MERITOR™

Maintenance Manual MM-0164

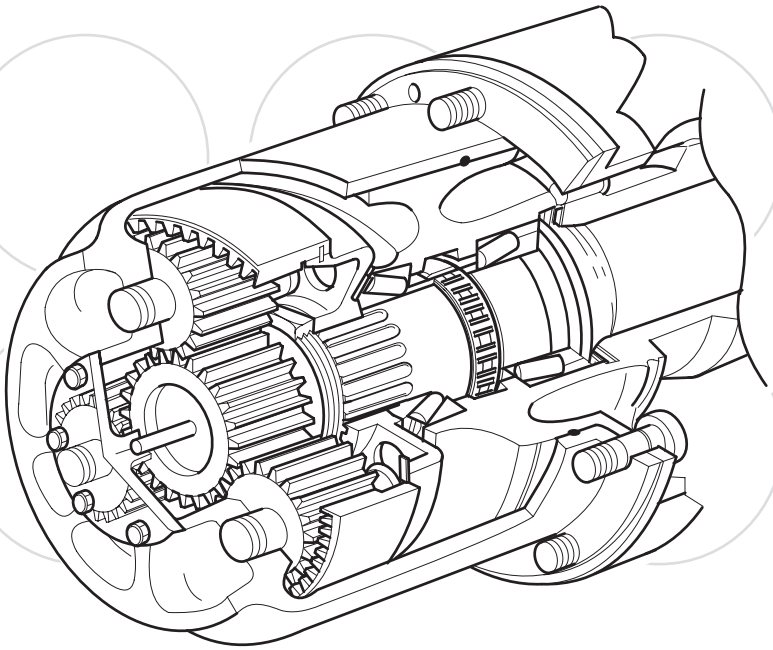
Wheel end assembly

Hub Reduction 3 - 4 planets

- Wheel end with unitized bearing

- Traditional wheel end

Revised 03-2019



Service Notes

Before You Begin

This publication provides installation and maintenance procedures for the MERITOR HVS wheel end assembly.

The information contained in this publication was current at the time of printing and is subject to revision without notice or liability.

You must understand all procedures and instructions before you begin maintenance and service procedures.

You must follow your company's maintenance and service guidelines.

You must use special tools, when required, to avoid serious personal injury and damage to components.

Meritor uses the following notations to alert the user of possible safety issues and to provide information that will help to prevent damage to equipment and components.

⚠ WARNING

A WARNING indicates a procedure that you must follow exactly to avoid serious personal injury.

⚠ CAUTION

A CAUTION indicates a procedure that you must follow exactly to avoid damaging equipment or components. Serious personal injury can also occur.

NOTE: A note indicates an operational, procedure or instruction that is important for proper service. A NOTE can also supply information that will help to make service quicker and easier.

This symbol indicates that you must tighten fasteners to a specific torque.

Access Information on Meritor's Web Site

Additional maintenance and service information for Meritor's commercial vehicle systems component lineup is also available at www.meritor.com.

To access information, click on Products & Services/Tech Library Icon/HVS Publications. The screen will display an index of publications by type.

Contents

Terms used in this manual

Manufacturer:
MERITOR

Manual:
Maintenance manual no. MM-0164

Device:
Wheel end assembly

Hub reduction with 3 - 4 planets:
- Wheel end with unitized bearing
- Traditional wheel end 3-4 planets

Technician:
Qualified personnel working on wheel end assembly maintenance and servicing.

Maintenance and servicing:
Maintenance and servicing refer to periodical checks and/or replacement of wheel end parts or components. It also refers to the determining of the cause of a malfunction in order to restore the initial operating conditions.

Operator:
Any person who will use the wheel end assembly as part of a more complex device.

Warranty
Warranty applies to the wheel end assembly installed on vehicles for which it was designed. Warranty is void in the following cases:

- Improper use of the vehicle on which the wheel end assembly is installed (usage conditions, overloading etc.)
- Tampering with vehicle components that may affect wheel end assembly performance.
- Use of non-original spare parts.
- Improper installation, adjustment, repair or modification.
- Poor or improper maintenance (including consumables other than those specified).

Further information on warranty conditions may be obtained directly from the manufacturer or by referring to the Meritor web site www.meritor.com

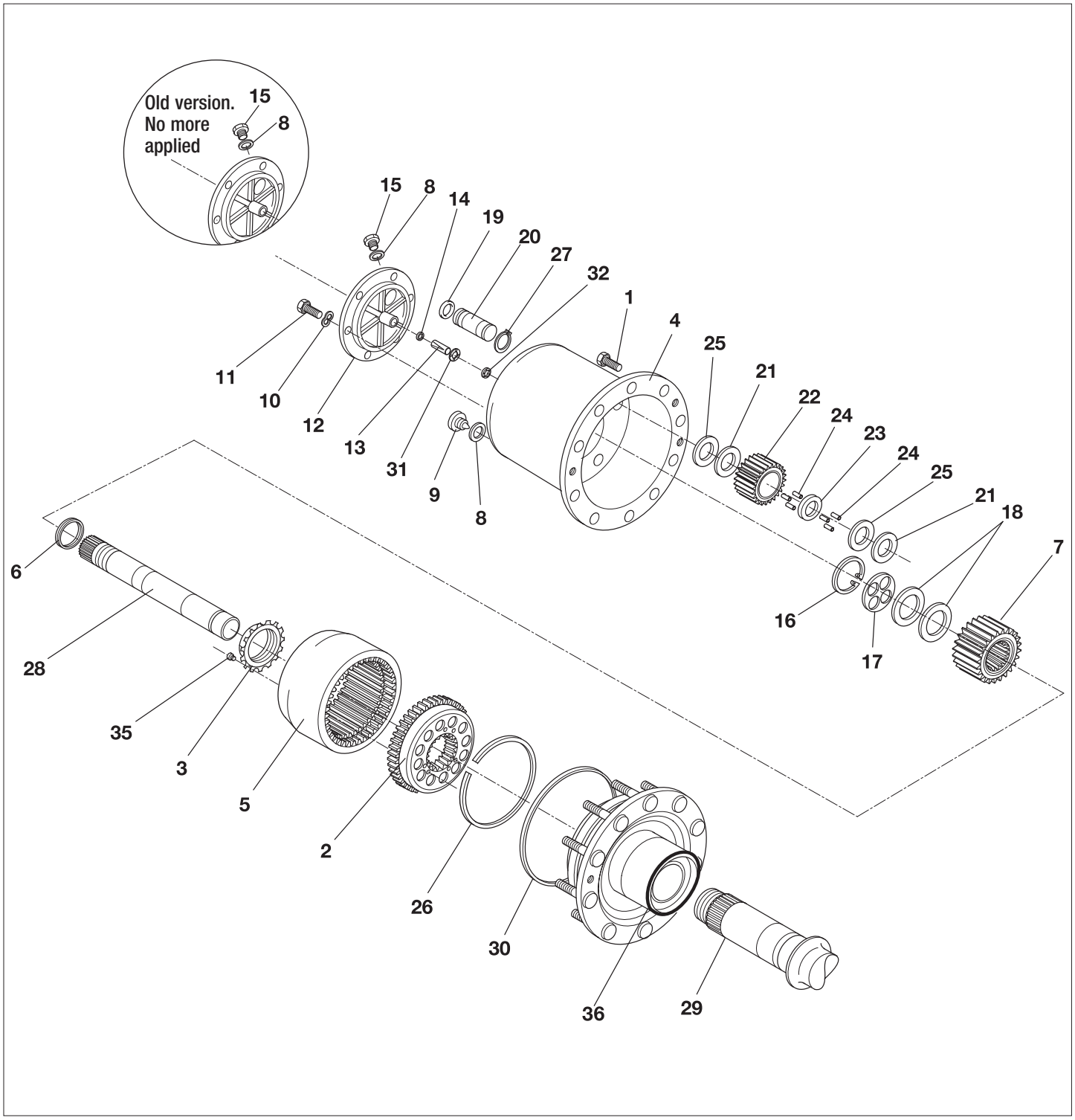
Part 1
Hub reduction with 3 - 4 planets: Wheel end with unitized bearing

