

# 10. Wheel installation

## 10.a. Wheel installation preparation

### Warning



Wheels that are not properly installed or maintained may not be safe.

Failure to follow proper wheel installation or maintenance practices may result in serious injury or death.

Follow the proper wheel installation and maintenance practices as contained in this Service Manual for Alcoa® Wheels.

For free training on proper installation and maintenance or for the most recent updates of online materials, contact Howmet Wheel Systems via web page [www.alcoawheelseurope.com](http://www.alcoawheelseurope.com).

### STEP 1

Clean the mating face of the hub / axle, remove dirt, oxidation and paint. Do not apply any rust inhibitor, surface coating, grease, oil or paint. Follow the recommendations of axle / vehicle manufacturers..



Picture 10-1

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### STEP 2

Clean the mating face of the wheel (disc), remove dirt, oxidation and paint. Do not apply any rust inhibitor, surface coating, grease, oil or paint. If the mating face(s) of wheel(s) is (are) severely corroded, remove wheel(s) from service.



Picture 10-2

### STEP 3

Clean the inner side of the hub bore of the wheel. Remove dirt, oxidation and other foreign residues.



Picture 10-3

Picture 10-4:

The abrasive tools used in pictures 10-2 and 10-3 are available from authorized distributors of Alcoa® Wheels, reference: Bristle Discs for Alcoa® Wheels.

For documentation contact Howmet Wheel Systems at: [www.alcoawheelseurope.com](http://www.alcoawheelseurope.com)



Picture 10-4

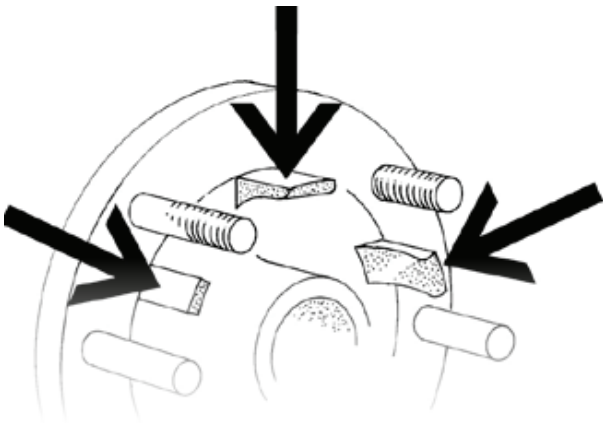
### STEP 4

Apply a layer of HUB grease, or another grease that does not contain metal or water, on the inner side of the hub bore of the wheel. See Picture 10-5.

Alternatively apply the same product at the pilot tabs, spigots or centring edge of the hub / axle. See Graphic 10-6.



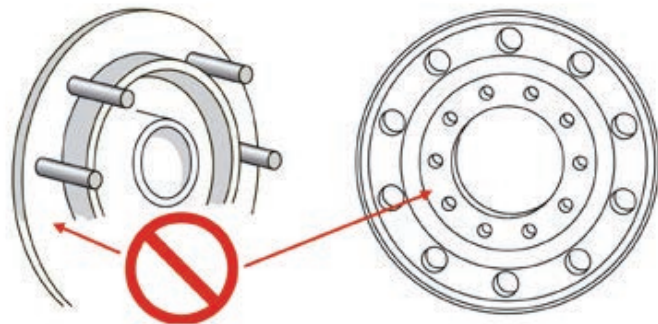
Picture 10-5



Graphic 10-6

#### Note:

Do not apply any rust inhibitor, surface coating, grease, oil or paint on either mating face of hub or mating face of wheel (disc). In case of an inner dual fitted wheel this applies to both sides of the wheel disc. See graphic 10-7.



Graphic 10-7

HUBgrease for Alcoa® Wheels is available from authorized distributors of Alcoa® Wheels. See picture 10-8.

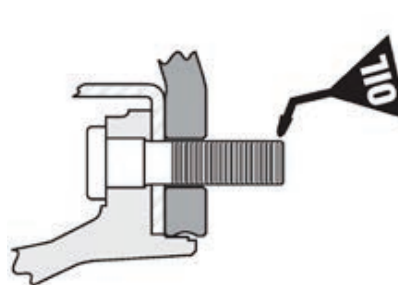


Picture 10-8

## STEP 5

For nuts used on hub piloted wheels apply two drops of motor oil to the first two threads of the tip of each stud (see graphic 10-9) and between the nut and the integrated washer (see graphic 10-10). This will minimize corrosion between the mating threads. Lubrication is not necessary with new hardware.

Check if the integrated washer freely rotates on nut applying some pressure on the integrated washer towards nut while rotating. Fit nut onto the stud and check if the nut can freely rotate by hand turning the nut towards the hub.



