Asia Pacific Region Only

TECHNICAL BULLETIN

TRAILER SUSPENSION TORQUE SPECIFICATIONS

LIT NO: 97117-251
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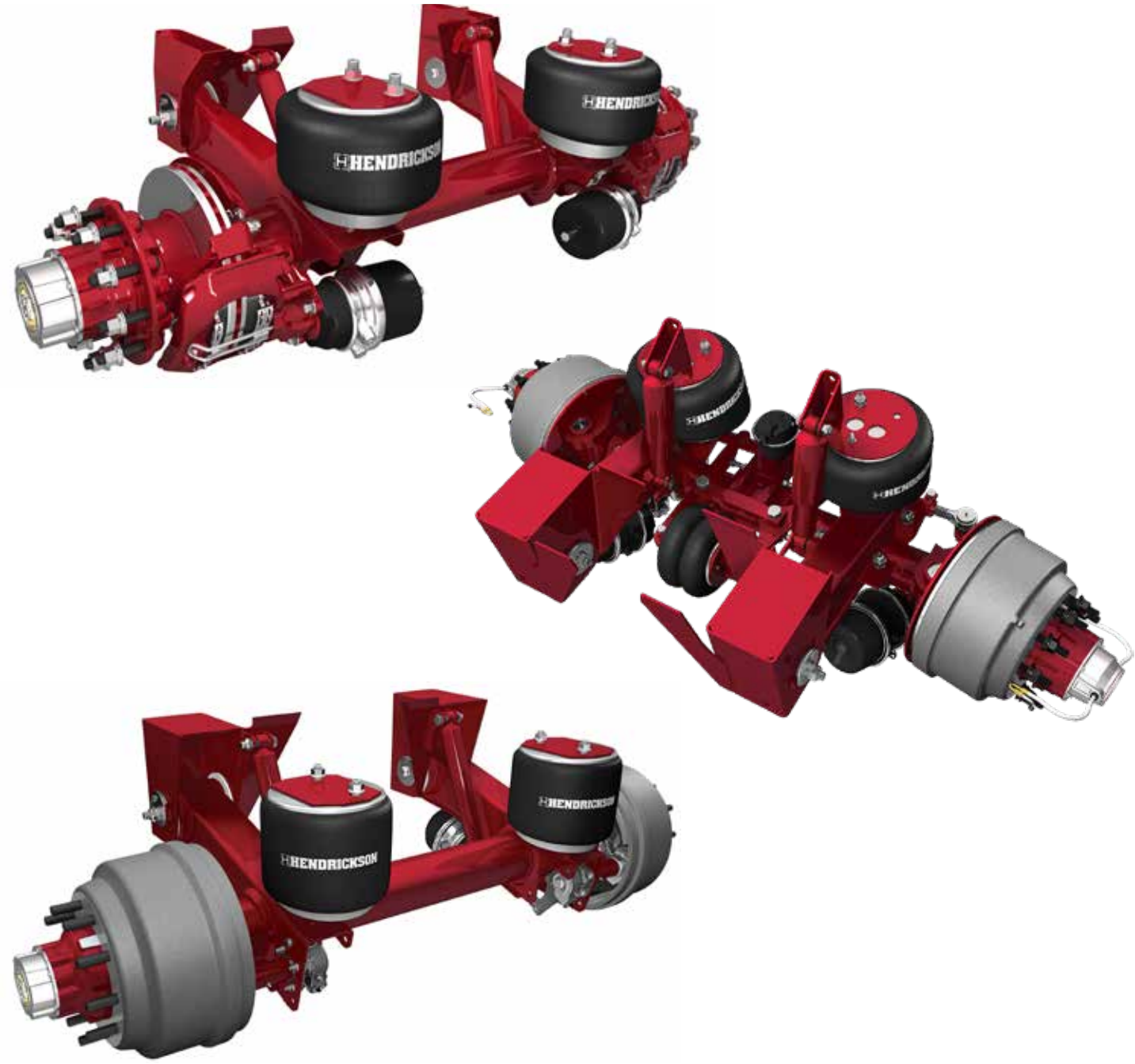

HENDRICKSON
The World Rides On Us™

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INTRODUCTION

This document is designed to assist in finding the correct torque for the most common Hendrickson trailer suspension systems used in the Asia Pacific region. It also provides supporting information to assist with bolt and nut identification and with the correct handling of QUIK-ALIGN® and shear-head bolts.

For further details about trailer service and maintenance refer to Trailer Suspension Maintenance Manual 97117-161.

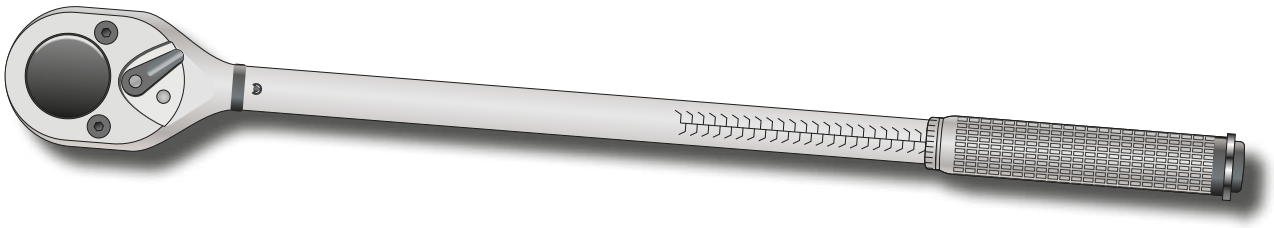
Important points to remember when working on Hendrickson suspensions:

- Confirm the torque of the bolt or nut with this document. Ensure that the thread size and grade or property class is same as that shown.
- Ensure the surface where the fastener sits is not cracked, gouged or fatigued and that the through holes are not elongated.
- Do not apply anti-seize or any lubricant to QUIK-ALIGN or shear-head bolts as it will interfere with the thread coating.
- Settle QUIK-ALIGN concentric and eccentric pivot washers by tapping them with a hammer before final tightening.
- Use a correctly calibrated torque wrench.
- Do not reuse critical fasteners.

Shock & Pivot Bolt Tightening: Shock and pivot bolts may be installed at any suspension position but bolts must only be fully tightened and torqued at specified suspension ride height.

Torque Wrenches

To maintain accuracy, Torque Wrenches must be calibrated regularly. According to ISO 6789 this should be every 5,000 cycles or every 12 months, whichever occurs first. However, they may be calibrated more often if deemed necessary.

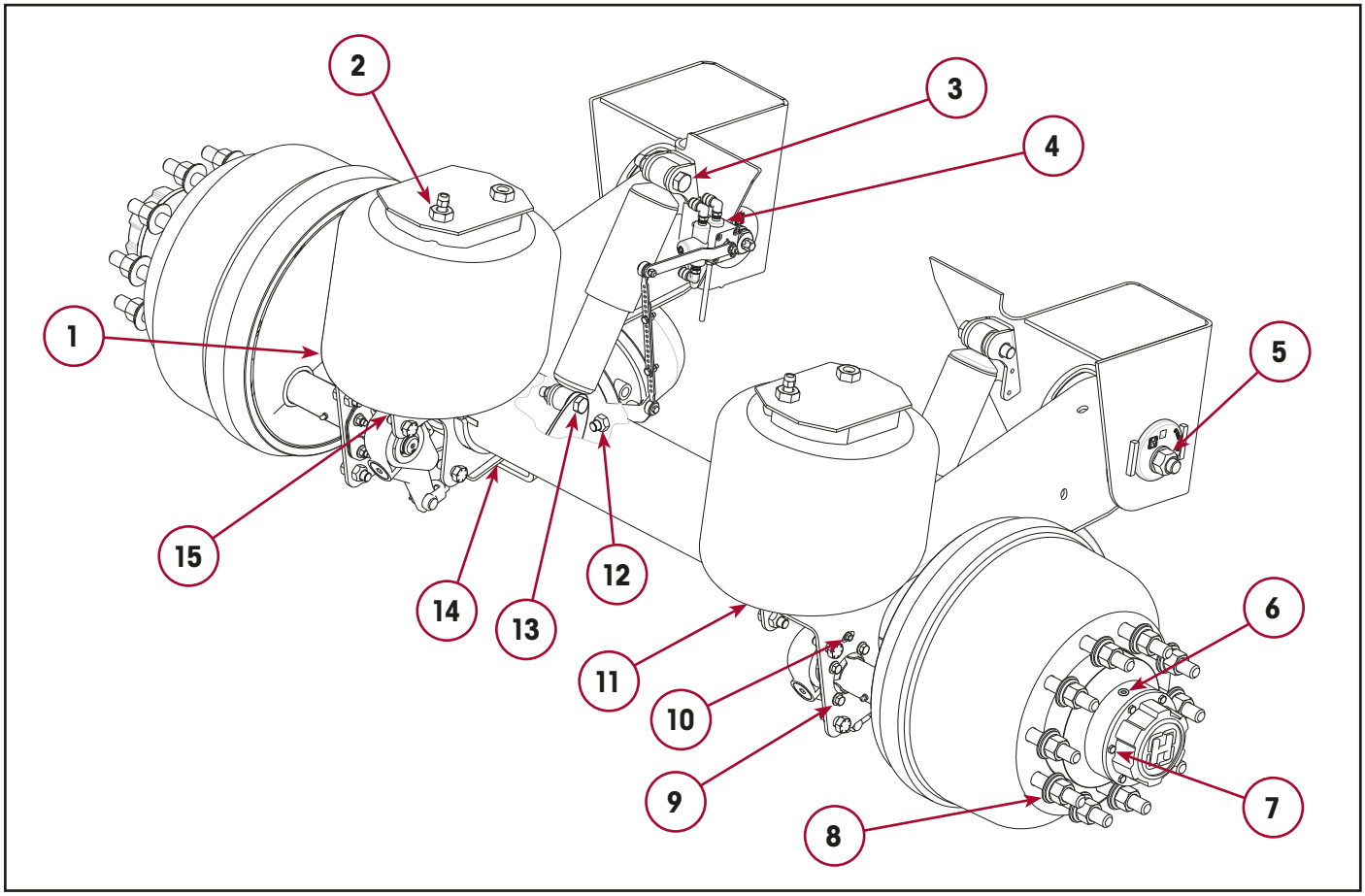


Abbreviations

Abbreviations used in this document may include the following terms:

- ARL – Axle Rebound Limiter
- PCD – Pitch Circle Diameter
- ZMD™ – Zero Maintenance Damping™

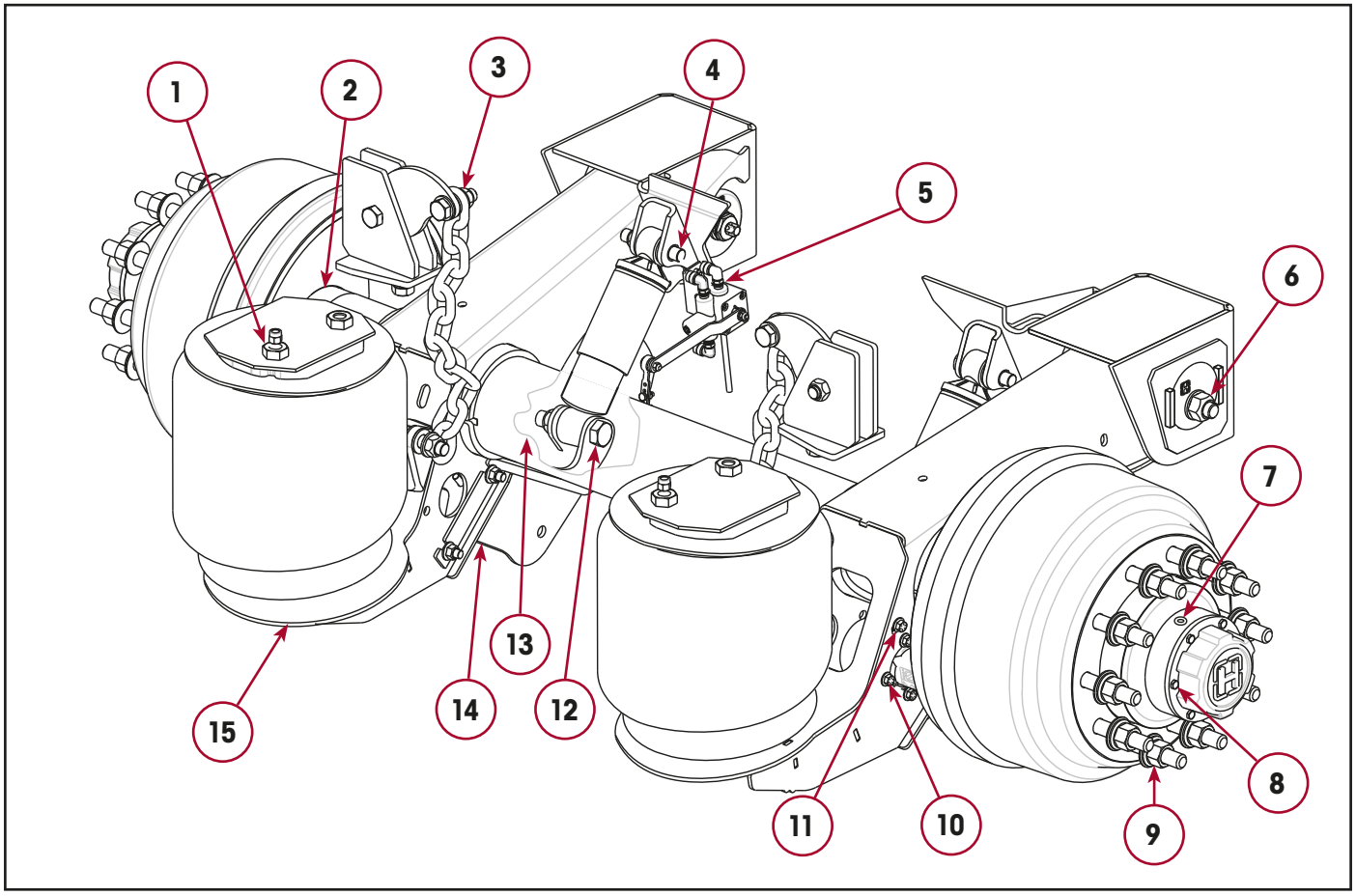
INTRAAX WIDE BUSH – SHOCKED
AAT DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Dust Shield Clamp	–	15
2	Air Spring Nut – Upper	3/4" – 16	135
3	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
4	Height Control Valve Fixing Nut	1/4" – 20	10
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
7	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
8	Wheel Nut	M22 x 1.5	610
9	S-Cam Bearing Bolt	3/8" – 16	60
10	Slack Adjuster Anchor Stud	7/16" – 14	60
11	Air Spring Nut – Lower	1/2" – 13	45
12	Brake Chamber Mounting Nut	5/8" – 11	150
13	Lower Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320*
14	Lower Shock Absorber Support Bolt	3/8" – 16	60
15	Pedestal Mount Bolt	3/8" – 16	60

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

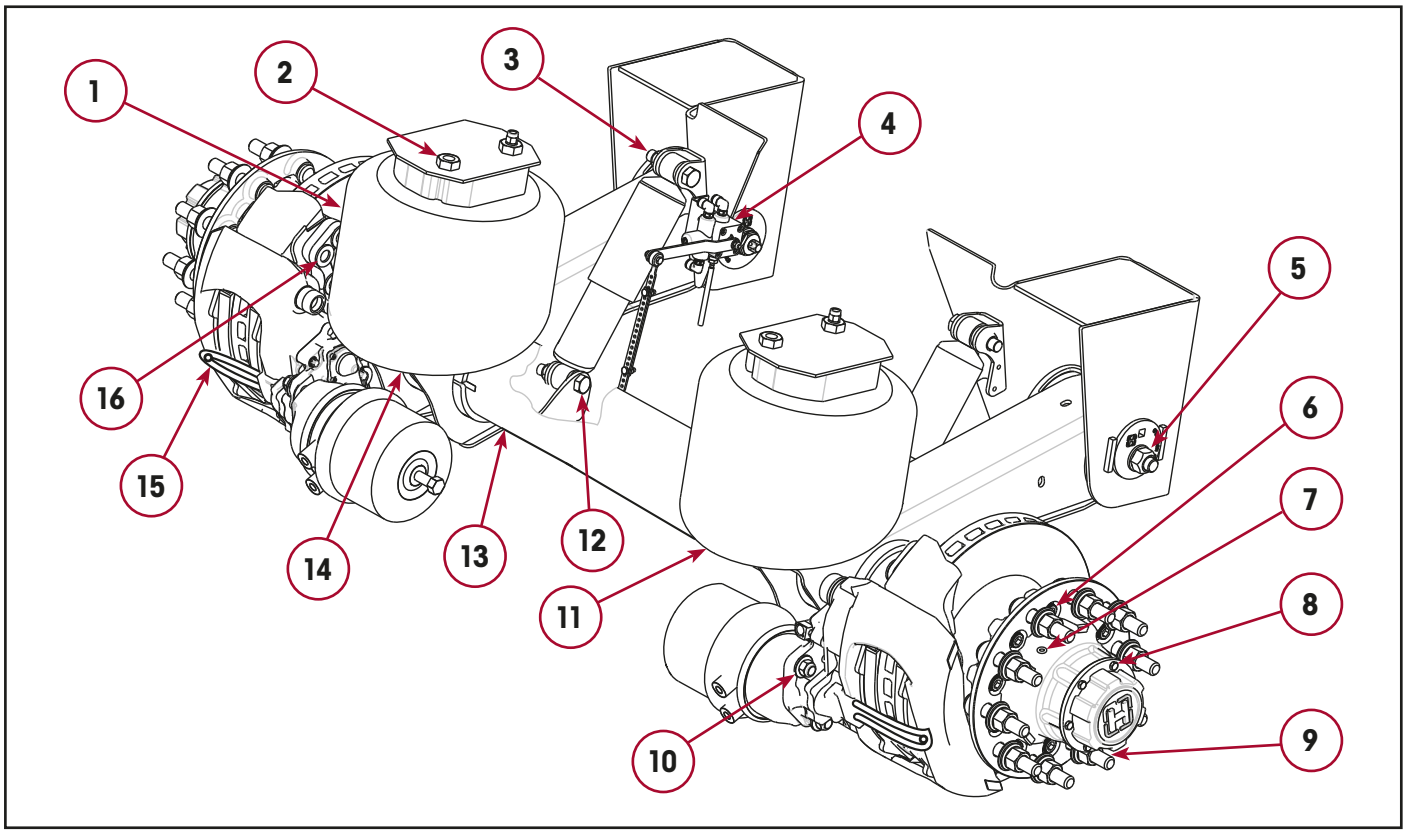
AAL DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Air Spring Nut – Upper	3/4" – 16	135
2	Dust Shield Clamp	–	15
3	Axle Restraint Chain to Clevis Bolt	3/4" – 10	350
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
5	Height Control Valve Fixing Nut	1/4" – 20	10
6	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
7	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
8	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
9	Wheel Nut	M22 x 1.5	610
10	S-Cam Bearing Bolt	3/8" – 16	60
11	Slack Adjuster Anchor Stud	7/16" – 14	60
12	Lower Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320*
13	Brake Chamber Mounting Nut	5/8" – 11	150
14	Lower Shock Absorber Support Bolt	3/8" – 16	60
15	Air Spring Nut – Lower	1/2" – 13	45

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAT DISC BRAKE (EXCLUDING MAXX22T)

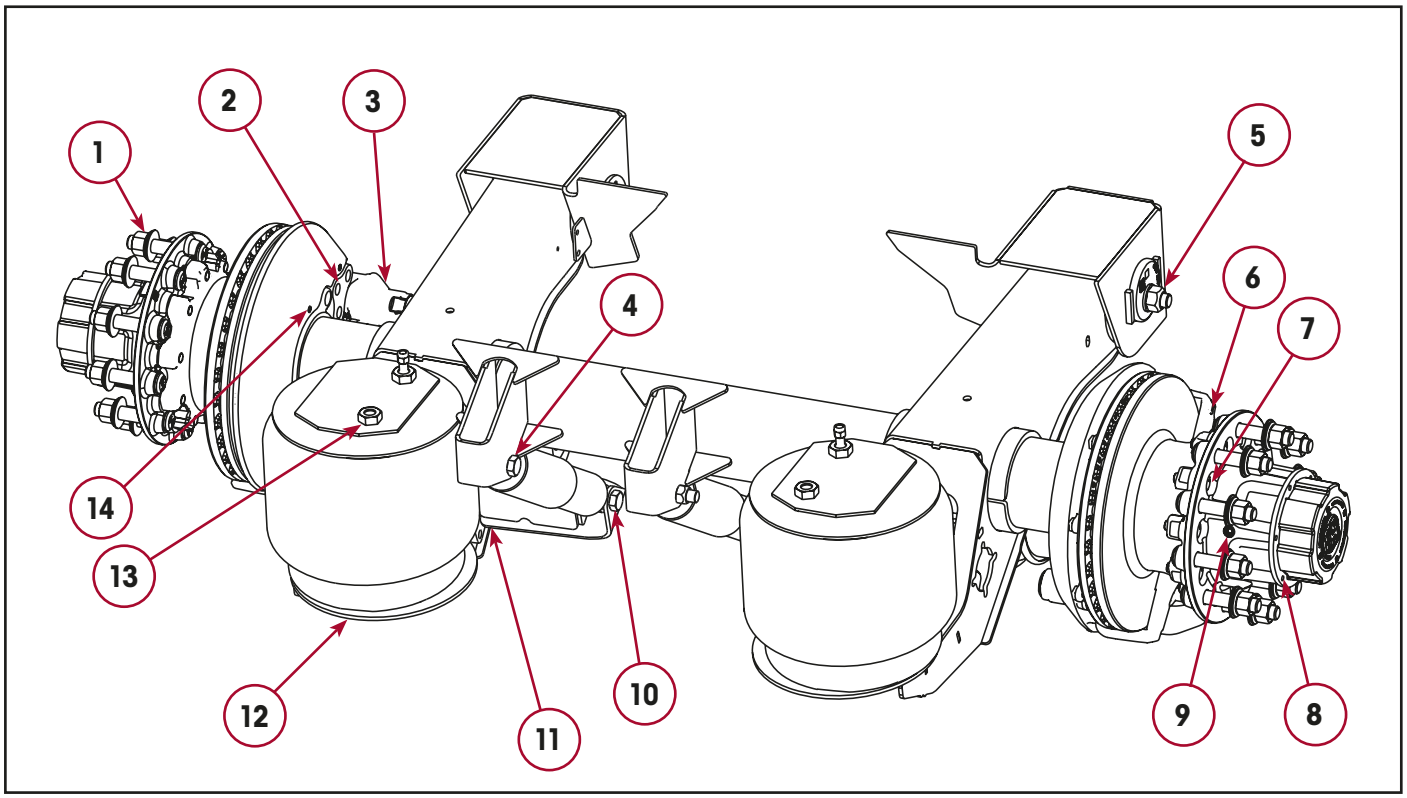


Item	Description	Thread/Grade	Torque (Nm)
1	Dust Shield Bolt (Bolt-On Style)	M8 x 1.25	20
2	Air Spring Nut – Upper	3/4" – 16	135
3	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
4	Height Control Valve Fixing Nut	1/4" – 20	10
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
	Rotor to Hub Mount Nut - ConMet	5/8" – 18 UNF	265
7	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
8	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
9	Wheel Nut	M22 x 1.5	610
10	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
11	Air Spring Nut – Lower	1/2" – 13	45
12	Lower Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320*
13	Lower Shock Absorber Support Bracket Bolt	3/8" – 16	60
14	Pedestal Mount Bolt	3/8" – 16	60
15	Brake Pad Retaining Bar Screw	M8 x 2	45
16	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAL DISC BRAKE (EXCLUDING MAXX22T)

