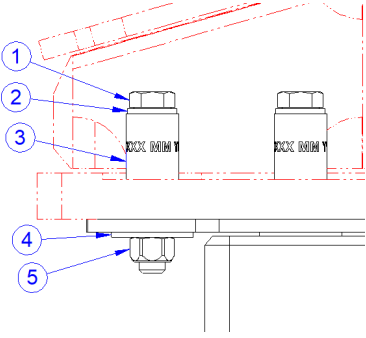
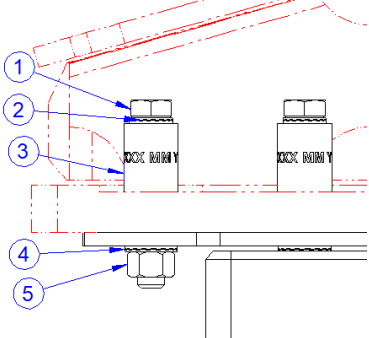
<b>Bolt Joint 22 : Air spring top side</b>		
<b>Description</b>	<b>Plain Washer + FS Lock Nut</b>	<b>Nord Lock Washer + Nut</b>
Joint		
1.Screw	61012001358 - HEXA HD SCREW ISO 4017-M16x70- 8.8,GEO SILVER	61012001358 - HEXA HD SCREW ISO 4017-M16x70- 8.8,GEO SILVER
2.Washer _Bolt side	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001914 - NORDLOCK _NL16sp,GEO SILVER
3.Washer _Nut side	61012001381 - WASHER ISO 7089-16-200 HV,GEO SILVER	61012001346 - NORDLOCK _NL16,GEO SILVER
4. Nut	61012001340 - NUT_FS-M16-8, GEO SILVER	61012001920 - NUT ISO 4032_M16-8,GEO SILVER
Tightening Torque	170 Nm	168 Nm


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### Bolt Joint 23 : Antennas Beam

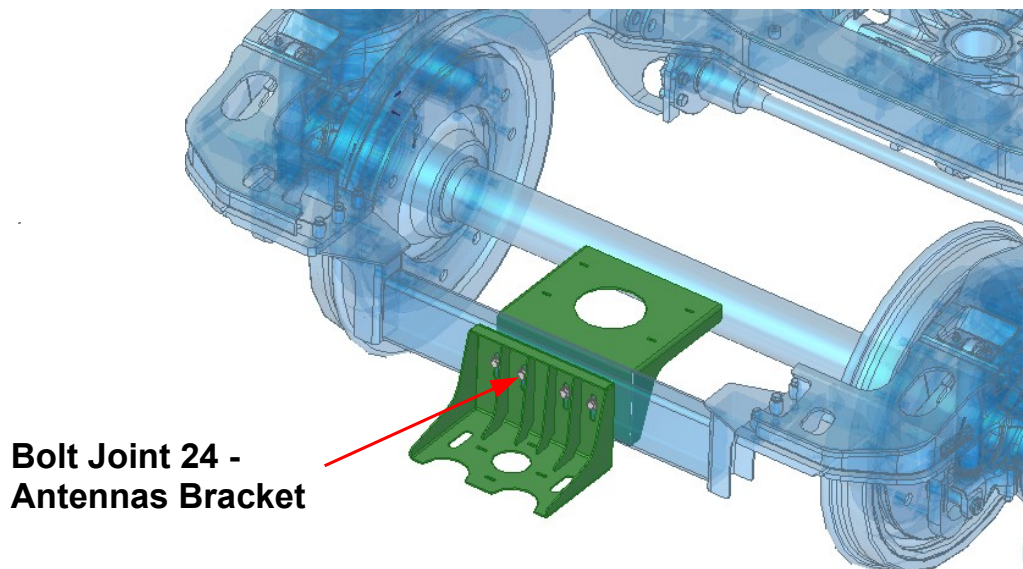


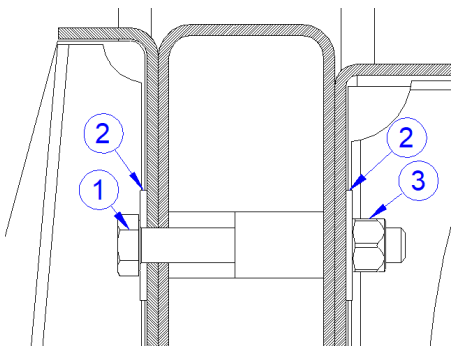
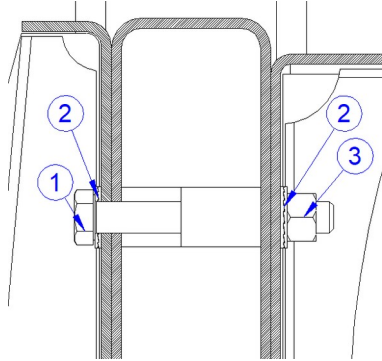
**Bolt Joint 23 -  
Antennas Beam**

Bolt Joint 23 : Antennas Beam		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001354 - HEXA HD SCREW ISO 4017-M16x100-10.9,GEO SILVER	61012001354 - HEXA HD SCREW ISO 4017-M16x100-10.9,GEO SILVER
2. Washer _ Bolt side	61012001382 - WASHER ISO 7089-16-300 HV,GEO SILVER	61012001346 - NORDLOCK_NL16,GEO SILVER
3.Spacer	B-A675UV2-142839 - BUSH FOR BEAM ASSY-MAE675UV2	B-A675UV2-142839 - BUSH FOR BEAM ASSY-MAE675UV2
4.Washer_Nut side	61012001379- WASHER ENISO7093-1-16-300HV-ST-A3A,GEO SILVER	61012001914 - NORDLOCK_NL16sp,GEO SILVER
5. Nut	61012001341 - NUT_FS-M16-10, GEO SILVER	61012001915 - NUT ISO 4032_M16-10,GEO SILVER
Tightening Torque	273 Nm	279 Nm


