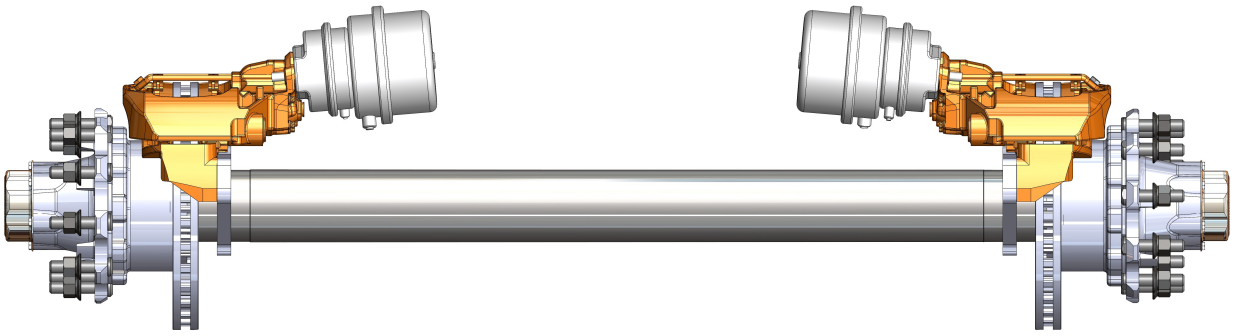
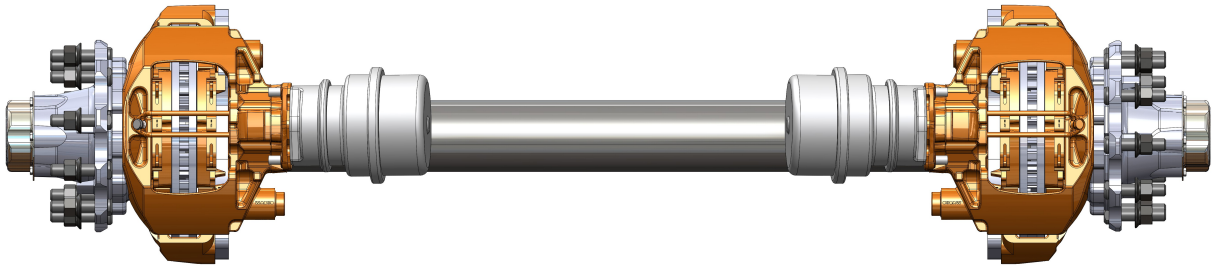
TMC PAN 22 DISC BRAKE

AXLE SERVICE MANUAL





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We Engineer Quality and Performance

RECOMMENDED SERVICE SCHEDULE

First Service 500 km or on Delivery:

Check torque settings of all wheel nuts
- On delivery.
- After all wheel changes.

After first 5000 Km:

Check and adjust all wheel bearings.

Every 50,000 km:

Check disc brake pad linings and pad retaining fork for wear. Replace if necessary.
With the axle end lifted rotate the wheels and determine if the wheel bearings need adjustment.
Re adjust the wheel bearings as necessary.

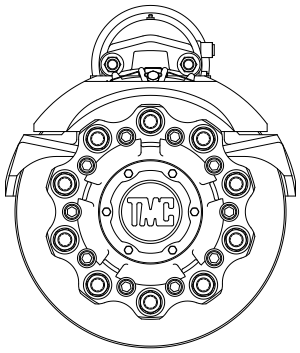
Every 100,000 km:

Remove the hubcaps and inspect the wheel bearings and lubricant.
Replace the lubricant if it appears badly contaminated.
Re-adjust the wheel bearings and re torque the axle lock nut.
Replace the hubcaps and ensure the correct amount of lubricant is in the hub end.
Check that the hubcap gasket and inboard seal is not damaged. Replace as necessary.
Check the axle for brake wear; check the rest of the axle components for wear or damage. Repair, adjust or replace as necessary.

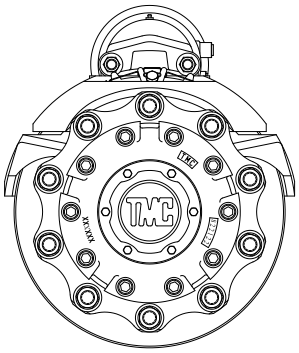
Every 300,000 km:

Remove wash and inspect the wheel bearings, replace as necessary.
When re assembling the wheel bearings, ensure they are correctly lubricated and adjusted.
See TMC Australia's recommended wheel bearing adjustment procedures.