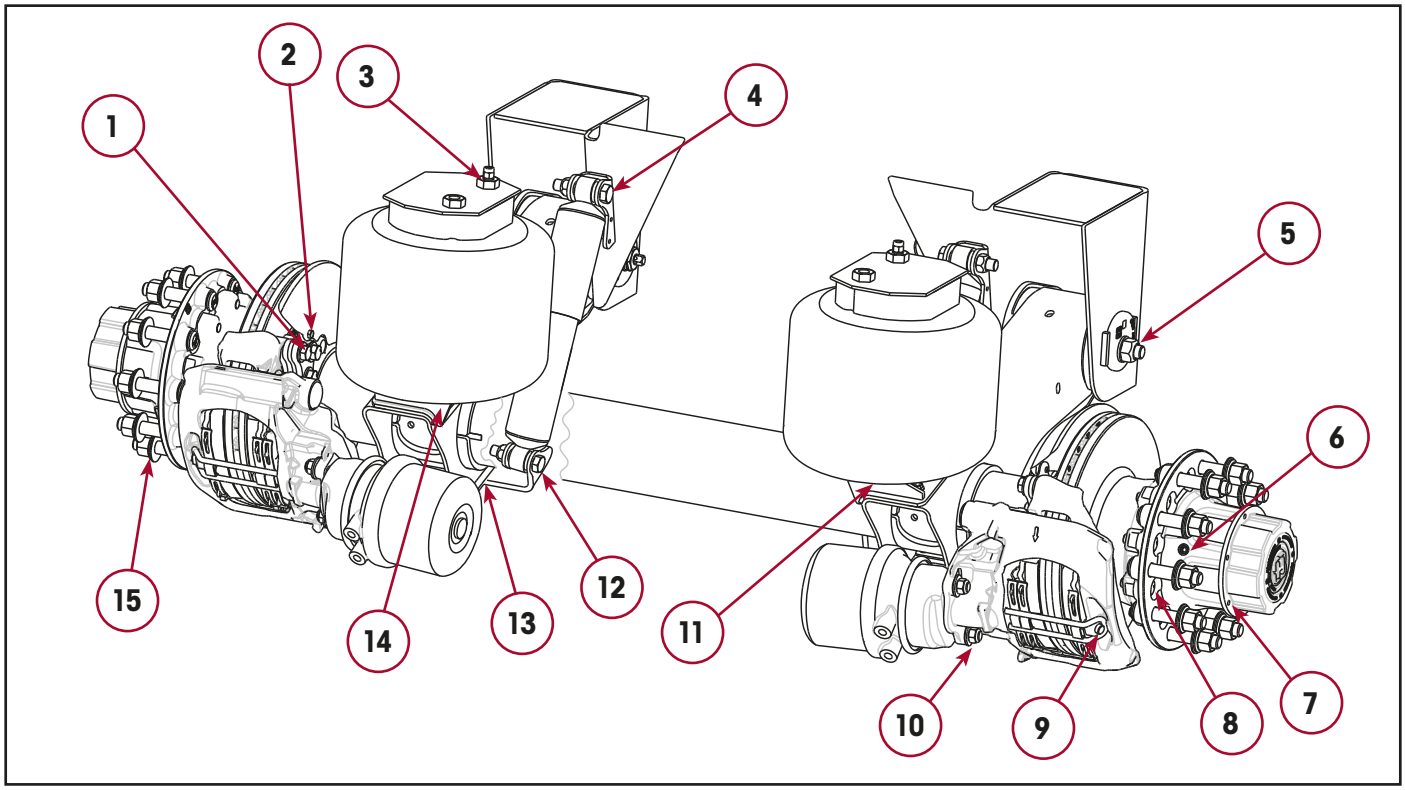


Item	Description	Thread/Grade	Torque (Nm)
1	Wheel Nut	M22 x 1.5	610
2	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475
3	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Brake Pad Retaining Bar Screw	M8 x 2	45
7	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
	Rotor to Hub Mount Nut - ConMet	5/8" – 18 UNF	265
8	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
9	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
10	Lower Shock Absorber Mount Bolt	3/4" – 10	320
11	Lower Shock Absorber Tower Bolt	1/2" – 13, Grade 8	150
12	Air Spring Nut – Lower	1/2" – 13	45
13	Air Spring Nut – Upper	3/4" – 16	135
14	Dust Shield Bolt (Bolt-On Style)	M8 x 1.25	20
15	Height Control Valve Fixing Nut (not shown)	1/4" – 20	10
16	Axle Restraint Chain to Clevis Bolt (not shown)	3/4" – 10	350

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAT MAXX22T™ HTD-415 DISC BRAKE

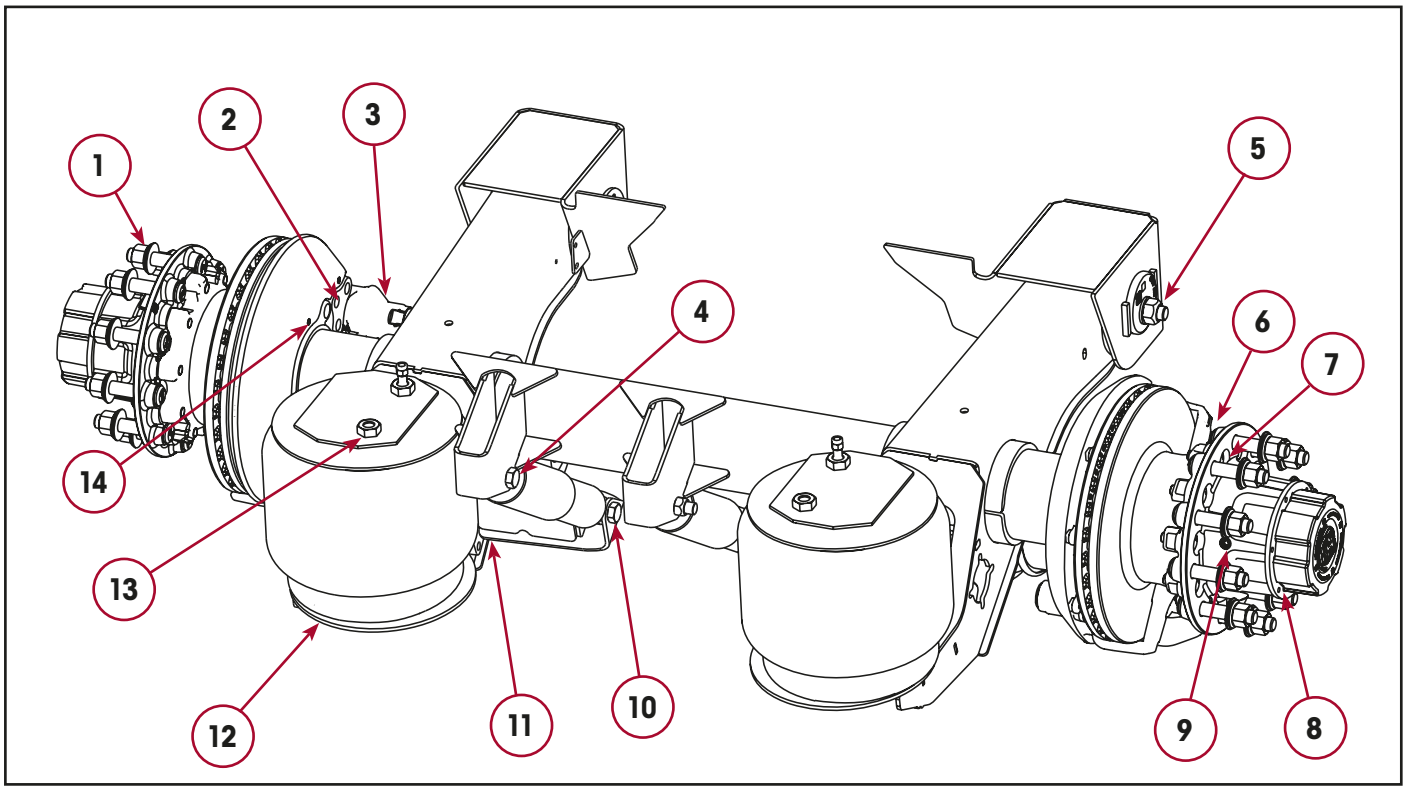


Item	Description	Thread/Grade	Torque (Nm)
1	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
2	Dust Shield Bolt	M8 x 1.25	20
3	Air Spring Nut – Upper	3/4" – 16	135
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Hub Filler Port	3/8" – 18 NPTF	30
7	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
8	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
9	Brake Pad Retaining Bar Screw	M8 x 2, 8.8 Class	45
10	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
11	Air Spring Nut – Lower	1/2" – 13	45
12	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
13	Lower Shock Absorber Support Bracket Bolt	3/8" – 16	60
14	Pedestal Mount Bolt	3/8" – 16	60
15	Wheel Nut	M22 x 1.5	610
16	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAL MAXX22T™ HTD-415 DISC BRAKE

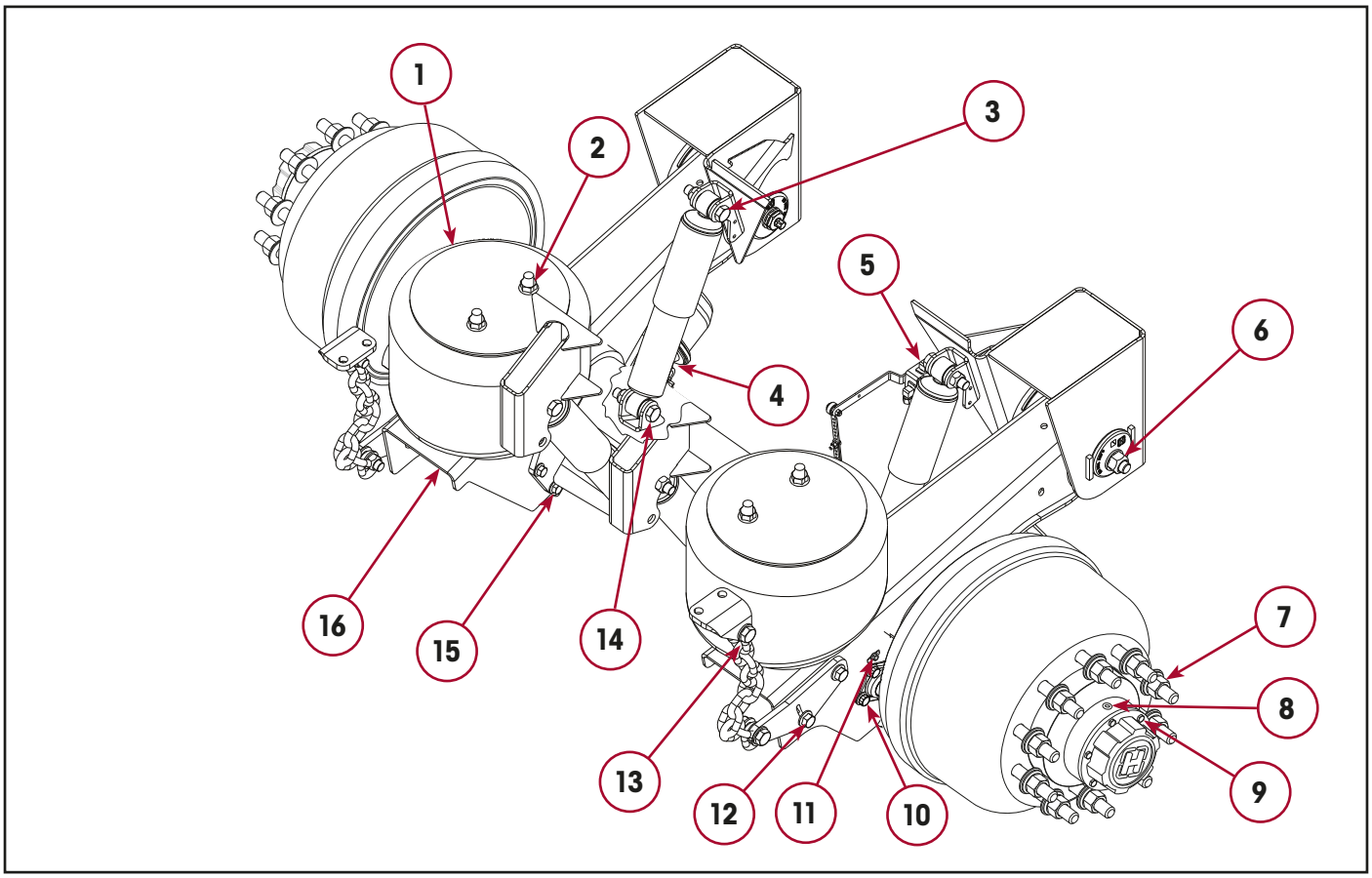


Item	Description	Thread/Grade	Torque (Nm)
1	Wheel Nut	M22 x 1.5	610
2	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
3	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Brake Pad Retaining Bar Screw	M8 x 2, 8.8 Class	45
7	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
8	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
9	Hub Filler Port	3/8" – 18 NPTF	30
10	Lower Shock Absorber Mount Bolt	3/4" – 10	320
11	Lower Shock Absorber Tower Bolt	1/2" – 13, Grade 8	150
12	Air Spring Nut – Lower	1/2" – 13	45
13	Air Spring Nut – Upper	3/4" – 16	135
14	Dust Shield Bolt	M8 x 1.25	20
15	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

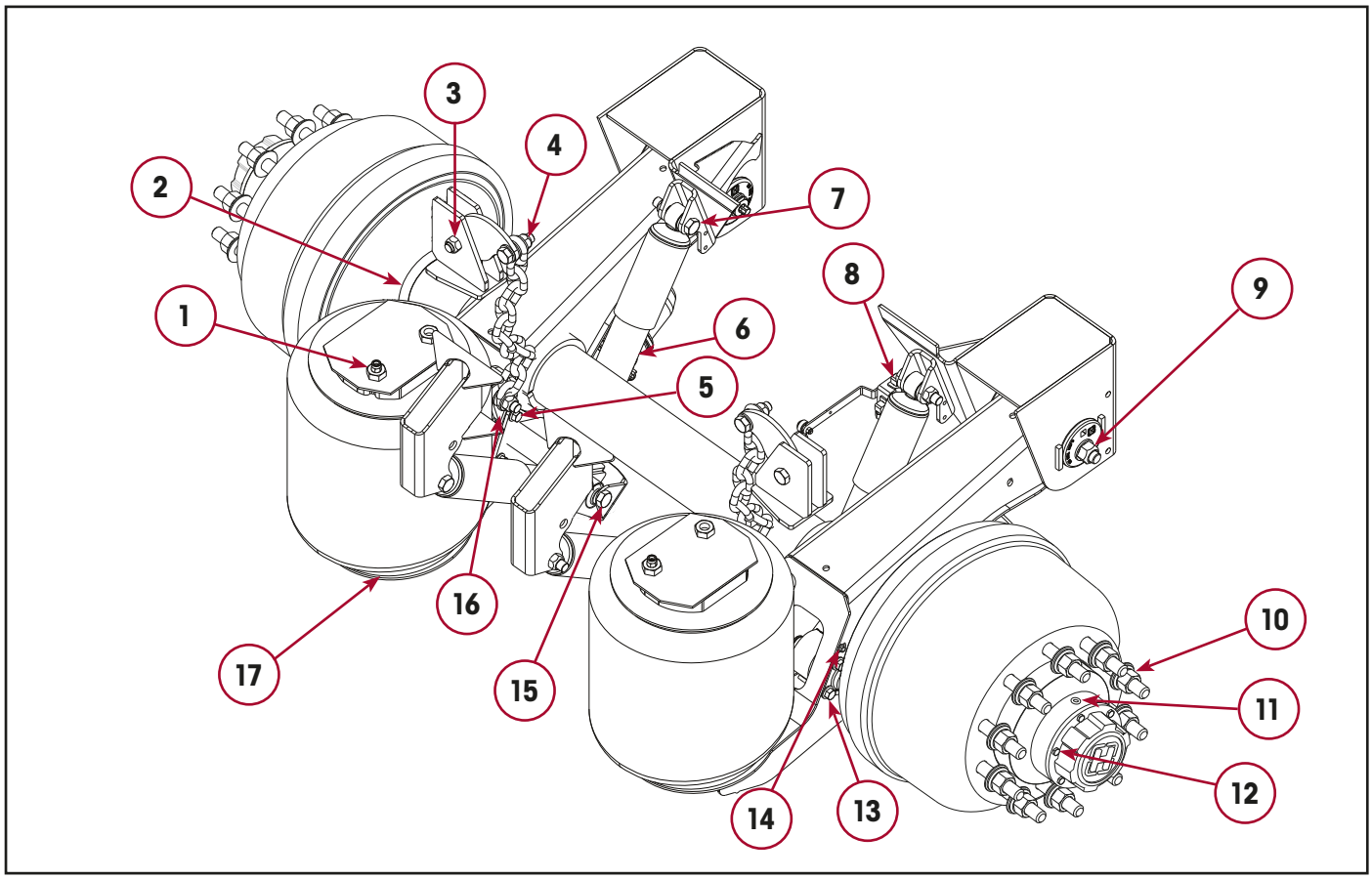
EDT300 DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Brake Dust Shield Clamp	–	15
2	Air Spring Nut – Upper	3/4" – 16	135
3	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
4	Brake Chamber Mounting Nut	5/8" – 11	150
5	Height Control Valve Fixing Nut	1/4" – 20	10
6	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
7	Wheel Nut	M22 x 1.5	610
8	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
9	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
10	S-Cam Bearing Bolt	3/8" – 16	60
11	Slack Adjuster Anchor Stud	7/16" – 14	60
12	Lower Chain Bracket Bolt	5/8" – 11	270
13	Chain Attachment Bolt	3/4" – 10	350
14	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
15	Lower Rear Shock Tower Bolt	1/2" – 13	150
16	Air Spring Nut – Lower	1/2" – 13	45

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

EDL300 DRUM BRAKE

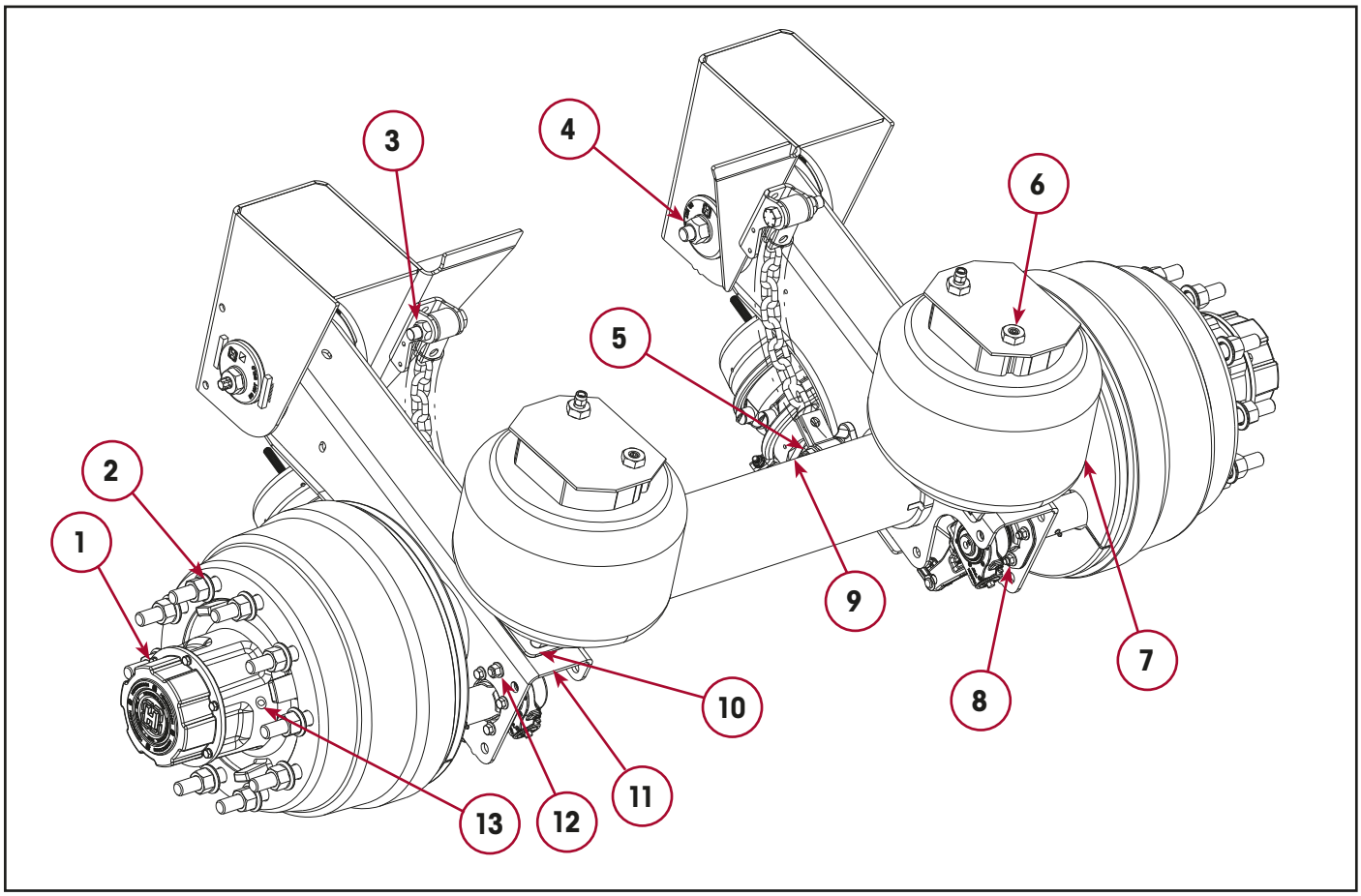


Item	Description	Thread/Grade	Torque (Nm)
1	Air Spring Nuts – Upper	3/4" – 16	135
2	Brake Dust Shield Clamp	–	15
3	Upper Chain Bracket Bolt	3/4" – 10	350
4	Chain Attachment Bolt	3/4" – 10	350
5	Lower Rear Shock Tower Bolt	1/2" – 13	150
6	Brake Chamber Mounting Nut	5/8" – 11	150
7	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
8	Height Control Valve Fixing Nut	1/4" – 20	10
9	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
10	Wheel Nut	M22 x 1.5	610
11	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
12	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
13	S-Cam Bearing Bolt	3/8" – 16	60
14	Slack Adjuster Anchor Stud	7/16" – 14	60
15	Lower Shock Absorber Mount Bolt	3/4" – 10	320
16	Lower Chain Bracket Bolt	5/8" – 11	270
17	Air Spring Nut – Lower	1/2" – 13	45