Graphic 10-9



Graphic 10-10

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### NOTICE

Do not use any lubricants that are water based or greases containing metals (e.g. copper grease). Water based products can lead to accelerated corrosion and products containing metals allow galvanic corrosion.

For information contact Howmet Wheel Systems via webpage [www.alcoawheelseurope.com](http://www.alcoawheelseurope.com)



Picture 10-11: Torque wrench

## STEP 6

1. Refer to the owner's manual of the vehicle or axle for correct torque value: Nm (kgf).
2. Hand tighten all nuts.
3. Impact wrenches, if used, should be carefully adjusted to apply torques within or below the limits recommended. See section 4.
4. Tighten to the recommended torque with a calibrated torque wrench (Picture 10-11) following the proper sequence. See graphics 10-12, 10-13, 10-14 and Section 12.b.
5. After each wheel mounting, torque should be checked with a calibrated torque wrench (Picture 10-11).

### IMPORTANT

After 8 - 80 kilometres or 5 - 50 miles of operation torque should be rechecked unless vehicle/axle manufacturer or your documented fleet practices determine otherwise.

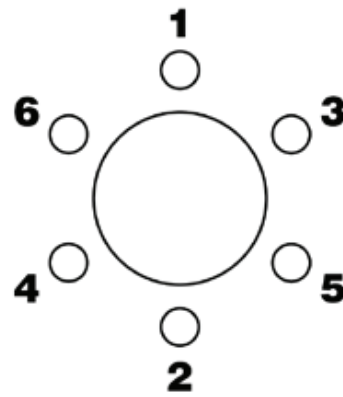
Check torque frequently from then on.

### NOTICE

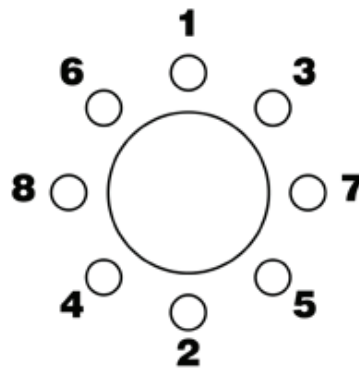
If nuts require frequent tightening, studs break frequently, wheel nut washers break or bolt holes are pounding out, hardware and mounting practices should be reviewed.

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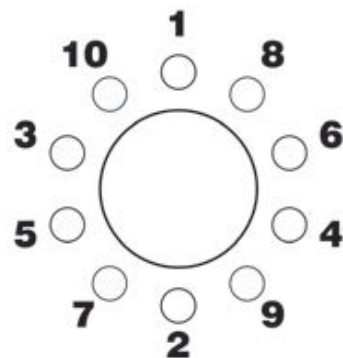
For additional information see Section 12.a.



Graphic 10-12



Graphic 10-13



Graphic 10-14

## 10.b. At wheel installation

Check for and replace bent, broken, cracked or damaged studs. When replacing broken studs, always replace the studs on each side of the broken stud.

If two or more studs are broken, replace all the studs for that wheel position. Check with the stud manufacturer for regular maintenance and stud replacement practices.

All wheel fastener hardware should be grade 8 or metric conversion 10.9. Follow the hardware manufacturers' recommendations when replacing studs. See Section 11.b.iii.

### Warning



Wheels that are not properly installed or maintained may not be safe.

Failure to follow proper wheel installation or maintenance practices may result in injury or death.

Follow the proper wheel installation and maintenance practices as described in this Section.

#### IMPORTANT

- Perform a wheel fitment check to ensure proper clearance from any obstructions. See 'Wheel fitment check' Section 5.d.
- Do not exceed maximum wheel load. Customer must compare OEM vehicle axle load ratings to maximum wheel load rating.
- Refer to tyre manufacturers' recommendations for proper tyre pressure, before mounting the tyre.