1

1 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

Exploded view

Old version
New version: 5.69375-02



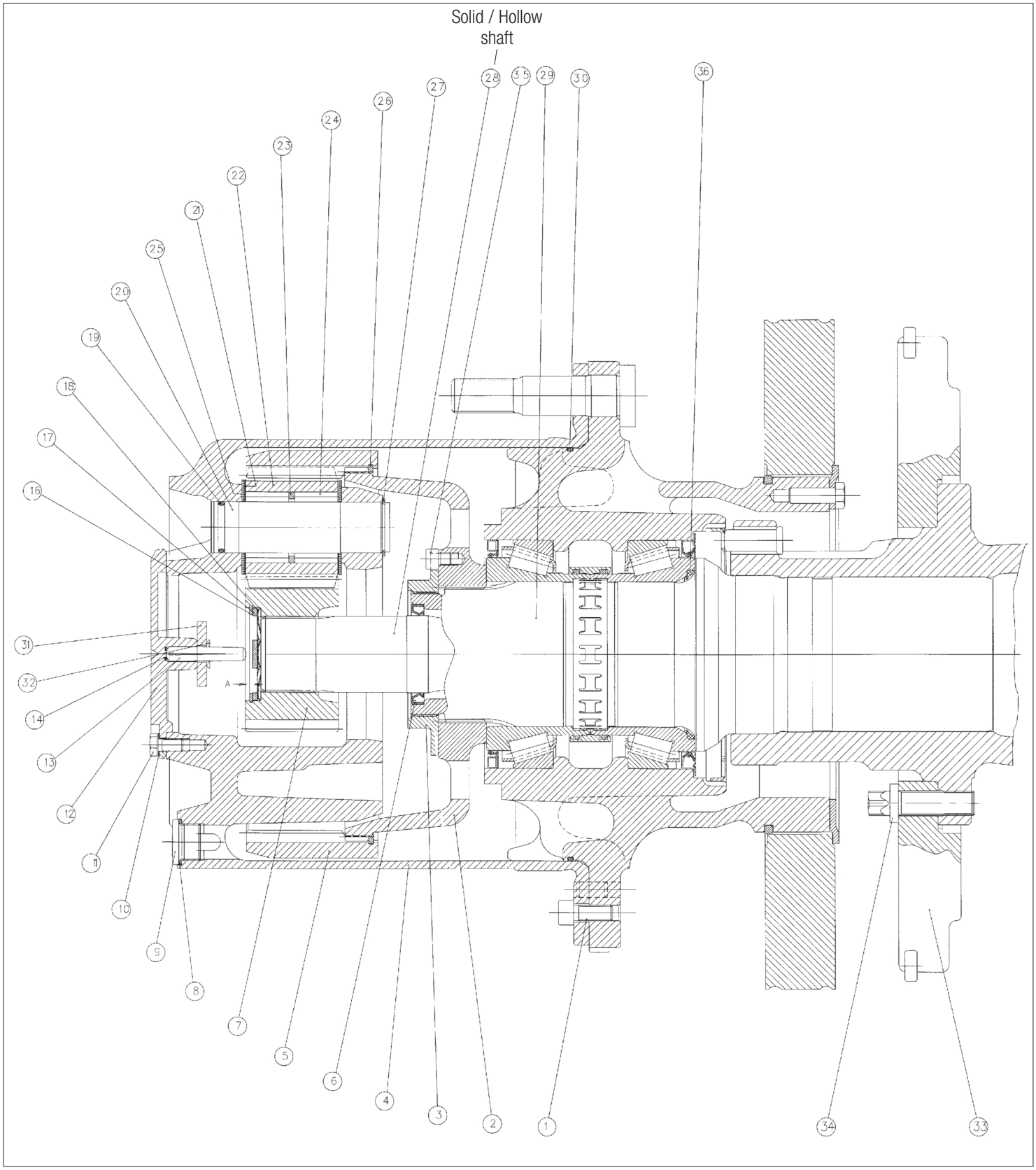
1 Part 1 - Hub reduction with 3 - 4 planets Wheel end with unitized bearing

Parts list

Item	Description
1	Hex. socket screw M10x25
2	Ring gear carrier
3	Hub nut M80x2
4	Hub casing
5	Ring gear
6	Sealing ring
7	Sun gear
8	Gasket
9	Magnetic plug
10	Spring washer
11	Hexagon screw
12	Cover, hub reduction
13	Grooved pin
14	Washer
15	Plug
16	Retaining ring
17	Thrust washer
18	Spring washers
19	O-ring
20	Bearing spindle
21	Thrust washer
22	Planet gear
23	Spacer ring
24	Needle rollers
25	Thrust washer
26	Circlip
27	Retaining ring - Circlips - Snap ring
28	Drive shaft
29	Spindle
30	O-ring
31	Magnetic washer
32	Star lock push on fastener
35	Locking Screw
36	Inner hub seal

1 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

Cross sectional vew - (Hub Nut Star version)



1 Part 1 - Hub reduction with 3 - 4 planets Wheel end with unitized bearing

Parts list - (Hub Nut Star version)

Item	Description
1	Sunk head screw M10x25
2	Ring gear carrier
3	Hub nut M80x2
4	Hub casing
5	Ring gear
6	Sealing ring
7	Sun gear
8	Gasket
9	Magnetic plug
10	Spring washer
11	Hexagon screw
12	Cover, hub reduction
13	Grooved pin
14	Washer
15	Plug
16	Retaining ring
17	Thrust washer
18	Spring washers
19	O-ring
20	Bearing spindle
21	Thrust washer
22	Planet gear
23	Spacer ring
24	Needle rollers
25	Thrust washer
26	Circlip
27	Retaining ring
28	Drive shaft
29	Spindle
30	O-ring
31	Magnet
32	Retaining clip
33	Adapter
34	Flange screw
35	Bolt socket head screw
36	Inner hub seal

1 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

Description

The hub reduction unit consists of a cylindrical planetary assembly in each hub, fig. 1.1. The reduction is made up of a sun gear, a number of planetary gears 3 or 4 which rotate round the sun gear and a ring gear which houses the planets gears. The sun gear is located on the axle shaft by spline, fig. 1.2

The ring gear is jointly to the rear axle spindle by spline, fig. 1.3

The hub is carried on two tapered roller bearings.

When the drive shaft, and the sun gear rotates, the rotation is transmitted to the planets gears.

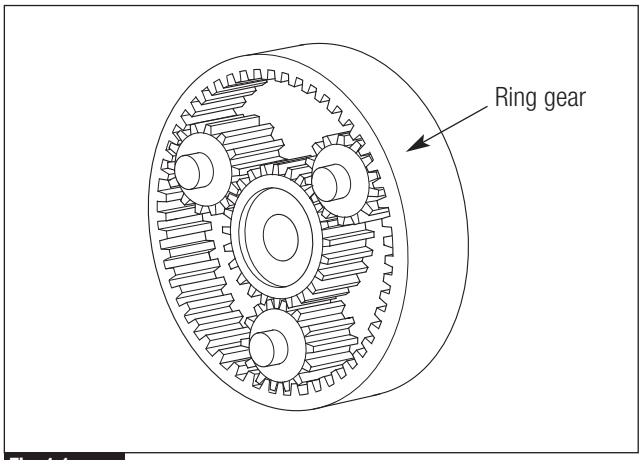


Fig. 1.1

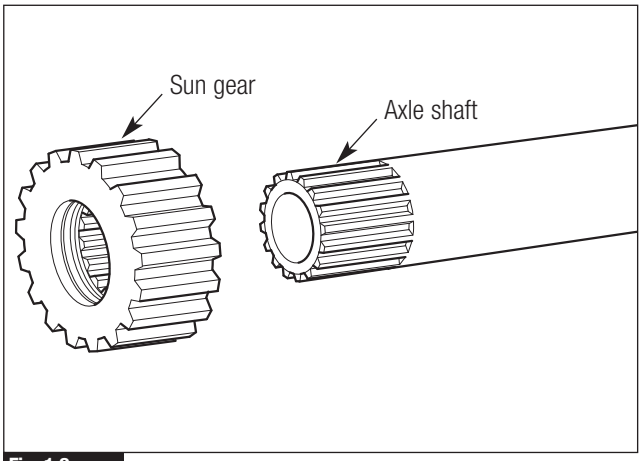


Fig. 1.2

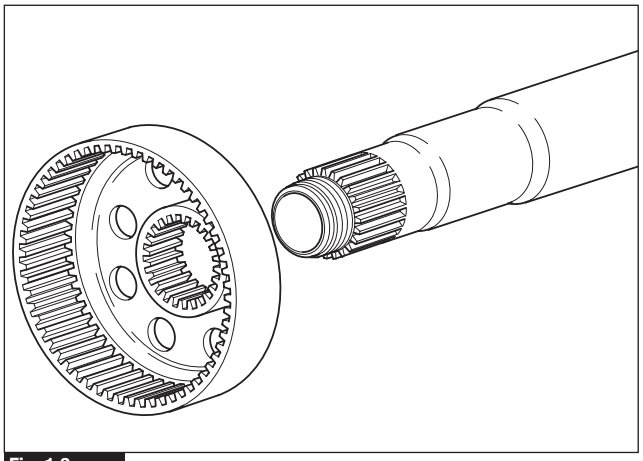


Fig. 1.3

Because the ring gear is fixed to the rear axle spindle, the planets gears rotate inside the ring gear and the rotation movement is transmitted to the hub assy.

Ratio formula = 1+(Z Ring gear / Z Sun teeth), fig. 1.4

The hub reduction ration is 3.46:1 or 3.33:1

Ratio (3.46:1) - 3 or 4 planets	**1+(64/26)=3.46**
Ratio (3.33:1) - 3 or 4 planets	**1+(63/27)=3.33**

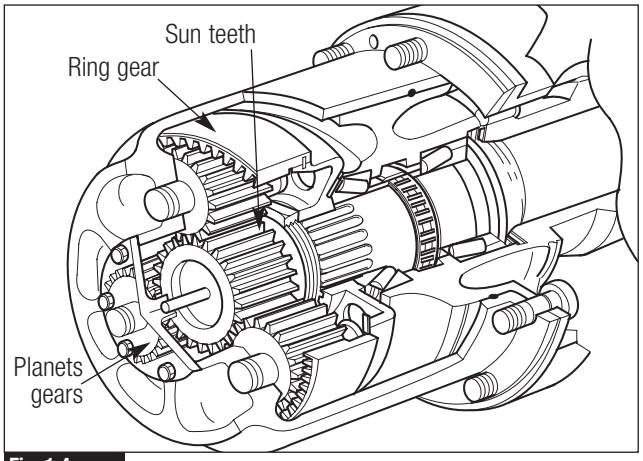


Fig. 1.4

1 Part 1 - Hub reduction with 3 - 4 planets Wheel end with unitized bearing

Description

Hub reduction 3 planets - fig. 1.5a
Hub reduction 4 planets - fig. 1.5b

In order to ensure reliable and efficient wheel end assembly operation, maintenance intervals, use of lubricants and correct procedures specified by the manufacturer should be strictly observed (refer to Lubrication Maintenance Manual no. 1).