* Shear-head bolts are used for pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

INTRAAX WIDE BUSH – ZMD

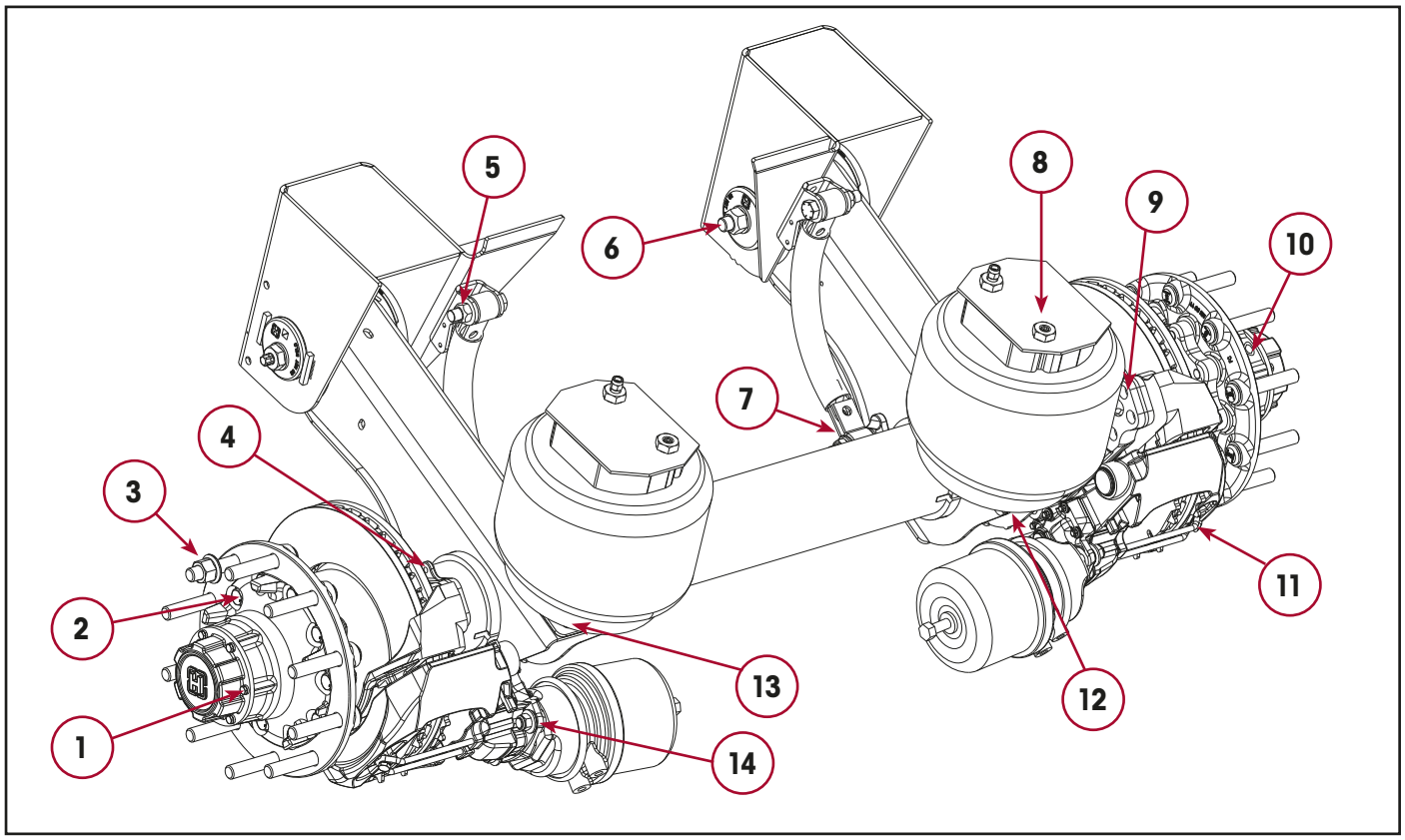
AAT ZMD™ DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	Downstop Upper Chain Mount Bolt	3/4" – 10, Grade 8	430
4	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
5	Downstop Lower Chain Mount Bolt	3/4" – 10, Grade 5	320*
6	Air Spring Nut – Upper	3/4" – 16	135
7	Dust Shield Clamp	–	15
8	S-Cam Bearing Bolt	3/8" – 16	60
9	Brake Chamber Mounting Nut	5/8" – 11	150
10	Pedestal Mount Bolt	3/8" – 16	60
11	Air Spring Nut – Lower	1/2" – 13	45
12	Slack Adjuster Anchor Stud	7/16" – 14	60
13	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
14	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

* Shear-head bolts are used for pivot alignment & lower downstop. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAT ZMD™ DISC BRAKE (EXCLUDING MAXX22T)

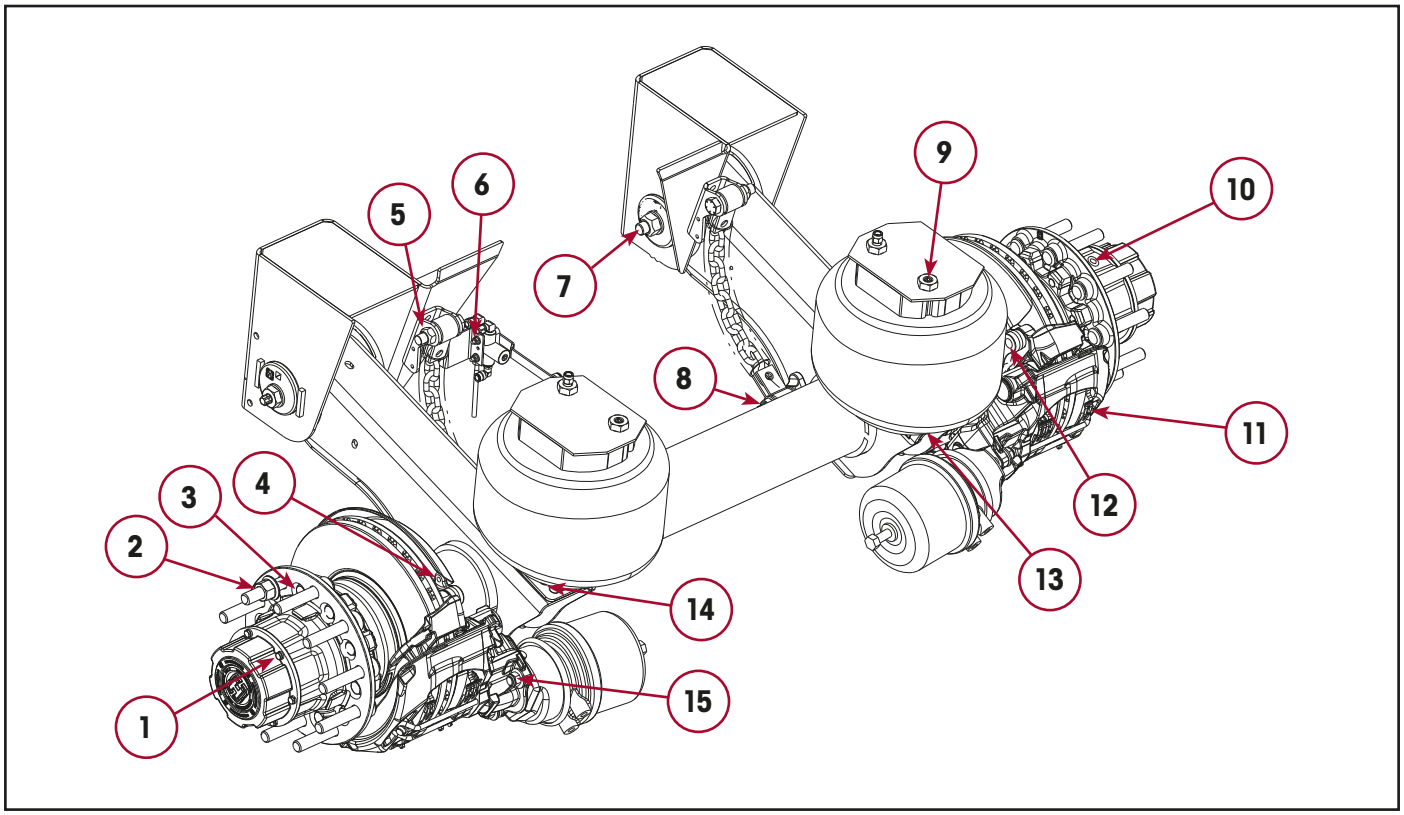


Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
	Rotor to Hub Mount Nut - ConMet	5/8" – 18 UNF	265
3	Wheel Nut	M22 x 1.5	610
4	Dust Shield Bolt (Bolt-On Style)	M8 x 1.25	20
5	Downstop Upper Chain Mount Bolt	3/4" – 10, Grade 8	430
6	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
7	Downstop Lower Chain Mount Bolt	3/4" – 10, Grade 5	320*
8	Air Spring Nut – Upper	3/4" – 16	135
9	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475
10	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
11	Brake Pad Retaining Bar Screw	M8 x 2	45
12	Air Spring Nut – Lower	1/2" – 13	45
13	Pedestal Mount Bolt	3/8" – 16	60
14	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
15	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for pivot alignment & lower downstop. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAT ZMD™ MAXX22T™ HTD-415 DISC BRAKE

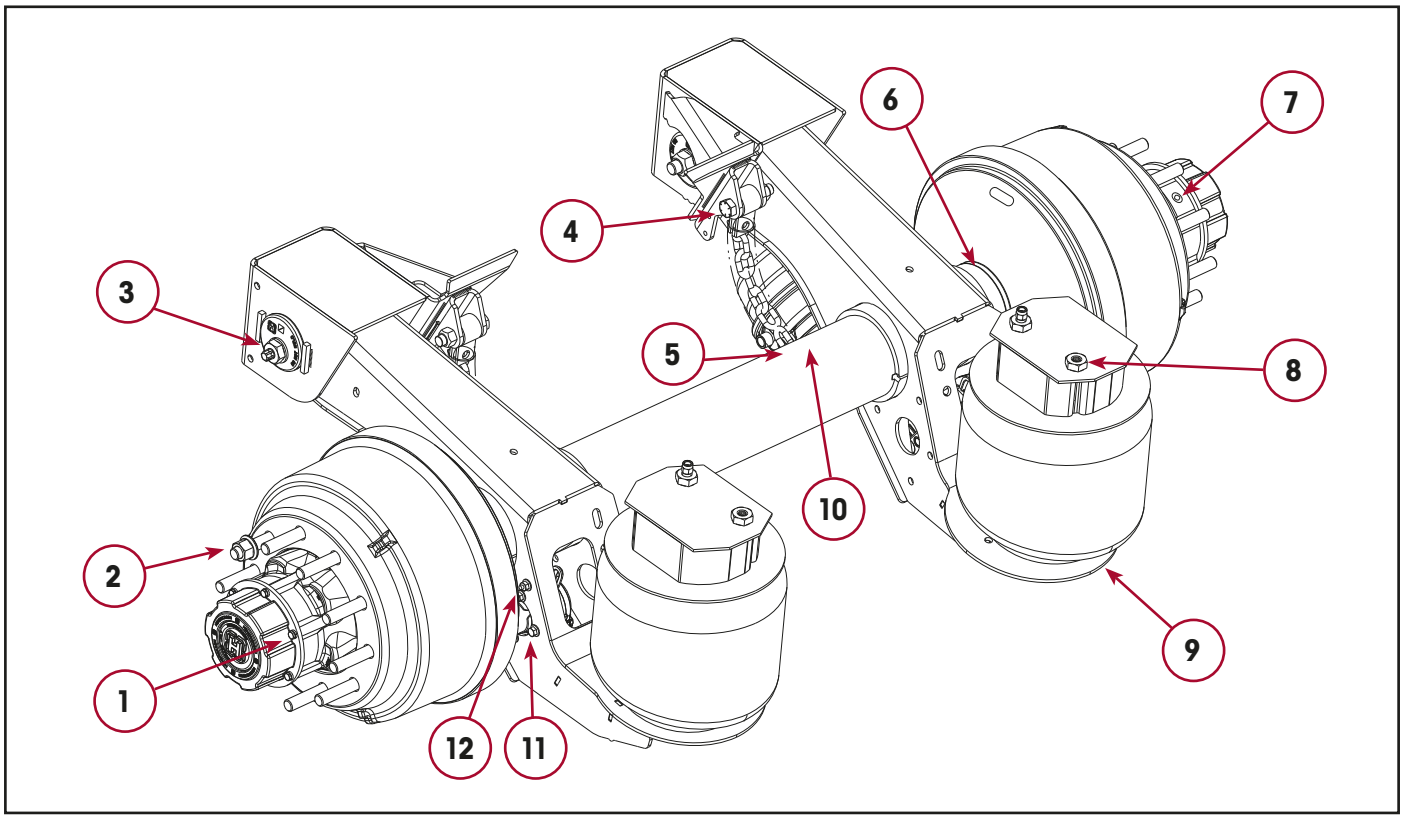


Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
4	Dust Shield Bolt	M8 x 1.25	20
5	Downstop Upper Chain Mount Bolt	3/4" – 10, Grade 8	430
6	Height Control Valve Fixing Nut	1/4" – 20	10
7	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
8	Downstop Lower Chain Mount Bolt	3/4" – 10	320*
9	Air Spring Nut – Upper	3/4" – 16	135
10	Hub Filler Port	3/8" – 18 NPTF	30
11	Brake Pad Retaining Bar Screw	M8 x 2, 8.8 Class	45
12	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
13	Air Spring Nut – Lower	1/2" – 13	45
14	Pedestal Mount Bolt	3/8" – 16	60
15	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for pivot alignment & lower downstop. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AAL ZMD™ DRUM BRAKE

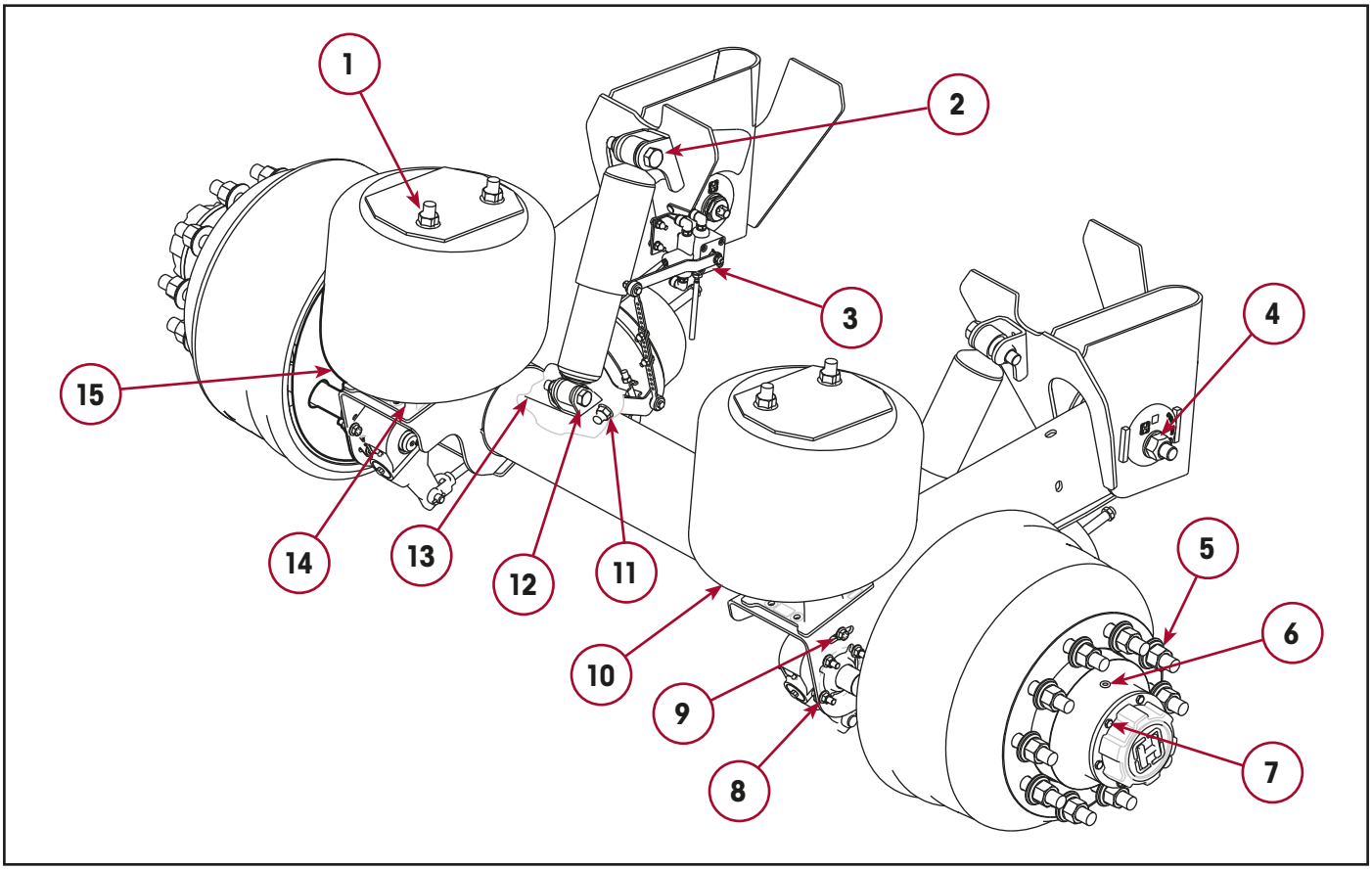


Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
4	Upper Downstop Chain Mount Bolt	3/4" – 10, Grade 8	430
5	Lower Downstop Chain Mount Bolt	3/4" – 10, Grade 5	320*
6	Dust Shield Clamp	–	15
7	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
8	Air Spring Nut – Upper	3/4" – 16	135
9	Air Spring Nut – Lower	1/2" – 13	45
10	Brake Chamber Mounting Nut	5/8" – 11	150
11	S-Cam Bearing Bolt	3/8" – 16	60
12	Slack Adjuster Anchor Stud	7/16" – 14	60
13	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

* Shear-head bolts are used for pivot alignment & lower downstop. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

INTRAAX NARROW BUSH – SHOCKED

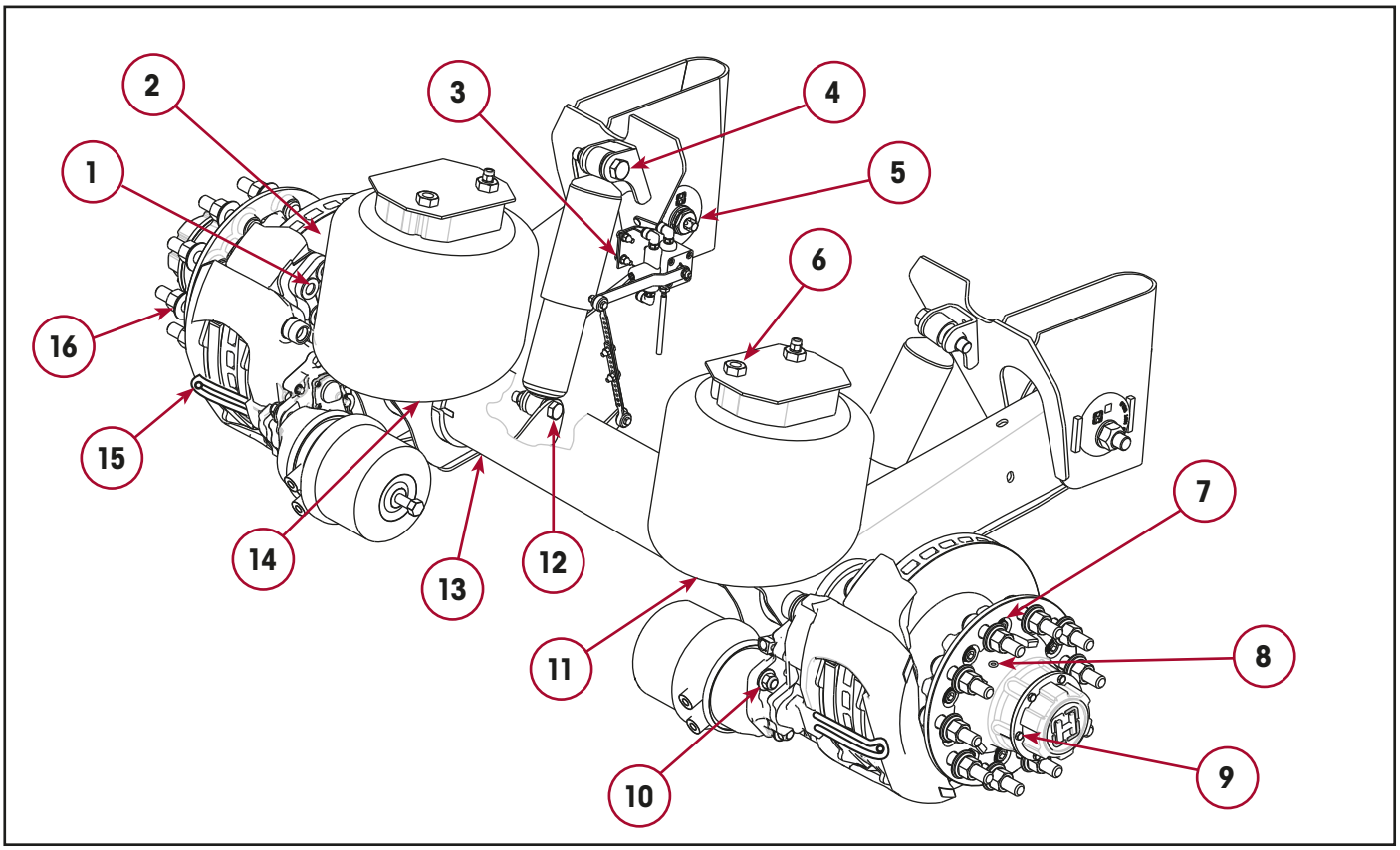
AANT DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Air Spring Nut – Upper	3/4" – 16	135
2	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
3	Height Control Valve Fixing Nut	1/4" – 20	10
4	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
5	Wheel Nut	M22 x 1.5	610
6	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
7	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
8	S-Cam Bearing Bolt	3/8" – 16	60
9	Slack Adjuster Anchor Stud	7/16" – 14	60
10	Air Spring Nut – Lower	1/2" – 13	45
11	Brake Chamber Mounting Nut	5/8" – 11	150
12	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
13	Lower Shock Absorber Support Bracket Bolt	3/8" – 16	60
14	Pedestal Mount Bolt	3/8" – 16	60
15	Dust Shield Clamp	–	15
16	Axle Restraint Chain to Clevis Bolt (not shown)	3/4" – 10	350

