14 Wheels

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14.1 Wheel removal

14.1.1 Remove the outside wheel

WARNING:
Tire and rim assemblies are extremely heavy and require proper handling equipment to safely remove them. Fully support and constrain the tire and rim assemblies before removal. Failure to use correct procedures and equipment can result in personal injury or death due to crushing.

Procedure

1. Exploded view of the triple wheel option.

2. Inflate the inside wheel to 241 kPa (35 psi) for the increased weight load.

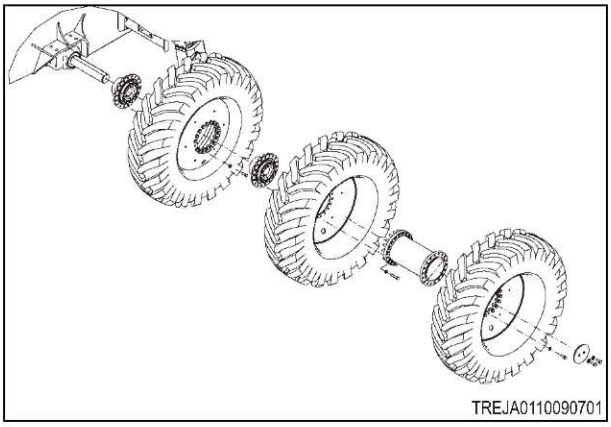


Fig. 1

3. Drive the inside wheel (1) up on to the blocking material so the weight of the machine is off of the outer wheels.

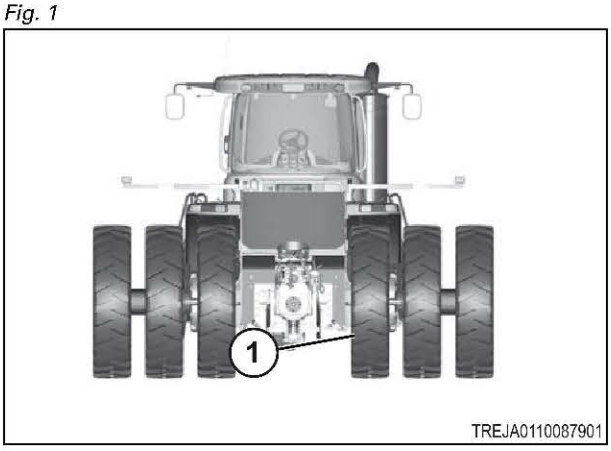


Fig. 2

4. Use the correct lifting tool to support the outer wheel assembly (1). Loosen and remove the mounting hardware (2) that fastens the outer wheel to the spacer (3).

NOTE:
The weight of the wheel assembly is approximately 331 kg (729 lb). The weight of each wheel weight is approximately 227 kg (500 lb).

5. Carefully remove the wheel assembly from the machine.

6. Repeat this procedure for the remaining outer wheels.

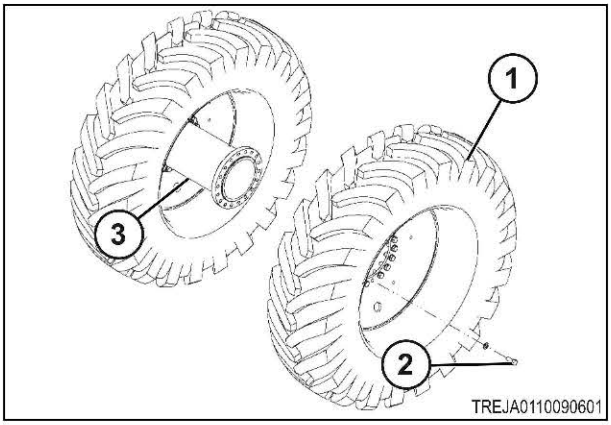


Fig. 3

14.1.2 Remove the center wheel

NOTE: *The procedure for the removal of the single and dual wheels is the same as the triples. The hub spacers may be different for wheel options.*

Special tools

Description	Part number	Vendor	Where used	Mandatory
Wheel guide stud 	332311	K-Line Industries, Inc.	Wheels	Mandatory

Procedure

1. Support the center wheel assembly (1) and the spacer (2) using the correct lifting equipment.

   NOTE:
   The weight range of the wheel assembly is 528.95 kg to 1586.85 kg (1166.14 lb to 3498.42 lb). The weight range of the spacer is 126 kg to 378 kg (277 lb to 831 lb). The weight of each wheel weight is 227 kg (500 lb) .

2. Loosen and remove the two opposite bolts (3) and replace with the wheel guide studs.

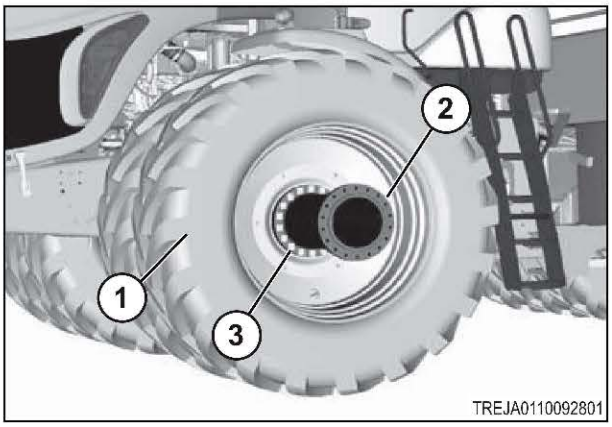


Fig. 4

3. Loosen and remove the remaining mounting hardware (3) that attaches the wheel assembly (1) and the spacer (2) to the hub.

   NOTE:
   The mounting hardware (3) *secures both the wheel assembly* (1) *and the spacer* (2) *to the hub. When the mounting hardware is removed both items will be loose.*

4. Carefully remove the spacer (2) and the wheel assembly (1) from the machine.

5. Remove the mounting hardware (1) and the end plate (2).

   NOTE:

6. Remove the hub and collet (3) from the axle.

7. Repeat this procedure for the remaining center wheels.

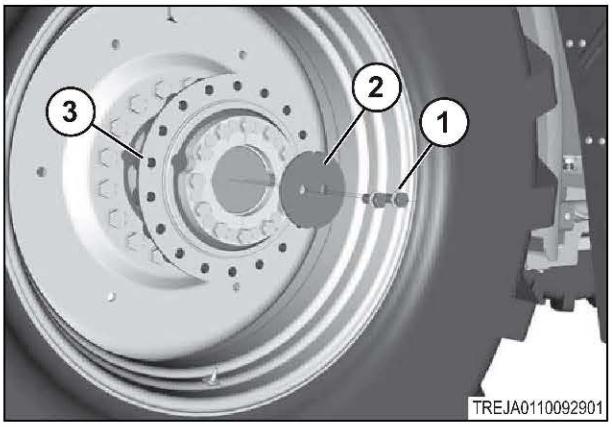


Fig. 5

Related Links

Remove the hub and collet page 14-25
Hub spacing page 14-23

14.1.3 Remove the inside wheel

Special tools

Description	Part number	Vendor	Where used	Mandatory
Support bracket	203-5584	Caterpillar dealer network	Drive train system	Mandatory
Support stand assembly	1U-7498	Caterpillar dealer network	Drive train system	Mandatory