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### Bolt Joint 24 : Antennas Bracket



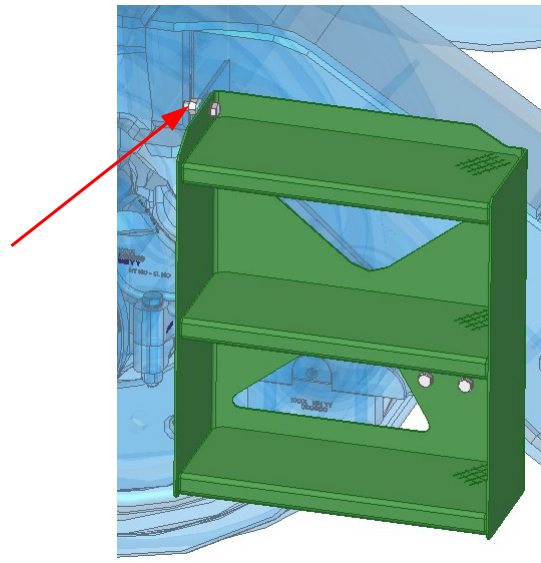
Bolt Joint 24 : Antennas Bracket		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001439 - HEXA HD SCREW ISO 4017-M16x120- 10.9,GEO SILVER	61012001439 - HEXA HD SCREW ISO 4017-M16x120- 10.9,GEO SILVER
2.Washer	61012001379- WASHER ENISO7093-1-16-300HV-ST- A3A,GEO SILVER	61012001914 - NORDLOCK_NL16sp,GEO SILVER
3. Nut	61012001341 - NUT_FS-M16-10, GEO SILVER	61012001915 - NUT ISO 4032_M16-10,GEO SILVER
Tightening Torque	273 Nm	279 Nm

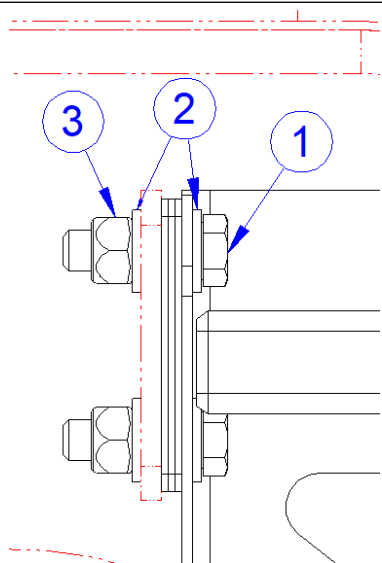
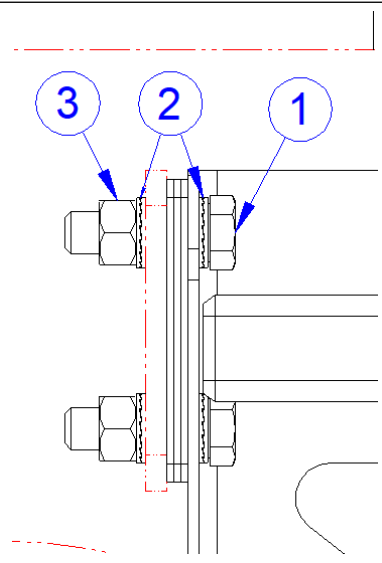
**Note:** Upto 7<sup>th</sup> Rake **HEXA HD SCREW ISO 4017-M16x140-10.9/8.8,GEO SILVER** will be supplied.


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**Bolt Joint 25 : Steps**

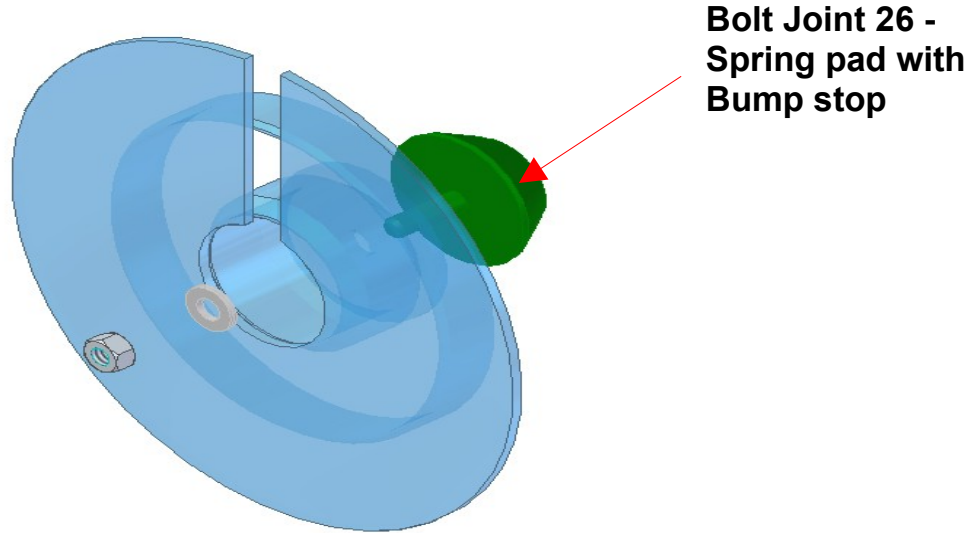
**Bolt Joint 25 - Steps**

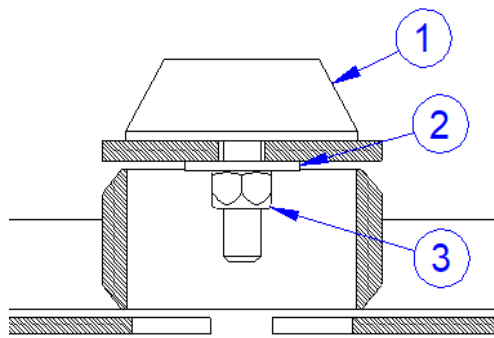
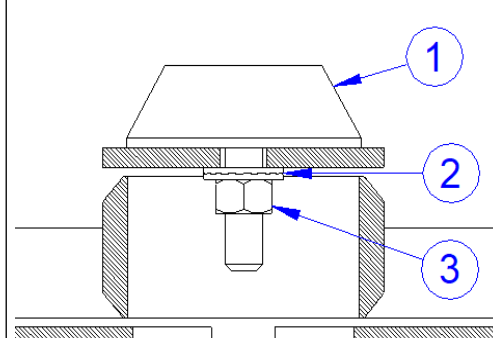