For further information contact the manufacturer's engineering department or refer to the Meritor Web site at www.meritor.com (technical library - manuals).

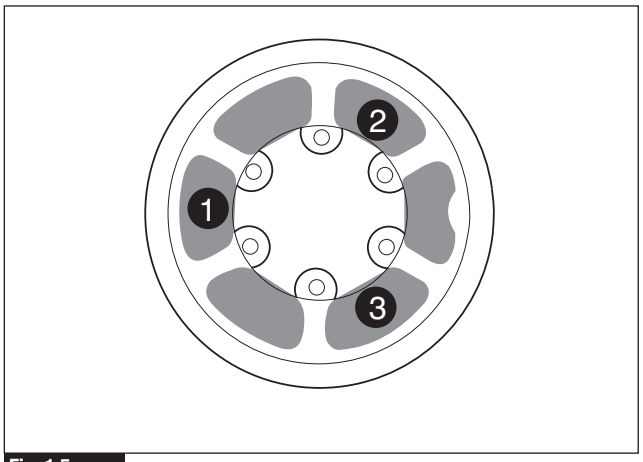


Fig. 1.5a

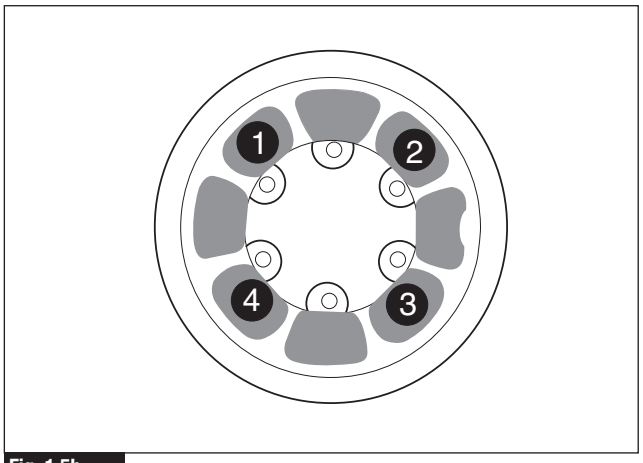


Fig. 1.5b

⚠ WARNING

Only original Meritor spare parts should be used. Use of non-recommended lubricants will adversely affect performance and service life. Use of non-original parts could seriously affect wheel end assembly performance.

Torque chart specifications and data

Hub gear

Type	cylindrical planetary gear
Designation	3 or 4 Planets (19 teeth)
Ratio (3.46:1)	1+(64/26)=3.46
Ratio (3.33:1)	1+(63/27)=3.33

Tightening torques	**Nm**
Hub nut	1200 ± 120
Hub nut locking screw version	45±5
Hub cover screws	20 ± 5
Hub casing screws	40 ± 10
Oil plugs (level and draining)	80 ± 20

Lubricants

Oil type

2.5 litres for each-hub

1 Part 1 - Hub reduction with 3 - 4 planets Wheel end with unitized bearing

Hub Reduction Magnets

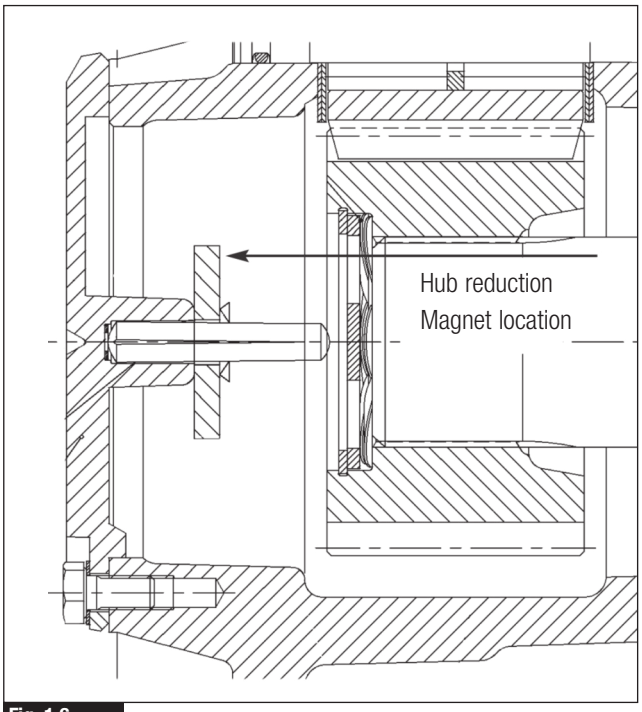


Fig. 1.6

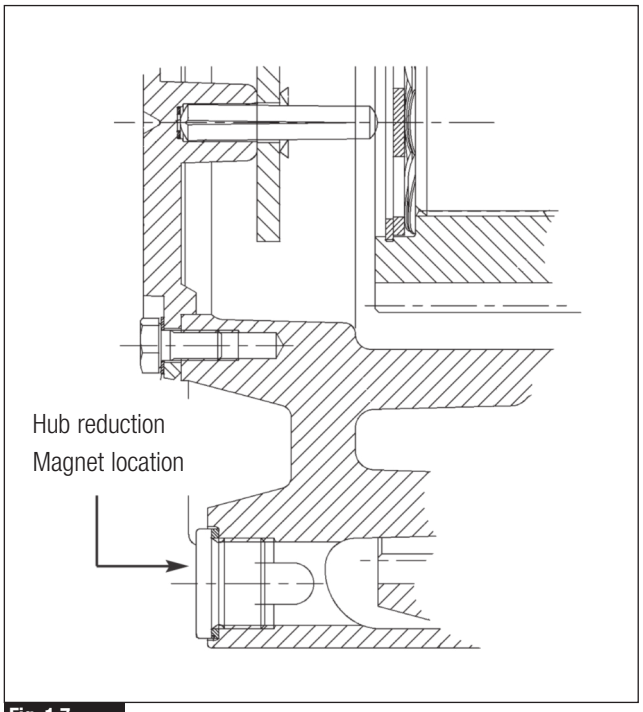


Fig. 1.7

Lubricant

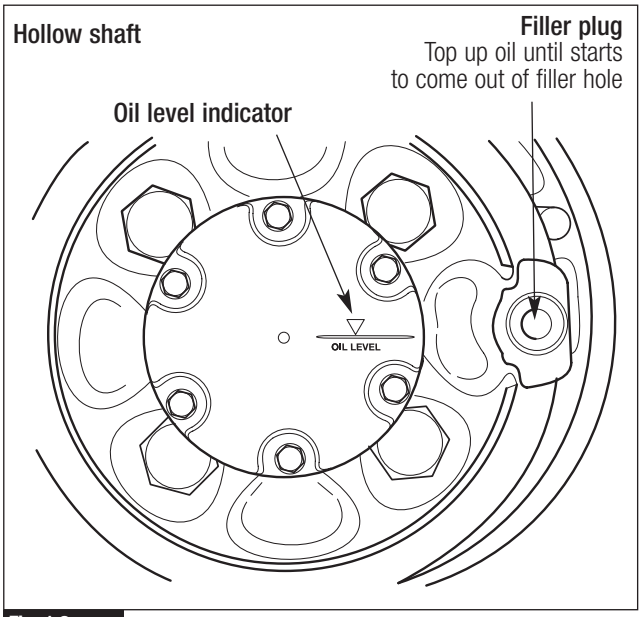


Fig. 1.8

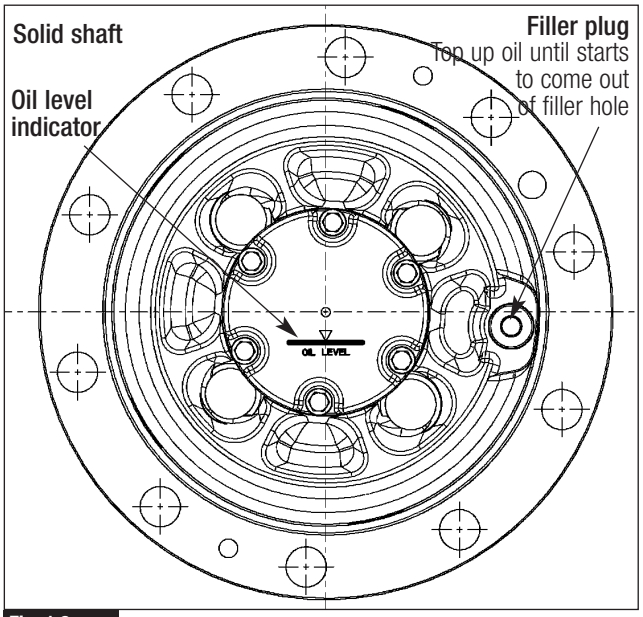


Fig. 1.9

Part 1
Wheel end disassembly

2

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

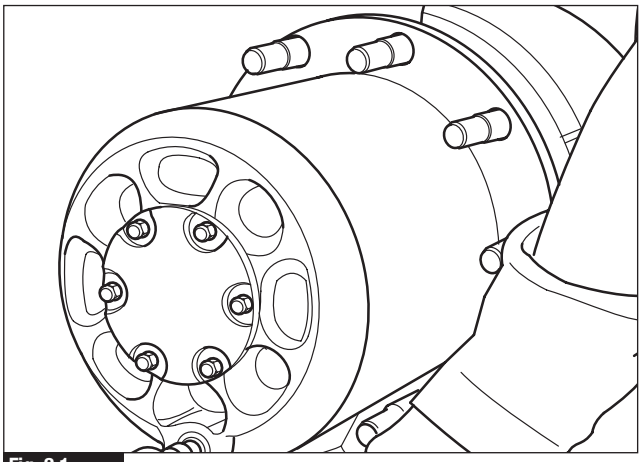


Fig. 2.1

Disassembly

Remove the wheel nuts and retain. Pull off the wheels using a wheel trolley. Remove the air inflation valve from its retainer in the inside wheel.