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AANT DISC BRAKE (EXCLUDING MAXX22T)

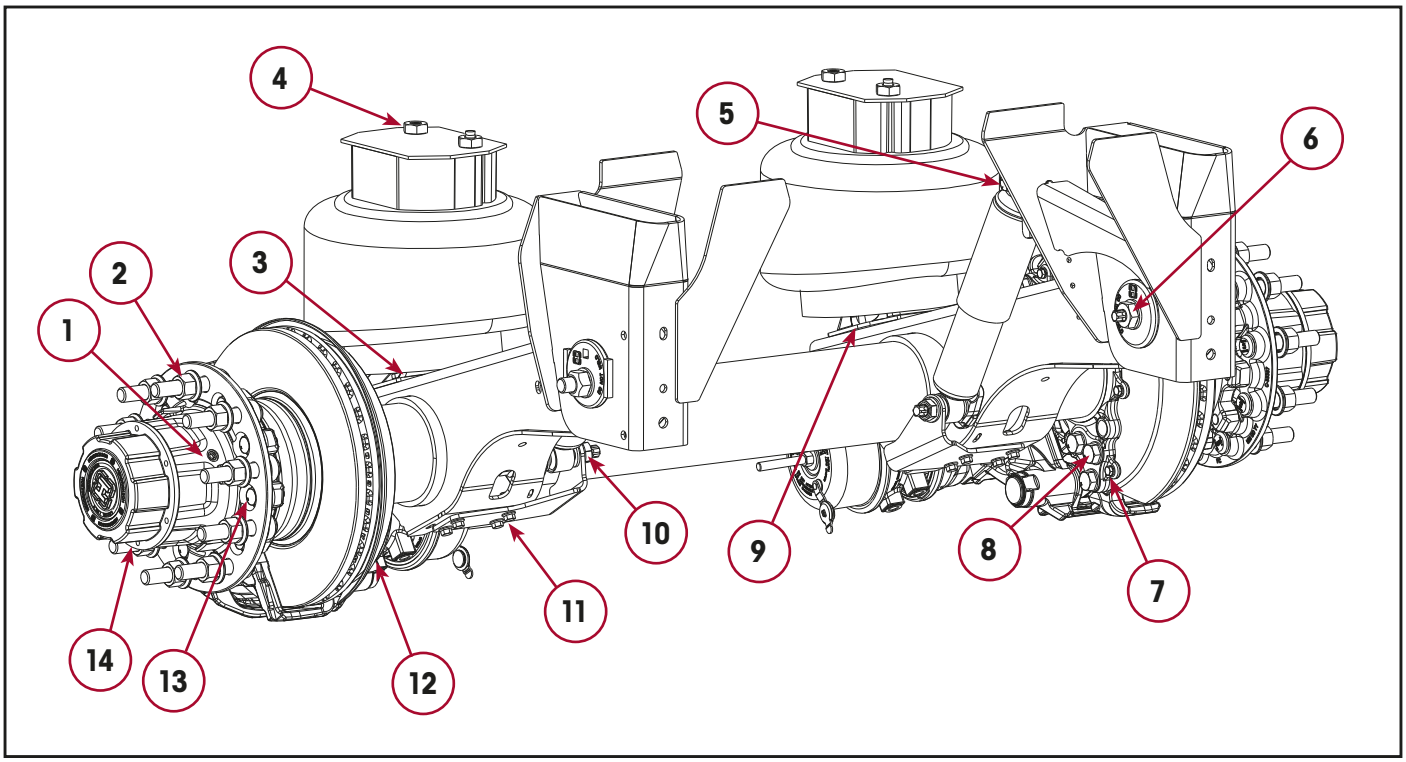


Item	Description	Thread/Grade	Torque (Nm)
1	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475
2	Dust Shield Bolt (Bolt-On Style)	M8 x 1.25	20
3	Height Control Valve Fixing Nut	1/4" – 20	10
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Air Spring Nut – Upper	3/4" – 16	135
7	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
8	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
9	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
10	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
11	Air Spring Nut – Lower	1/2" – 13	45
12	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
13	Lower Shock Absorber Support Bracket Bolt	3/8" – 16	60
14	Pedestal Mount Bolt	3/8" – 16	60
15	Brake Pad Retaining Bar Screw	M8 x 2	45
16	Wheel Nut	M22 x 1.5	610

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

AANT MAXX22T™ HTD-415 DISC BRAKE

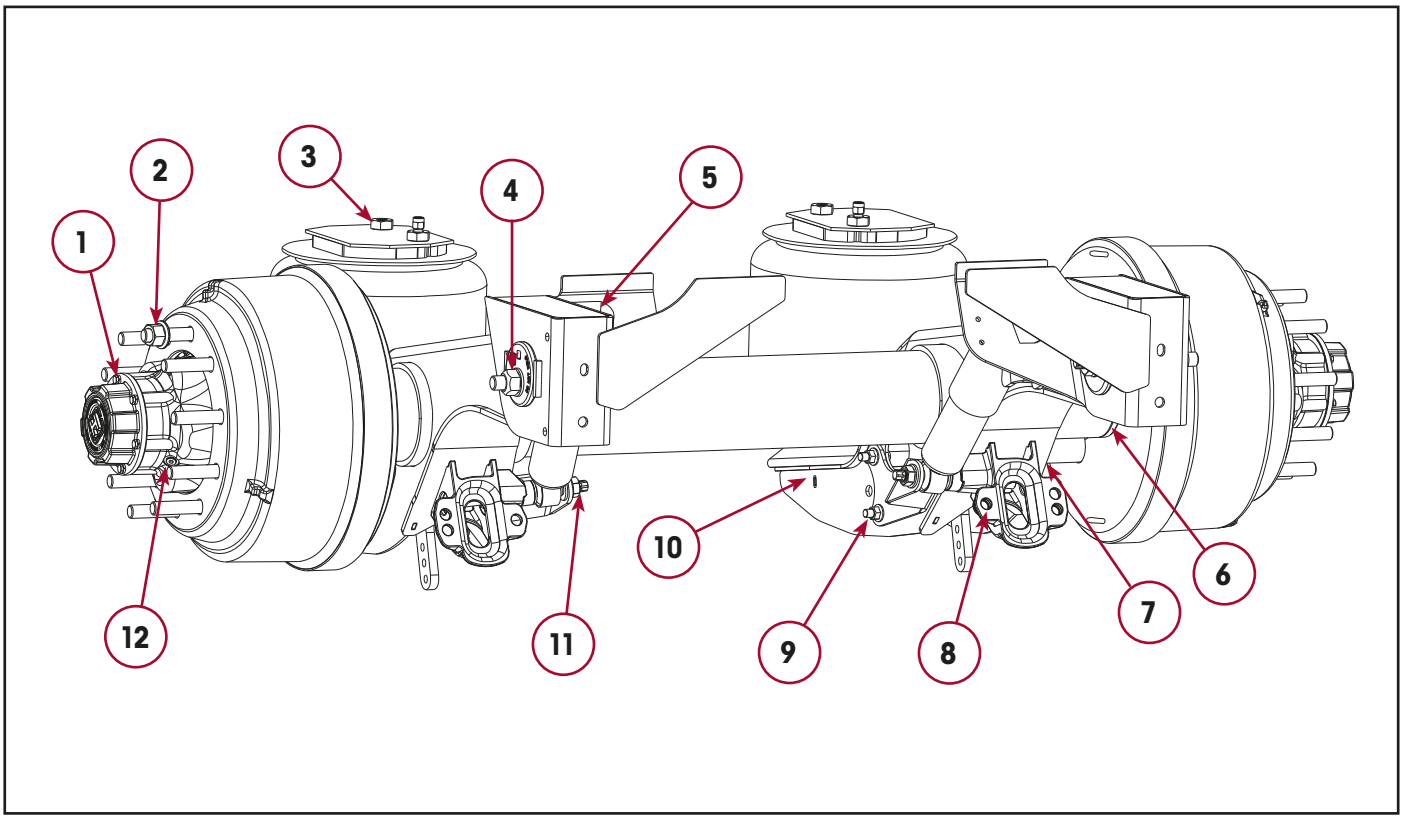


Item	Description	Thread/Grade	Torque (Nm)
1	Hub Filler Port	3/8" – 18 NPTF	30
2	Wheel Nut	M22 x 1.5	610
3	Air Spring Nut – Lower	1/2" – 13	45
4	Air Spring Nut – Upper	3/4" – 16	135
5	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
6	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
7	Dust Shield Bolt	M8 x 1.25	20
8	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
9	Pedestal Mount Bolt	3/8" – 16	60
10	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
11	Lower Shock Absorber Support Bracket Bolt	3/8" – 16	60
12	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
13	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
14	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
15	Brake Pad Retaining Bar Screw (Not shown)	M8 x 2, 8.8 Class	45
16	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

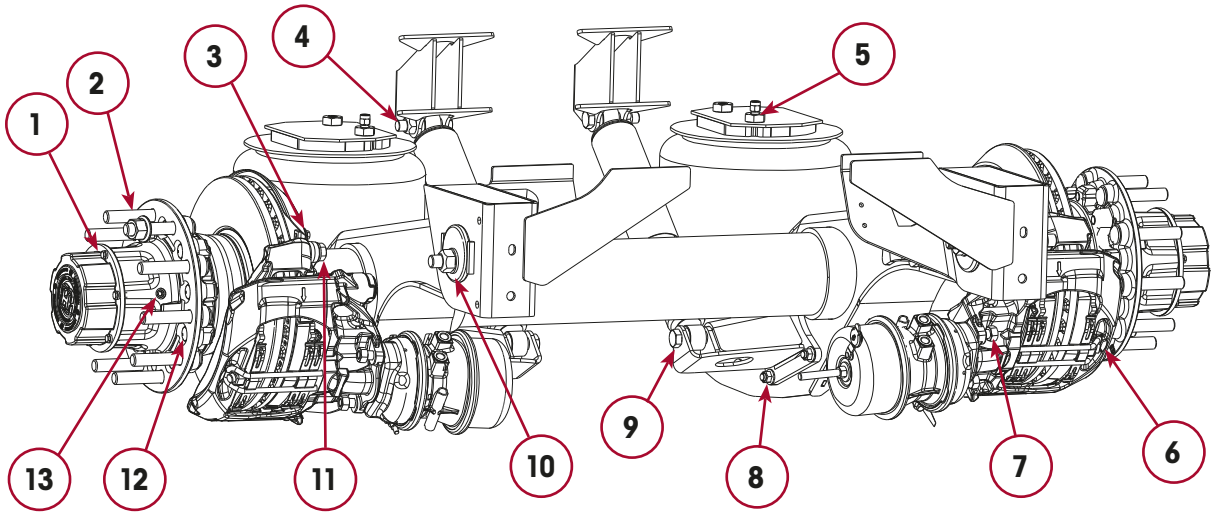
AANL DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	Air Spring Nut – Upper	3/4" – 16	135
4	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
5	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 8	430
6	Dust Shield Clamp	–	15
7	S-Cam Bearing Bolt	3/8" – 16	60
8	Brake Chamber Mounting Nut	5/8" – 11	150
9	Lower Shock Absorber Support Bolt	1/2" – 13 UNC, Grade 5	100
10	Air Spring Nut – Lower	1/2" – 13	45
11	Lower Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320*
12	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
13	Slack Adjuster Anchor Stud (Not shown)	7/16" – 14	60
14	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AANL MAXX22T™ HTD-415 DISC BRAKE



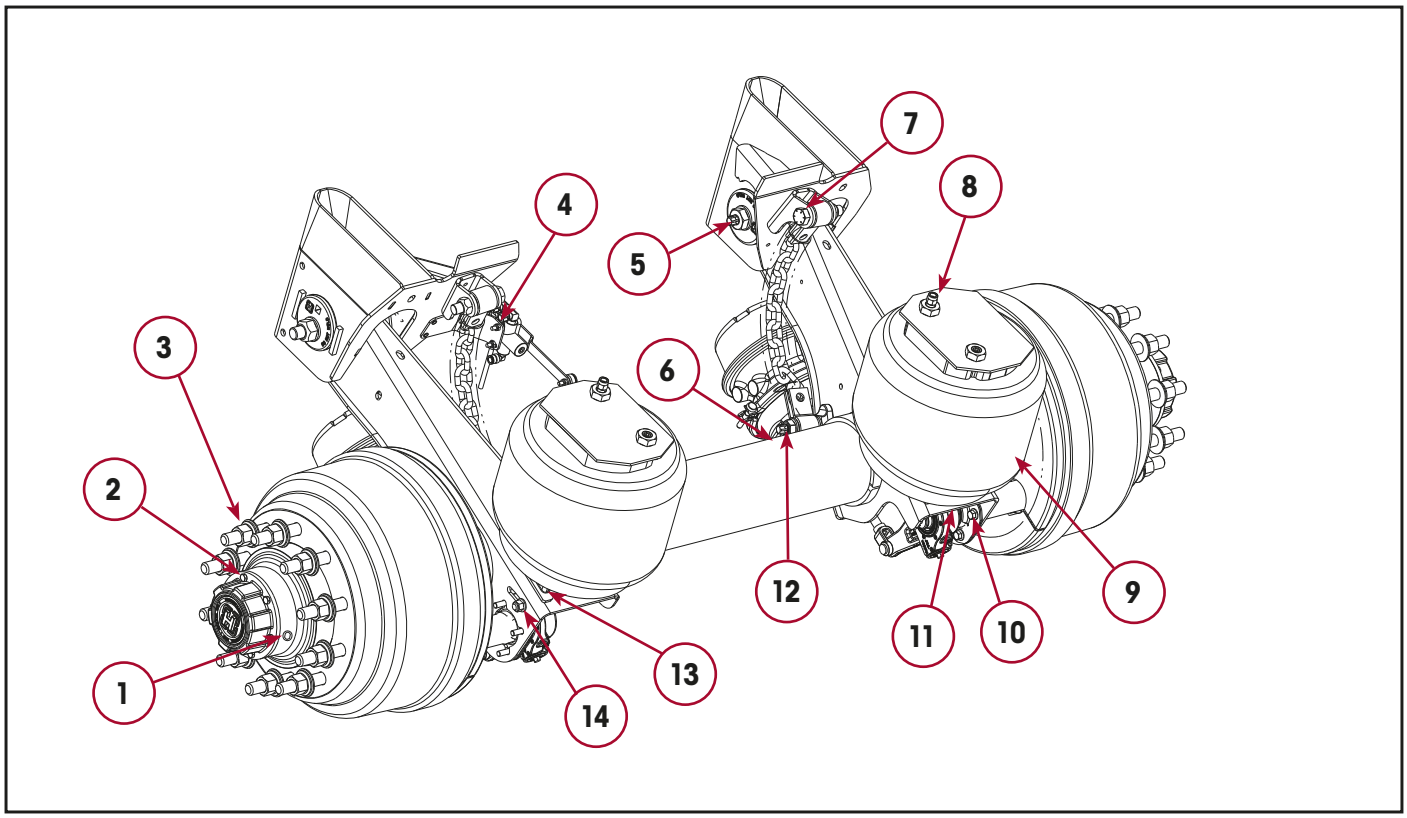
Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	Dust Shield Bolt	M8 x 1.25	20
4	Upper Shock Absorber Mount Bolt	3/4" – 10, Grade 5	320
5	Air Spring Nut – Upper	3/4" – 16	135
6	Brake Pad Retaining Bar Screw	M8 x 2, 8.8 Class	45
7	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
8	Lower Shock Absorber Tower Bolt	1/2" – 13, Grade 8	150
9	Lower Shock Absorber Mount Bolt	3/4" – 10	320
10	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
11	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
12	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
13	Hub Filler Port	3/8" – 18 NPTF	30
14	Air Spring Nut – Lower (Not shown)	1/2" – 13	45
15	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

INTRAAX NARROW BUSH – ZMD

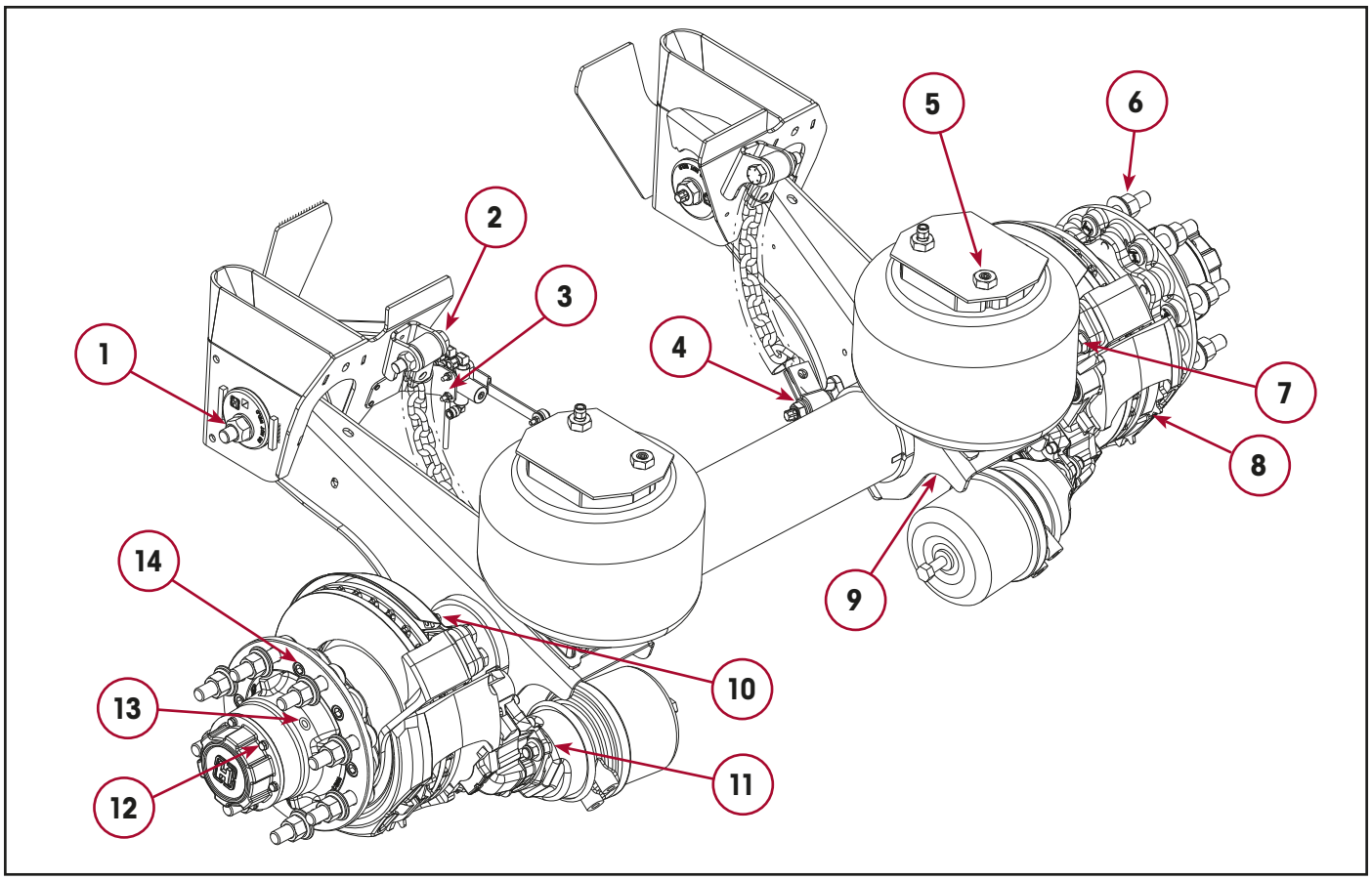
AANT ZMD™ DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
2	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
3	Wheel Nut	M22 x 1.5	610
4	Height Control Valve Fixing Nut	1/4" – 20	10
5	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
6	Brake Chamber Mounting Nut	5/8" – 11	150
7	Downstop Upper Chain Bolt	3/4" – 10, Grade 8	430
8	Air Spring Nut – Upper	3/4" – 16	135
9	Dust Shield Clamp	–	15
10	S-Cam Bearing Bolt	3/8" – 16	60
11	Air Spring Nut – Lower	1/2" – 13	45
12	Downstop Lower Chain Bolt	3/4" – 10	320*
13	Pedestal Mount Bolt	3/8" – 16	60
14	Slack Adjuster Anchor Stud	7/16" – 14	60

***** Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AANT ZMD™ DISC BRAKE (EXCLUDING MAXX22T)

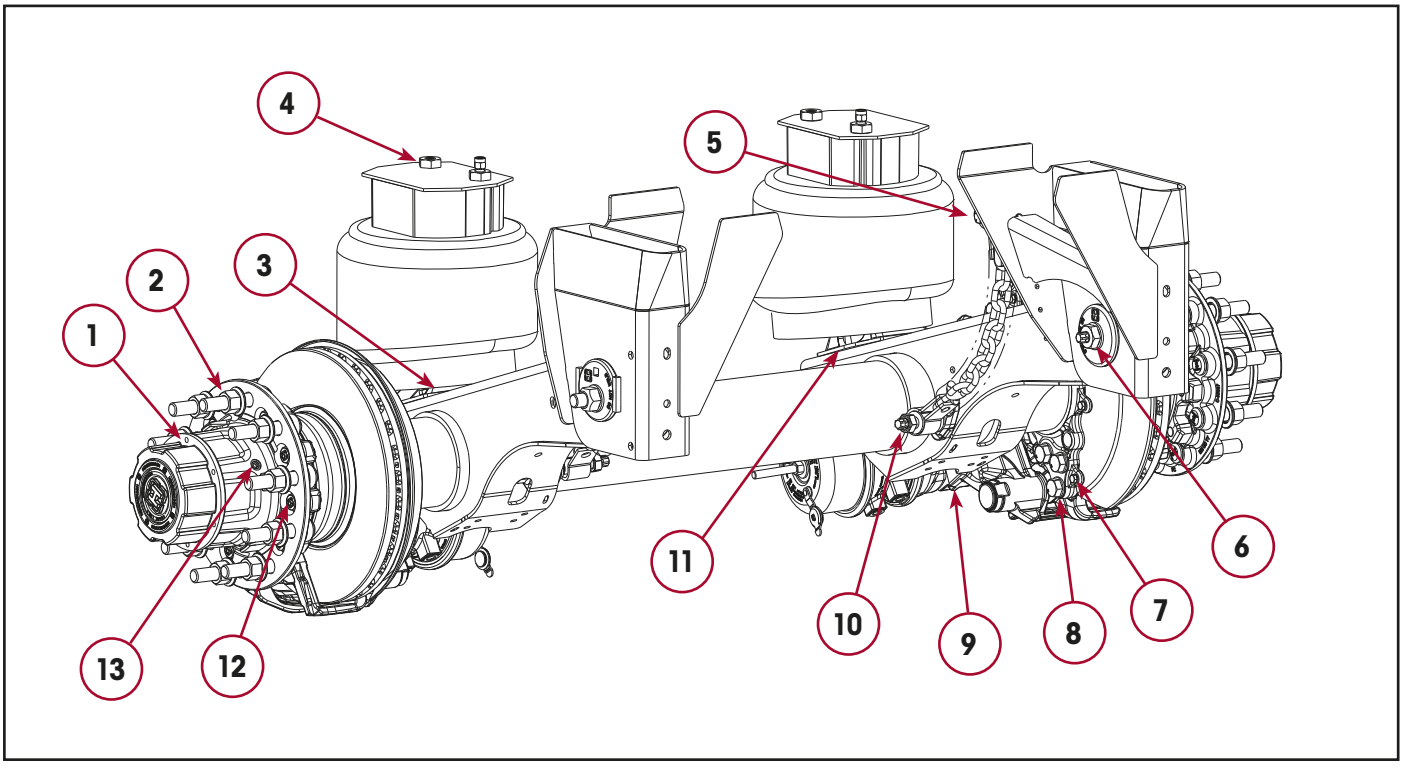


Item	Description	Thread/Grade	Torque (Nm)
1	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
2	Downstop Upper Chain Bolt	3/4" – 10, Grade 8	430
3	Height Control Valve Fixing Nut	1/4" – 20	10
4	Downstop Lower Chain Bolt	3/4" – 10	320*
5	Air Spring Nut – Upper	3/4" – 16	135
6	Wheel Nut	M22 x 1.5	610
7	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475
8	Brake Pad Retaining Bar Screw	M8 x 2	45
9	Air Spring Nut – Lower	1/2" – 13	45
10	Dust Shield Bolt	M8 x 1.25	20
11	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
12	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
13	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
14	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300

* Shear-head bolts are used for pivot alignment & lower downstop. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

AANT ZMD™ MAXX22T™ HTD-415 DISC BRAKE

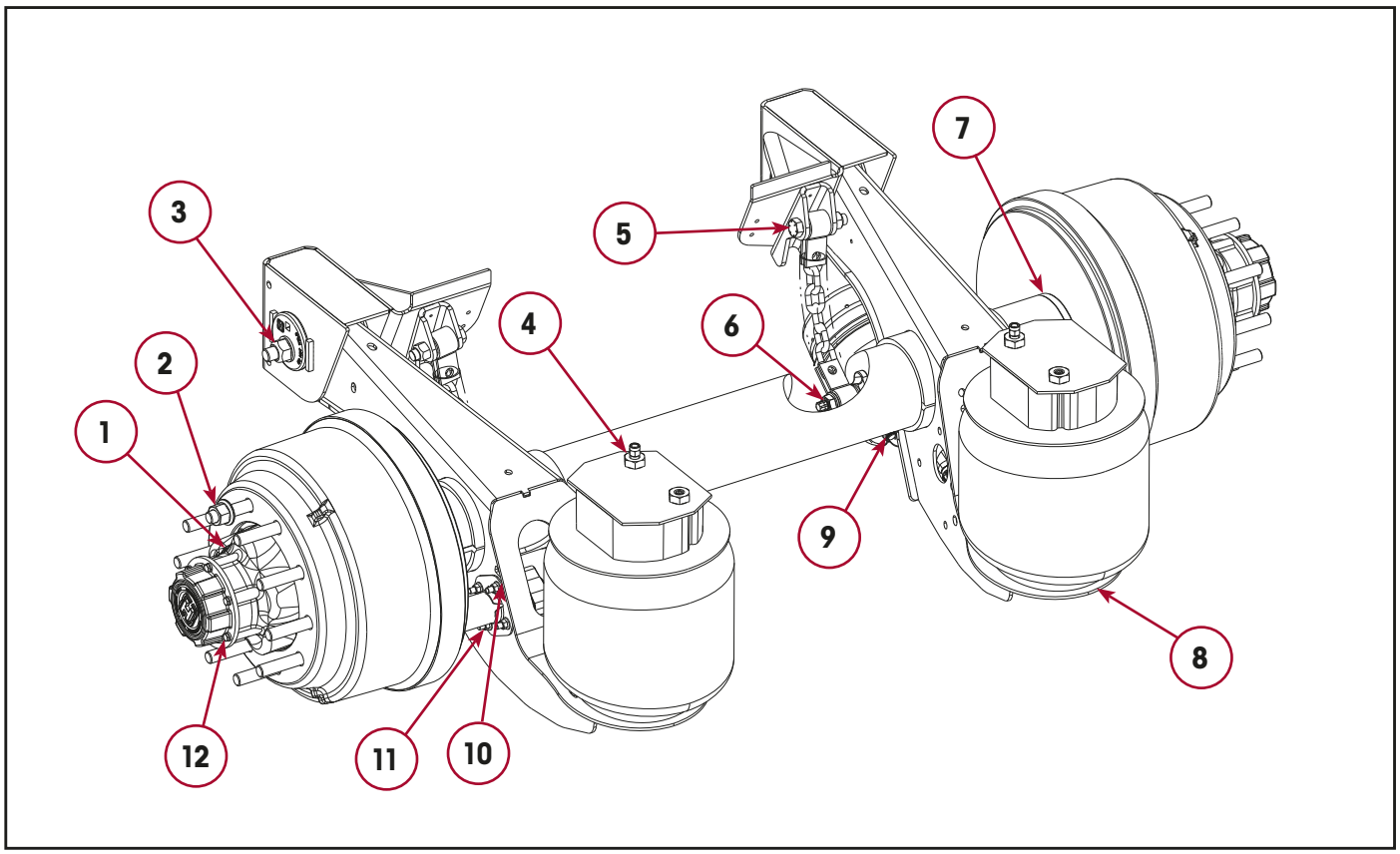


Item	Description	Thread/Grade	Torque (Nm)
1	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
2	Wheel Nut	M22 x 1.5	610
3	Air Spring Nut – Lower	1/2" – 13	45
4	Air Spring Nut – Upper	3/4" – 16	135
5	Downstop Upper Chain Bolt	3/4" – 10, Grade 8	430
6	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
7	Dust Shield Bolt	M8 x 1.25	20
8	Calliper to Torque Plate Mounting Bolt (27mm socket)	M18 x 2.5 x 55	380
11	Pedestal Mount Bolt	3/8" – 16	60
10	Downstop Lower Chain Bolt	3/4" – 10	320*
9	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
12	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
13	Hub Filler Port	3/8" – 18 NPTF	30
14	Brake Pad Retaining Bar Screw (Not shown)	M8 x 2, 8.8 Class	45
15	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

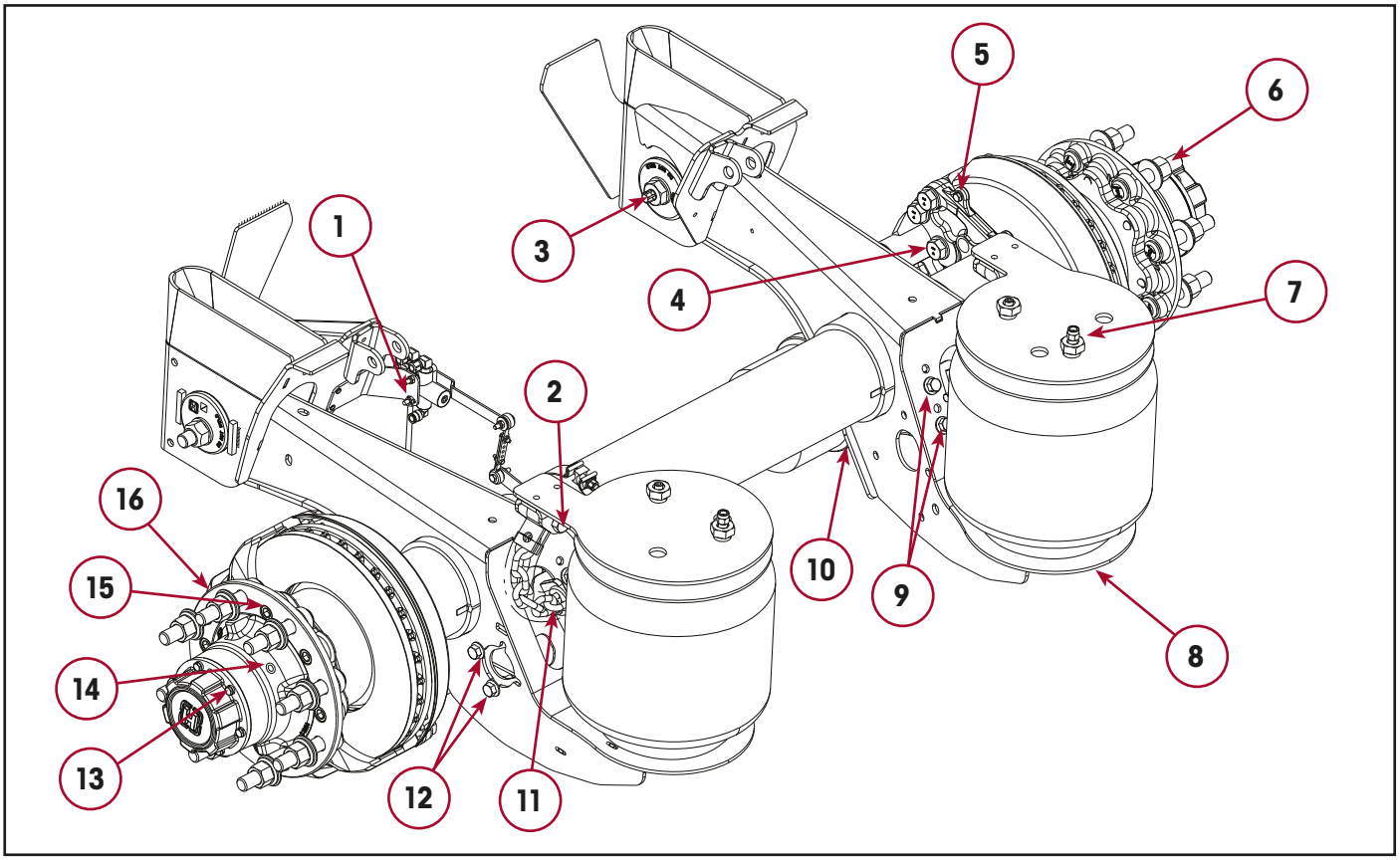
AANL ZMD™ DRUM BRAKE



Item	Description	Thread/Grade	Torque (Nm)
1	Hub Filler Port	3/8" – 18 NPTF or 9/16" – 18	30
2	Wheel Nut	M22 x 1.5	610
3	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
4	Air Spring Nut – Upper	3/4" – 16	135
5	Downstop Upper Chain Bolt	3/4" – 10, Grade 8	430
6	Downstop Lower Chain Bolt	3/4" – 10, Grade 5	320*
7	Dust Shield Clamp	–	15
8	Air Spring Nut – Lower	1/2" – 13	45
9	Brake Chamber Mounting Nut	5/8" – 11	150
10	Slack Adjuster Anchor Stud	7/16" – 14	60
11	S-Cam Bearing Bolt	3/8" – 16	60
12	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
13	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

AANL ZMD™ DISC BRAKE – NEW ZEALAND ONLY (EXCLUDING MAXX22T)

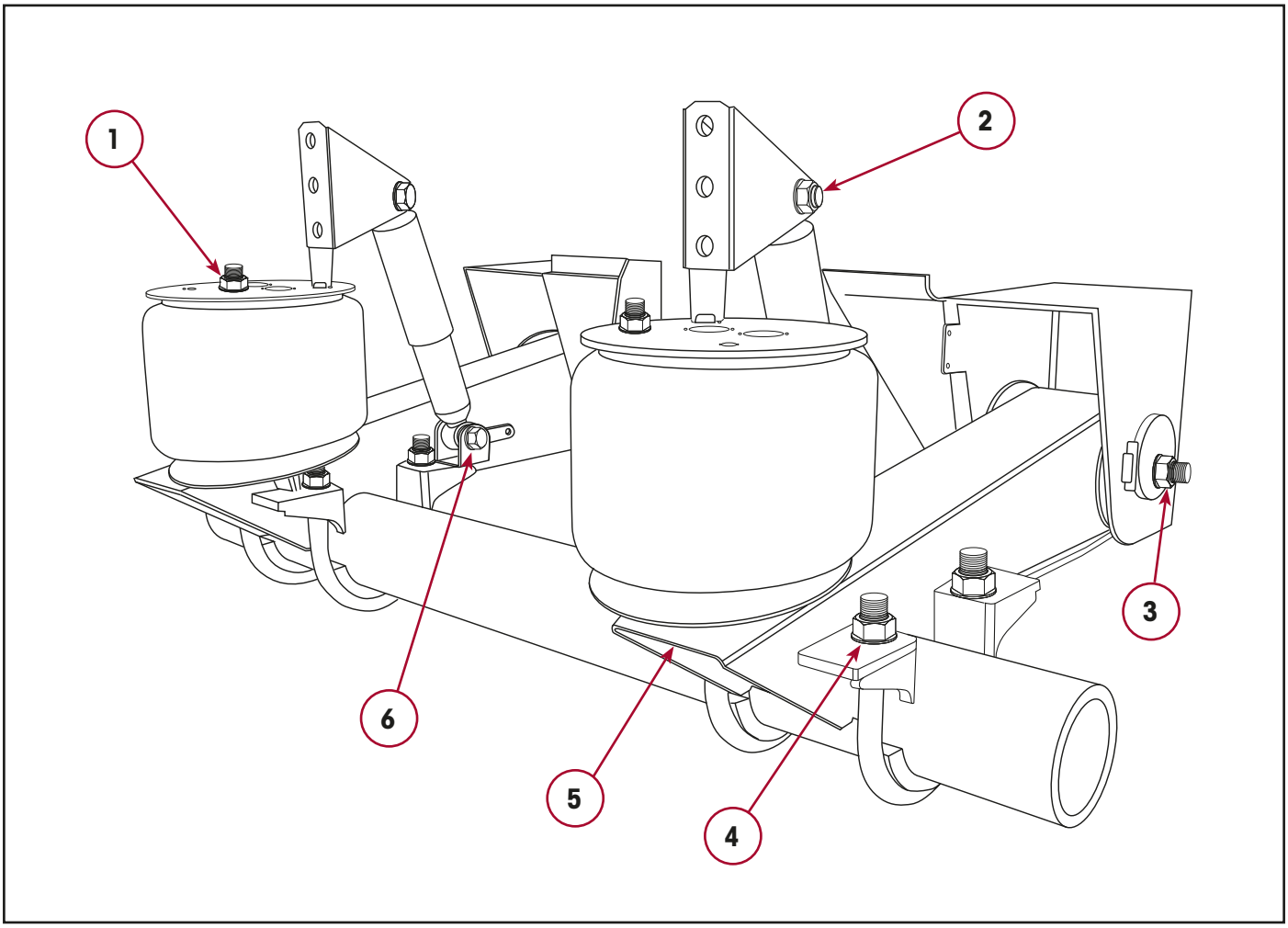


Item	Description	Thread/Grade	Torque (Nm)
1	Height Control Valve Fixing Nut	1/4" – 20	10
2	Downstop Upper Chain Bolt	3/4" – 10, Grade 5	320
3	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
4	Calliper to Torque Plate Mounting Bolt (30mm socket)	M20 x 2.5 x 60	475
5	Dust Shield Bolt	M8 x 1.25	20
6	Wheel Nut	M22 x 1.5	610
7	Air Spring Nut – Upper	3/4" – 16	135
8	Air Spring Nut – Lower	1/2" – 13	45
9	Downstop Bracket Top Mounting Bolts	1/2" – 13, Grade 8	150
10	Brake Chamber Mounting Nut	M16 x 1.5 or 5/8" – 11	1st 100 / 2nd 210#
11	Downstop Lower Mounting Bolt	1/2" – 13, Grade 8	150
12	Downstop Bracket Lower Mounting Bolts	3/8" – 16, Grade 8	60
13	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	20
	Hub Cap Screw (335 PCD)	M8 x 1.25 x 20	20
14	Hub Filler Port	3/8"-18 NPTF or 9/16"-18	30
15	Rotor to Hub – Silver Zinc Coated Bolt and Washer	M16 x 2	270
	Rotor to Hub – Black Phosphate Bolt & Washer or Socket Bolt	M16 x 2	300
16	Brake Pad Retaining Bar Screw	M8 x 2	45

* Shear-head bolts are used for axle pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

M16 brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

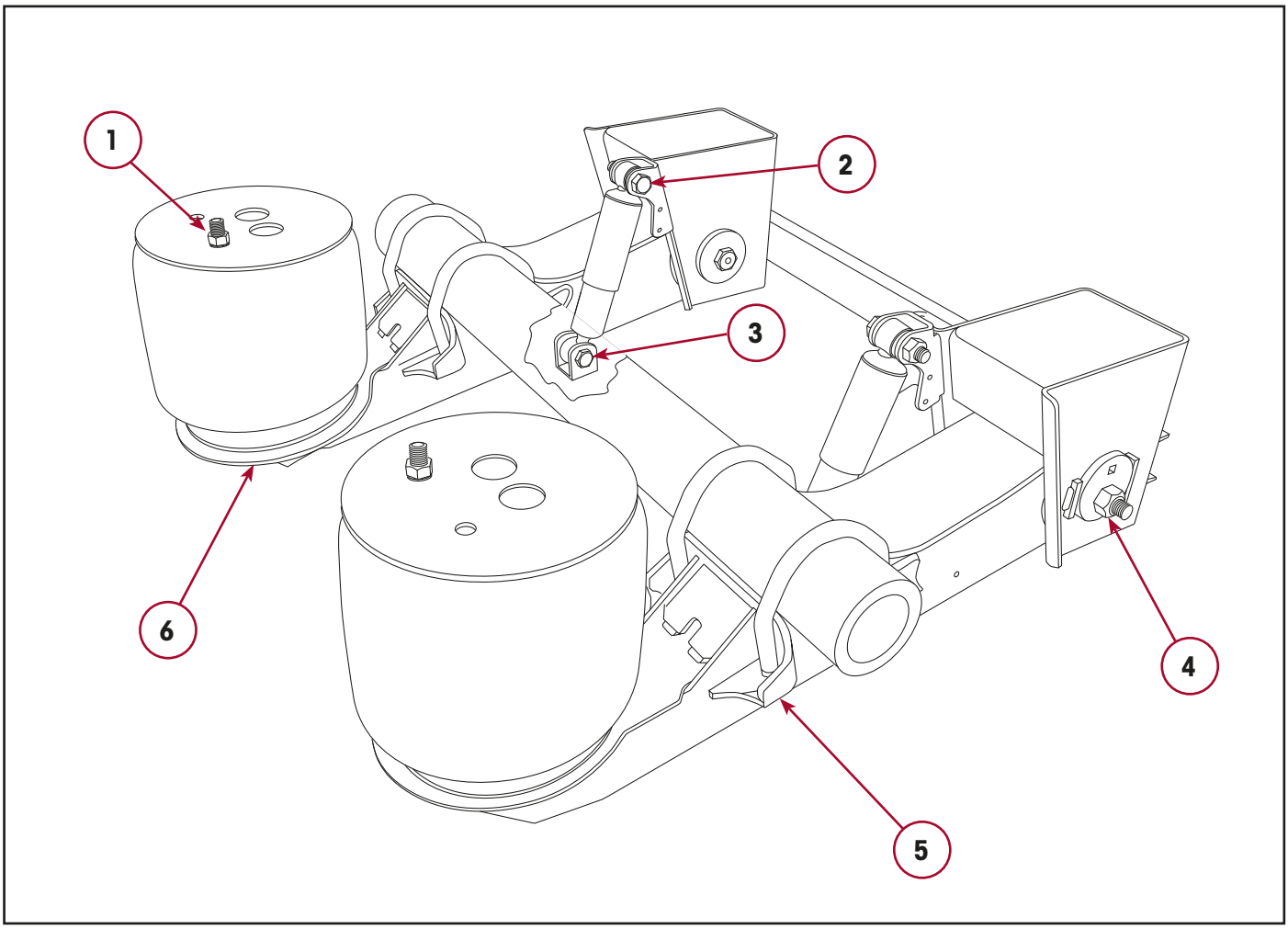
VARIOUS OTHER
HT230TA TOP MOUNT SUSPENSION



Item	Description	Thread/Grade	Torque (Nm)
1	Air Spring Nut – Upper	3/4″ – 16	135
2	Upper Shock Absorber Mount Bolt	3/4″ – 10	320
3	QUIK-ALIGN® Torx Head Pivot Bolt	7/8″ UNC x 10	800*
	Welded Pivot Connection	1 1/8″	1100
4	U-Bolts & Spacer Kit	7/8″ – 14 UNF	710
5	Air Spring Bolt – Lower	1/2″ – 13	65
6	Lower Shock Absorber Mount Bolt	3/4″ – 10	320
7	Height Control Valve Fixing Nut (Not shown)	1/4″ – 20	10