<b>Bolt Joint 25 : Steps</b>		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	61012001439 - HEXA HD SCREW ISO 4017-M16x120-10.9,GEO SILVER	61012001435 - HEXA HD SCREW ISO 4017-M12x40-8.8,GEO SILVER
2.Washer	61012001380 - WASHER ISO 7089-12-200 HV,GEO SILVER	61012001913 - NORDLOCK_NL12,GEO SILVER
3. Nut	61012001436 - NUT_FS-M12-10,GEO SILVER	61012001922 - NUT ISO 4032_M12-10,GEO SILVER
Tightening Torque	97 Nm	102 Nm

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**Bolt Joint 26 : Spring pad with Bump stop**



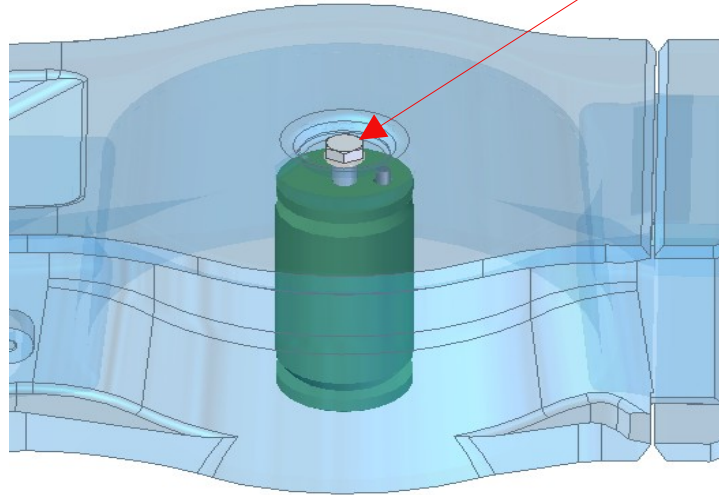
Bolt Joint 26 : Spring pad with Bump stop		
Description	Plain Washer + FS Lock Nut	Nord Lock Washer + Nut
Joint		
1.Screw	6101000011 - PRIMARY SUSPENSION BUMP STOP FOR BOGIE	6101000011 - PRIMARY SUSPENSION BUMP STOP FOR BOGIE
2.Washer	61012001385 - WASHER ISO 7093-1-12-200 HV,GEO SILVER	61012001911 - NORDLOCK_NL12sp,GEO SILVER
3. Nut	61012001338 - NUT_FS-M12-8, GEO SILVER	61012001921 - NUT ISO 4032_M12-8,GEO SILVER
Tightening Torque	40 Nm	40 Nm

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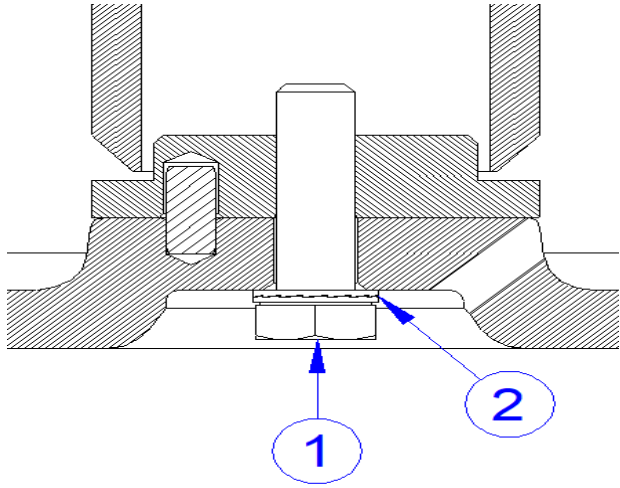
## Common Joints


### Bolt Joint-27: Bump stops

**Bolt Joint 27 -  
Bump stop**

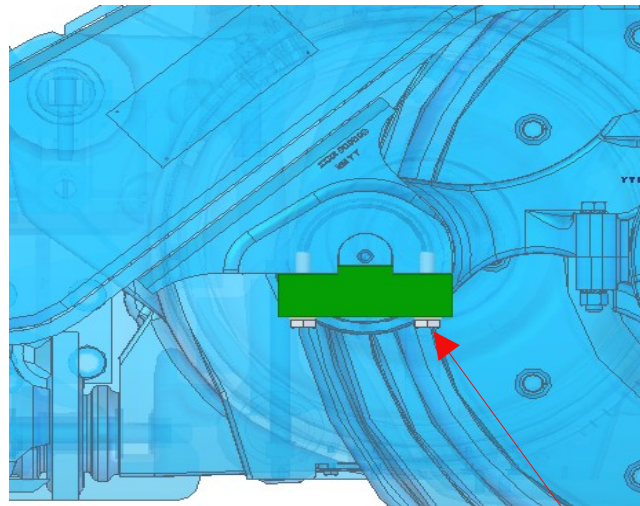


**Bolt Joint 27 : Bump stop**

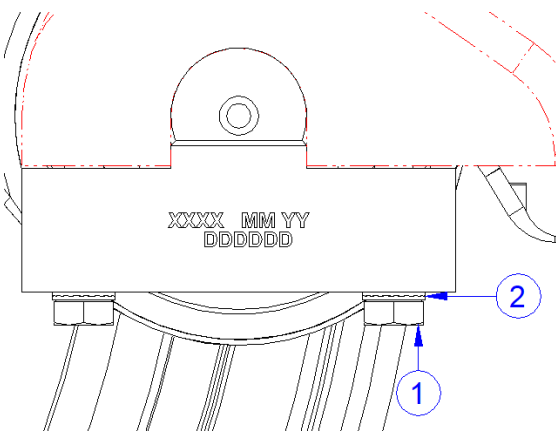
Description	Nord Lock Washer
Joint	
1.Screw	61012001357 - HEXA HD SCREW ISO 4017-M16x60-8.8,GEO SILVER
2.Washer	61012001346 - NORDLOCK_NL16,GEO SILVER
Tightening Torque	188 Nm