NOTE: *The procedure for the removal of the single and dual wheels is the same as the triples. The hub spacers may be different for wheel options.*

Procedure

1. Lock the articulation joint with the articulation lock link (1).

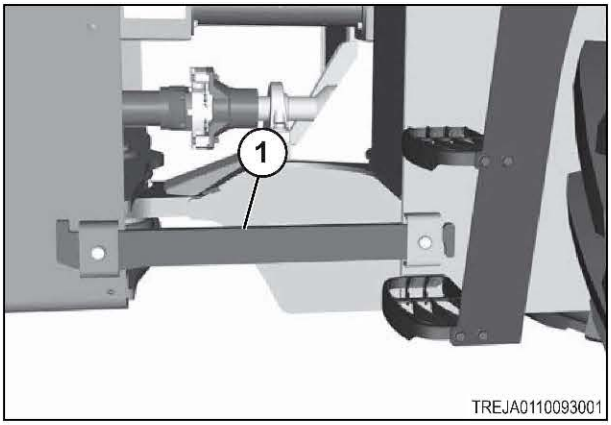


Fig. 6

2. Remove the plugs (1).

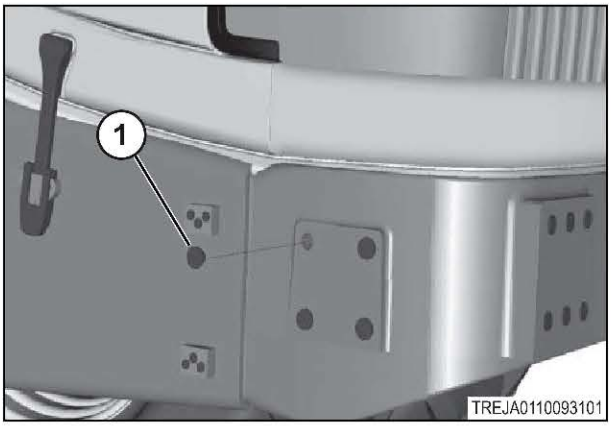


Fig. 7

3. Lift at this location (1) under the front of the machine.

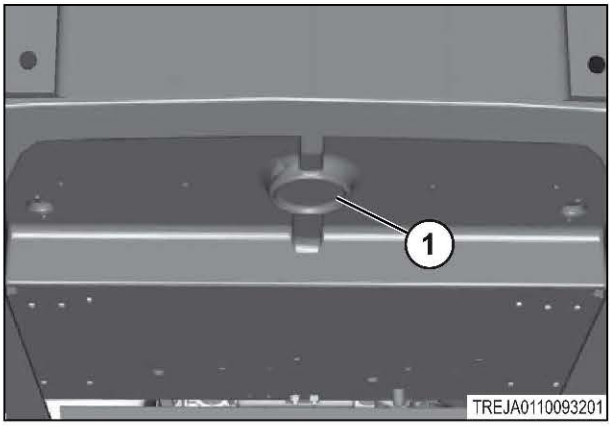


Fig. 8

4. Install the support stand brackets (1) to both sides of the front frame with the mounting hardware (2).

5. Position the correct lifting equipment (3) under the front frame and raise the front end of the machine off of the ground.

   IMPORTANT: *Make sure that the lifting equipment is rated for the weight of the machine.*

6. Install the support stands (4) under the support stand bracket (1).

   IMPORTANT: *Make sure that the support stands are rated for the weight of the machine.*

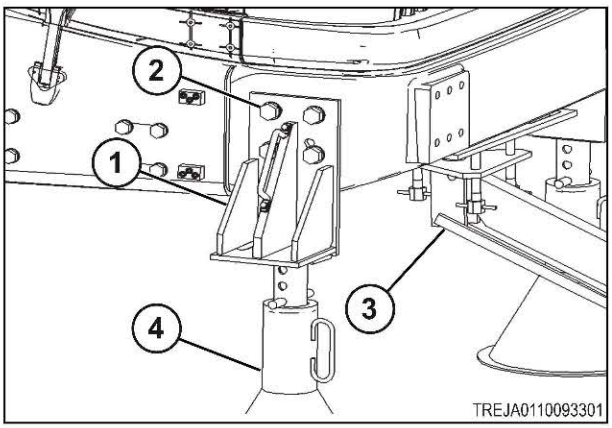


Fig. 9

7. Lower the machine onto the support stands.

8. Install the support stand brackets to both sides of the rear frame (1).

9. Lift the rear of the machine off the ground.

   IMPORTANT: *Do not lift on the axle or serious damage can occur. Make sure that the lifting equipment is rated for the weight of the machine.*

10. Install the support stands for the rear frame.

    IMPORTANT: *Make sure that the support stands are rated for the weight of the machine.*

11. Lower the machine onto the support stands.

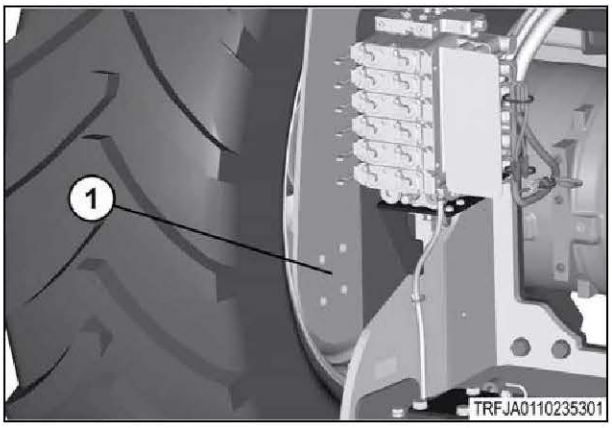


Fig. 10

12. Use the correct lifting equipment to support the inside wheel assembly (1).

IMPORTANT: *The weight of the wheel assembly is approximately 331 kg (729 lb).*

13. Loosen and remove the mounting hardware (2) that fastens the inside wheel to the hub (3). The hub is securely fastened to the axle.