Jack up the rear axle of the vehicle to vehicle manufacturers recommendations and drain the oil from the axle(s). Fig. 2.2

Remove the hub drain plug and discard.
Drain oil from wheel end. Fig. 2.3

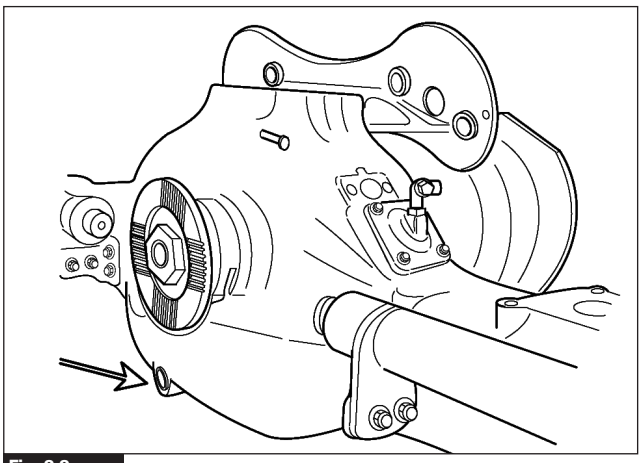


Fig. 2.2

Tighten in dedicated holes the tool's screws equally and simultaneously, and avoid using excessive force as this could damage the drum. Fig. 2.4

A soft-faced mallet may be used on the drum to loosen and ease withdraw.

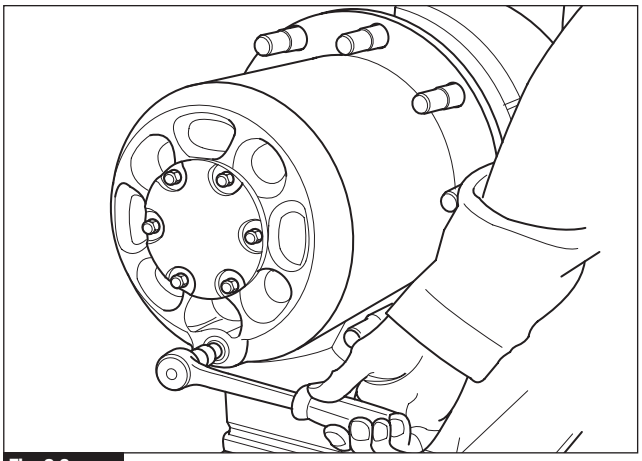


Fig. 2.3

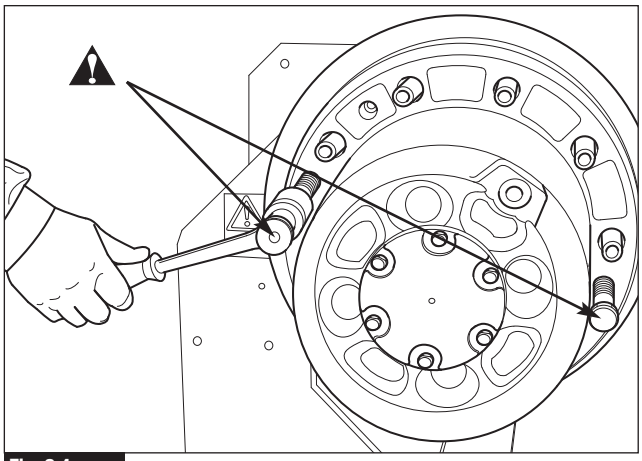


Fig. 2.4

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

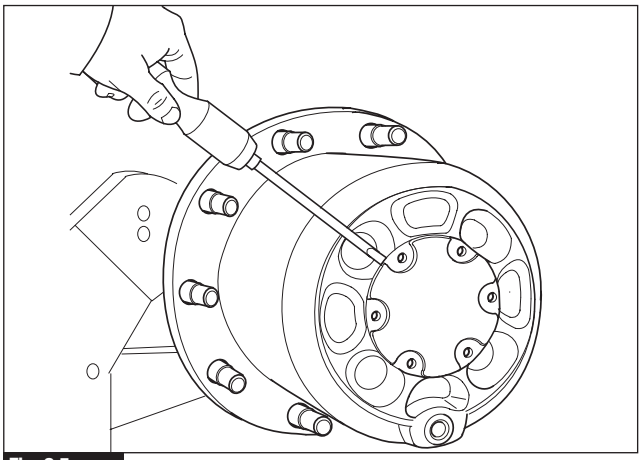


Fig. 2.5

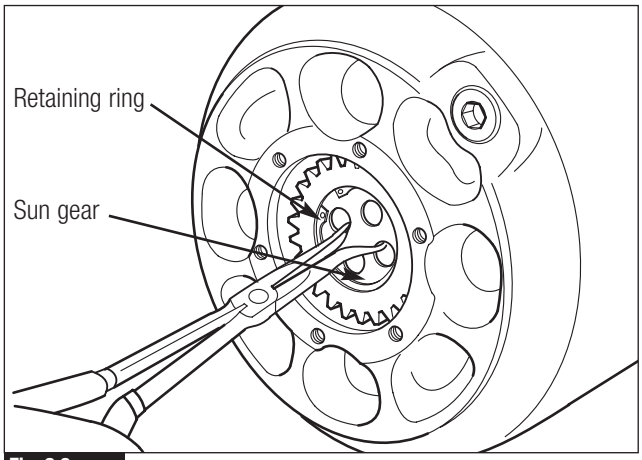


Fig. 2.6

Remove cover retainer screws with suitable sized wrench and remove the hub cover from the end of the hub casing - Fig. 2.5

Remove the retaining ring sun gear and spring washers from axle shaft - Fig. 2.6

Remove the 2 sunk head screws M10X25 - Fig. 2.7

Remove the hub casing group and remove axle shaft - Fig. 2.8

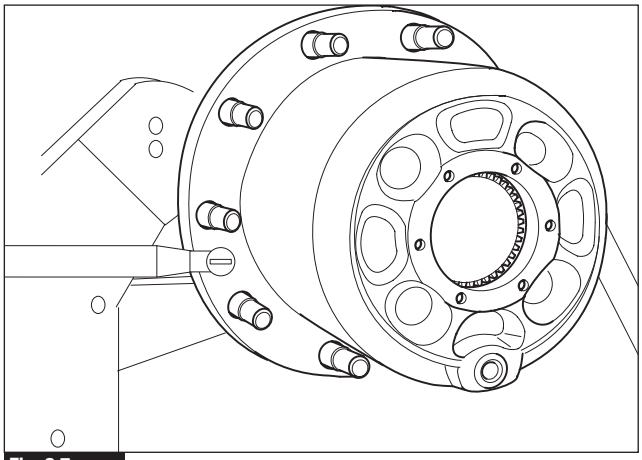


Fig. 2.7

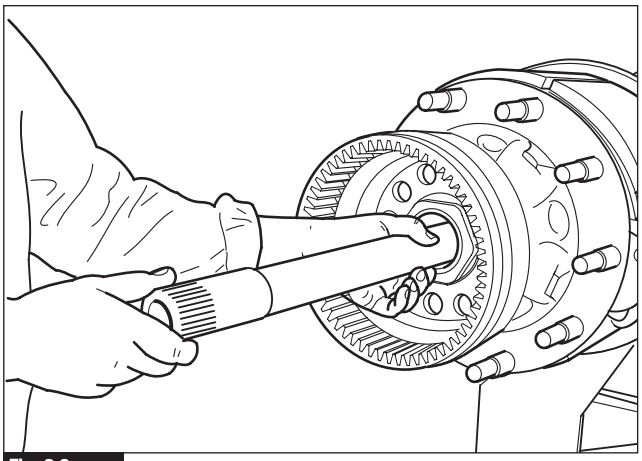


Fig. 2.8

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

The current Meritor wheel end assembly is based on with star nut solution.

NOTE: A high torque is required to shear the staking points and a torque multiplication device should be employed. Fig. 2.10

Remove the hub nut and discard.

Star hub nut dismantling

Remove locking screw and discard. Unscrew the hub retaining nut and discard. Fig. 2.11

Nut cannot be reused because the anti-friction coating on the hub nut face maybe damaged.

NOTE: A high torque is required to release the nut, therefore a torque multiplication device should be employed.