***** Shear-head bolts are used for axle pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

HT250US UNDERSLUNG SUSPENSION

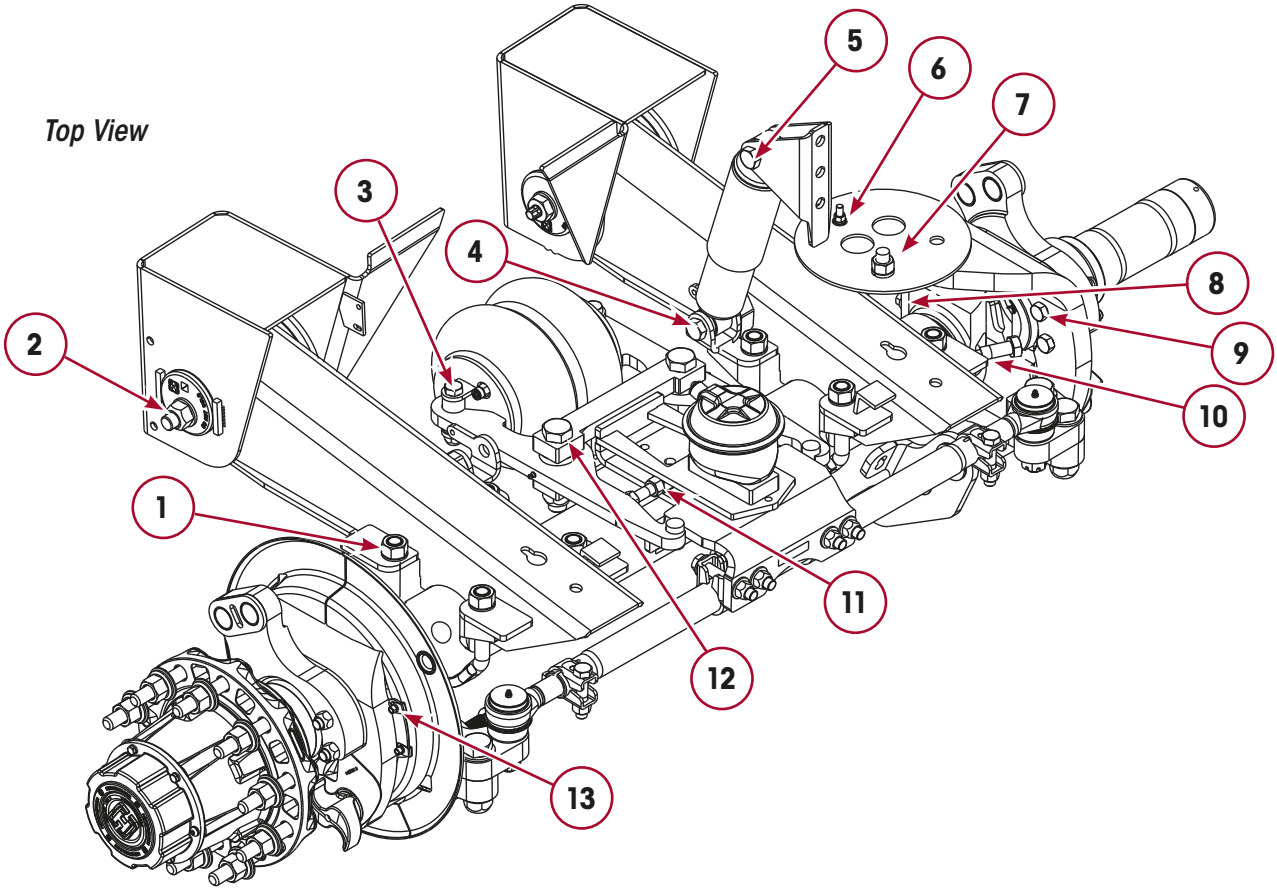


Item	Description	Thread/Grade	Torque (Nm)
1	Air Spring Nut – Upper	3/4" – 16	135
2	Upper Shock Absorber Mount Bolt	3/4" – 10	320
3	Lower Shock Absorber Mount Bolt	3/4" – 10	320*
4	QUIK-ALIGN® Torx Head Pivot Bolt	7/8" UNC x 10	800*
	Welded Pivot Connection	1 1/8"	1100
5	U-Bolts & Spacer Kit	7/8" – 14 UNF	710
6	Air Spring Bolt – Lower	1/2" – 13	65
7	Height Control Valve Fixing Nut (Not shown)	1/4" – 20	10

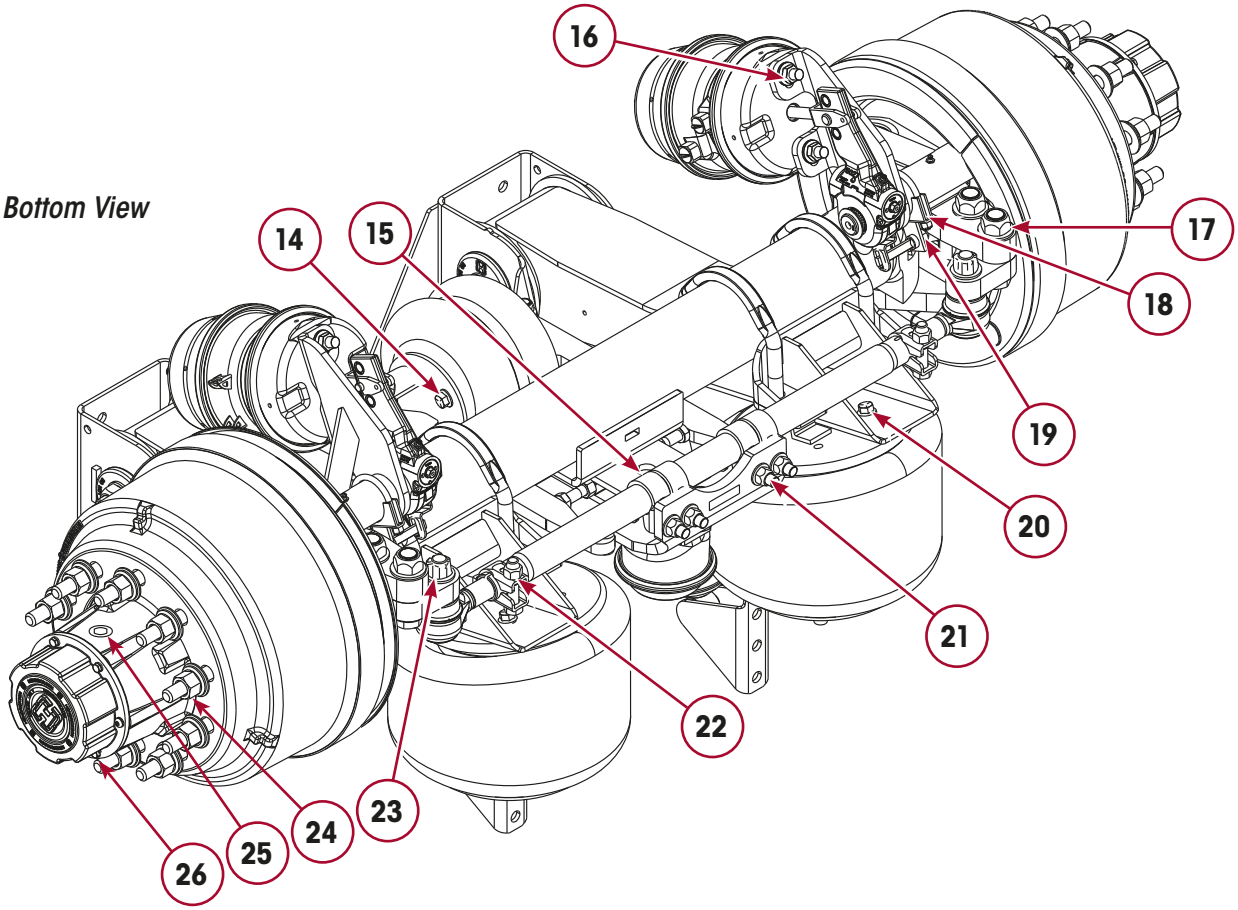
* Shear-head bolts are used for lower shocker mount & pivot alignment. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38.

CONNEX™ ST TOP MOUNT DRUM BRAKE STEERABLE

Top View



Bottom View



CONNEX ST TOP MOUNT DRUM BRAKE STEERABLE

Item	Fastener Location	Thread	Socket Size	Torque	
				Nm	ft. lbs.
1	Axle U-Bolt	7/8"-14	1-5/16"	710	525
2	QUIK-ALIGN® Pivot Bolt	7/8"-9	E20 / 1-7/16"	800 [4]	590 [4]
3	Centring Air Spring Plate Pivot Bolt	5/8"-11 x 3.5"	15/16"	Note- [3]	Note- [3]
4	Shock Absorber Bolt, Lower	3/4"-10	1-1/8"	320	235
5	Shock Absorber Bolt, Upper	3/4"-10	1-1/8"	320	235
6	Air Spring Locating Stud Lock Nut	3/8"-16	9/16"	25	20
7	Air Spring Upper Nut	3/4"-16	1-1/8"	135	100
8	Kingpin Draw Key	7/16"-20	11/16"	40	30
9	Knuckle Spindle Bolts	5/8"-11	15/16"	245	180
10	Wheel-Cut Stop Bolt & Jam Nut	3/4"-10	1-1/8"	190	140
11	Centring Stop Bolt & Jam Nut	5/8"-11	15/16"	190 [2]	140 [2]
12	Centring Arm Assembly Pivot Bolt	1.0"-8 x 5.0"	1-1/2"	Note- [3]	Note- [3]
13	Dust Shield Bolts	5/16"-18	1/2"	30	24
14	Centring Air Spring Mounting Bolt	3/8"-16	9/16"	40	30
15	Lock-Straight Air Chamber Nut	7/16"-20	11/16"	55	40
16	Brake Chamber Mounting Nut	5/8"-11	15/16"	150	110
17	Steering Arm Spacer Bolt	1.0"-8 x 7.0"	1-1/2"	920	680
18	Slack Adjuster Bracket U-Bolt	3/8"-16	9/16"	40	30
19	Slack Adjuster Anchor Stud	7/16"-14	11/16"	60	45
20	Air Spring Lower Bolt	1/2"-13	3/4"	65	48
21	Tie Rod Bracket Locking Clamp Bolt	5/8"-11 x 4.0"	15/16"	130 [2]	95 [2]
22	Tie Rod End Locking Clamp	5/8"-11 x 3.0"	15/16"	75 [2]	55 [2]
23	Tie Rod End Castle Nut	7/8"-14	1-5/16"	225 [1]	165 [1]
24	Wheel Nut	M22 x 1.5	33 mm	610	450
25	Hub Fill Port Plug	3/8"-18 or 9/16"-18	1/4" or 5/16" Hex	30	22
26	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	1/2"	20	15
	Hub Cap Screw (355 PCD)	M8 x 1.25 x 20	1/2"	20	15

NOTES:

[1] Advance (tighten) to nearest split pin hole after torquing to specified value.

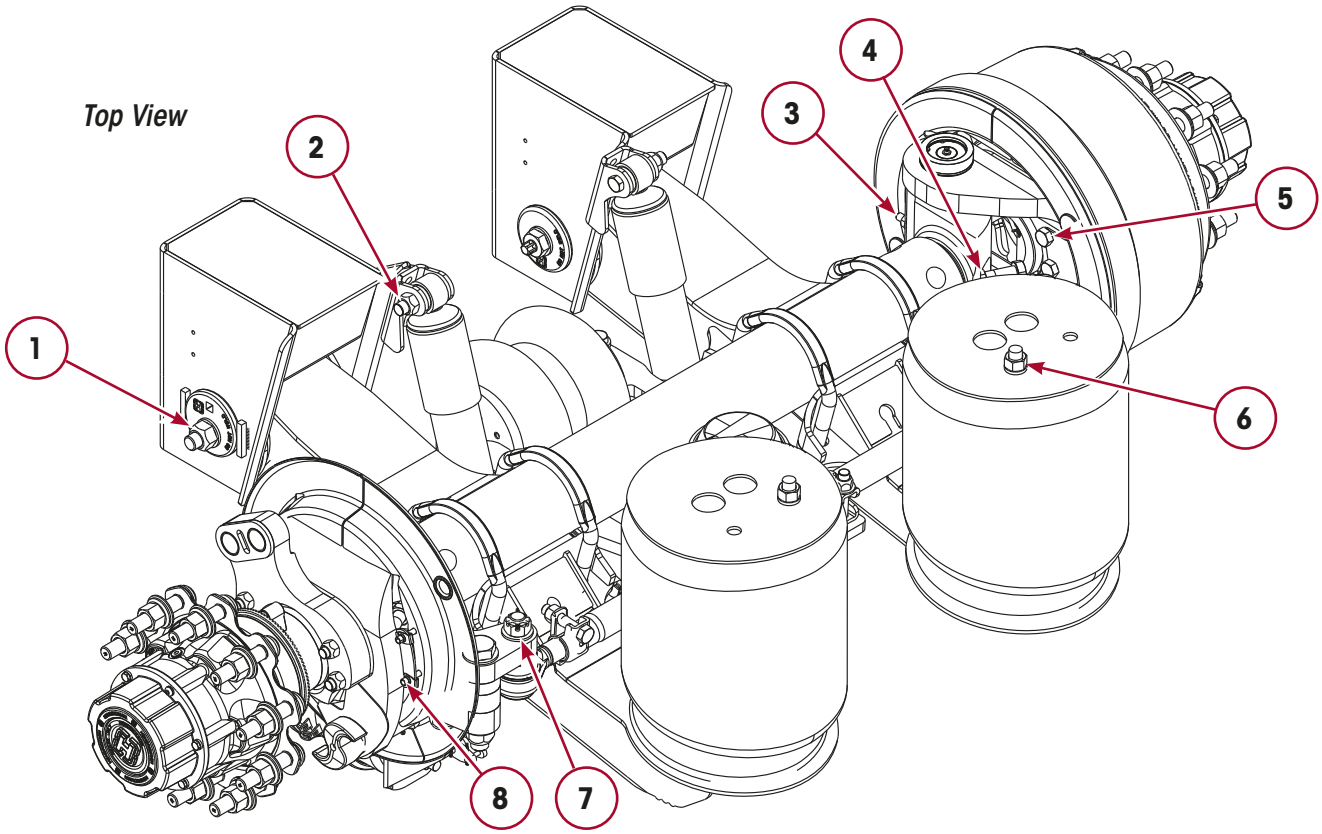
[2] Tighten only after adjustments have been made.

[3] Tighten only until nut seats up against bracket. Feature must rotate freely.

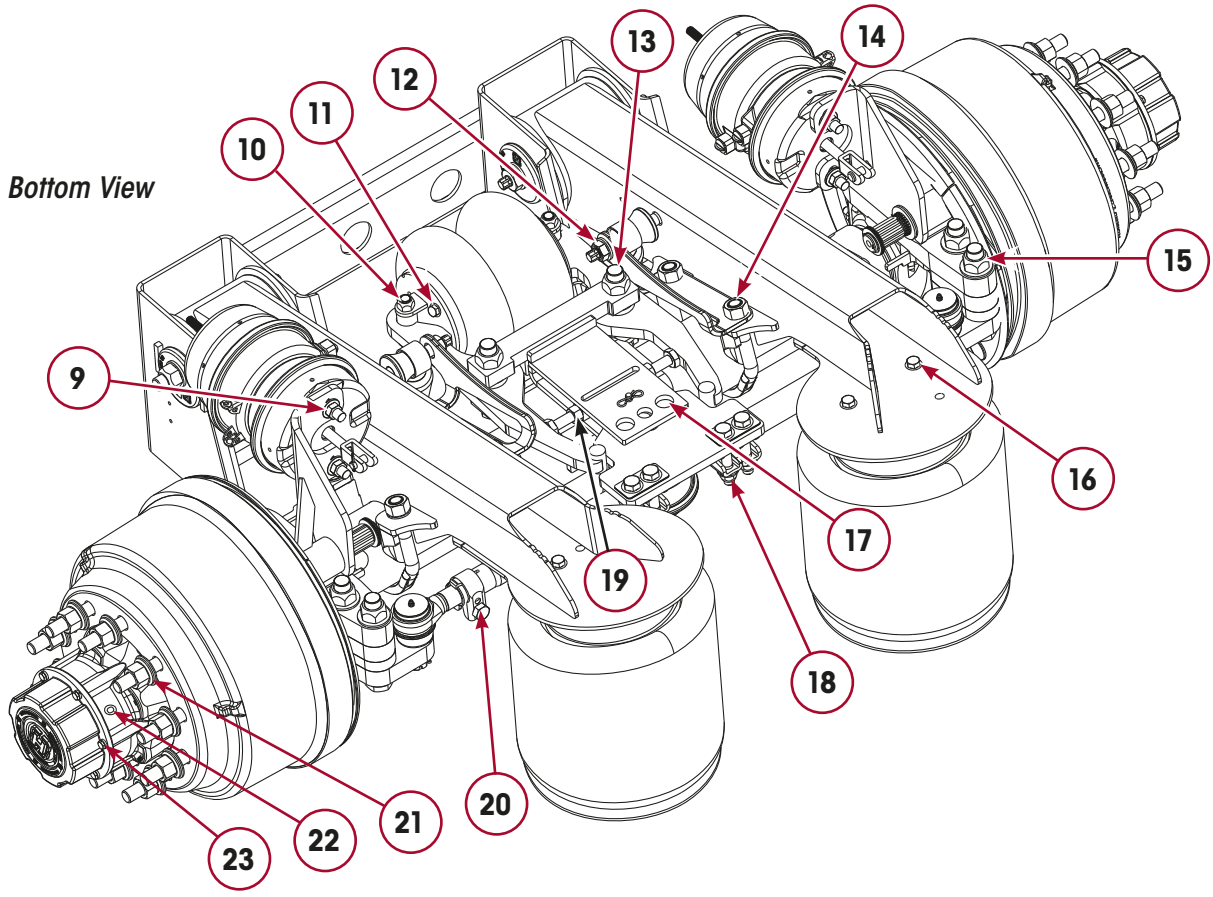
[4] Shear-head bolts must be tightened until the Torx head shears off. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38. Subsequent to initial tightening, they should be checked at the first service (5,000 km) for tightness at the specified torque.

CONNEX™ ST UNDERSLUNG DRUM BRAKE STEERABLE

Top View



Bottom View



CONNEX ST UNDERSLUNG DRUM BRAKE STEERABLE

Item	Fastener Location	Thread	Socket Size	Torque	
				Nm	ft. lbs.
1	QUIK-ALIGN Pivot Bolt	7/8"-9	E20 / 1-7/16"	800 [4]	590 [4]
2	Shock Absorber Bolt, Upper	3/4"-10	1-1/8"	320	235
3	Kingpin Draw Key	7/16"-20	11/16"	40	30
4	Wheel-Cut Stop Bolt & Jam Nut	3/4"-10	1-1/8"	190	140
5	Knuckle Spindle Bolts	5/8"-11	15/16"	245	180
6	Air Spring Upper Nut	3/4"-16	1-1/8"	135	100
7	Tie Rod End Castle Nut	7/8"-14	1-5/16"	225 [1]	165 [1]
8	Dust Shield Bolts	5/16"-18	1/2"	30	24
9	Brake Chamber Mounting Nut	5/8"-11	15/16"	150	110
10	Centring Air Spring Plate Pivot Bolt	5/8"-11 x 3.5"	15/16"	Note- [3]	Note- [3]
11	Centring Air Spring Mounting Bolt	3/8"-16	9/16"	40	30
12	Shock Absorber Bolt, Lower	3/4"-10	1-1/8"	320	235
13	Centring Arm Assembly Pivot Bolt	1.0"-8 x 5.0"	1-1/2"	Note- [3]	Note- [3]
14	Axle U-Bolt	7/8"-14	1-5/16"	710	525
15	Steering Arm Spacer Bolt	1.0"-8 x 7.0"	1-1/2"	920	680
16	Air Spring Lower Bolt	1/2"-13	3/4"	65	48
17	Lock-Straight Air Chamber Nut	7/16"-20	11/16"	55	40
18	Tie Rod Bracket Locking Clamp Bolt	5/8"-11 x 4.0"	15/16"	130 [2]	95 [2]
19	Centring Stop Bolt & Jam Nut	5/8"-11	15/16"	190 [2]	140 [2]
20	Tie Rod End Locking Clamp	5/8"-11 x 3.0"	15/16"	75 [2]	55 [2]
21	Wheel Nut	M22 x 1.5	33 mm	610	450
22	Hub Fill Port Plug	3/8"-18 or 9/16"-18	1/4" or 5/16" Hex	30	22
23	Hub Cap Screw (285 PCD)	5/16" UNC x 7/8	1/2"	20	15
	Hub Cap Screw (355 PCD)	M8 x 1.25 x 20	1/2"	20	15

NOTES:

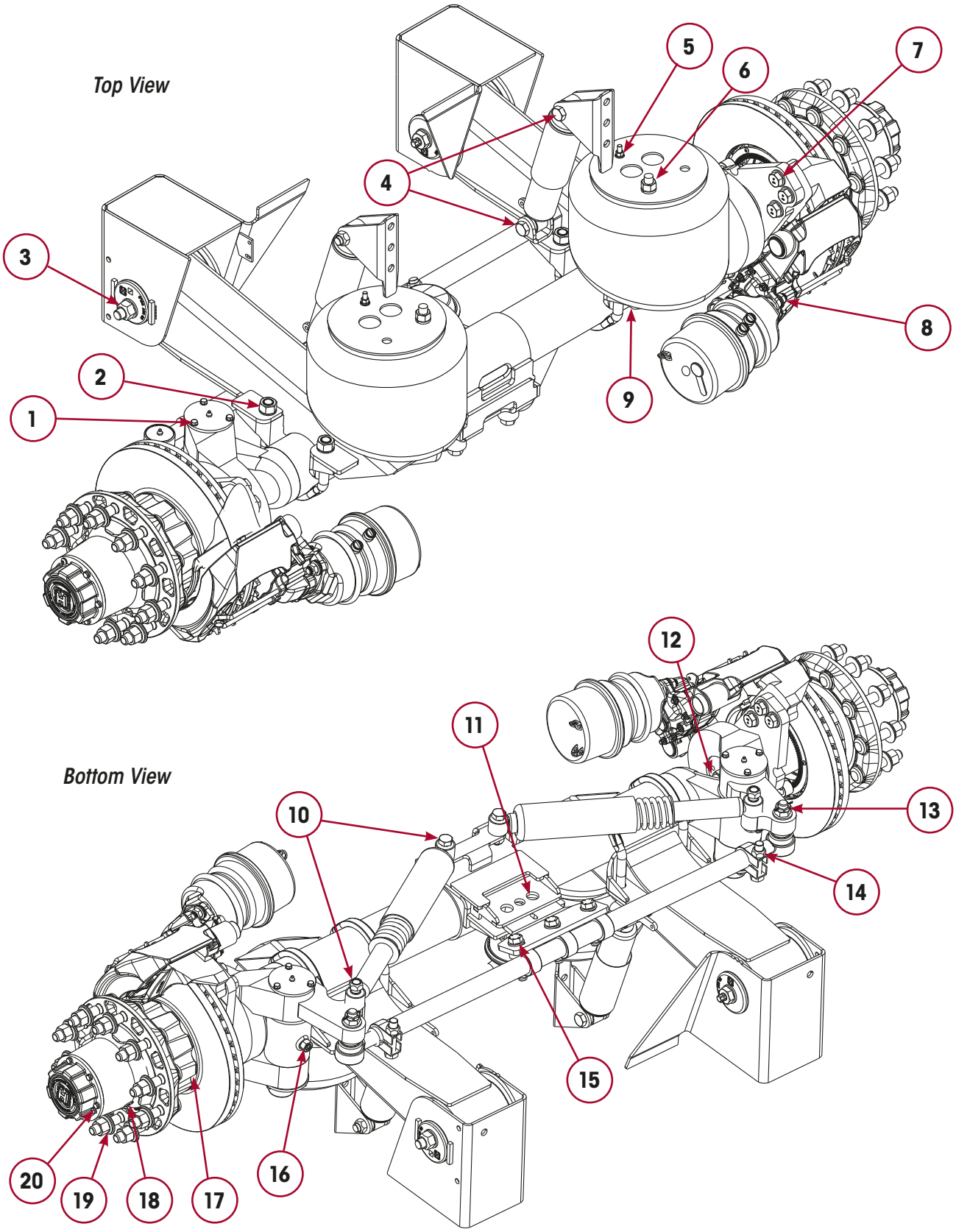
[1] Advance (tighten) to nearest split pin hole after torquing to specified value.