Note: TMC's range of "LMV", "LMVS, "SL10", and "TL12" suspensions, TN, TP, UB90 and UB82 trailer axle combinations are generally designed for operating on clean paved roads. Although occasional use on graded or gravel roads is acceptable, for equipment that is regularly used "off-road" or "off-highway" TMC recommends that service intervals should be halved. In extremely severe operating conditions, weekly and in certain cases even daily inspections of the equipment may be required to ensure safe and correct operation of the suspension and axle combination.



10 Stud x 285 pcd Hub
430 diameter disc brake



10 Stud x 335 pcd Hub
430 diameter disc brake

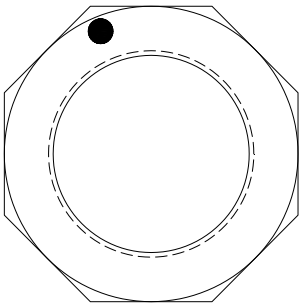
WHEEL BEARING ADJUSTMENT PROCEDURE

Double Axle Lock Nuts and Lock Washer – TN Wheel Bearings.

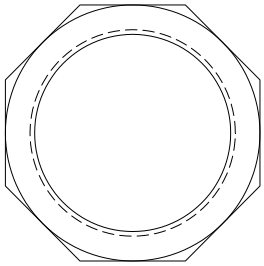
It is recommended that the wheel bearings in new axles (or whenever the wheel bearings are replaced in service) are adjusted after the first 5000 km. The wheel bearings should then be adjusted at 100,000 km intervals for the axle's service life. These are the minimum recommended service requirements, dependent on service conditions more frequent service and maintenance schedules may be required for correct operation of the trailer axle.

Recommended wheel bearing adjustment procedure:

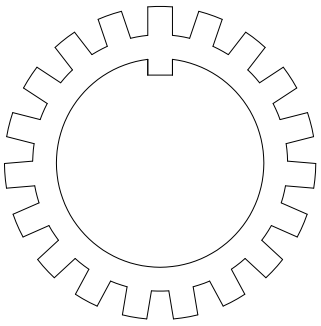
1. Ensure that the hub rotates freely in both directions. If any brake drag (binding) is felt temporally back off the brake adjustment to ensure free rotation of the hub.
2. Rotate the hub in both directions and at the same time tighten the wheel bearing adjusting nut until a torque setting of 150/180 Nm is reached.
3. Then back off the adjusting nut five (5) holes, use the axle lock washer as a guide. Refit the axle lock washer, taking care that the wheel bearing adjustment is not disturbed. Fit the lock tab washer. Fit the axle locknut and tighten to a torque of 350/400 Nm.
4. Check the bearing end float is 0.08mm to 0.20mm. Finally check that the hub rotates freely. If it does not rotate freely it may be necessary to redo the wheel bearing adjustment procedure. If necessary, now re adjust the brakes.
5. Bend two of the tabs (one on opposite side) on the lock tab washer over to prevent the locknut from coming loose in service.



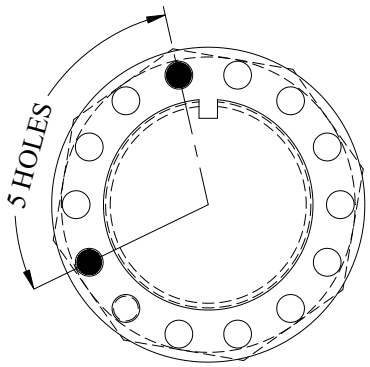
SPINDLE ADJUSTING NUT



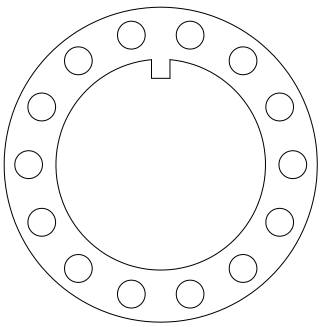
SPINDLE LOCK NUT



LOCK TAB WASHER



USE THE LOCK WASHER AS A GUIDE, SLACKEN BACK BY 5 HOLES



LOCK WASHER

CHECK WHEEL BEARING END FLOAT IS 0.08mm TO 0.20mm.
RE ADJUST IF NECESSARY.