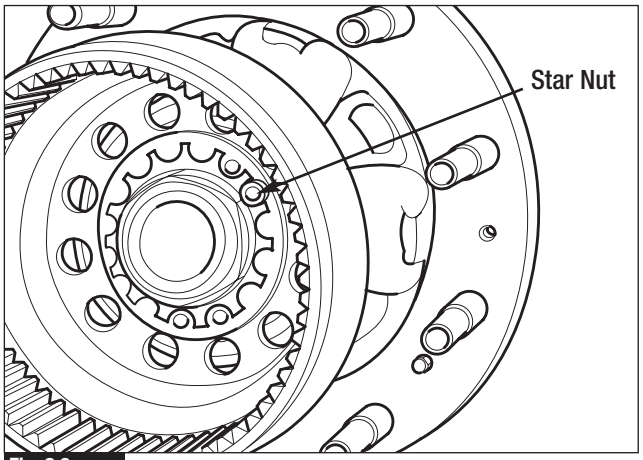


Fig. 2.9

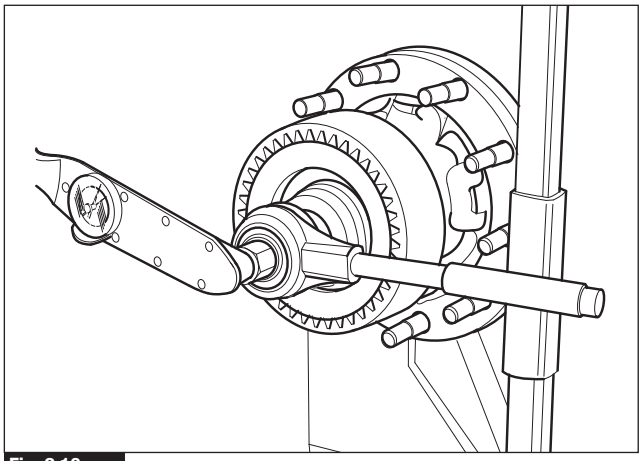


Fig. 2.10

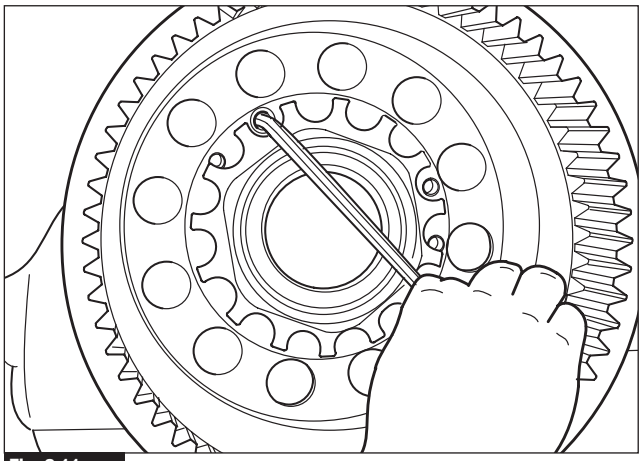


Fig. 2.11

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

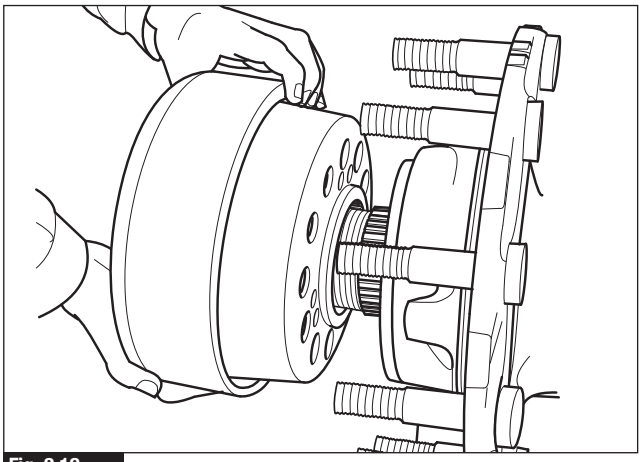


Fig. 2.12

Remove the ring gear group. Fig. 2.12

Remove the hub assembly. Fig. 2.13

⚠ WARNING:
Do not reuse this seal.

Remove the outer O-ring from the hub and discard. Fig. 2.14

Remove the drive shaft seal by levering out, and discard. Fig.2.15

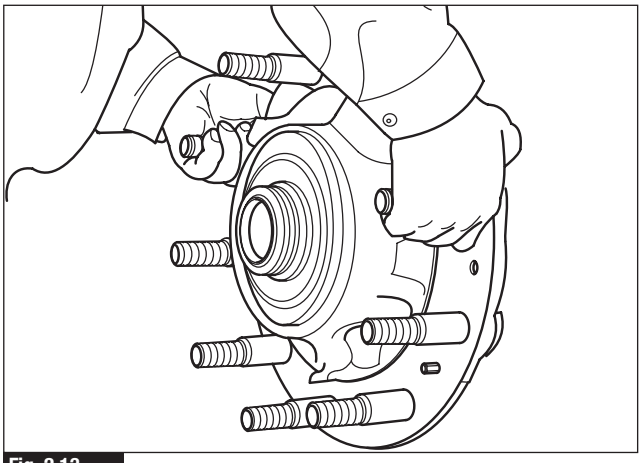


Fig. 2.13

⚠ WARNING:
Do not reuse this seal.

Hub bearings are pre-adjusted cartridge type and cannot be individually replaced. In case of non serviceability a replacement service exchange hub should be refitted.

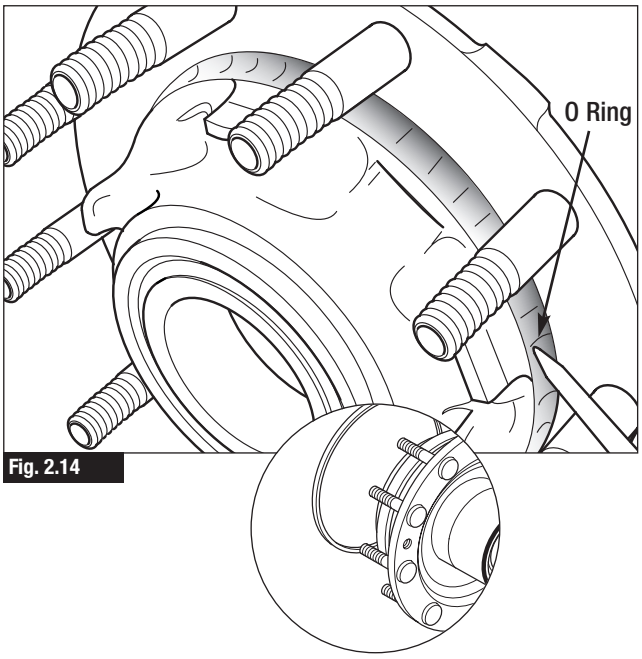


Fig. 2.14

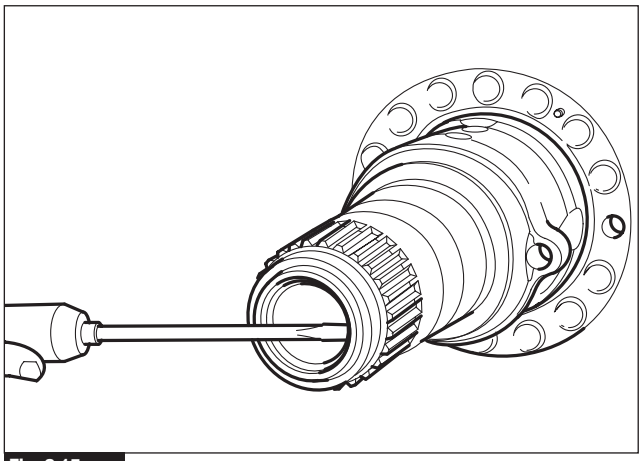


Fig. 2.15

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

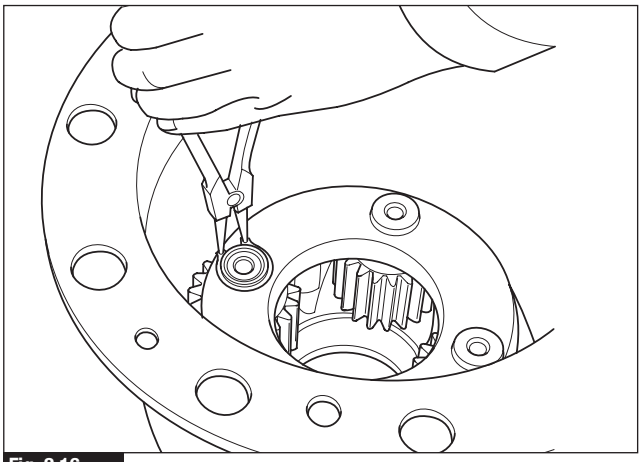


Fig. 2.16

Remove the circlips from the planets gear journal pins Fig. 2.16

Hubs can contain 3 or 4 planetary gears.
A: 3 planets version
B: 4 planets version (showed)

Press out the journal pins using a suitable drift.
Remove the planet gears, washers and needle rollers. Fig. 2.17

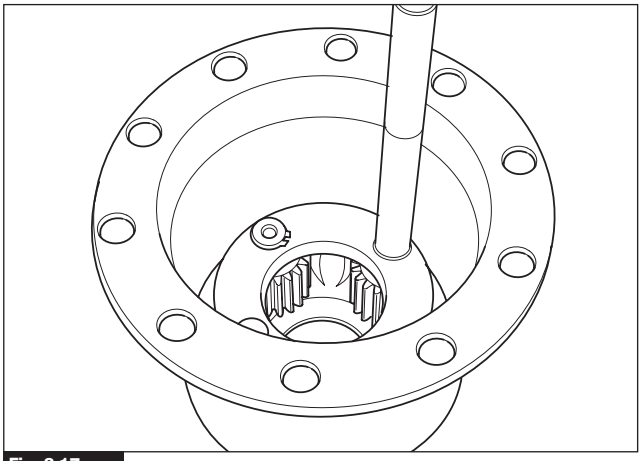


Fig. 2.17

Remove the O-ring seals from the journal pins, and discard.
Fig. 2.18

⚠ WARNING:
Do not reuse these O-Ring seals as old seals cannot protect against oil leaks when rebuilt.