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**Bolt Joint-28: Control arm closing plate**

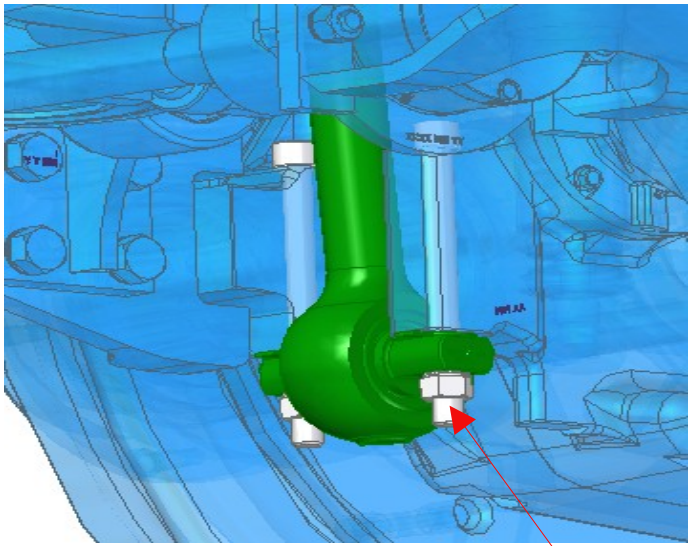


**Bolt Joint 28 -  
Inversion close plate**

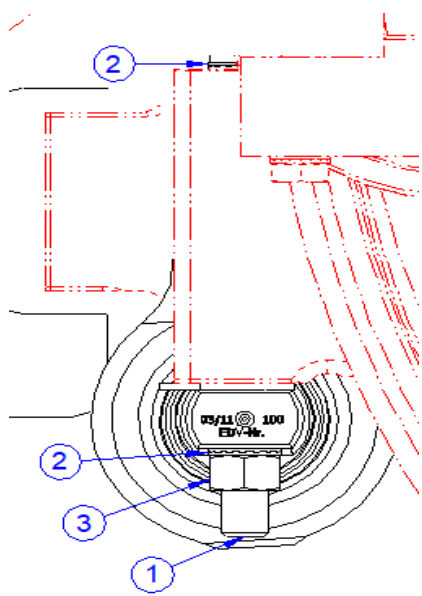
<b>Bolt Joint 28 : Control arm closing plate</b>			
Description	Nord Lock Washer		
Joint			
1.Screw	61012001359 - ISO 4017-M16x80-10.9,GEO SILVER		
2.Washer	61012001346 - NORDLOCK_NL16,GEO SILVER		
Tightening Torque <b>(Apply Torque in 3 steps)</b>	248 Nm	1 <sup>st</sup> step	124 Nm
		2 <sup>nd</sup> step	186 Nm
		3 <sup>rd</sup> step	248 Nm


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**Bolt Joint-29:** Reaction rod bottom

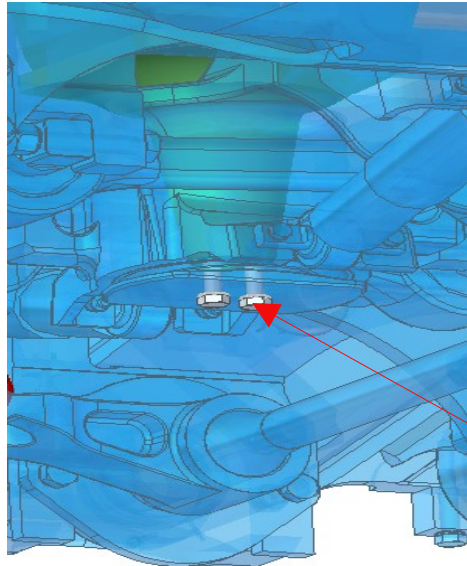


**Bolt Joint 29 -  
Reaction rod bottom**

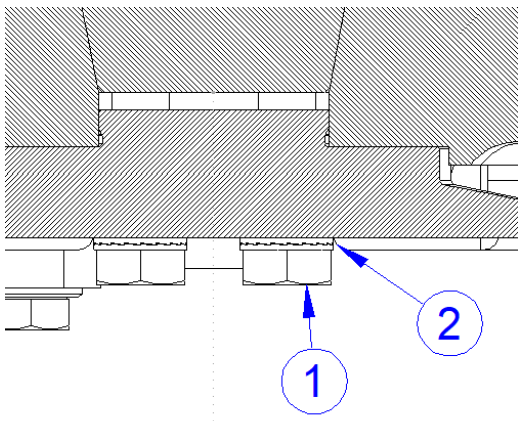
Bolt Joint 29 : Reaction rod bottom	
<b>Description</b>	<b>Nord Lock Washer + Nut</b>
Joint	
1.Screw	M20 X 240 HEX SOCKET HEAD SCREW
2..Washer	NORDLOCK_NL20 WASHER
3. Nut	M20 NUT
Tightening Torque	592 Nm


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**Bolt Joint-30:** Center pivot closing plate side