14. Carefully remove the wheel assembly (1) from the machine.

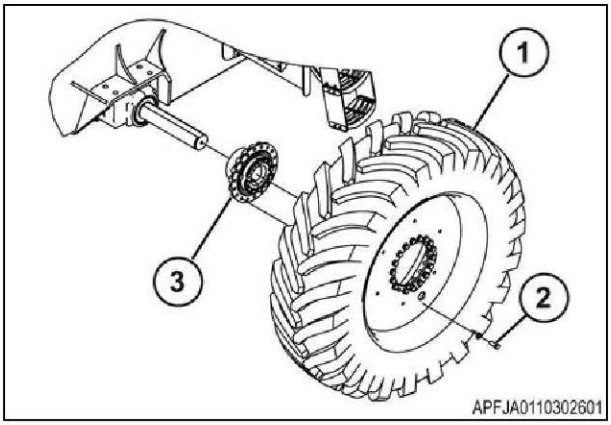


Fig. 11

15. Remove the hub and collet (1) from the axle.

16. Repeat this procedure for the remaining inside wheel assemblies.

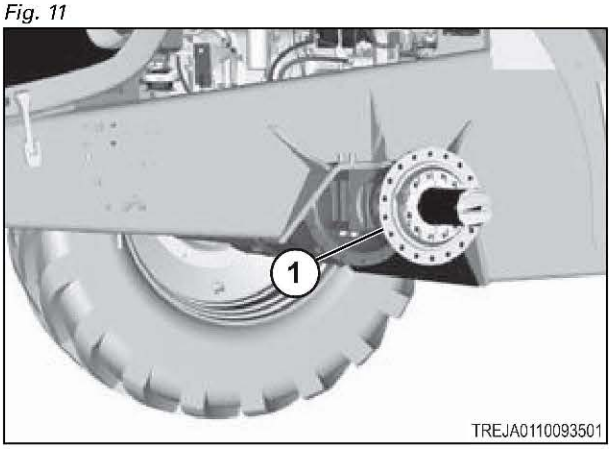


Fig. 12

Related Links

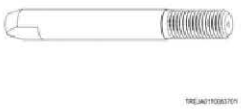
Remove the hub and collet page 14-25
Hub spacing page 14-23

14.2 Wheel installation

14.2.1 Install the inside wheel

NOTE: *The procedure for installation of the single and dual wheels is the same as the triples. The hub spacers may be different for wheel options.*

Special tools

Description	Part number	Vendor	Where used	Mandatory
Support bracket	203-5584	Caterpillar dealer network	Drive train system	Mandatory
Support stand assembly	1U-7498	Caterpillar dealer network	Drive train system	Mandatory
Wheel guide stud 	332311	K-Line Industries, Inc.	Wheels	Mandatory

Torque specifications

Description	Torque
Wheel mounting hardware	900 Nm (664 lbf ft)

WARNING: *The tire and rim assemblies are extremely heavy and require correct handling equipment to safely install them. Fully support and constrain the tire and rim assemblies before installation. Failure to use correct procedures and equipment may result in personal injury or death due to crushing.*

Procedure

1. Exploded view of the triple wheel option.

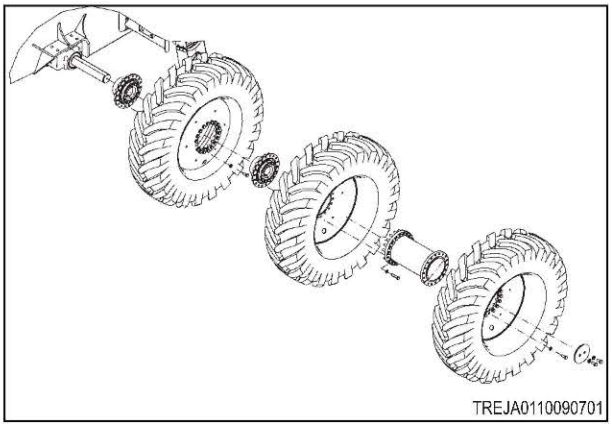


Fig. 13

2. Lock the articulation joint with the articulation lock link (1).

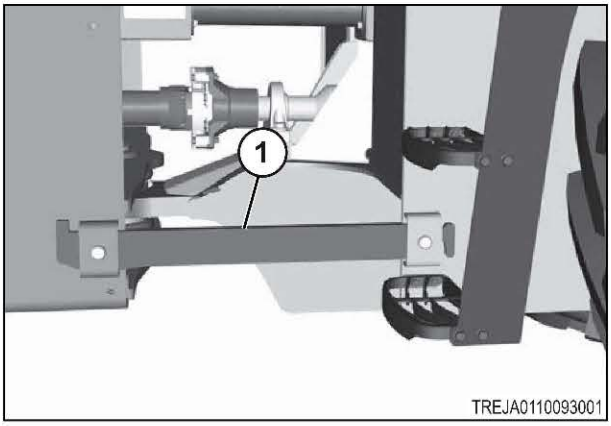


Fig. 14

3. Use the correct lifting tool to raise the front of the machine.

   IMPORTANT: *Make sure not to lift on the axle or serious damage can occur.*

4. Install the correct support stands (1) rated for the weight of the machine.

5. Lower the machine onto the support stands.

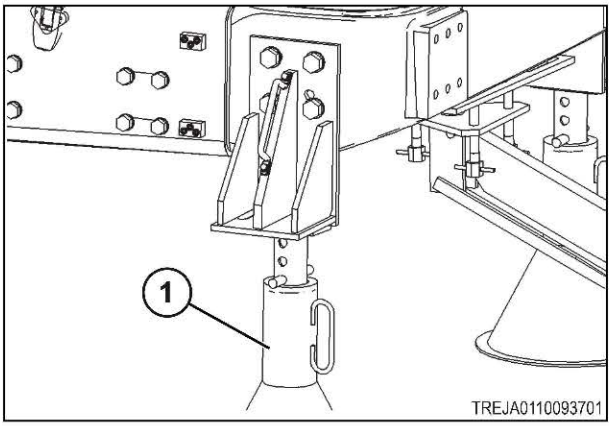


Fig. 15

6. Raise the rear of the machine with the correct lifting tool.

   IMPORTANT: *Make sure not to lift on the axle. Serious damage can occur.*

7. Install the support stand brackets to both sides of the rear frame (1).

8. Lower the machine onto the support stands.

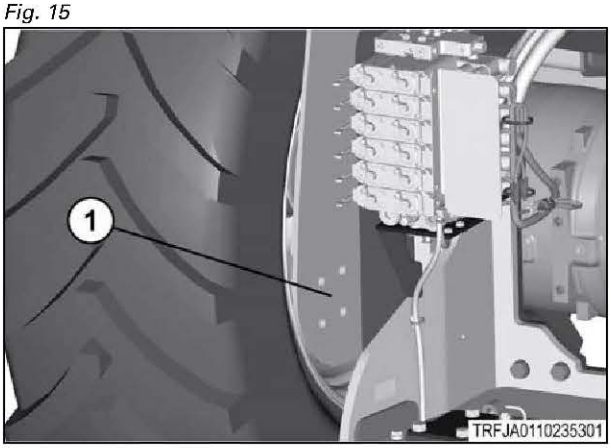


Fig. 16

9. Install the hub (1) onto the axle shaft.

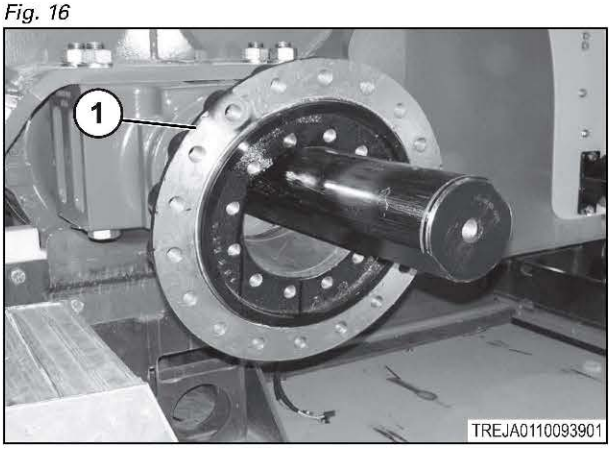


Fig. 17

10. Install both halves of the collet (1) and start the mounting hardware (2).
11. Correctly position the hub.
12. Make sure that the hub and collet are correctly attached to the axle.