[2] Tighten only after adjustments have been made.

[3] Tighten only until nut seats up against bracket. Feature must rotate freely.

[4] Shear-head bolts must be tightened until the Torx head shears off. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38. Subsequent to initial tightening, they should be checked at the first service (5,000 km) for tightness at the specified torque.

DISC BRAKE TOP MOUNT STEERABLE SUSPENSION



DISC BRAKE TOP MOUNT STEERABLE SUSPENSION

Item	Fastener Location	Thread	Socket Size	Torque	
				Nm	ft. lbs.
1	Dust Cap Bolts	5/16"	1/2"	15	11
2	Axle U-Bolt	7/8"-14	1-5/16"	710	525
3	QUIK-ALIGN Pivot Bolt	7/8"-9	E20 / 1-7/16"	800 [1]	590 [1]
4	Shock Absorber Bolt, Upper & Lower	3/4"-10	1-1/8"	320	235
5	Air Spring Locating Stud Lock Nut	3/8"-16	9/16"	25	20
6	Air Spring Upper Nut	3/4"-16	1-1/8"	135	100
7	Brake Calliper Bolt	M20 x 2.5	30 mm	475	350
8	Brake Chamber Mounting Nut	M16 x 1.5	15/16"	210 [2]	155 [2]
9	Air Spring Lower Bolt	1/2"-13	3/4"	65	48
10	Steering Damper Assembly	3/4"	1-1/8"	120	90
11	Lock-straight Air Chamber Nut	7/16"-20	11/16"	55	40
12	Wheel Cut Stop & Jam Nut	3/4"	1-1/8"	120	90
13	Tie Rod End Castle Nut	7/8"	1-15/16"	305 [3]	225 [3]
14	Tie Rod End Locking Clamp	3/4"	1-1/8"	120 [4]	90 [4]
15	Tie Rod Bracket Locking Clamp Bolt	3/4"	1-1/8"	230 [4]	170 [4]
16	Kingpin Locking Screw	5/8"	5/16" Hex	120	90
	Kingpin Locking Screw Locknut	5/8"	15/16"	120	90
17	Rotor to Hub Bolt – HTD-377 8-Stud	M16 x 2	14 mm	300	220
	Rotor to Hub Nut – HTD-430 10-Stud	5/8"-18	1"	265	195
18	Fill Port Plug	3/8" or 9/16"	1/4" or 5/16" Hex	30	22
19	Wheel Nut	M22 x 1.5	33 mm	610	450
20	Hubcap Screw	5/16"-18	1/2"	20	

NOTES:

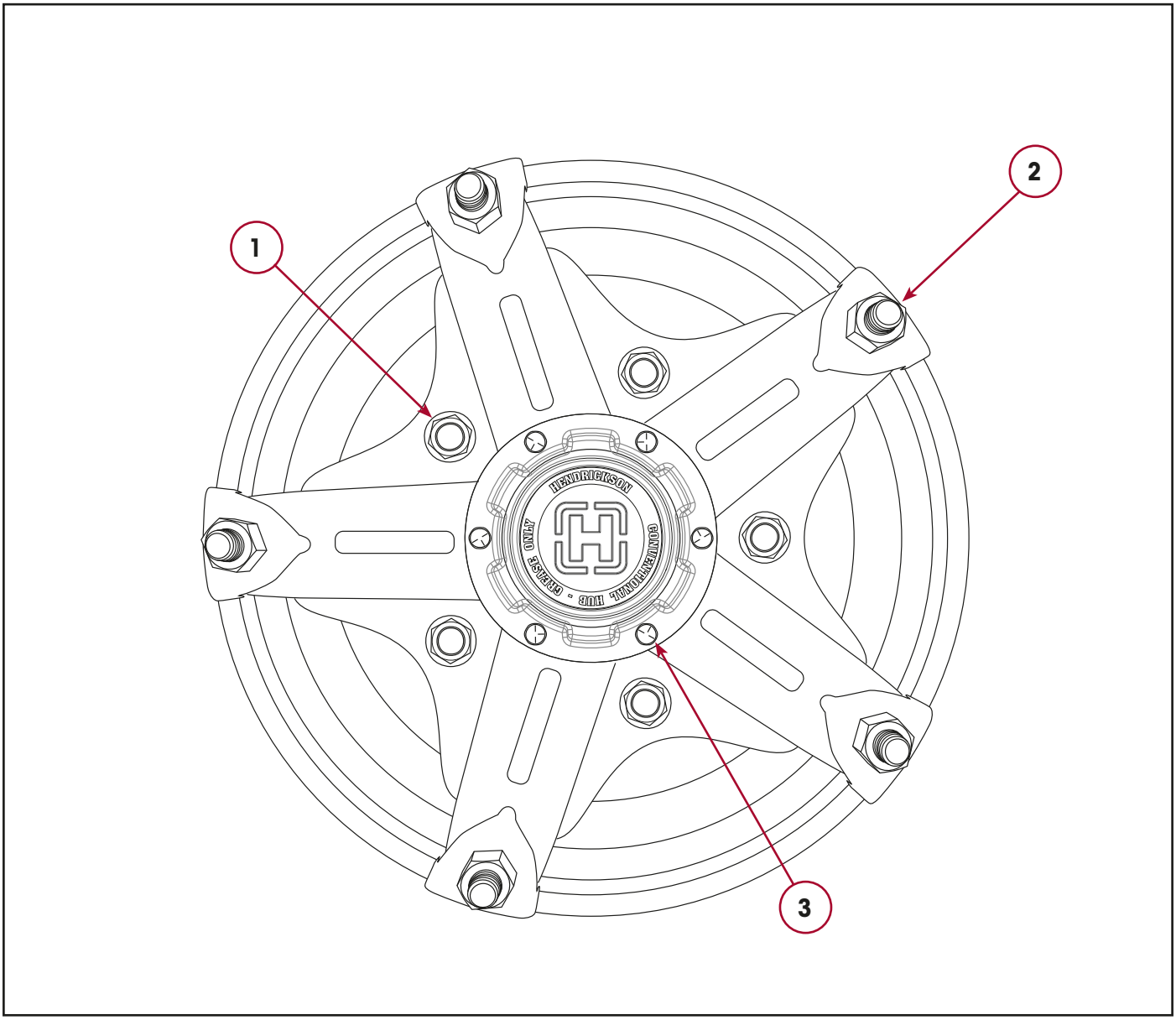
[1] Shear-head bolts must be tightened until the Torx head shears off. Refer to "QUIK-ALIGN® & Shear-head Bolts" on page 38. Subsequent to initial tightening, they should be checked at the first service (5,000 km) for tightness at the specified torque.

[2] M16 & 5/8" brake chamber mounting nuts are to be torqued in two stages: 1st Stage – 100 Nm, 2nd Stage – 210 Nm.

[3] Advance (tighten) to nearest split pin hole after torquing to specified value.

[4] Tighten only after adjustments have been made.

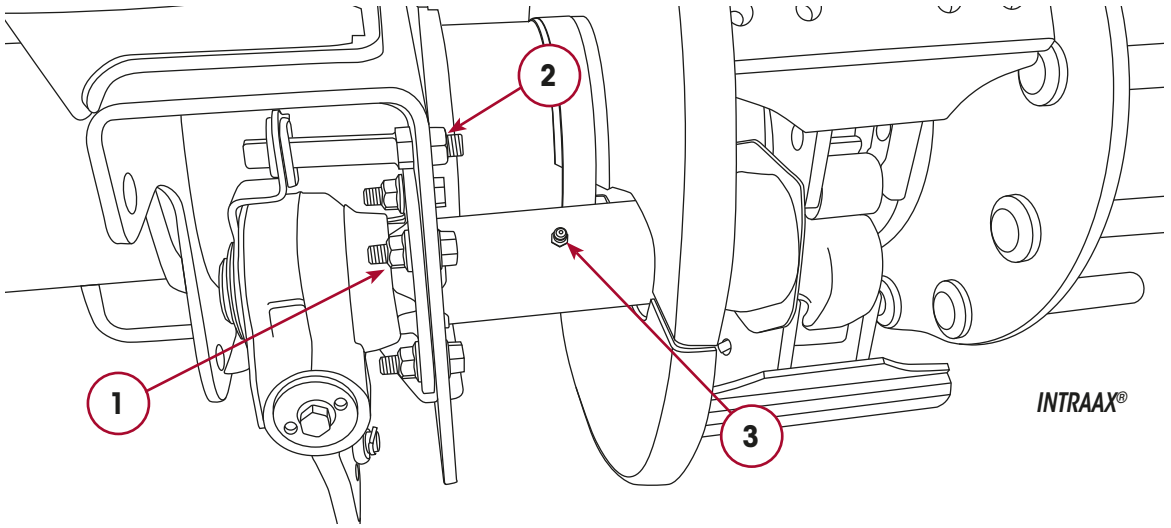
5 SPOKE HUB & DRUM



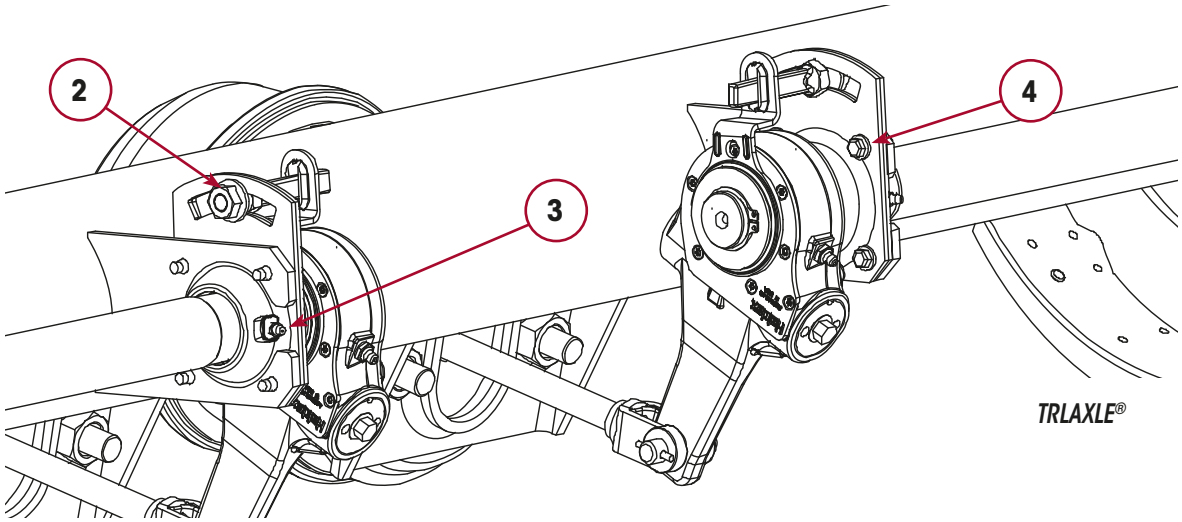
Item	Description	Thread/Grade	Torque (Nm)
1	Drum / Hub Nut	3/4" – 16 UNF, Grade 8	440*
2	Rim Clamp Nut	3/4" – 10 UNC	370*
3	Hubcap Bolt	5/16" UNC x 7/8"	20

***** Tighten in 70 Nm steps in a criss-cross pattern until final torque is reached. Recheck after 100 km and then every 15,000 km.

BRAKE S-CAM SUPPORT & ANCHOR



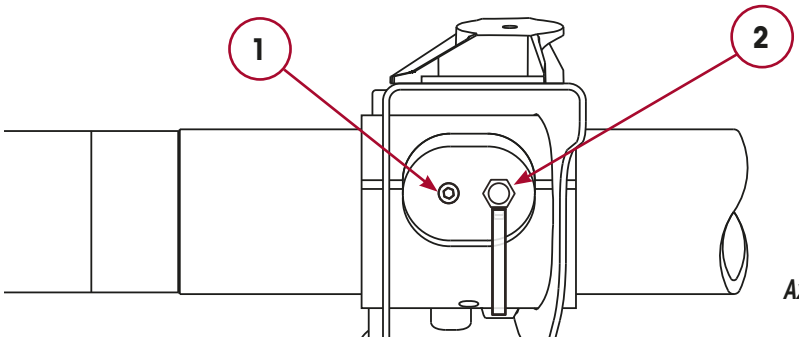
INTRAAX®



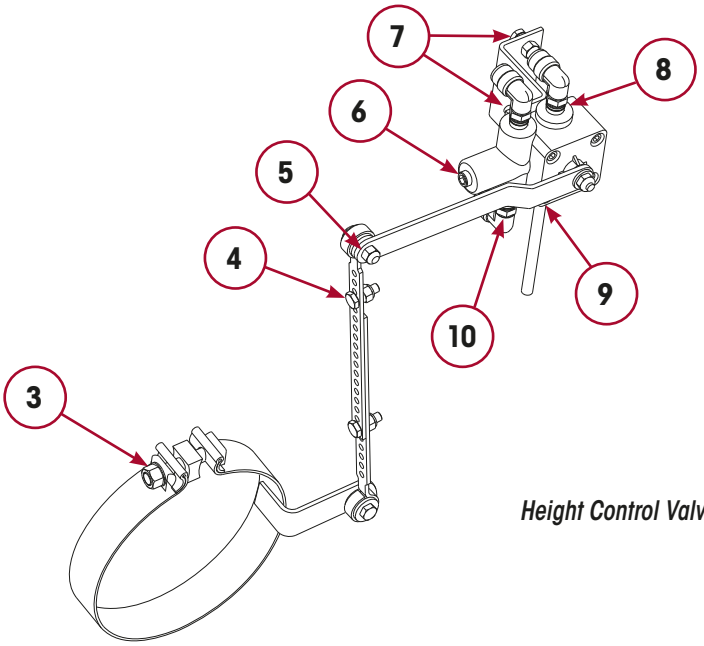
TRLAXLE®

Item	Description	Thread/Grade	Torque (Nm)
1	INTRAAX® S-Cam Support Bearing	3/8″-16	60
2	Brake Adjuster Anchor Nut	7/16″-14	60
3	Grease Nipple – Zerk Fitting	1/4″-28 Tapered SAE-LT	4.5
4	TRLAXLE® S-Cam Support Bearing	5/16″-18	40

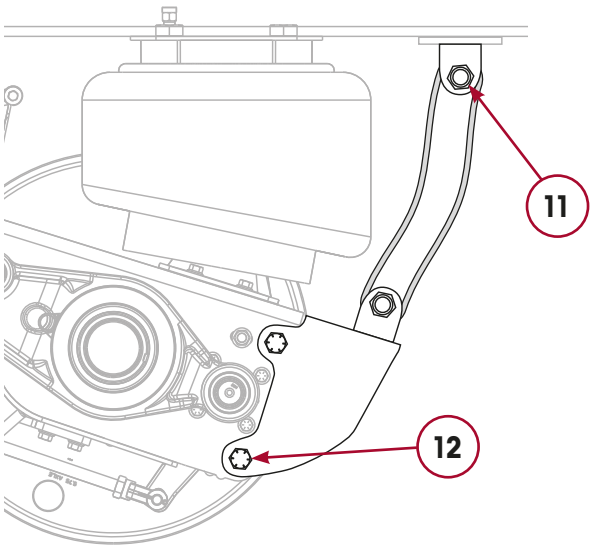
ANCILLARY COMPONENTS



Axle Fittings



Height Control Valve



Axle Rebound Limiter – AAT

ANCILLARY COMPONENTS

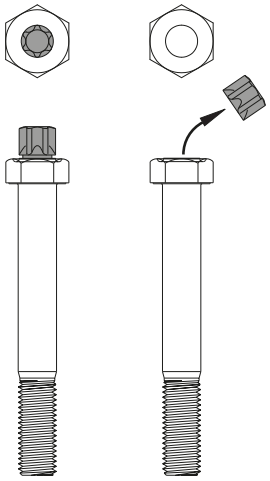
Item	Description	Thread Grade	Fastener Size	Torque (Nm)
1	Axle Plug	1/4" NPTF	1/4" Hex	Refer Note "**[1]**"
2	Axle Vent	1/4" NPT	26 mm cut socket	Refer Note "**[1]**"
3	Band Clamp	––	15 mm	45
4	Height Control Link Bolt & Nut	10-24	5/6" & 3/8"	5
5	Height Control Link Shoulder Bolt	1/4"–20 UNC	7/16"	10 Refer Note "**[2]**"
6	Pipe Plug	1/4" NPTF	1/4"	Refer Note "**[1]**"
7	Mounting Lock Nut	1/4"–20 UNC	7/16"	10
8	Air Fitting	1/4" NPTF	15 mm	Refer Note "**[1]**"
9	Barbed Fitting	1/4" NPT	3/8"	Refer Note "**[1]**"
10	Air Fitting	1/4" NPT	9/16"	Refer Note "**[1]**"
11	Axle Restraint Strap to Clevis Bolt – AAT INTRAAX	3/4"–10	1-1/8"	205
12	Axle Restraint Beam Extension Bolt – AAT INTRAAX	5/8" UNC	15/16"	280

[1] NPT Air Fitting Assembly

1. Inspect air fitting and port to ensure that both are free of debris and excessive scoring.
2. Apply a band of a liquid thread sealant, such as Loctite 567, around the fitting threads leaving the first two threads bare.
3. Install fitting into port and tighten finger tight.
4. Using a suitable spanner or Allen key, tighten the fitting a further 1.5 to 3 further turns. Ensure directional fittings are turned to the correct orientation without exceeding the recommended turns. Total thread engagement for correctly assembled fittings should be between 3.5 to 6 turns.

[2] Ensure link pivots freely after tightening.

QUIK-ALIGN® & SHEAR-HEAD BOLTS



The E20 Head Shears Off

Shear-head bolts are often used in critical applications where fastener tightness is essential. These bolts have heads that shear off when the specified torque is reached. In Hendrickson suspensions they are commonly used in the critical areas of pivot alignment bolts and lower shock absorber mounting bolts.

The shear-head bolts, and associated nuts, are not reusable and must only be used once. However, they may be partially tightened until the suspension is correctly aligned. Then, when it is fully aligned, the bolt must be tightened with the correct E20 socket until the head shears off. This is usually carried out with a suitable rattle gun capable of up to 400 Nm for shocker bolts and 1000 Nm for pivot bolts.

⚠ **CAUTION:** Failure to correctly torque shear-head bolts will result in damage to suspension components.

No Anti-Seize Compound

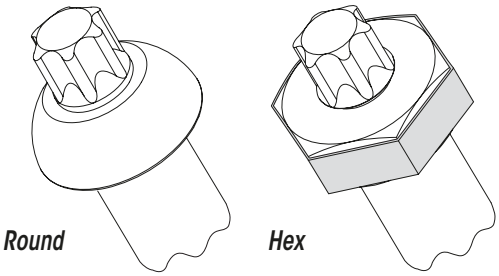
Do not apply anti-seize compound or additional lubricant to the bolt or nut thread. Hendrickson shear-head bolts have a GEOMET™ coating. The coating is comprised of minuscule flakes of zinc and aluminium, which protects the bolts from corrosion, in addition to providing a surface that allows for consistent bolt torque and clamp load.

Do not allow paint, surface coatings, oil, nickel anti-seize or any other commonly used compounds to contact the threads before final tightening. These compounds can lead to overtightened fasteners, unpredictable clamp loads and possible component failure. Threads should be clean, dry, free of contamination and not have any visible damage that could cause galling. Refer to section "Thread Damage and Galling" on page 41.

Removal

Shear-head bolts may have a round or a hexagonal head. Removal of the hexagonal headed bolt is straightforward, simply ensure the bolt and nut are disposed of after removal. Rounded head bolts can be removed without undue effort by keeping to the following procedure.

1. Spray a liberal amount of anti-seize onto the inboard hex nut.
2. File a flat on either side of the dome head of the bolt using a 2nd Cut Mill Saw file. ***Refer diagram A***.
3. Attach locking pliers onto the filed flat section of the bolt head. ***Refer diagram B***.
4. Loosen the nut, remove and discard both the bolt and nut.