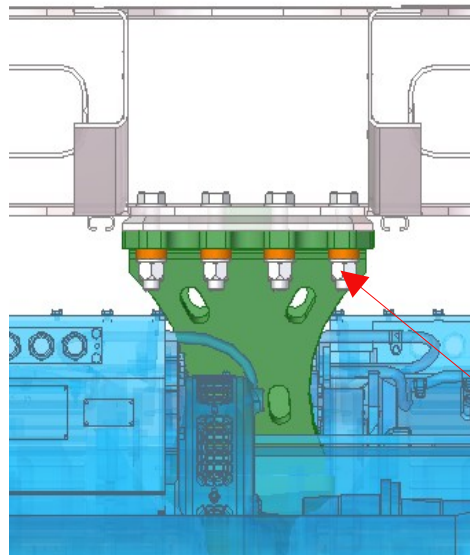


**Bolt Joint 30 -  
Center pivot closing  
plate side**

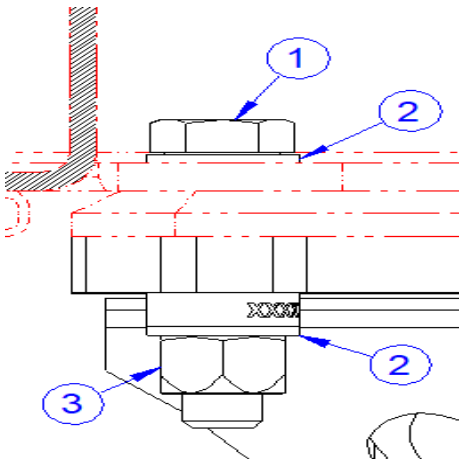
Bolt Joint 30 : Center pivot closing plate side			
<b>Description</b>	<b>Nord Lock Washer</b>		
Joint			
1.Screw	61012001359 - ISO 4017-M16x80-10.9,GEO SILVER		
2..Washer	61012001346 - NORDLOCK_NL16,GEO SILVER		
Tightening Torque <b>(Apply Torque in 3 steps)</b>	232 Nm	1 <sup>st</sup> step	116 Nm
		2 <sup>nd</sup> step	174 Nm
		3 <sup>rd</sup> step	232 Nm


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**Bolt Joint-31: Center pivot carbody side**

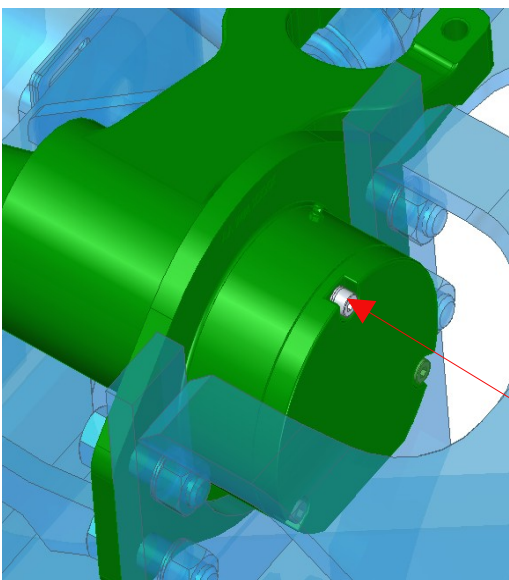


**Bolt Joint 31 -  
Center pivot  
Car body side**

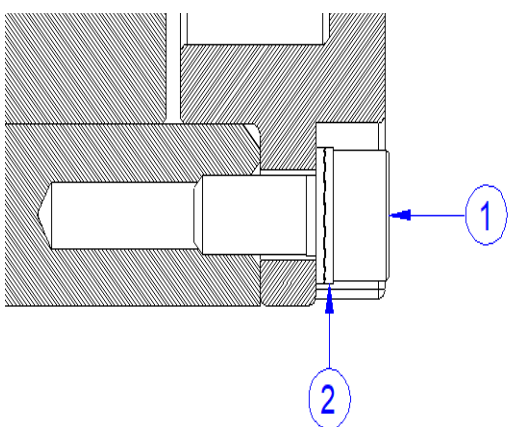
<b>Bolt Joint 31 : Center pivot Car body side</b>	
<b>Description</b>	<b>Plain washer + FS locknut</b>
Joint	
1.Screw	66244120120 - BOLT M24,HEX HD120,HTS F/T ZINCFLAKE10.9
2..Washer	61012001384 - WASHER ISO 7089-24-300 HV,GEO SILVER
3.Nut	61012001344 - NUT_FS-M24-10, GEO SILVER
Tightening Torque	900 Nm


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**Bolt Joint-32: Stabilizer link assembly cover**

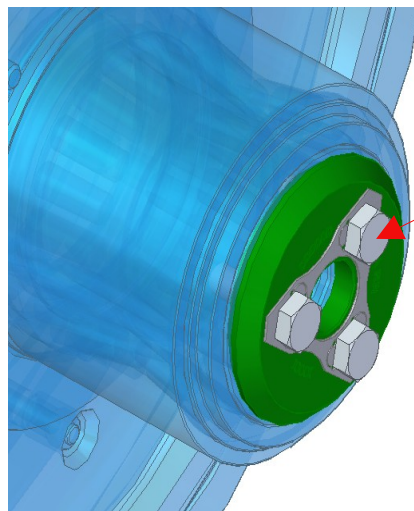


**Bolt Joint 32 - Stabilizer link assembly cover**

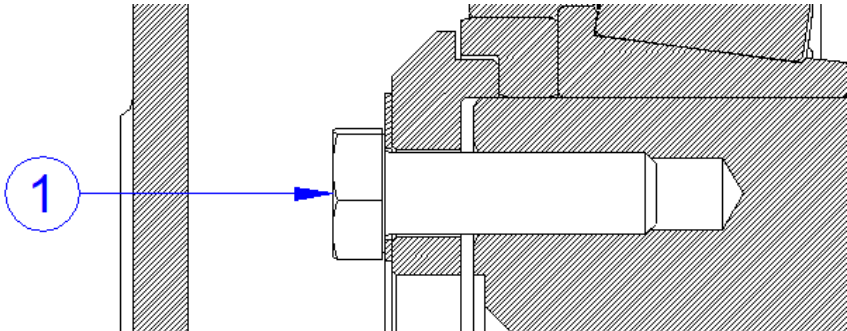
Bolt Joint 32 : Stabilizer link assembly cover	
Description	Nordlock washer
Joint	
1.Screw	61012001362 - HEXAGON SOCKET HEAD CAP SCREW ISO 4762-M8x20-8.8,GEO SILVER
2..Washer	61012001347 - NORDLOCK_NL8,GEO SILVER
Tightening Torque	23 Nm