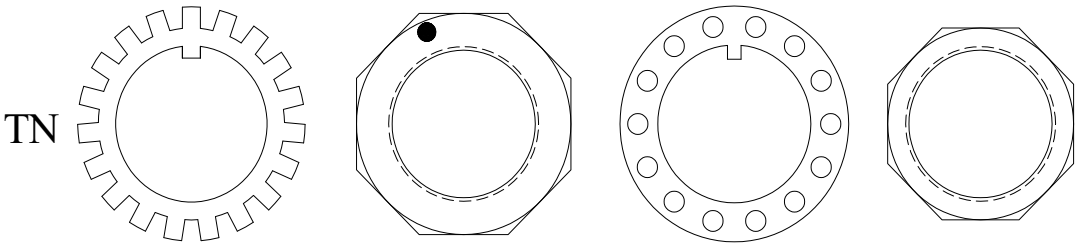
WHEEL BEARING ADJUSTMENT PROCEDURE - PRESET

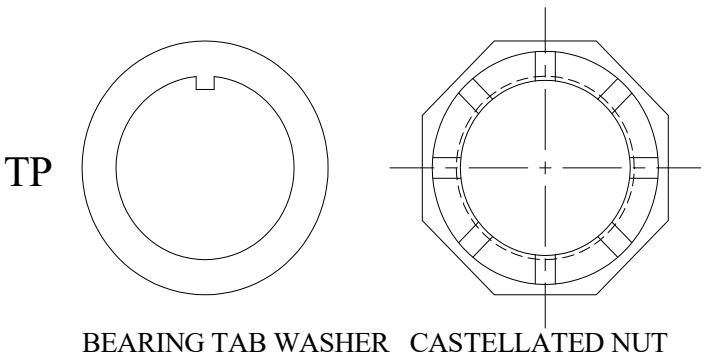
TN Double Axle Lock Nuts and Lock Washer
TP Castellated Nut and Split Pin

It is recommended that the wheel bearings in new axles (or whenever the wheel bearings are replaced in service) are checked for end float after the first 5000 km. The wheel bearings should then be re checked for end float at 100,000 km intervals for the axle's service life. These are the minimum recommended service requirements, dependent on service conditions more frequent service and maintenance schedules may be required for correct operation of the trailer axle.

Recommended wheel bearing end float checking procedure:

1. Ensure that the hub rotates freely in both directions, back off brakes if necessary.
2. Rotate the hub in both directions and at the same time tighten the wheel bearing adjusting nut until a torque setting of 390/410 Nm is reached.
3. TN - Fit the axle lock washer onto the axle. Adjust the adjusting nut TIGHTER if necessary to get the lock washer properly seated onto the adjusting nut. Fit the lock tab washer then the axle locknut and tighten to a torque of 290/310 Nm. Bend two tabs of the lock tab washer against the lock nut.
   TP – install the cotter pin. Adjust the Castellated nut tighter if necessary to install the cotter pin.
4. Check the bearing end float is 0.08mm to 0.20mm. Finally check that the hub rotates freely. If it does not rotate freely it may be necessary to repeat the wheel bearing adjustment procedure. Re adjust the brakes if necessary.





Note:

Preset wheel bearings are unique bearings and cannot be mixed with other bearing types. When being serviced or replaced bearing cups and cones must be kept as sets or replaced as full sets.
The Preset bearing cups and cones must not be mixed.

WHEEL BEARING ADJUSTMENT PROCEDURE

Castellated Axle Nut with Split Pin – TP (Parallel) Wheel Bearings.

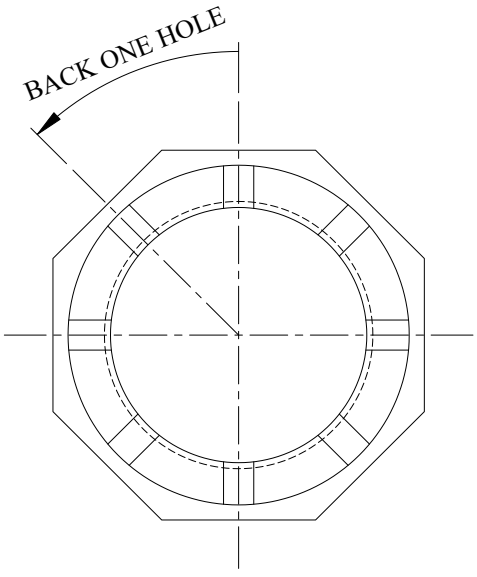
It is recommended that the wheel bearings in new axles (or whenever the wheel bearings are replaced in service) are adjusted after the first 5000 km. The wheel bearings should then be adjusted at 100,000 km intervals for the axle's service life. These are the minimum recommended service requirements, dependent on service conditions more frequent service and maintenance schedules may be required for correct operation of the trailer axle.

Recommended wheel bearing adjustment procedure:

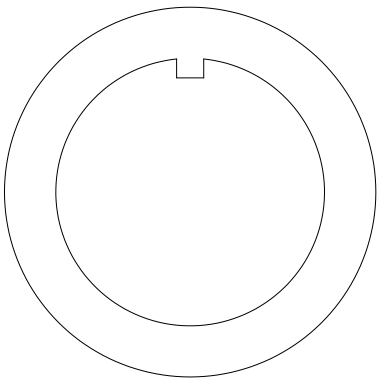
1. Ensure that the hub rotates freely in both directions. If any brake drag (binding) is felt temporally back off the brake adjustment to ensure free rotation of the hub.