Remove the ring gear locking ring (internal circlip), and separate the ring gear from its carrier - Fig. 2.19

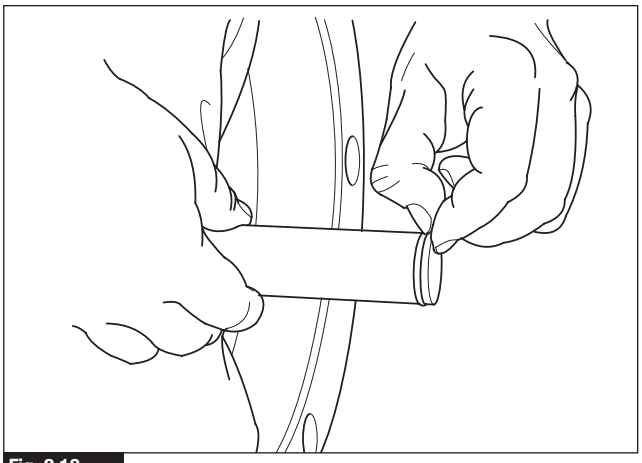


Fig. 2.18

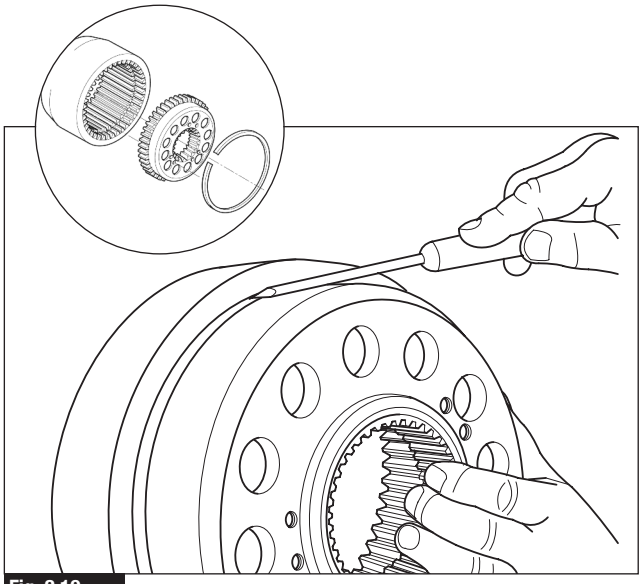


Fig. 2.19

2 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

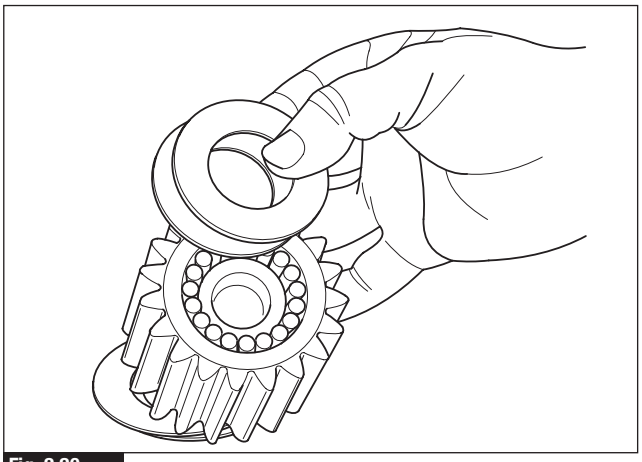


Fig. 2.20

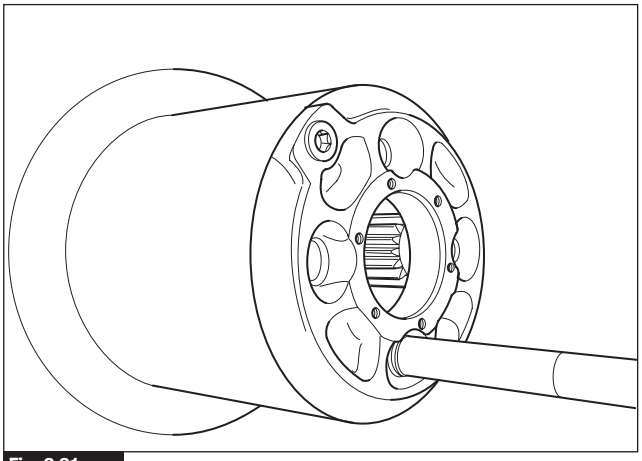


Fig. 2.21

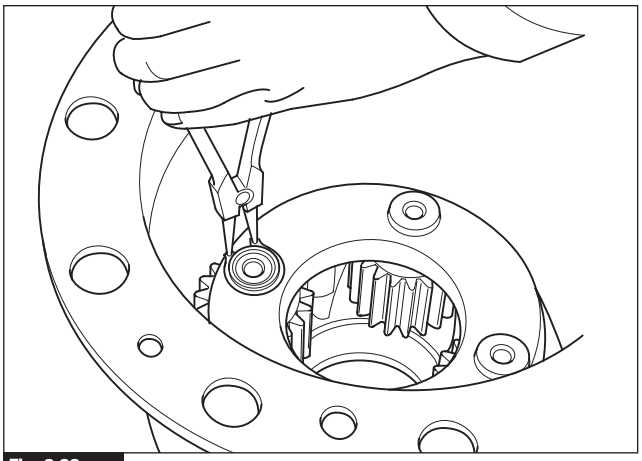


Fig. 2.22

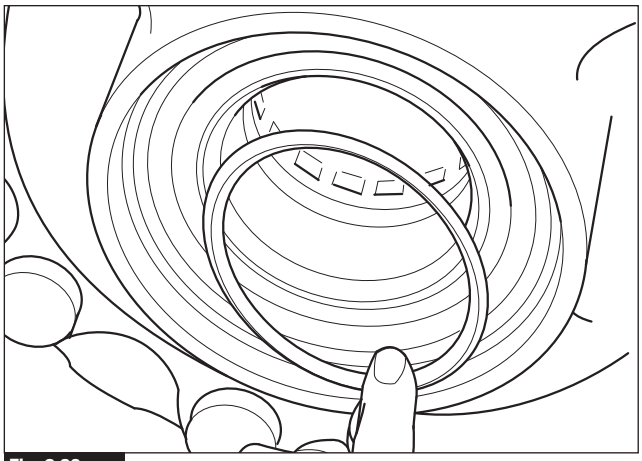


Fig. 2.23

Checking and replacing parts.

1. Thoroughly clean all the hub parts.
2. Check all the parts for wear, deformation or other damage.
3. Check needle rollers, gears and all bearing surfaces.
4. If a planetary gears is damaged, all the planetary gear journals and rollers must also be replaced at the same time since they are matched within the same tolerance class for optimally smooth operation.
5. Also check the contact surface of the seal on the drive shaft.
6. Replace damaged parts. Grease the rollers of the planets gears and assemble them in the gears, with the spacer sleeve. Fig. 2.20

NOTE: each gear must have 38 needle rollers.

Place the planets gears and thrust washers in the hub casing, aligning with the journal pin bore, and ensuring that the brass washers are in contact with the hub casing. Fit new O-rings on the journal pins and grease thoroughly with GLEITMO 805 grease. Press in the journal pins using a drift. The pins should be pressed in sufficiently to allow the retaining circlips to be fitted inside. Fig. 2.21

Fit the retaining circlips on the journal pins. Fig. 2.22

If damaged: remove the old inner seal and lubricate and press into position by hand a new inner hub seal. Fig. 2.23

Part 1
Wheel end assembly

3

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

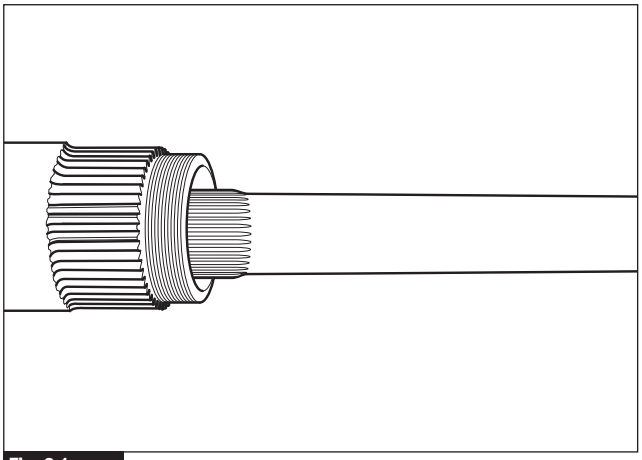


Fig. 3.1

Seal Assembly

First insert the axle shaft into the housing. Fig. 3.1

Take the dedicated tool and place the seal into the tool bore in the right position i.e. with spring's lip toward the spindle or external to the tool. Fig. 3.2