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**Bolt Joint-33:** Axle Bearing end pad without Phonic wheel

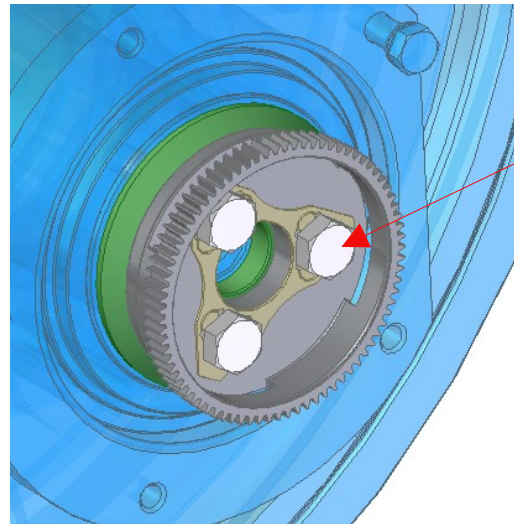


**Bolt Joint 33 -  
Axle Bearing end  
pad without  
Phonic wheel**

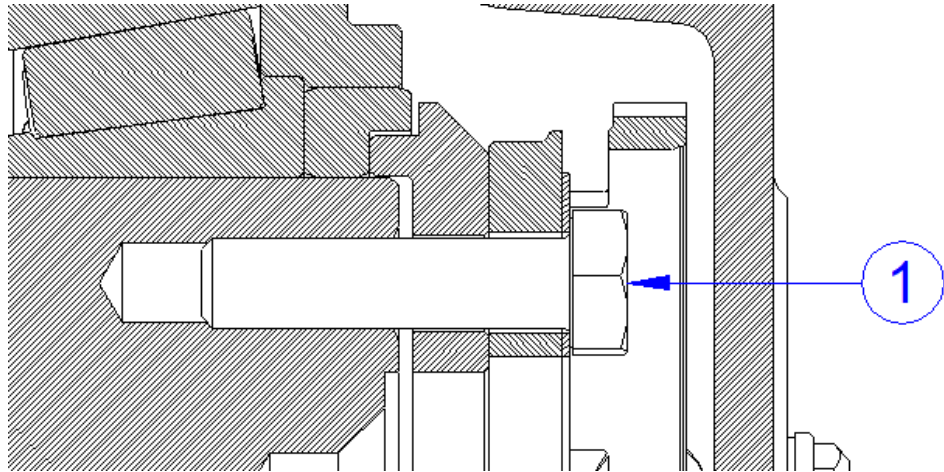
<b>Bolt Joint 33 :Axle Bearing end pad without Phonic wheel</b>	
<b>Description</b>	<b>bolt</b>
Joint	
1.Screw	61012001361 - HEXA HD SCREW ISO 4017-M20x65-10.9,GEO SILVER
Tightening Torque	157 Nm


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**Bolt Joint-34:** Axle Bearing end pad with Phonic wheel

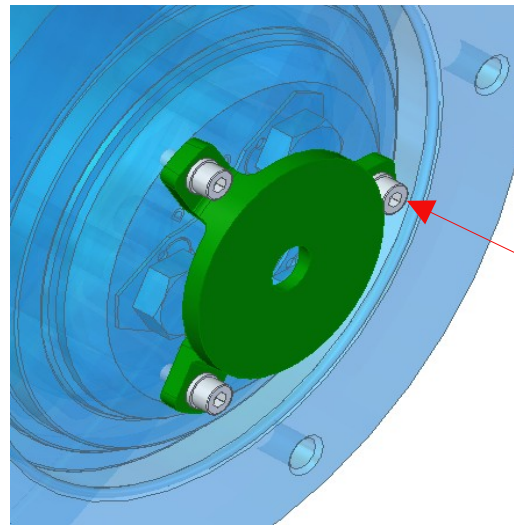


**Bolt Joint 34 -  
Axle Bearing end  
pad with Phonic  
wheel**

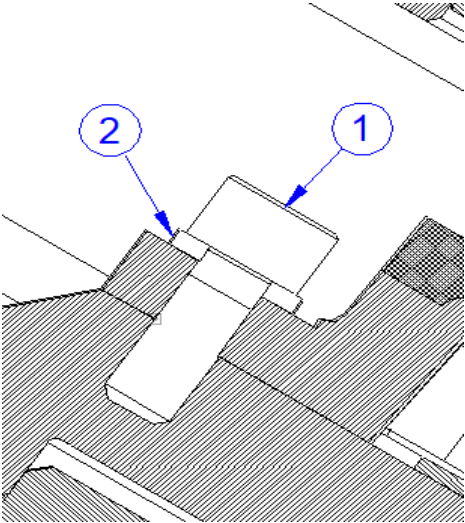
<b>Bolt Joint 34 : Axle Bearing end pad with Phonic wheel</b>	
Description	bolt
Joint	
1.Screw	61012001365 - HEXA HD SCREW ISO 4017-M20x80-10.9,GEO SILVER
Tightening Torque	157 Nm


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**Bolt Joint-35:** ERCU contact Disc