2. Rotate the hub in both directions and at the same time tighten the axle adjusting nut (castellated) until a torque setting of 150/180 Nm is reached.

3. Then back off the axle adjusting nut approximately one eighth of a turn, using the axle adjusting nut as a guide. Refit the axle cotter (split) pin and lock in place. Take care that the wheel bearing adjustment is not disturbed.
   Check the bearing end float is 0.08mm to 0.20mm. Finally check that the hub rotates freely. If it does not rotate freely it may be necessary to redo the wheel bearing adjustment procedure. If necessary, now re adjust the brakes.



USE THE AXLE ADJUSTING NUT AS A GUIDE, SLACKEN BACK TO FIRST AVAILABLE SPLIT PIN HOLE.



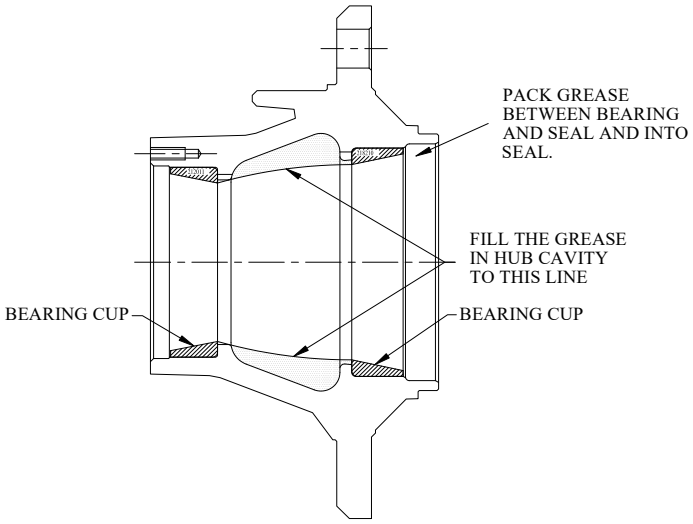
BEARING TAB WASHER

CHECK WHEEL BEARING END FLOAT IS 0.08mm TO 0.20mm.
RE ADJUST IF NECESSARY.

AXLE HUB LUBRICATION

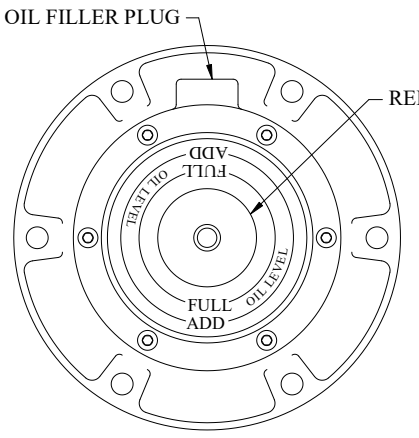
Grease Filled Hubs:

1. The wheel bearings must be fully packed with grease, it is recommended that a wheel bearing packer or suitable equipment is used to correctly pack the wheel bearings with grease.
2. Fill the hub cavity with grease as shown. The cavity is to be filled to a line running from inner bearing cup inner diameter to outer bearing cup inner diameter.
   Caution: Do not overfill the hub cavity.
3. Apply grease to the cavity between the inner bearing and the seal. Ensure grease is lightly packed into the seal. Apply a light smear of grease to the complete spindle including the seal running surface, nuts and lock washers.

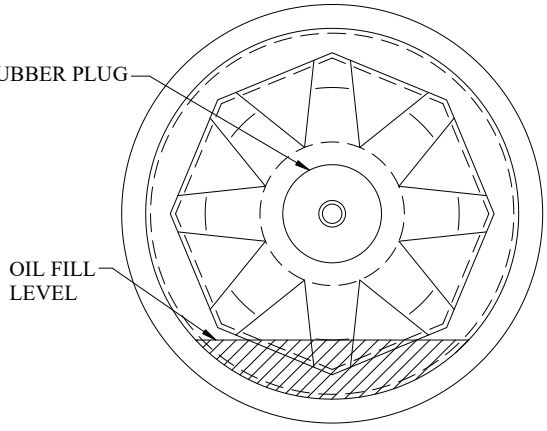


Oil Filled Hubs:

1. Remove the rubber plug or screwed plug from the hubcap so that the oil can be added to the hub.
2. Fill the hub with oil to the full level on the sight glass in the hubcap window.
3. Allow time for the oil to flow through the wheel bearings. Top up the hub with oil to the full mark. Caution: Do not overfill the hub.
4. Refit the rubber plug or screwed plug back into the hubcap. Check that the plug seals.