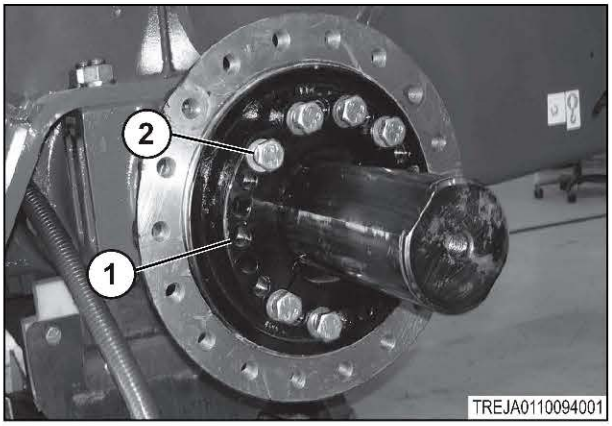


Fig. 18

13. Install the alignment studs (1) in the hub to help with the wheel installation.
14. Install the wheel weights before the wheel is installed.
15. Use the correct lifting equipment and move the wheel assembly into position.

    IMPORTANT: *The weight range of the wheel assembly is 528.95 kg to 1586.85 kg (1166.14 lb to 3498.42 lb).*

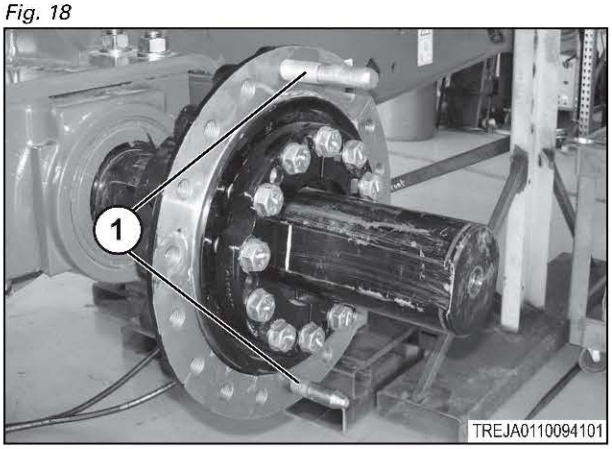


Fig. 19

16. Install the wheel assembly with the mounting hardware (1).
17. Tighten the mounting hardware and tighten in a star shaped pattern to 900 Nm (664 lbf ft).
18. Repeat this procedure for the remaining inner wheel assemblies.
19. Inflate all tires to the correct pressure for the necessary axle weight and load.
20. Once all inside wheels have been installed, lower the machine to the ground. Drive the machine for a minimum of ten minutes to seat the wheel weights and the hub collets. Starting at approximately 5 to 8 km/h (3 to 5 mph), bring the machine to a quick stop at least five times, using the service brakes.

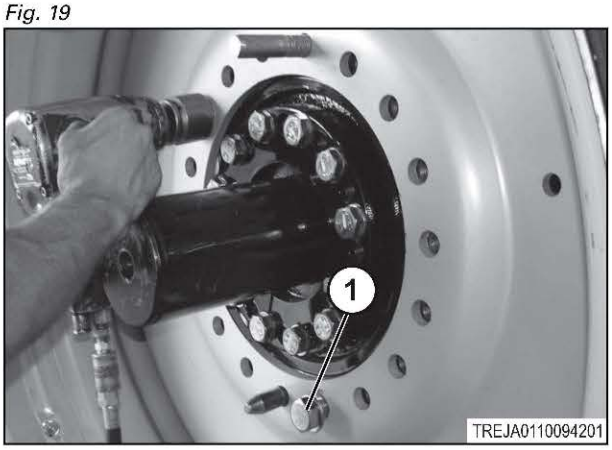


Fig. 20

21. Tighten the wheel bolts.
22. Tighten the inner collet bolts.
23. Tighten the wheel weight mounting bolts.
24. All the wheels can be installed before to the re-torque procedure.

Related Links

Re-torque the wheel and counterweight page 14-15
Hub spacing page 14-23
Install the hub and collet page 14-26
Install the wheel weights page 17-28

14.2.2 Install the center wheel

NOTE: *The procedure for installation of the single and dual wheels is the same as the triples. The hub spacers may be different for wheel options.*

Special tools

Description	Part number	Vendor	Where used	Mandatory
Wheel guide stud 	332311	K-Line Industries, Inc.	Wheels	Mandatory

Torque specifications

Description	Torque
End plate mounting hardware	240 Nm (177 lbf ft)
Wheel mounting hardware	900 Nm (664 lbf ft)

Procedure

1. Inflate inside wheel to 241 kPa (35 psi).
2. If the machine is not already supported by jack stands, drive the primary wheels up on to blocking material (1) so that the wheels are off of the ground.