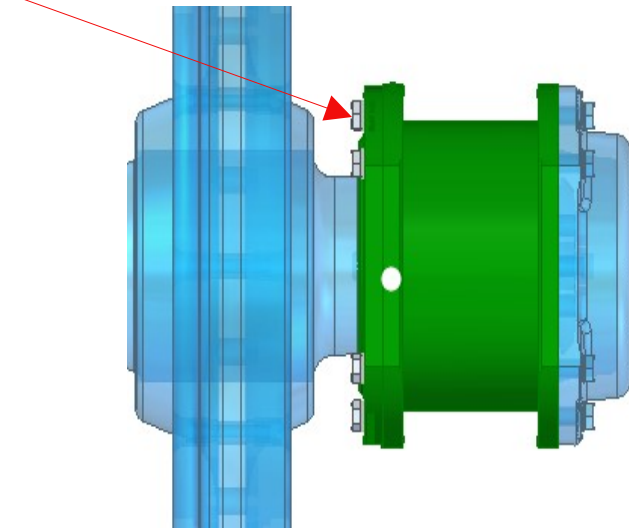
**Bolt Joint 35 -  
ERCU contact Disc**

Bolt Joint 35 :ERCU contact Disc	
Description	Spring lock washer
Joint	
1.Screw	61012001362 - HEXAGON SOCKET HEAD CAP SCREW ISO 4762-M8x20-8.8,GEO SILVER
2.Washer	69008111801 - SPRING LOCK WASHER REC C/S M8, HTS
Tightening Torque	25 Nm

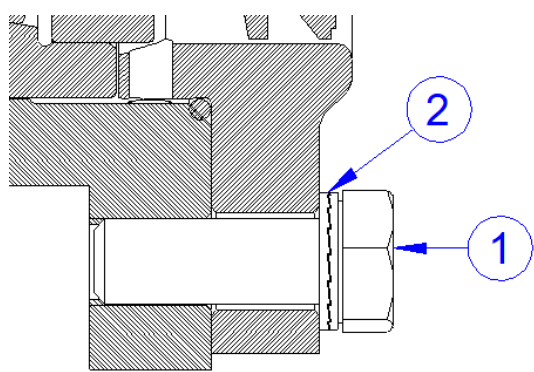
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**Bolt Joint-36: Axle Bearing Rear cover**

**Bolt Joint 36 -  
Bearing Rear  
cover**

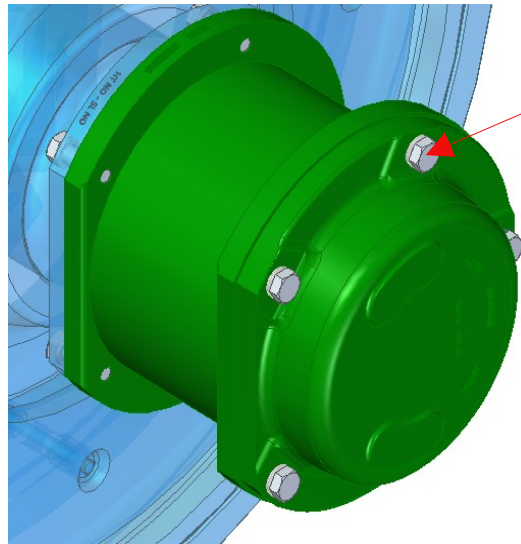


**Bolt Joint 36 :Axle Bearing Rear cover**

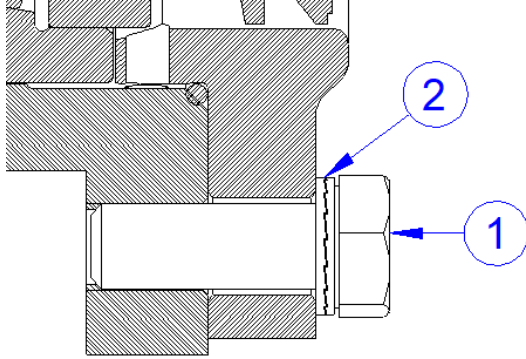
Description	Nord lock washer
Joint	
1.Screw	61012001355 - HEXA HD SCREW ISO 4017-M16x45-10.9,GEO SILVER
2.Washer	61012001346 - NORDLOCK_NL16,GEO SILVER
Tightening Torque	279 Nm


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**Bolt Joint-37: Axle Bearing End cover**



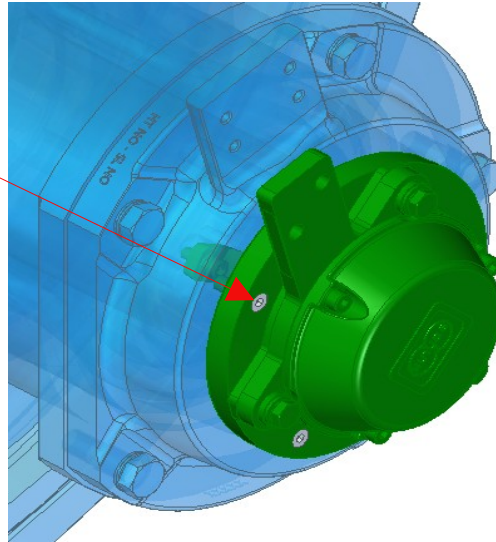
**Bolt Joint 37 -  
Axle Bearing End  
cover**

<b>Bolt Joint 37 : Axle Bearing End cover</b>	
<b>Description</b>	<b>Nord lock washer</b>
Joint	
1.Screw	61012001356 - HEXA HD SCREW ISO 4017-M16x50-10.9,GEO SILVER
2.Washer	61012001346 - NORDLOCK_NL16,GEO SILVER
Tightening Torque	279 Nm

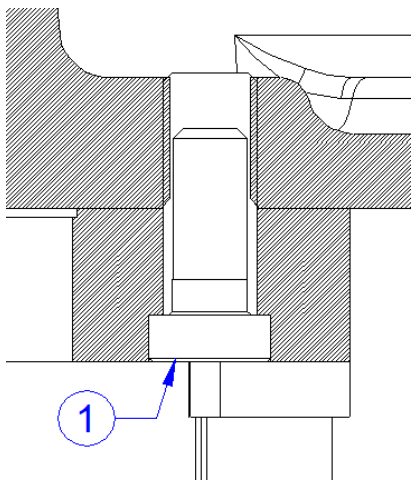
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**Bolt Joint-38: ERCU unit**