OIL HUBCAP - 6 BOLT TYPE



OIL HUBCAP - SCREW IN TYPE

WHEEL BEARING LUBRICANTS

Grease: **Mobil XHP222 or equivalent lithium complex grease.**
Oil: **Mobil 85W/140 or an approved equivalent oil.**

WELDING TO TMC AXLE BEAMS

Recommended welding procedures:

1. Before any welding (including spot welding) is conducted, the axle tube must be pre heated to 150 – 200^{0}C at the area to which the welding is to be done.
   Caution: Do not apply excessive heat to the axle tube.
2. All welding is to be applied to the axle tube as near as possible to the axle's neutral axis.
   Do not weld circumferentially around the axle tube.
3. All welds must be conducted using low hydrogen rods or an approved equivalent MIG process.
   Grounding/Earth wire must be attached directly to axle beam not to the hub or hub components.

TORQUE SETTINGS CHART

Wheel nuts:

M22 ISO wheel studs	**- 550/600 Nm.**
¾" Unc Spider hub wheel studs	**- 200/260 Nm.**

Axle Hub to Disc Brake Rotor Studs:

M16 socket head studs grade 10.9	**- 300/320 Nm.**

Brake Calliper Mounting Bolts:

M16 Bolts grade 10.9	**- 250/290 Nm.**

Hub Cap Bolts:

M8 studs	**- 20/25 Nm.**
5/16" UNC studs	**- 20/25 Nm.**

Brake Booster Nuts:

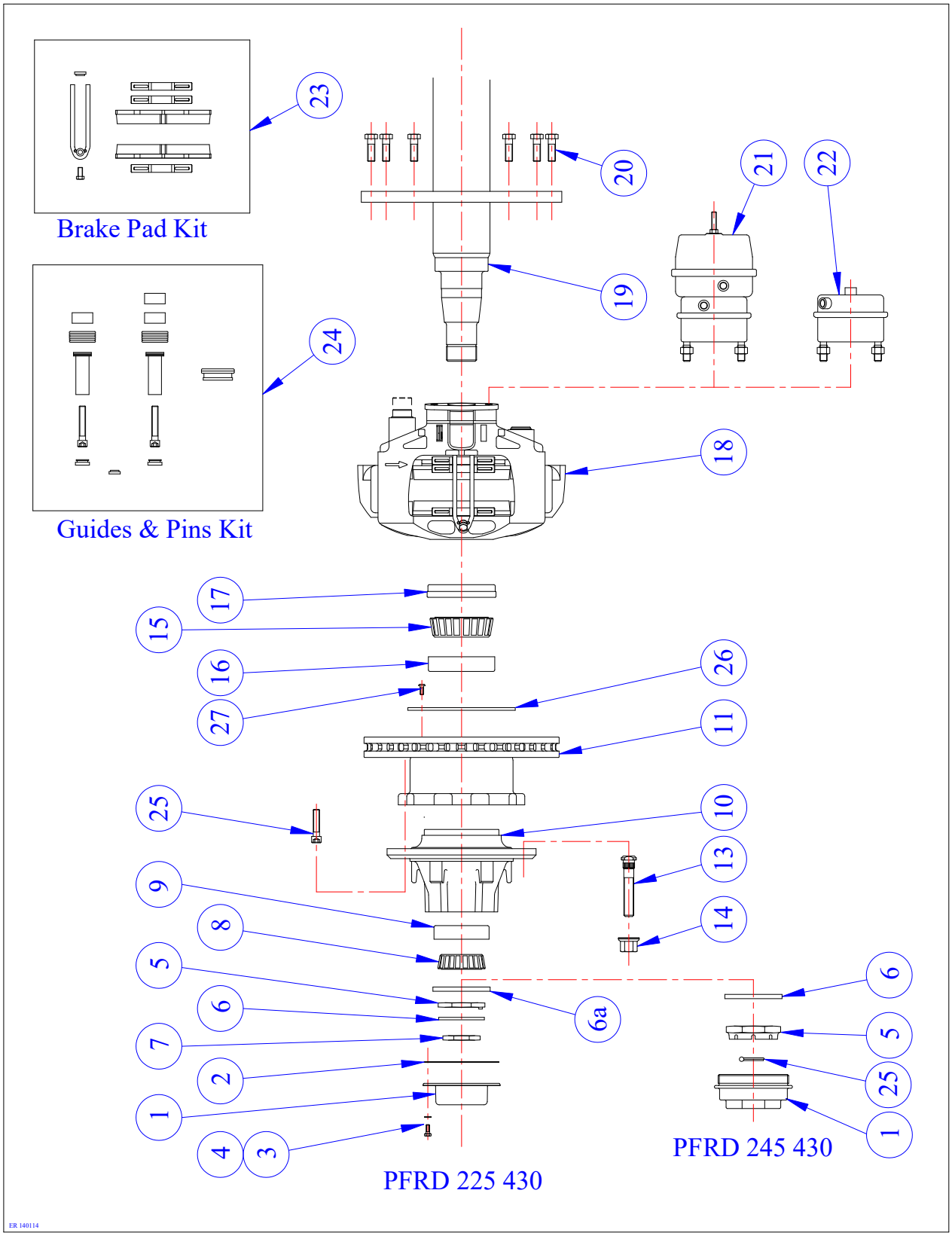
M16 x 1.5	**-180/210 Nm**

It is recommended on assembly that:
On the hub to rotor studs (M14) a small amount of loctite 243 is applied to the threads.
On the brake calliper mounting studs (M16) a small amount of anti-seize is applied to the threads.

Pan 22-1 Disc Brake Axle Spares Listing

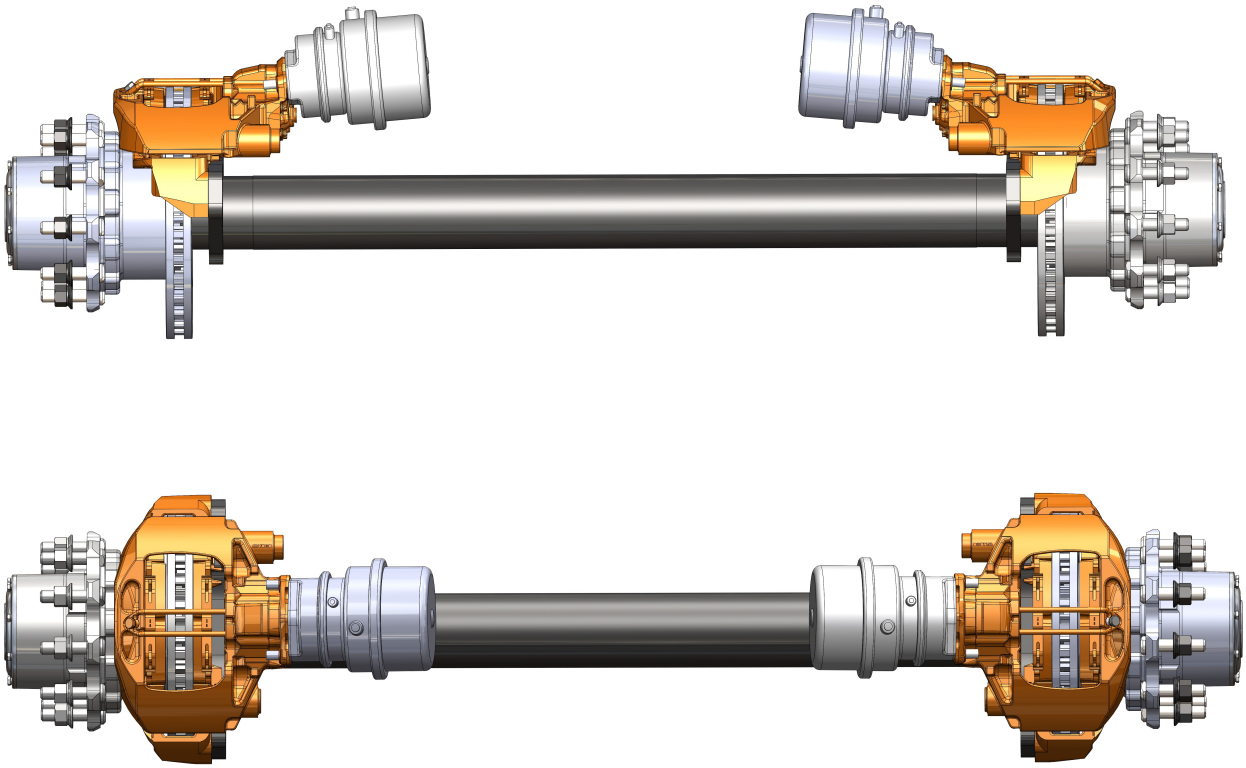
Item	TN Model Part Number	TP Model Part Number	Description
1	810146	822133	Hubcap – grease
	810176		Hubcap – oil
2	810147	822134	Hubcap gasket
3	9HBM08125025	9HB5/16UNC.75	Hubcap stud M8 x 20 long
	9HB5/16UNC1.00	9HB5/16UNC1.00	Hubcap stud 5/16" UNC x 1" long (Aluminum hubs)
4	9SWM08	9SWM08	Hubcap spring washer
5	810124	800110	Axle spindle adjusting nut
6	810123	800111	Axle spindle lock washer
6a	810284		Lock tab washer
7	810125		Axle spindle lock nut
8	81HM212049	81HM518445	Outer bearing cone
	81NP431952		Outer bearing cone - Preset
9	81HM212011	81HM518410	Outer bearing cup
	81NP378092		Outer bearing cup - Preset
	8104144		Bearing spacer - Preset
10	822121	822132	Hub 10 stud x 285 pcd
	822123		Hub 10 stud x 335 pcd
	822501		Hub aluminum preset 10 stud x 285 pcd
	810081730		Hub rebuild kit – Preset – includes 8,9,15,16 & spacer
10a	Contact TMC		ABS Pole wheel
11	822201	822201	Rotor – 430mm diameter – steel hubs
	822512		Rotor – 430mm diameter – aluminum hubs new
	822502		Rotor – 430mm diameter – aluminum hubs old
12	9SHM16200035	9SHM16200035	Hub to rotor bolt M16 x 35 long Gr 10.9
13	810144	810144	Wheel stud M22 x 100 long
14	820145	820145	Wheel nut M22
15	81HM218248	81HM518445	Inner wheel bearing cone
	81NP022333		Inner wheel bearing cone - Preset
16	81HM218210	81HM518410	Inner wheel bearing cup
	81NP250023		Inner wheel bearing cup - Preset
17	810135	800723/01	Hub seal
18	822211	822211	Disc brake caliper assembly Pan 22 LH
	822212	822212	Disc brake caliper assembly Pan 22 RH
19	Contact TMC	Contact TMC	Axle beam assembly – refer TMC
20	9HBM16150050	9HBM16150050	Caliper attachment bolts M16x50 long Gr 10.9
21	820109	820109	Brake chamber Type 16/24 universal
	820131	820131	Brake chamber Type 16/16 universal
	820133	820133	Brake chamber Type 12/16 universal
	820138	820138	Brake chamber Type 14/16 universal
	820139	820139	Brake chamber Type 14/24 universal
	820140	820140	Brake chamber Type 20/16 universal
	820149	820149	Brake chamber Type 20/24 universal
22	820132	820132	Brake chamber Type 16 universal
	820134	820134	Brake chamber Type 12 universal
	820135	820135	Brake chamber Type 20 universal
	820136	820136	Brake chamber Type 24 universal
22	820137	820137	Brake chamber Type 22 universal
23	822676	822676	Replacement brake pad set (per axle)
24	820738	820738	Replacement caliper guide pins and seals set (per caliper)
	820736	820736	Main piston & seal set with piston (per caliper)
25		9SP8.0x120	Split Pin
26	Contact TMC		ABS sensor, sensor bush, block and pole wheel
27			8-32 x 5/8" long Stainless steel screw for ABS pole wheel