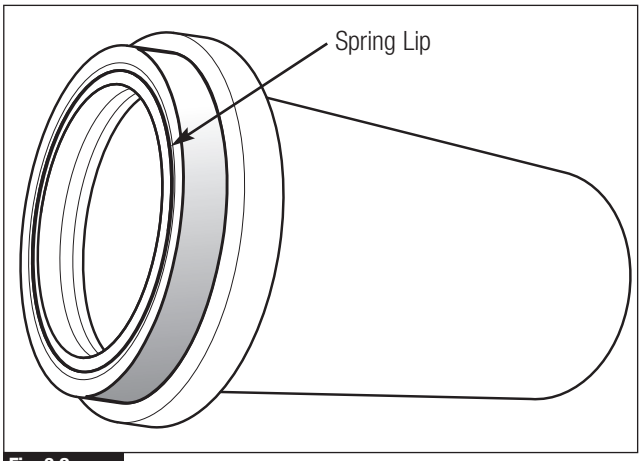


Fig. 3.2

Press the seal into the spindle bore. Fig. 3.3

The tool (through its shape) drives the seal into the spindle, leaving the proper seal protrusion, avoiding any seal distortion. Fig. 3.4

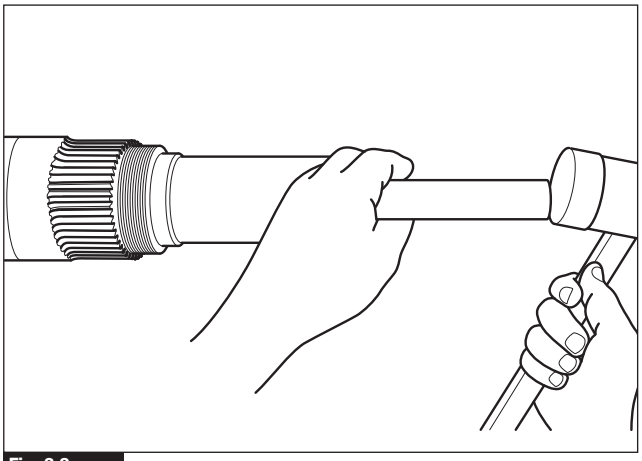


Fig. 3.3

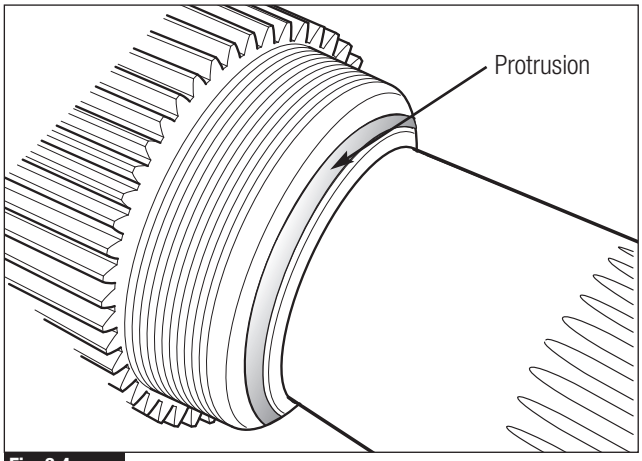


Fig. 3.4

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

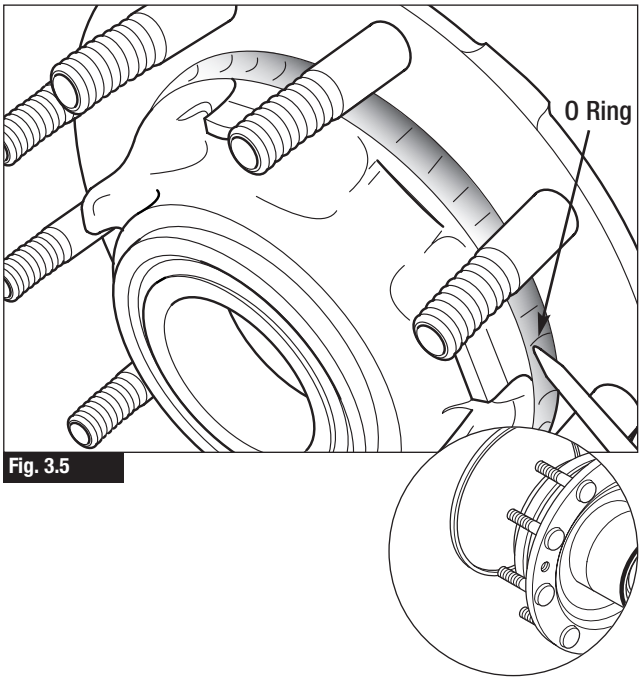


Fig. 3.5

Refit a new outer O-ring on the hub using grease as lubricant. Fig. 3.5

Refit the hub assembly.

Thoroughly grease the spindle bearing journals and locate the hub in position on the spindle. Locate the ring gear carrier into position. Fig. 3.6

Assembly ring gear group. Fig. 3.7

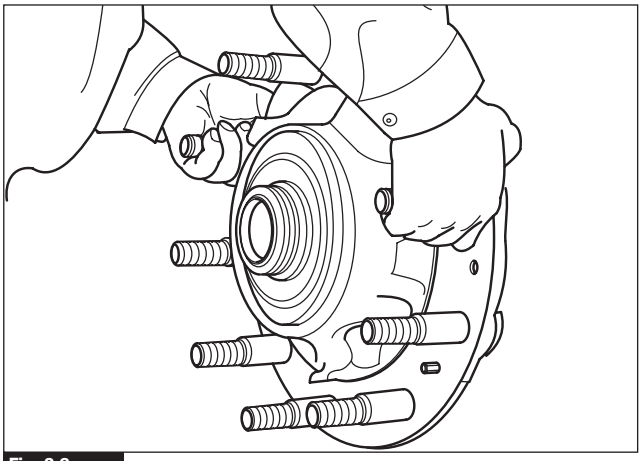


Fig. 3.6

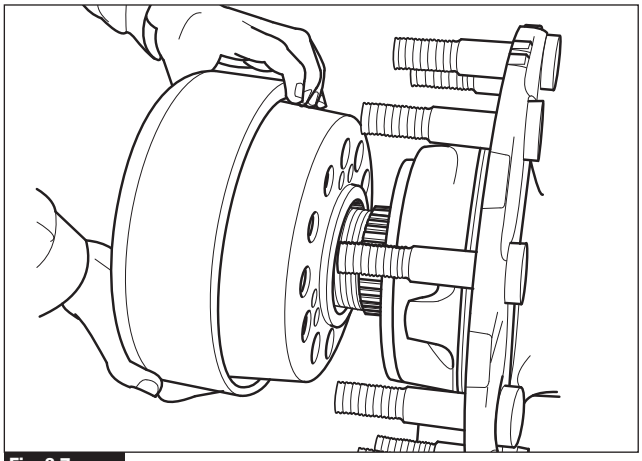


Fig. 3.7

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

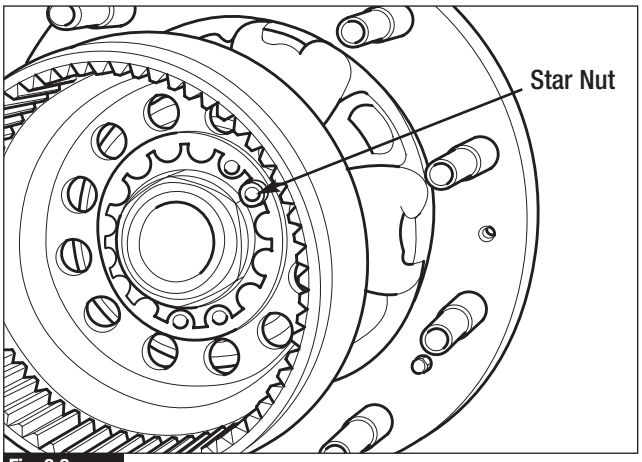


Fig. 3.8

⚠ WARNING:

Always use a new star Hub Nut. Fig. 3.8

Original nut cannot be used because the anti-friction coating on the hub nut face may be damaged.

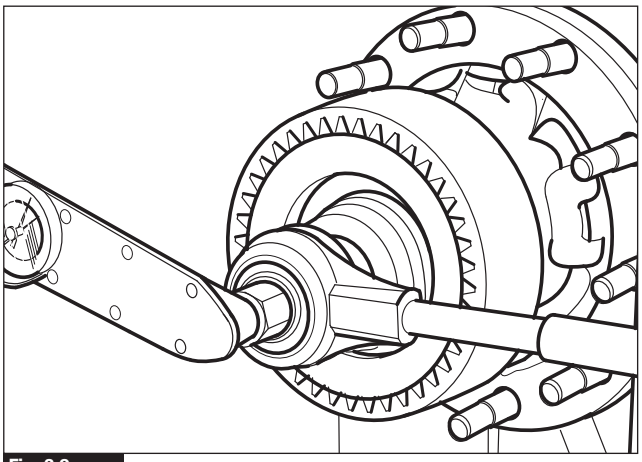


Fig. 3.9

Tighten hub nut to: 150 ± 30 Nm

Rotate hub 20 revolutions.

Tighten hub nut to: 1200 ± 120 Nm

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

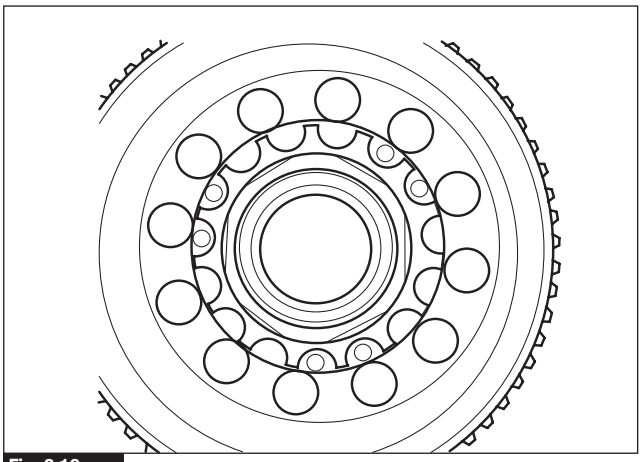


Fig. 3.10

Star Nut

Fit new locking patch screw to one of the six thread holes that allows the cap screw head to sit into one of the slots in the nut flange. Fig. 3.10

Do not clamp the nut flange under the head of the locking screw.