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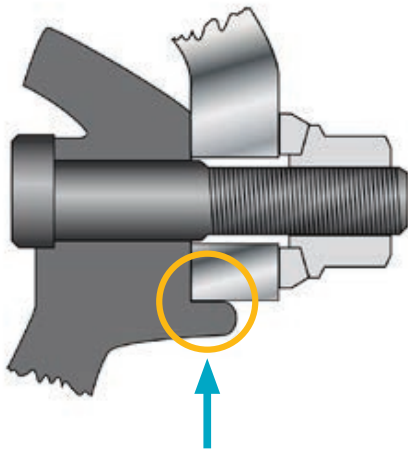
1. Make sure all wheel nuts are properly torqued. Check them often. See Section 12.a. If the wheel is loose, the holes will pound out or deform. If some nuts are tight and others are loose, the wheel may develop cracks or studs may break. This condition may cause wheels to loosen and disengage from the vehicle. Dirt streaks or rust radiating from bolt holes and / or vent holes can indicate loose nuts. See Section 13.h.
2. Ensure the end of the wheel wrench is smooth or cover the wheel mounting surface with a protective shield prior to tightening the nuts. The wheel wrench end will mar the wheel around the nuts if it is not smooth.
3. Keep all component contact surfaces smooth and clean. Dirt or projections on mounting surfaces may lead to loose or losing wheels. Remove all projections resulting from burrs, nicks, etc. Take care that loose dirt does not fall onto mounting surface during assembly.
4. Do not introduce any foreign objects such as spacers or top hats (hub caps or covers) into the contact surface areas of the mounting system unless approved by Howmet Wheel Systems. Do not paint, powder coat or otherwise coat Alcoa® Wheels.
5. Additional care should be used when mounting Dura-Bright® surface treated Alcoa® Wheels, since minor nicks and scratches cannot be polished out. See Section 14.b. for specific cautions, care and maintenance procedures.
6. Discmates for Alcoa® Wheels or nylon protection gaskets are designed to be placed between wheels and hub or brake drum contact surfaces and as well as between the dual mounted wheels contact surfaces. See Sections 4.g. and 10.a. Discmates for Alcoa® Wheels or nylon protection gaskets are recommended to be replaced when the tyre/wheel assemblies are removed and reinstalled.

## 10.c. Hub centring

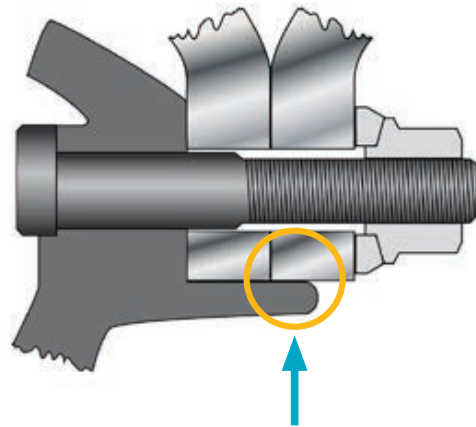
All European type Alcoa® Wheels for medium and heavy-duty commercial vehicles are hub centred wheels. European type Alcoa® Wheels have cylindrical bolt holes and are not suitable for bolt centring with conical or spherical nuts: never use any kind of this type of hardware on wheels with cylindrical bolt holes. For reference consult the Specification Sheet for Alcoa® Wheels available from the web or consult Howmet Wheel Systems.

Hubs designed for steel hub piloted wheels may not have enough pilot tab length to locate dual aluminium wheels. Pay close attention to pilot tab length, particularly when converting from steel to aluminium duals.

Measure the hub pilot tab length to make sure the hub properly centres the wheels. The pilot tab length for sufficient centring must be 5 mm or more for single mounting (Graphic 10-15) and 1x disc thickness + 5 mm or more for dual mounting (Graphic 10-16). In both cases dimensions are excluding bevelled edges. Longer spigots make mounting easier.



Graphic 10-15



Graphic 10-16

### NOTICE

Always apply HUBgrease for Alcoa® Wheels or another grease that does not contain metal or water, on the pilot tabs or spigots (Picture 10-17) to reduce corrosion and make it easier to remove wheels when replacing tyres or other components for service.



Picture 10-17



## 10.d. Disc thickness and thread engagement

The mounting flange or disc of medium and heavy-duty truck Alcoa® Wheels is thicker (19.1 to 28.6 mm) than the mounting flange of steel wheels (9 to 16 mm) and therefore requires different mounting hardware.

For correct mounting of Alcoa® Wheels use:

- Longer (replacement) studs with standard nuts, as described in Section 11.a., or
- Sleeved nuts (available from Howmet Wheel Systems) with standard length studs, as described in Section 11.b.

For reference see the latest Specification Sheet for Alcoa® Wheels with details about wheel sizes, part numbers, dimensional properties such as disc thickness, bolt hole diameters and more.

## Warning



Insufficient engagement of threading between stud and nut may cause cracking or breaking of the stud.

Cracking or breaking studs may result in separation of the tyre/wheel assembly from the vehicle resulting in serious injury or death.

Follow the proper wheel installation and maintenance practices as described in this Section.