Pan 22-1 Disc Brake Axle Spares Listing



TMC PAN 22 DISC BRAKE

UNITISED BEARINGS MANUAL



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RECOMMENDED SERVICE SCHEDULE.

First Service 500 km or on Delivery:

Check torque settings of all wheel nuts
- On delivery.
- After all wheel changes.

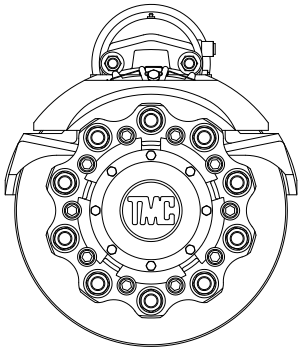
Every 50,000 km:

Check disc brake pad linings and pad retaining fork for wear. Replace if necessary.

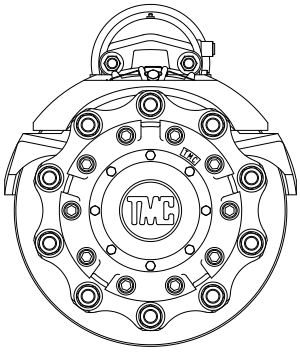
Every 100,000 km:

With the axle end lifted rotate the hubs and determine if the wheel bearing has excessive movement or noise. If in doubt, please contact TMC or its approved service outlet.
Inspect hubcap and check for signs of damage to the gasket. Replace gasket if damaged.
Check inboard hub seal for leakage or damage, remove hub and replace seal if necessary.