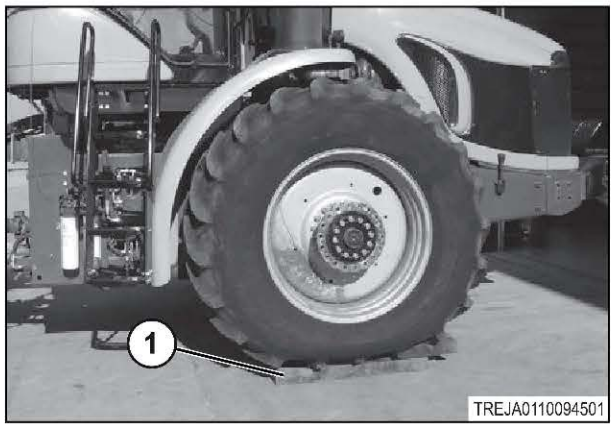


Fig. 21

3. Install the hub (1) and the collet (2) onto the axle.

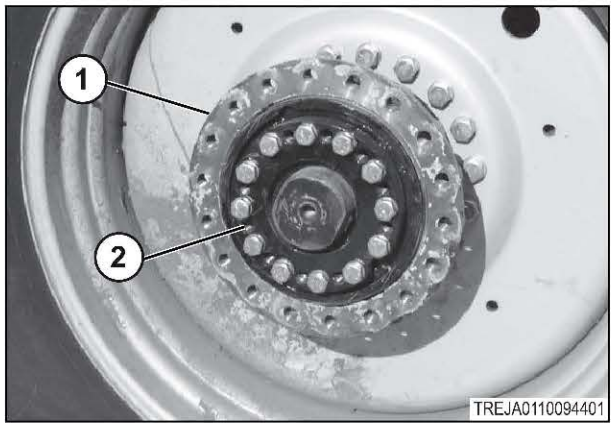


Fig. 22

4. Install the end plate (1) with the mounting hardware (2). Tighten the mounting hardware (2) to 240 Nm (177 lbf ft) .

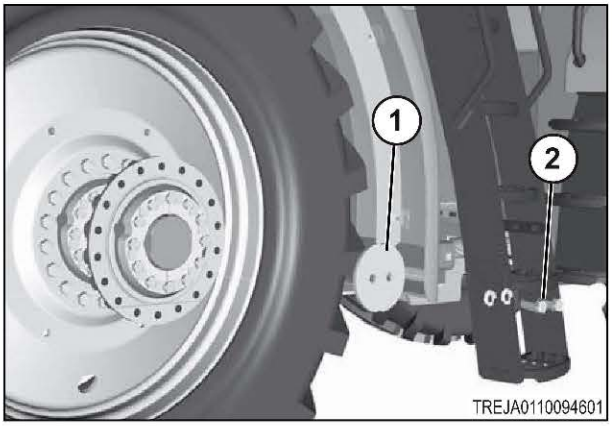


Fig. 23

5. Install the wheel guide studs (1) in hub to aid in the wheel installation.

   NOTE:

   Install wheel weights prior to the wheel, if equipped.

6. Use the correct lifting tool to move the center wheel assembly and spacer into position.

   NOTE:
   The weight range of the wheel assembly is 528.95 kg to 1586.85 kg (1166.14 lb to 3498.42 lb). The weight range of the spacer is approximately 126 kg to 378 kg (277 lb to 831 lb). The weight of each wheel weight is 227 kg (500 lb).

Fig. 24

7. Mount the center wheel assembly (1) and spacer (2) to the hub with the eighteen bolts with washers (3). Tighten the bolts and torque in a star shaped pattern to 900 Nm (664 lbf ft).
8. Make sure all tire pressures are set to the correct level for the intended axle weight and load.
9. Repeat this procedure for the remaining center wheel assemblies.
10. Once all center wheels have been installed, lower the machine to the ground.

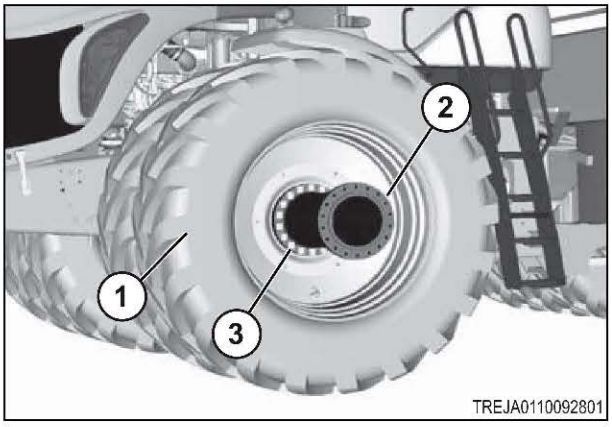


Fig. 25

11. Operate the machine at 5 km/h to 8 km/h (3 mph to 5 mph) for a minimum of ten minutes.
12. Use the service brakes to bring the machine to a quick stop several times.
13. Tighten the wheel bolts.

Related Links

Re-torque the wheel and counterweight page 14-15
Hub spacing page 14-23
Install the hub and collet page 14-26
Install the wheel weights page 17-28

14.2.3 Install the outside wheel

NOTE: *The procedure for installation of the single and dual wheels is the same as the triples. The hub spacers may be different for wheel options.*

Special tools

Description	Part number	Vendor	Where used	Mandatory
Wheel guide stud 	332311	K-Line Industries, Inc.	Wheels	Mandatory

Torque specifications

Description	Torque
Wheel mounting hardware	900 Nm (664 lbf ft)

Procedure

1. If the machine is not already supported by jack stands, drive the primary wheels (1) up on to the blocking material so the weight of the machine is off of the outer wheels. Install wheel guide studs into the mounting holes (2) in the spacer to aid in the wheel installation.

   NOTE:
   The wheel weights must be installed before the wheel.

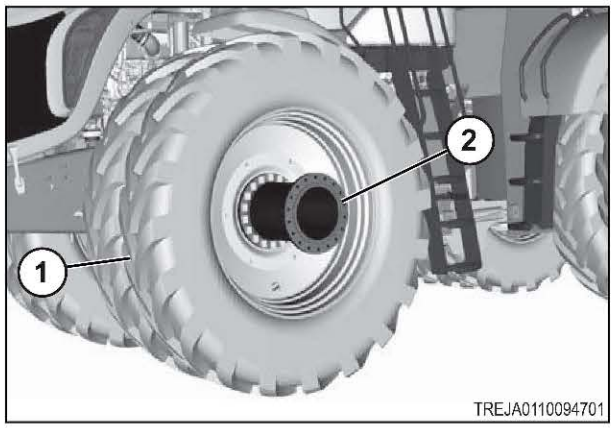


Fig. 26

2. Use the correct lifting equipment and move the wheel assembly into position.

   NOTE:
   The weight of the wheel assembly is between 528.95 kg to 1586.85 kg (1166.14 lb to 3498.42 lb). The weight of each wheel weight is 227 kg to 454 kg (500 lb to 1000 lb) .

3. Mount the outer wheel assembly (1) to the spacer with the mounting hardware (2). Tighten the mounting hardware in a star shaped pattern to 900 Nm (664 lbf ft).
4. Make sure that all tire pressures are set to the correct level for the intended axle weight and load.
5. Repeat this procedure for the remaining outer wheel assemblies.
6. Once all outside wheels have been installed, lower the machine to the ground.

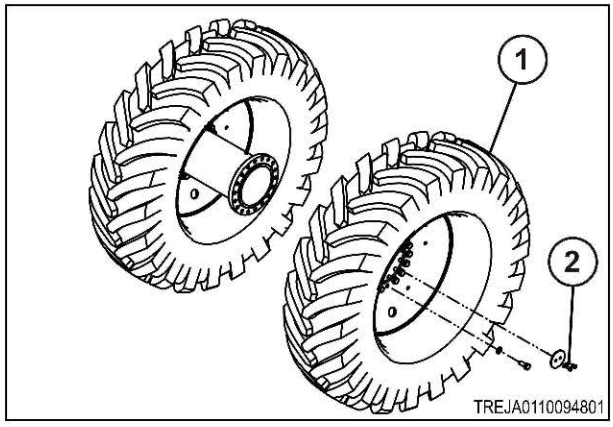


Fig. 27

7. Drive the machine for a minimum of ten minutes to seat wheel weights and hub collets. Starting at approximately 5 km/h to 8 km/h (3 mph to 5 mph), bring machine to a quick stop at least five times, using the service brakes.
8. Tighten the inner collet bolts using the hub and collet installation procedure.
9. Tighten the wheel and spacer bolts.
10. Tighten the wheel weight mounting bolts using the weight installation procedure. All wheels can be installed before performing the re-torque procedure.