**Bolt Joint 38 -  
ERCU unit**



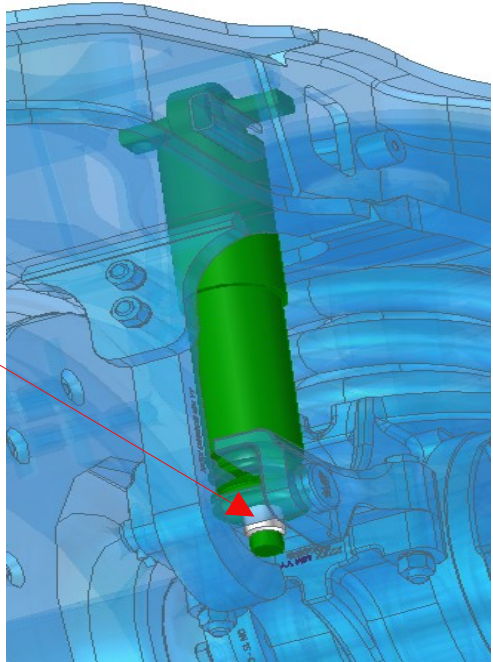
**Bolt Joint 38 : ERCU unit**

Description	screw
Joint	
1.Screw	DIN 7984-M8x20-8.8
Tightening Torque	49 Nm

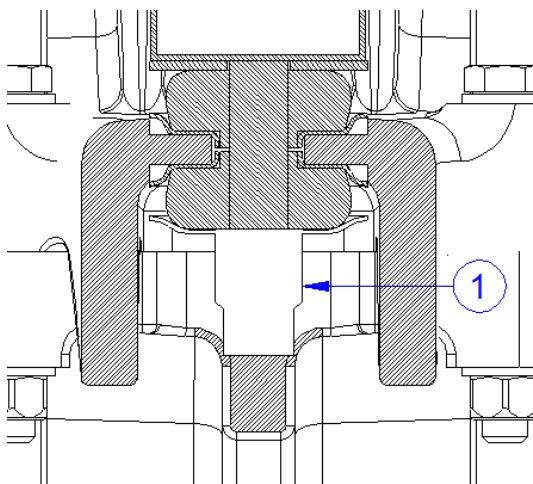
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**Bolt Joint-39: Primary Damper bottom**

**Bolt Joint 39 -  
Primary Damper  
Bottom**



**Bolt Joint 39 : Primary Damper Bottom**

Description	Nut
Joint	
1.Nut	M16 nut
Tightening Torque	100 Nm

**Title: Hardware usage guide for Train set Bogie**

Prepared by

Checked by

Approved by

Initiated date

G.Divakar

Srikanth.P

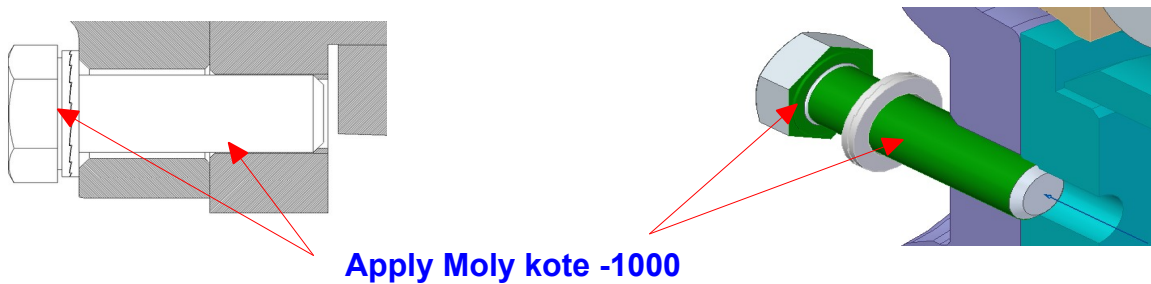
BOC Reddy

30.09.2022

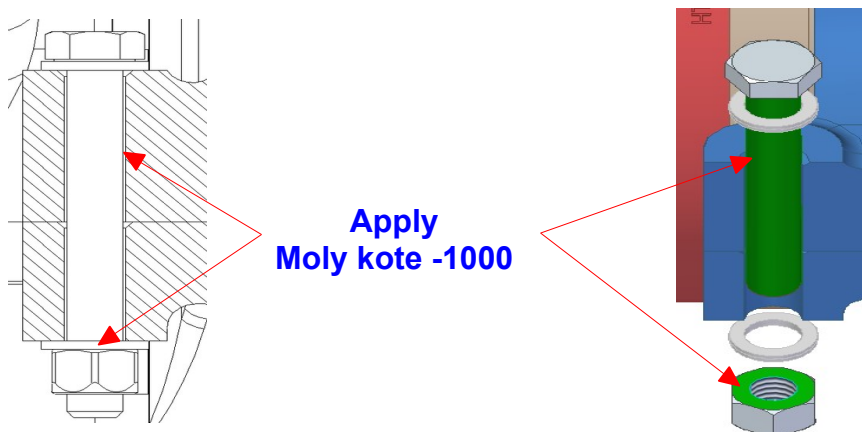
**Pre – Assembly Instructions :**


- Lubricate the threaded portion of all hardware with Molykote – 1000 Anti seize paste.
- Always wear hand gloves while handling Molykote products.
- After applying mentioned tightening torque for hardware, mark with torque seal.

**Lubricate the head portion of bolt (mating face with washer) while applying tightening torque on bolt & also on the threaded portion of the bolt (green coloured portions).**



**Lubricate the nut face (mating face with washer) while applying tightening torque on nut & also on the threaded portion of the bolt (green coloured portions).**



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02	25.10.2022	----	Pre assembly instructions added, Common hardware combination joints added
01	17.10.2022	----	Lift stop (Joint 08) bolt side nordlock washer is replaced with plain washer, Note added for Joint -24
<b>REV. NO.</b>	<b>DATE</b>	<b>ECR NO.</b>	<b>DESCRIPTION OF REVISION</b>