Note: TMC's range of "LMV", "LMVS, "SL10", and "TL12" suspensions, TN, TP, UB90 and UB82 trailer axle combinations are generally designed for operating on clean paved roads. Although occasional use on graded or gravel roads is acceptable, for equipment that is regularly used "off-road" or "off-highway" TMC recommends that service intervals should be halved. In extremely severe operating conditions, weekly and in certain cases even daily inspections of the equipment may be required to ensure safe and correct operation of the suspension and axle combination.



10 Stud x 285 pcd Hub
430 diameter disc brake



10 Stud x 335 pcd Hub
430 diameter disc brake

APPLICATION OF GREASE INTO HUB.

1. It is required to partially fill the cavity in between the seal and bearing with grease. This additional grease will extend the seal and bearing life by preventing contaminants entering into the bearing assembly. If there are any questions, please contact TMC engineering.

   Type of grease: **Mobil grease XHP 222 OR an approved equivalent.**

   Quantity: **50g to 100g.**

AXLE SPINDLE NUT TIGHTENING PROCEDURE.

1. Fit the axle spindle nut (part 812103) onto the axle spindle and tighten to 1200 Nm. Re check the torque to ensure 1200 Nm. Ensure that a light smear of oil or grease is applied to the axle spindle thread area before installing the axle spindle nuts.
2. Fit the axle lock tab washer (part 812118) onto the axle spindle.
3. Fit the axle spindle lock nut (part 812104) onto the axle spindle and tighten to 1000 Nm.
4. Bend the lock tab washer tabs both inwards over the axle spindle nut and outwards over the axle spindle lock nut to ensure they cannot move. Apply a light smear of grease over all the parts on the axle spindle end to prevent rusting. Finally refit the axle hubcap and gasket onto the axle hub end. Tighten the hubcap studs (M8) to 20 / 25 Nm.

TORQUE SETTINGS CHART.

Wheel nuts: M22 ISO	**- 550/600 Nm.**
Axle Hub to Disc Brake Rotor Studs M16	**- 300/320 Nm.**
Brake Calliper Mounting Bolts M16	**- 250/290 Nm.**
Hub Cap Bolts M8	**- 20/25 Nm.**

It is recommended on assembly that:
On the hub to rotor studs (M16) a small amount of Loctite 243 is applied to the threads.
On the brake calliper mounting studs (M16) a small amount of anti seize is applied to the threads.

SPARE PARTS - AXLE MODEL PFRD-U90-430.

Axles with Pan 22-1 disc brakes - 430mm diameter brake rotor.

Item	Model PFRD-U90-430 Part Number	Description
1	822159	Hub cap – grease
2	822158	Hub cap gasket
3	9HBM08125025	Hub cap stud M8 x 25 long
4	9SWM08	Spring washer M8
5	812103	Axle spindle adjusting nut – M90
6	812118	Axle spindle lock tab washer
7	812104	Axle spindle lock nut – M90
8	9SHM16200035	Hub to rotor bolt – M16 x 35 long socket head Grade 10.9
9	812115	Lock ring - bearing
10	812108	Unitised wheel bearing assembly – 90mm diameter
11	812107	Hub seal
12	820738	Caliper guide pins and seals set (per caliper)
13	822676	Brake pad set Pan 22 (per axle)
14	810145	Wheel nut – M22 ISO
15	810144	Wheel stud – M22 ISO x 100mm (short)
16	822160	Hub assembly – 10 x 285 ISO steel – UB90
	822167	Hub assembly – 10 x 335 ISO steel – UB90
17	822201	Rotor – 430mm diameter
18	822211	Disc brake calliper assembly LH Pan22
	822212	Disc brake calliper assembly RH Pan22
19	822170	Axle beam assembly – refer TMC
20	9HBM16150050	Calliper attachment bolts – M16 x 50 long Grade 10.9
21	820109	Brake chamber Type 16/24 universal
	820131	Brake chamber Type 16/16 universal
	820133	Brake chamber Type 12/16 universal
	820138	Brake chamber Type 14/16 universal
	820139	Brake chamber Type 14/24 universal
	820140	Brake chamber Type 20/16 universal
	820149	Brake chamber Type 20/24 universal
22	820132	Brake chamber Type 16 universal
	820134	Brake chamber Type 12 universal
	820135	Brake chamber Type 20 universal
	820136	Brake chamber Type 24 universal
	820137	Brake chamber Type 22 universal
23	Contact TMC	ABS sensor, sensor bush, block and pole wheel
24		8-32 x 5/8” long Stainless steel screw for ABS pole wheel

SPARE PARTS - AXLE MODEL PFRD-U90-430.