Related Links

Re-torque the wheel and counterweight page 14-15
Hub spacing page 14-23
Install the hub and collet page 14-26
Install the wheel weights page 17-28

14.3 Wheel and counterweight re-torque

14.3.1 Re-torque the wheel and counterweight

Procedure

1. When all wheels have been installed, lower the machine to the ground.
2. Drive the machine for a minimum of ten minutes to set wheel weights and hub collets. Starting at approximately 5 to 8 km/h (3 to 5 mph), bring machine to a quick stop at least five times, using the service brakes.
3. Tighten all the wheel and spacer bolts in a star shaped pattern to 900 Nm (664 lbf ft).

   NOTE:
   Refer to the special tooling table for the appropriate tool.

   NOTE:
   When special tooling is used, the torque specification will have to be modified. Refer to the spacer torque wrench extension table for the proper adjustment.
4. Tighten all inner collet bolts using the hub and collet installation procedure.

   NOTE:
   See the information for installing the hub and collet.
5. Tighten all wheel weight mounting bolts using the weight installation procedure.

   NOTE: *See the information for installing the wheel weight.*

Related Links

Install the hub and collet page 14-26
Install the wheel weights page 17-28

14.4 Wheel special tooling

14.4.1 Collet torque wrench extension AG332273

Description	Part Number	Vendor	Where used
Collet hex wrench 30 mm 	332273	K-Line Industries, Inc.	Wheels

NOTE:
This tool is used to check the inner wheel hub collet bolt torque on the machines equipped with dual and triple wheel arrangements.

Collet torque wrench extension AG332273				
Torque Wrench Length	Torque Wrench Length	Angle From Straight	Torque Wrench Setting	Torque Wrench Setting
cm	in	degrees	Nm	lbf ft
76	30	0	344	254
76	30	45	383	283
76	30	90	528	390
89	35	0	362	267
89	35	45	399	294
89	35	90	528	390
102	40	0	377	278
102	40	45	411	304
102	40	90	528	390
114	45	0	389	287
114	45	45	422	311
114	45	90	528	390
127	50	0	400	295
127	50	45	430	318
127	50	90	528	390
140	55	0	409	302
140	55	45	438	323
140	55	90	528	390
152	60	0	417	307
152	60	45	444	328

Collet torque wrench extension AG332273				
152	60	90	528	390
165	65	0	424	313
165	65	45	450	332
165	65	90	528	390
178	70	0	430	317
178	70	45	455	335
178	70	90	528	390

14.4.2 Spacer torque wrench extension AG332274

Description	Part number	Vendor	Where used	Mandatory
Straight wrench 	332274	K-Line Industries, Inc.	Wheels	Mandatory

NOTE:
This tool is used to check the bolt torque for the outer wheel and the spacer hub on the machines equipped with dual or triple wheel arrangements.

Spacer torque wrench extension AG332274				
Torque Wrench Length	**Torque Wrench Length**	**Angle From Straight**	**Torque Wrench Setting**	**Torque Wrench Setting**
cm	**in**	**degrees**	**Nm**	**lbf ft**
30	12	0	782	577
30	12	45	814	601
30	12	90	901	665
35	14	0	797	588
35	14	45	825	609
35	14	90	901	665
40	16	0	809	597
40	16	45	834	615
40	16	90	901	665
45	18	0	818	604
45	18	45	841	621
45	18	90	901	665
50	20	0	826	610
50	20	45	847	625
50	20	90	901	665

Spacer torque wrench extension AG332274				
55	22	0	832	614
55	22	45	851	628
55	22	90	901	665
60	24	0	838	618
60	24	45	855	631
60	24	90	901	665
65	26	0	842	621
65	26	45	859	634
65	26	90	901	665
70	28	0	846	624
70	28	45	861	636
70	28	90	901	665
76	30	0	782	577
76	30	45	814	601
76	30	90	901	665
89	35	0	797	588
89	35	45	825	609
89	35	90	901	665
102	40	0	809	597
102	40	45	834	615
102	40	90	901	665
114	45	0	818	604
114	45	45	841	621
114	45	90	901	665
127	50	0	826	610
127	50	45	847	625
127	50	90	901	665
140	55	0	832	614
140	55	45	851	628
140	55	90	901	665
152	60	0	838	618
152	60	45	855	631
152	60	90	901	665
165	65	0	842	621
165	65	45	859	634
165	65	90	901	665

Spacer torque wrench extension AG332274				
178	70	0	846	624
178	70	45	861	636
178	70	90	901	665

14.4.3 Single wheel bolt wrench AG332275

Description	Part number	Vendor	Where used	Mandatory
Single wheel bolt wrench 36 mm 	332275	K-Line Industries, Inc.	Wheels	Mandatory

NOTE:
This tool is used to check the torque for the wheel bolts on the machines equipped with the single tire arrangement.

Single Wheel Bolt Wrench (PN AG332275)				
Torque Wrench Length	**Torque Wrench Length**	**Angle From Straight**	**Torque Wrench Setting**	**Torque Wrench Setting**
cm	**in**	**degrees**	**Nm**	**lbf ft**
30	12	0	813	600
30	12	45	837	618
30	12	90	901	665
35	14	0	825	608
35	14	45	846	624
35	14	90	901	665
40	16	0	833	615
40	16	45	852	629
40	16	90	901	665
45	18	0	840	620
45	18	45	857	633
45	18	90	901	665
50	20	0	846	624
50	20	45	861	636
50	20	90	901	665
55	22	0	851	628
55	22	45	865	638
55	22	90	901	665

Single Wheel Bolt Wrench (PN AG332275)				
60	24	0	855	631
60	24	45	868	640
60	24	90	901	665
65	26	0	858	633
65	26	45	870	642
65	26	90	901	665
70	28	0	861	635
70	28	45	872	644
70	28	90	901	665
76	30	0	813	600
76	30	45	837	618
76	30	90	901	665
89	35	0	825	608
89	35	45	846	624
89	35	90	901	665
102	40	0	833	615
102	40	45	852	629
102	40	90	901	665
114	45	0	840	620
114	45	45	857	633
114	45	90	901	665
127	50	0	846	624
127	50	45	861	636
127	50	90	901	665
140	55	0	851	628
140	55	45	865	638
140	55	90	901	665
152	60	0	855	631
152	60	45	868	640
152	60	90	901	665
165	65	0	858	633
165	65	45	870	642
165	65	90	901	665
178	70	0	861	635
178	70	45	872	644
178	70	90	901	665

14.4.4 Wheel bolt 36 mm wrench AG332272

Description	Part number	Vendor	Where used	Mandatory
Wheel bolt wrench 36 mm 	332272	K-Line Industries, Inc.	Wheels	Mandatory

NOTE:
This tool is used to check the inner wheel bolt torque on the machines equipped with dual and triple wheel arrangements.