Round *Hex*

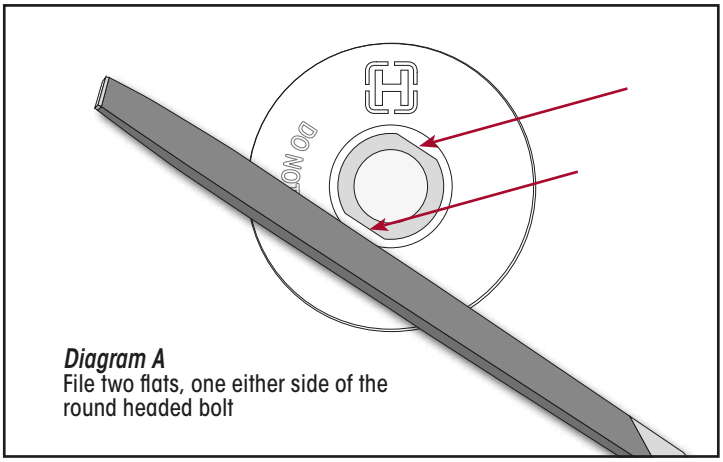


Diagram A
File two flats, one either side of the round headed bolt

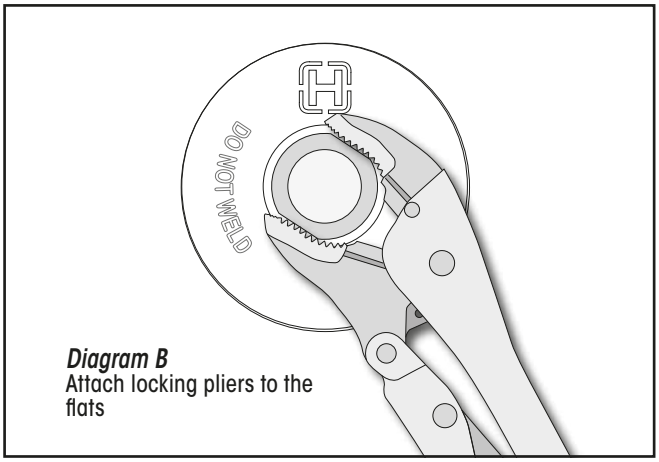


Diagram B
Attach locking pliers to the flats

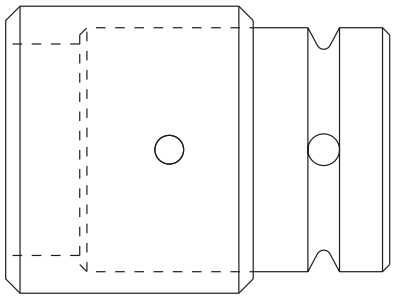
Tools

Hendrickson offers three drive sockets that may be used with these shear-head type bolts. However, equivalent 3/4 and 1 inch drive impact sockets may also be used. For example, Action Impact Tools 3/4" drive ***63340020*** or 1" drive ***63350020*** are available in Australia. Other possible sockets are Camcar/Apex TX-8120 and Strong Tools E-20 T.S.

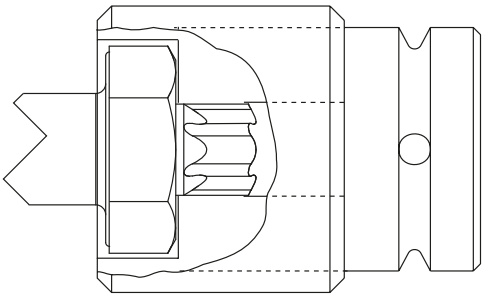
Description	Drive Size	Part Number	Comments
Hendrickson E20 Torx™ Socket	3/4 Inch	S-24303	Cost effective tool for occasional use (not recommended for use in high-volume production).
Hendrickson E20 Torx Socket	1 Inch	S-24536	For medium-duty use (dealers, repair facilities, etc.) or for those with one-inch drive air tools.
Hendrickson E20 Torx Socket With Sleeve	1 Inch	S-25119	Ideal for high-volume trailer production environments or manufacturing facilities.

Socket with Sleeve

One inch drive socket S-25119 has a sleeve that helps support the tool by sitting over the entire head of the shear-head bolt. The operator can rest the tool against the collar during the entire tightening procedure. This assists in getting full socket-to-bolt engagement, it reduces fatigue and helps to achieve consistent, properly torqued pivot connections.



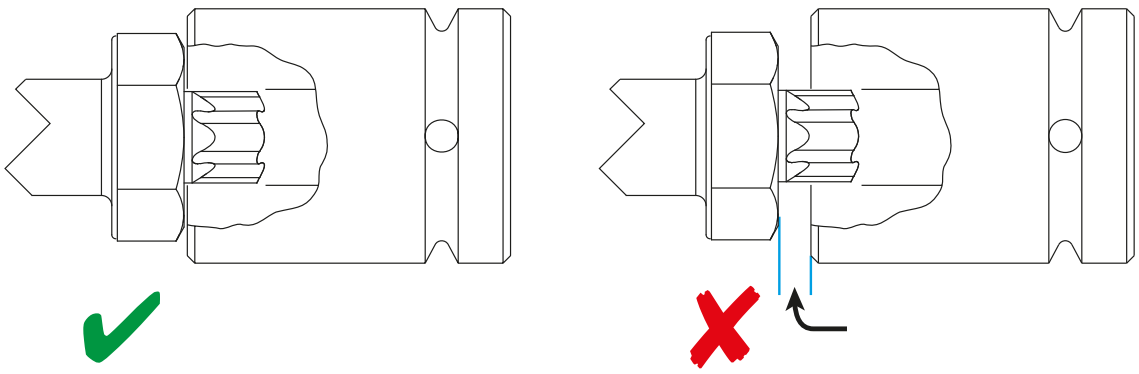
S-25119 Socket



Sleeve holds socket in place over bolt head

Torx Head Damage

To avoid damaging the shear-head bolt's Torx head (regardless of the drive socket being used), ensure that the drive socket is fully engaged with the Torx head. If the socket is not fully engaged, the head will simply twist, instead of breaking off cleanly at the specified torque. The bolt will then need to be replaced to avoid suspension damage.

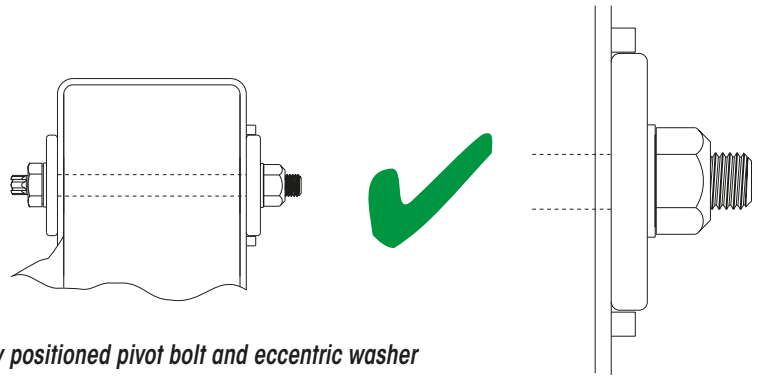


Ensure that the socket is completely engaged with the bolt otherwise you will damage the bolt.

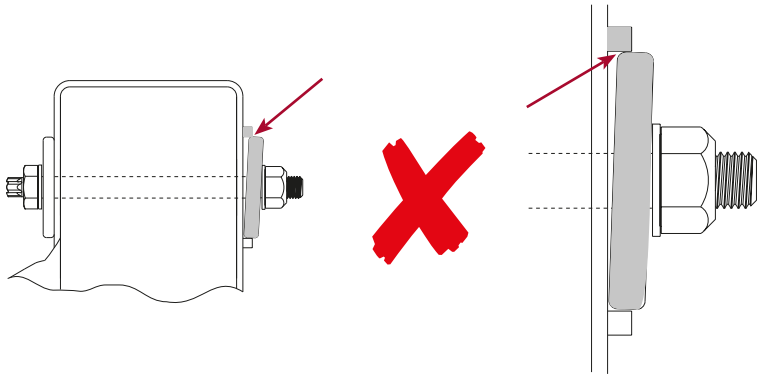
QUIK-ALIGN® Bolt Installation Tips

Install the alignment collars, bolt, hardened washers and nut to the suspension pivot, ensuring the bolt and nut threads are kept clean and dry. If the pivot does not move evenly, when rotating the eccentric for alignment, you may need to tap the concentric (inboard side) collar with a hammer.

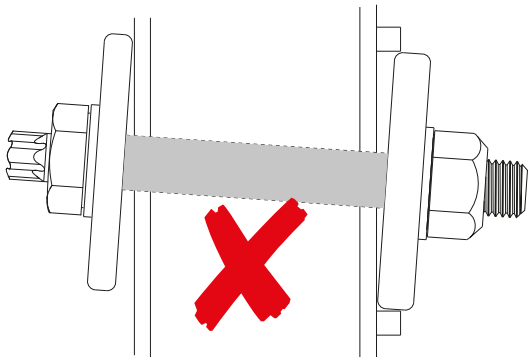
Ensure the eccentric collar is properly positioned against the axle and is not caught up on the alignment guide. The pivot bolt must at right angles to the suspension arm. Tap the washers with a hammer before tightening to ensure that they are positioned correctly and properly seated. ***Refer diagrams below***.



Correct – Properly positioned pivot bolt and eccentric washer



Wrong – Eccentric washer collar caught on alignment guide

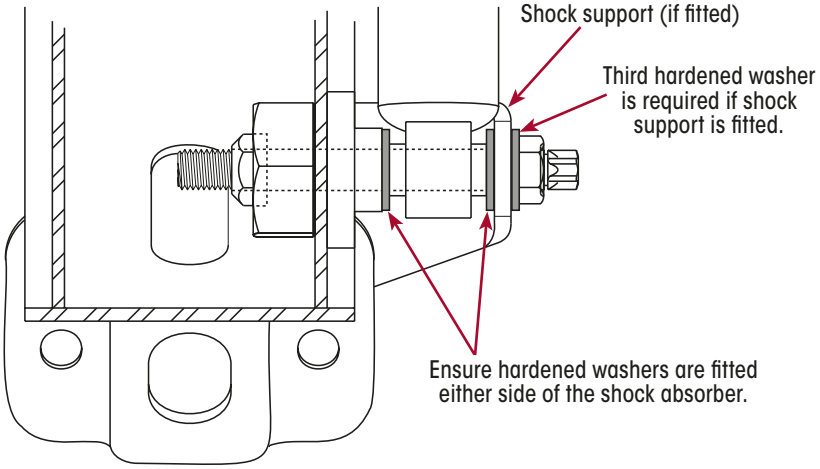


Wrong – Pivot bolt at an angle

Shock Bolt Installation Tips

Lower shock Torx shear head bolts can be tightened correctly by simply using an E20 Torx 3/4" drive impact socket and a rattle gun. If there is a nut, hold it with a spanner and tighten the bolt with the rattle gun until the shear head breaks off. Recheck bolt torque at first service and at regular service intervals.

Hardened washers should be installed on either side of the lower shock mount, and also for the shock support, if fitted. No hardened washers are used on the upper shock mounts. ***Refer diagram***.



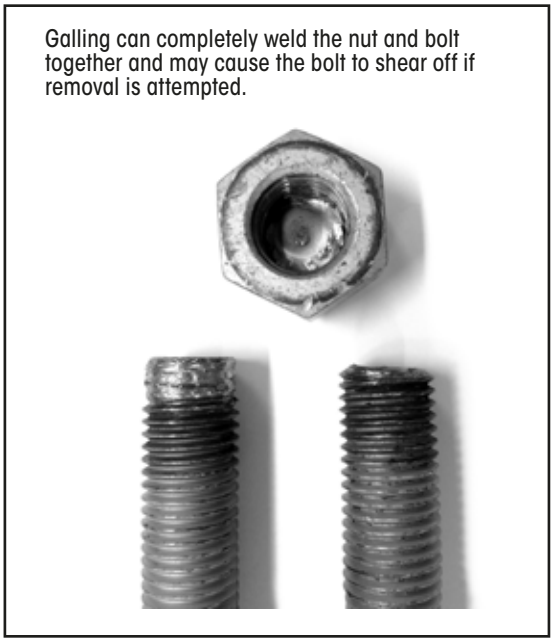
Typical Lower Shock Bolt Installation

NOTE: Shock bolts must only be tightened and torqued at the specified suspension ride height.

For further details about shock inspection and shock strap installation refer to Trailer Maintenance Manual 97117-161.

THREAD DAMAGE AND GALLING

Galling can cause permanent damage to bolt and nut threads. The coating on critical shear-head bolts, such as Hendrickson QUIK-ALIGN® pivot bolts, helps prevent galling. But it can still occur if there is any damage to the thread before assembly. Therefore, to minimise any likelihood of damage, it is important to visually check the threads for damage before assembly.



Galling can completely weld the nut and bolt together and may cause the bolt to shear off if removal is attempted.

Galling

Galling is where materials adhere to one another. In fasteners, this means that metal from one surface, usually the bolt, transfers over to the moving nut. As the nut moves further down the thread the galled-up metal grows in size as it collects more metal from the adjoining surfaces.

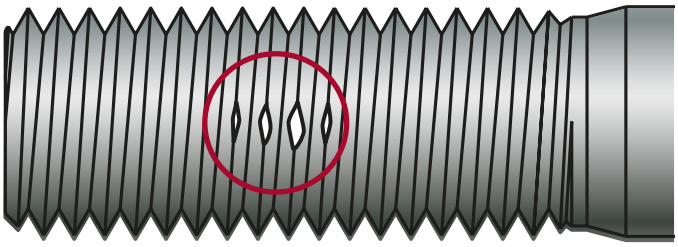
Heat from friction increases the likelihood of the metal thread galling. Prevailing torque locknuts have added friction, which is why they are particularly susceptible to galling.

Not all metals have the same susceptibility to galling. Aluminium, stainless steel and titanium are particularly prone to galling. On the other hand, brass is used in bushings because of its resistance to galling.

Thread Damage

New bolt threads can easily be damaged in transit. Even a small amount of damage can initiate galling as the fastener is tightened. Once the metal begins to gall, it will simply get worse as the bolt is tightened until the thread is beyond repair. Therefore, it is essential to visually inspect every QUIK-ALIGN and shear-head bolt before assembly to ensure there is no damage that could cause galling.

Threaded bolt holes can also cause galling due to weld splatter or hole misalignment. So, they should be checked as well. It only takes a few seconds to run a bolt through with your fingers to check the thread. Any problems can be quickly repaired with a tap before serious damage occurs.



Even what may initially appear to be minor thread damage can cause galling.

Galling Prevention Tips

There are several steps you can take to reduce the likelihood of galling.

- Inspect the threads for damage before assembly.
- Tighten the fastener slowly to reduce heat from friction.
- Stop tightening if it does begin to gall. If the galling is near the start of the thread, you may be able to save the bolt with a thread die. At the very least, it will be easier to remove the bolt before the metals have completely fused together.
- Never reuse critical nut or bolts.
- Some fastener use allows for the application of a thread lubricant, such as anti-seize. However, never apply lubricants to coated shear-head bolts, for example Hendrickson shock absorber and QUIK-ALIGN pivot bolts.
- Run the bolt through by hand for a few threads to confirm thread consistency.

BOLT TIGHTENING PROCEDURES

Selection Importance

Correct bolt and nut selection is vital for component reliability. Lower grade (or Class) fasteners will likely give way or fail under load. This applies equally to nuts, bolts and washers. Therefore, if a low grade nut is fitted to a high grade bolt, it will result in distortion of the nut thread and subsequent failure. Similarly, a low grade washer will yield over time, resulting in play between the components being held and movement between the parts.

Bolt & Nut Identification

There are a large number of Grades or Classes of fasteners that can be selected, along with the choice of metric or imperial threads, fine or coarse. They could be designed to meet various ISO (International Organization for Standardization) standards, or to meet the standards from various countries, such as the UK (BS - British Standards), USA (ANSI - The American National Standards Institute) or Germany (DIN - Deutsches Institut fur Normung). Standards Australia alone lists 23 different standards for fasteners.

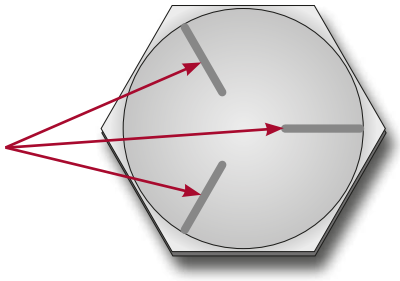
However, there are generally only three different grades of metals commonly used in the automotive field. They are Mild Steel, High Tensile and Higher Tensile. Inch SAE (imperial) bolts will usually be graded 2, 5 or 8, while Metric ISO bolts will meet a numbered property class.

The marking for each bolt and nut varies depending on the Standard and whether they are metric ISO or inch SAE. Usually, they will match up to the markings shown in the diagram on the next page.

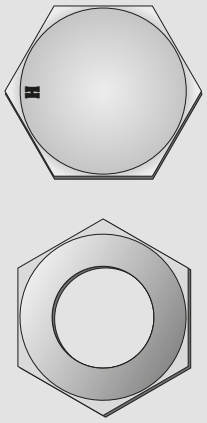
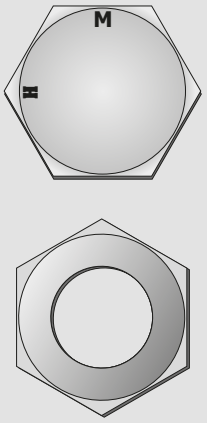
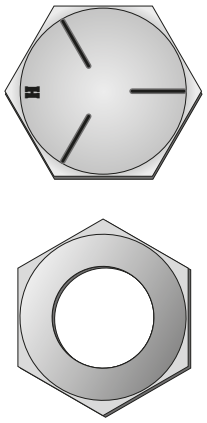
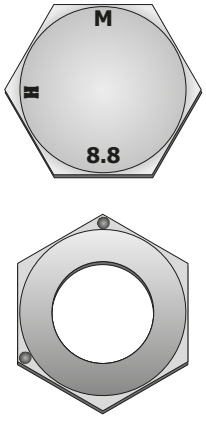
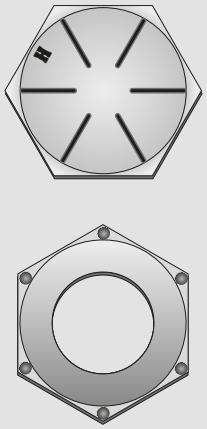
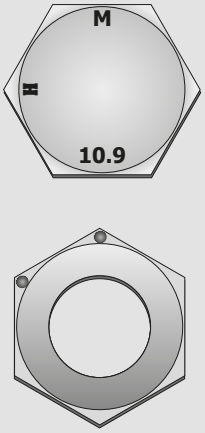
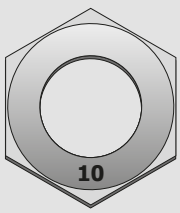
- ***Mild Steel*** bolts and nuts will normally have no markings except for the manufacturer's markings. Critical suspension fasteners will not use mild steel.
- ***High Tensile*** bolts will be marked with three lines for SAE Grade-5 or the number 8.8 to denote metric Class 8.8. SAE Grade-5 high-tensile nuts will have no marking. Metric Class-8 nuts can have either two dots on the corners or the number 8 stamped into the face.
- ***Higher Tensile*** bolts will be marked with six lines for Grade-8 imperial or the 10.9 to denote metric 10.9. Imperial nuts will have six dots on the corners. Metric will have either two dots on adjacent corners or the number 10 stamped into the face. However, locking nuts will have crimp marks on the dome from the manufacturing process, which must not be confused with markings for Grade or Class.

TIP: As a quick guide for inch fasteners, the number of lines on the bolt plus two equals the Grade. Therefore, three lines, plus two, indicates that it is a Grade-Five bolt.

3 lines + 2 = Grade 5



CAUTION: Fasteners will only be as strong as their weakest component. For example, a high-grade bolt attached to a low-grade nut will cause failure of the nut thread. For that reason all components, including washers, must match.

Metal	Inch – SAE J429	Metric – ISO 898
Mild Steel – Low or Medium Carbon Steel	**Grade 2**  No markings except for manufacturer's mark on bolt head.	**Class 4.6 Bolt / Class 4 Nut**  No markings except for a manufacturer's mark and an M to denote metric on bolt head.
High Tensile – Medium Carbon Steel	**Grade 5**  The bolt head has three radial lines. Similar to Grade 2, the nut has no markings.	**Class 8.8 Bolt / Class 8 Nut**  The bolt head has 8.8 and may also have a manufacturer's mark and an M for Metric. The nut has either two dots (one at 12 o'clock and the other at 8 o'clock) or the number eight stamped into the face. 
Higher Tensile – Medium Carbon Alloy Steel	**Grade 8**  The bolt head has six radial lines. The nut has six dots, one on each corner. The dots should not be confused with crimp marks that occur from manufacturing domed lock nuts.	**Class 10.9 Bolt / Class 10 Nut**  The bolt head has 10.9 and may also have a manufacturer's mark and an M for Metric. The nut has either two dots (one at 12 o'clock and the other at 10 o'clock) or the number ten stamped into the face. 

CONVERSION OF UNITS

This bulletin refers purely to metric Newton Metres. If necessary, convert units by using these formulae.

Units	Formula
Nm to Foot Pound	Multiply by 0.738
Nm to Inch Pound	Multiply by 0.113
Foot Pound to Nm	Multiply by 1.356
Inch Pound to Nm	Multiply by 8.85

REVISIONS TABLE

Date	Rev	Page	Description
Mar-2023	H	33, 39, 40	Add socket size. Add more socket choices. Expand shock bolt installation.
Mar-2023	H	29, 31	Amend centring spring bolt torque.
Mar-2023	H	Many	Amend brake anchor stud torque.
Nov-2023	I	Many	Add calliper socket size.
Nov-2023	I	36, 37	Add Ancillary Components page with Height Control Valve and Axle tube fittings.
Nov-2023	I	4	Correct Axle Restraint Beam Extension and move to Ancillary Components page.

Actual product performance may vary depending upon vehicle configuration, operation, service and other factors.
All applications must comply with applicable Hendrickson specifications and must be approved by the respective vehicle manufacturer with the vehicle in its original, as-built configuration.
Contact Hendrickson for additional details regarding specifications, applications, capacities, and operation, service and maintenance instructions.

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