# 11. Mounting hardware

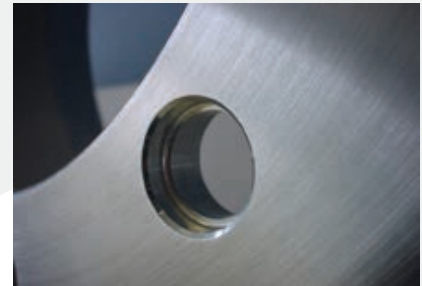
Depending on the mounting hardware or type of mounting an Alcoa® Wheel may be offered with different bolt hole diameters:



Picture 11-1



Picture 11-2



Picture 11-3

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From left to right various bolt hole diameters for M22 or 7/8" bolt / stud diameters:

- Picture 11-1 26 mm bolt hole for standard nuts and longer studs. See Section 11.a.
- Picture 11-2 32 mm bolt hole for sleeved nuts and standard studs. See Section 11.b.
- Picture 11-3 Bolt hole a.k.a. 'dual hole' for Volvo OEM hardware only. See Section 11.d.

## Warning



Use of chrome-plated wheel nuts, which have chrome plating on the surfaces that contact the wheel, can cause reduced and inconsistent wheel clamping.

This condition can cause wheels to loosen and disengage from the vehicle, causing serious injury or death.

Never use wheel nuts with chrome-plated contact surfaces. Use only recommended hardware on Alcoa® Wheels.

## IMPORTANT

1-piece flange nuts are not approved for use on any Alcoa® Wheels application. See picture 11-4.

Stud standout is critical to understand for the proper application of the various nuts used for these three different bolt hole diameters. The stud standout must be checked very carefully.

The stud standout is measured from the flat mounting surface of the hub, or drum brake, which is in contact with the disc of the wheel, to the outer end of the stud.

The stud standout on steer axle / single mounting (picture 11-5) and stud standout on drive axle / dual mounting (picture 11-6) must be checked both for sufficient length.



Picture 11-4



Picture 11-5



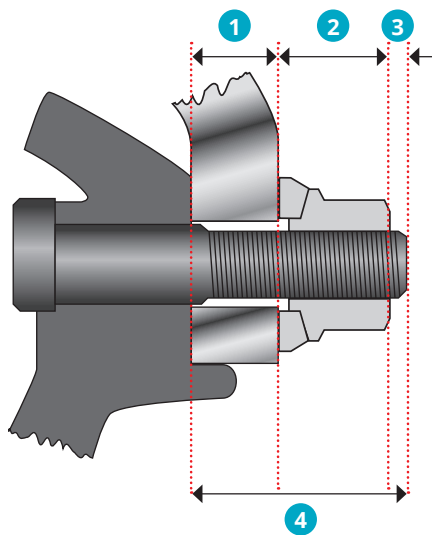
Picture 11-6

## 11.a. Mounting Alcoa® Wheels with standard 2-piece flange nuts and replacing wheel studs

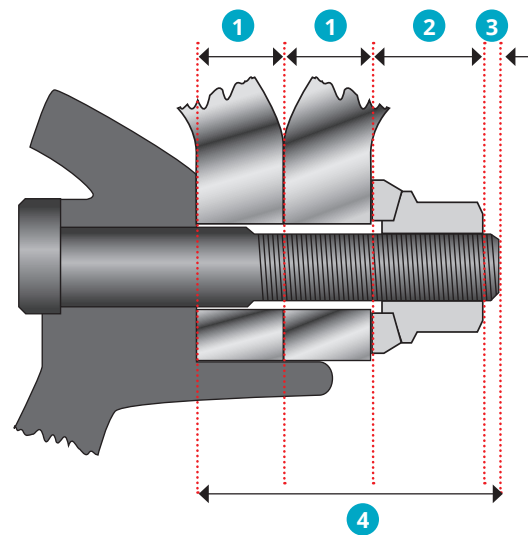
Alcoa® Wheels with this type of mounting system require longer studs than for steel wheels. The stud standout must be long enough to cover the disc thickness of single or dual mounted aluminium wheels, the height of the wheel nut and an additional two threads of the stud protruding from the top of the nut.

For single mounting the minimum stud standout required =  
1x disc thickness of the Alcoa® Wheel + height of standard nut +  
2 full threads, 3 mm\*\* @ M22, M20 or M18 x 1.5 studs.  
See graphic 11-7.

For dual mounting the minimum stud standout required = 2x disc thickness of the Alcoa® Wheel + height of standard nut + 2 full threads, 3 mm\*\* @ M22, M20 or M18 x 1.5 studs. See Graphic 11-8.



Graphic 11-7



Graphic 11-8

1. Disc thickness of the Alcoa® Wheel
2. Height of standard nut
3. 2 full threads
4. Total stud standout

\*\* or 2 full threads in case of 7/8"-11 BSF studs (Scania) or 7/8"-14 UNF studs (Volvo >2004)