Wheel torque wrench extension AG332272				
Torque wrench length	**Torque wrench length**	**Angle from straight**	**Torque wrench setting**	**Torque wrench setting**
cm	**in**	**degrees**	**Nm**	**lbf ft**
76	30	0	711	525
76	30	45	758	559
76	30	90	901	665
89	35	0	733	541
89	35	45	776	572
89	35	90	901	665
102	40	0	751	554
102	40	45	789	583
102	40	90	901	665
114	45	0	765	565
114	45	45	800	591
114	45	90	901	665
127	50	0	777	573
127	50	45	809	597
127	50	90	901	665
140	55	0	787	581
140	55	45	817	603
140	55	90	901	665
152	60	0	795	587
152	60	45	823	608
152	60	90	901	665
165	65	0	802	592

Wheel torque wrench extension AG332272				
165	65	45	829	612
165	65	90	901	665
178	70	0	809	597
178	70	45	834	615
178	70	90	901	665

14.4.5 Wheel guide stud AG332311

Description	Part number	Vendor	Where used	Mandatory
Wheel guide stud 	332311	K-Line Industries, Inc.	Wheels	Mandatory

NOTE:
This tool is used to help with installation of the tires/wheels. Quantity one of this part number includes two guide studs.

14.5 Hub spacing

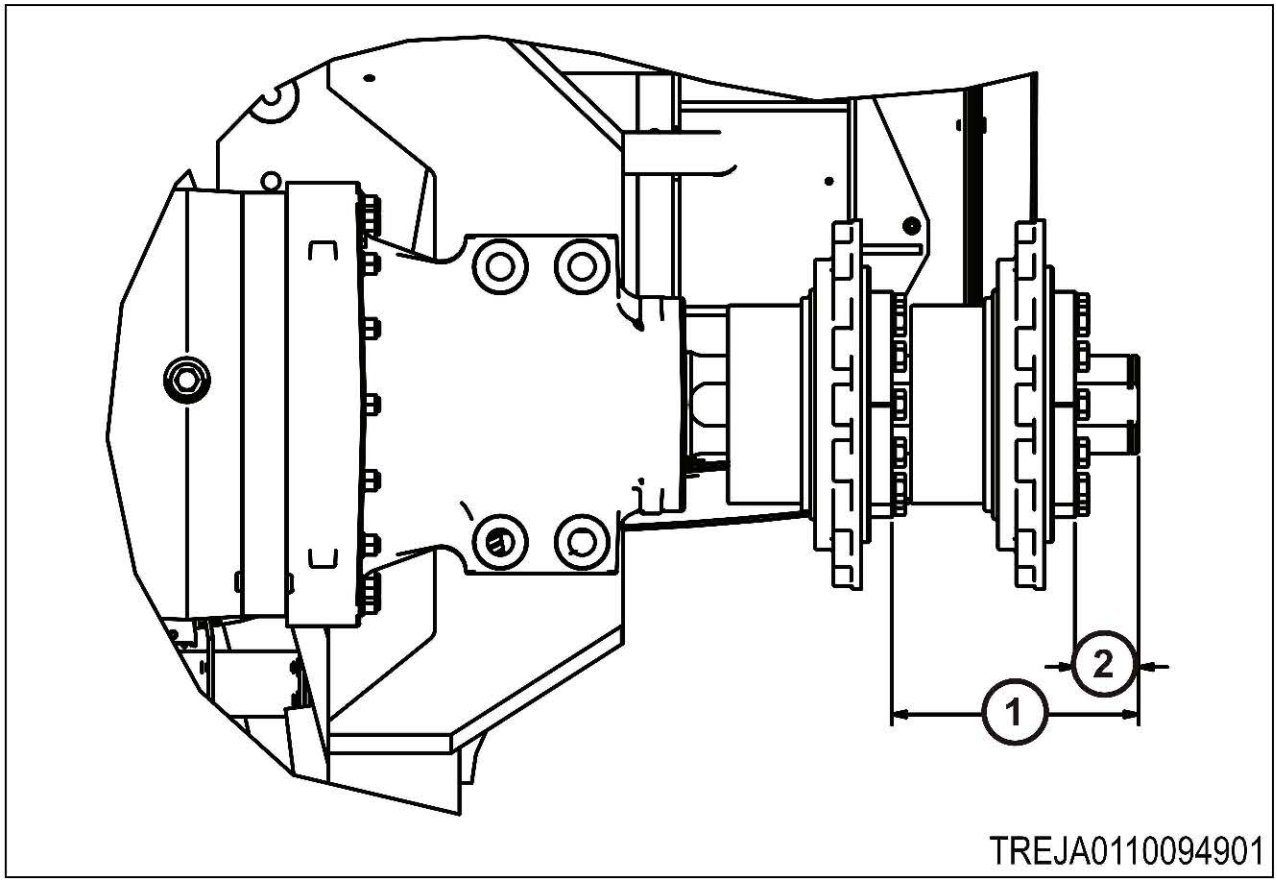


Fig. 28

Triple hubs spacing		
Tire size	End of axle to inner collet face (1)	End of axle to outer collet face (2)
480/80R46	302 mm (11.89 in)	16 mm (0.63 in)
480/80R50	302 mm (11.89 in)	16 mm (0.63 in)
520/85R42	302 mm (11.89 in)	16 mm (0.63 in)
520/85R46	302 mm (11.89 in)	16 mm (0.63 in)

Dual hubs spacing		
Tire size	End of axle to inner collet face (1)	End of axle to outer collet face (2)
620/70R46	302 mm (11.89 in)	65 mm (2.56 in)
650/85R38	285 mm (11.22 in)	-20 mm (-0.79 in)
710/70R38	269 mm (10.59 in)	32 mm (1.26 in)
710/70R42	293 mm (11.54 in)	56 mm (2.20 in)
710/70R42	217 mm (8.54 in)	-20 mm (-0.79 in)
800/70R38	217 mm (8.54 in)	-20 mm (-0.79 in)

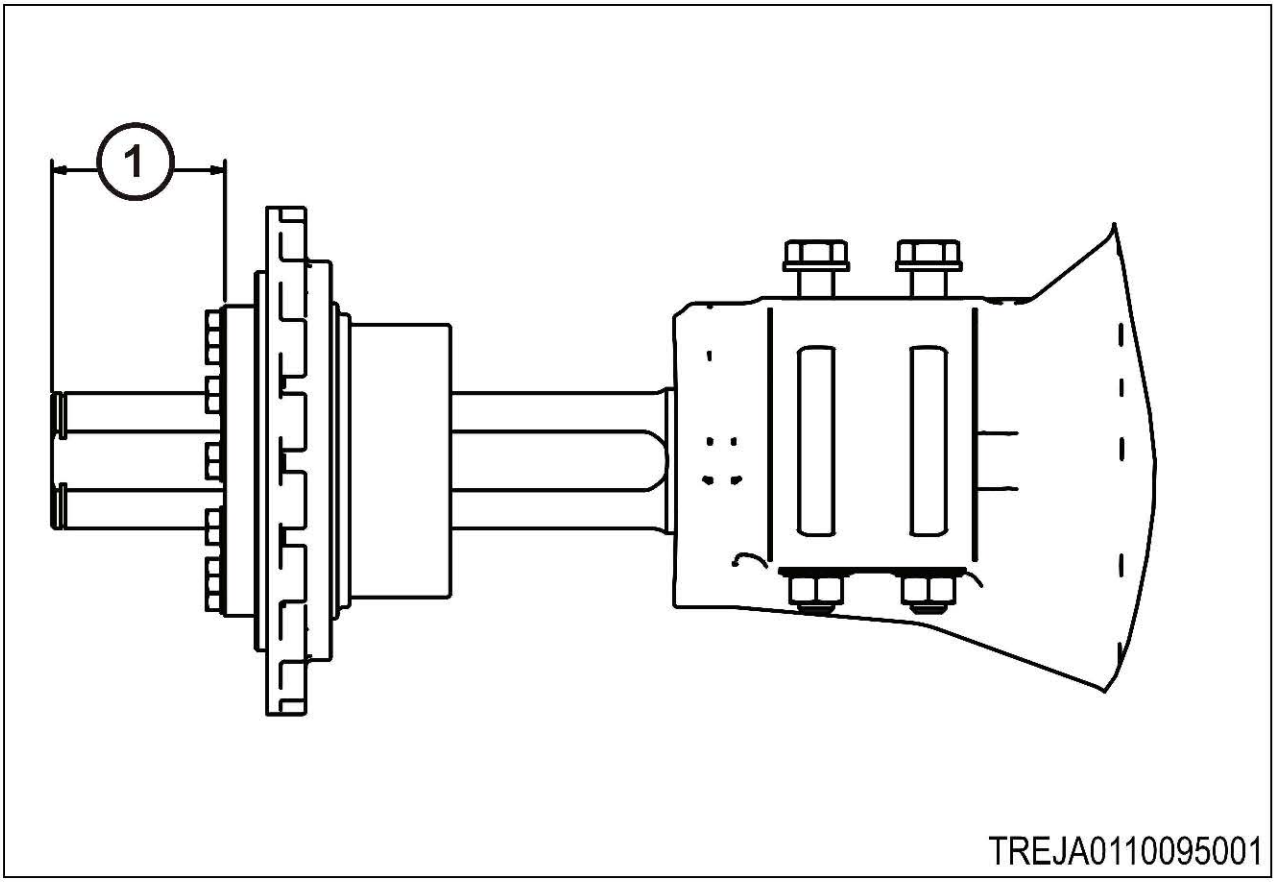


Fig. 29

Single hubs spacing	
Tire size	End of axle to collet face (1)
35.5L32	138 mm (5.44 in)
100/45R46	180 mm (7.09 in)

14.6 Remove the hub and collet

Procedure

1. **CAUTION:**
   Make sure that enough thread remains in the hub to safely hold the collet.

   Loosen and remove all of the bolts and washers that secure the collet (1) except four bolts (2).

   Two of the bolts are located on the joint between the two halves of the collets. The other two bolts are located in between the joints.

Fig. 30

2. Back out the bolts by 19.0 mm (0.75 in). These bolts will hold the collet if there is any sudden movement.

   NOTE:
   The bolts may need to back out more than 19.0 mm (0.75 in) to let the collet move freely.

3. Install pusher bolts (1) to the collet.

4. Alternate turning the pusher bolts (1) clockwise so that the collet slowly retracts from the hub (2).

   NOTE:
   Additional pusher bolts may be needed.

5. Once the collet has broken free of the hub, remove the bolts, both halves of the collet, and the hub.

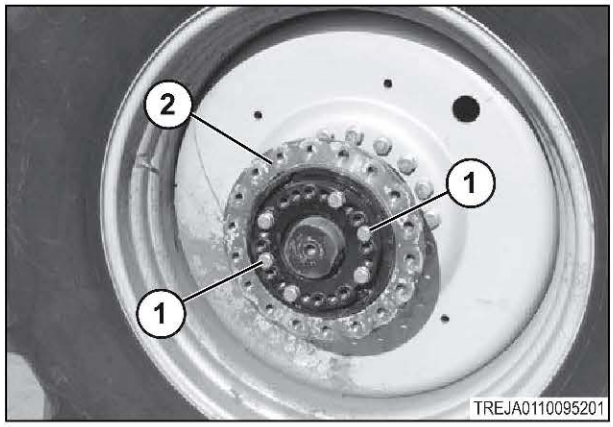


Fig. 31

14.7 Install the hub and collet

Before starting the procedure

Coat the bolt threads with antiseize lubricant prior to installation. Antiseize lubricant not permitted on mating tapered surfaces of collets and outer hub.

Collet Bolt Tightening Sequence.

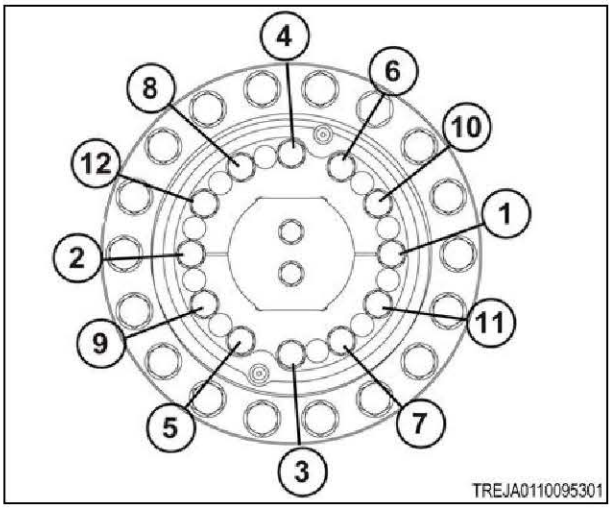


Fig. 32

Procedure

1. Tighten the mounting hardware (1) followed by mounting hardware (2) to a maximum torque of 530 Nm (391 lbf ft).
2. Tighten the mounting hardware (3) followed by mounting hardware (4) to a maximum torque of 530 Nm (391 lbf ft).
3. Tighten the mounting hardware (5) followed by mounting hardware (6) to a maximum torque of 530 Nm (391 lbf ft).
4. Tighten the mounting hardware (7) followed by mounting hardware (8) to a maximum torque of 530 Nm (391 lbf ft).
5. Tighten the mounting hardware (9) followed by mounting hardware (10) to a maximum torque of 530 Nm (391 lbf ft).
6. Tighten the mounting hardware (11) followed by mounting hardware (12) to a maximum torque of 530 Nm (391 lbf ft).
7. Repeat the procedure two more times for a total of three passes.
8. Then repeat the procedure one more time at standard torque of 460 Nm (339 lbf ft).