Tighten screw to 45 ± 5 Nm.

⚠ WARNING:

see fig. 3.11

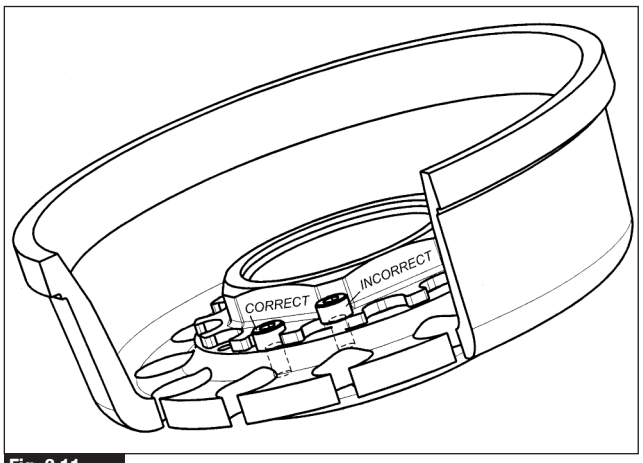


Fig. 3.11

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

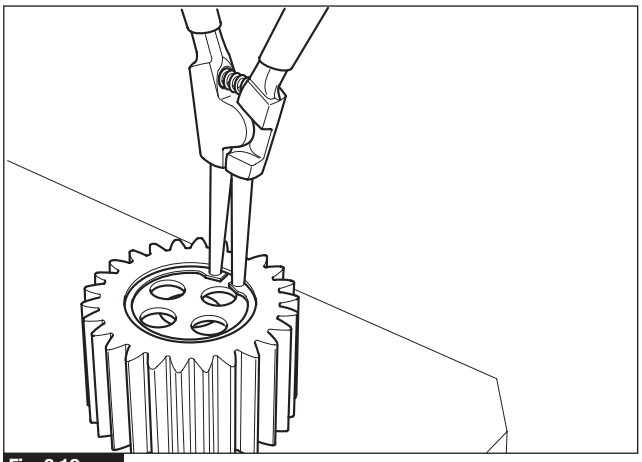


Fig. 3.12

Hub assembly

Fit the sun gear with spring washers and thrust washer and retain with an internal circlip. Fig. 3.12

Fit the hub casing onto the hub ensuring that the hub external O-ring is thoroughly lubricated using hub oil. Fig. 3.13a

Retain the hub casing in position with two socket bolts using thread locking compound (Loctite 243). Fig. 3.13b

Tighten bolts to a torque of: 40 ± 10 Nm - Fig. 3.14

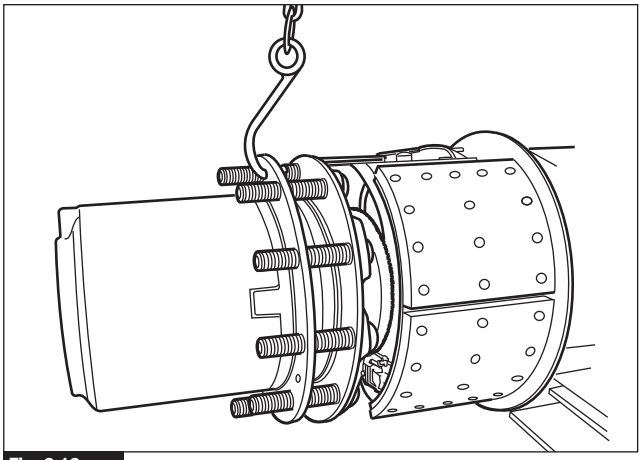


Fig. 3.13a

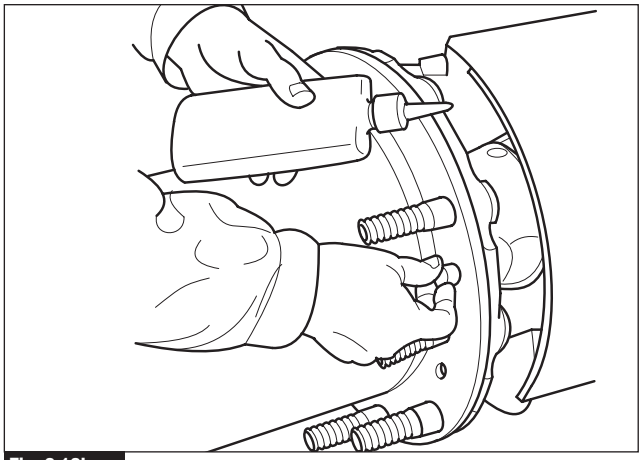


Fig. 3.13b

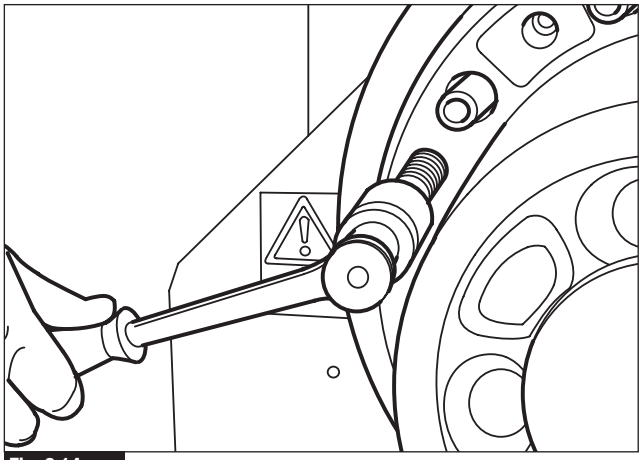


Fig. 3.14

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

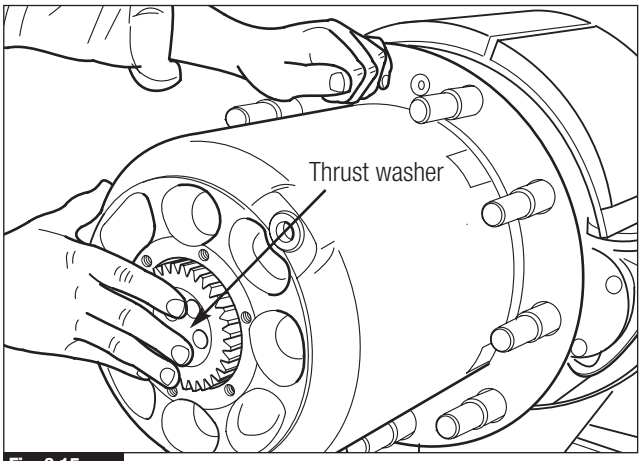


Fig. 3.15

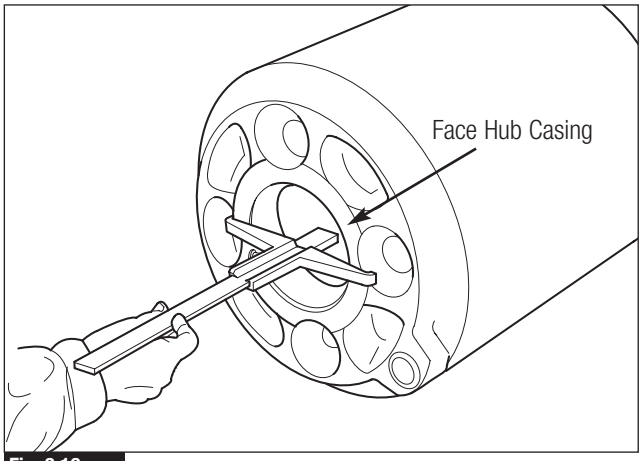


Fig. 3.16

Insert the sun gear.

Rotate the hub to engage the sun gear with axle shaft spline and ensure that the sun gear and the axle shaft are completely pressed in. Fig. 3.15

Dimension A
With the depth slide gauge measure the distance between the sun gear thrust washers and the face of the hub casing. Fig. 3.16

Record Dimension A (mm) - Fig. 3.17a

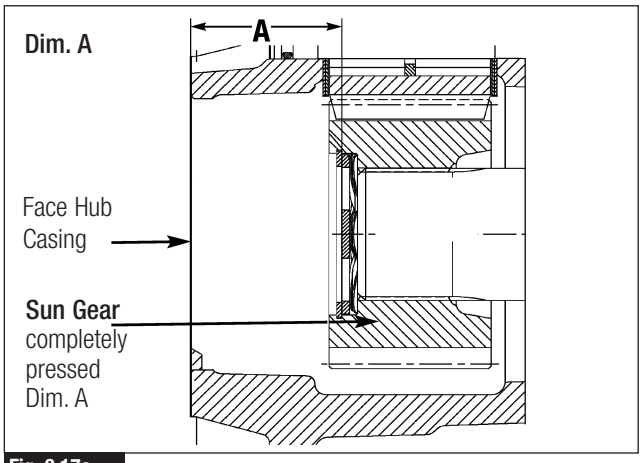


Fig. 3.17a

Pull out the sun gear approximately 10 mm. Fig. 3.17b

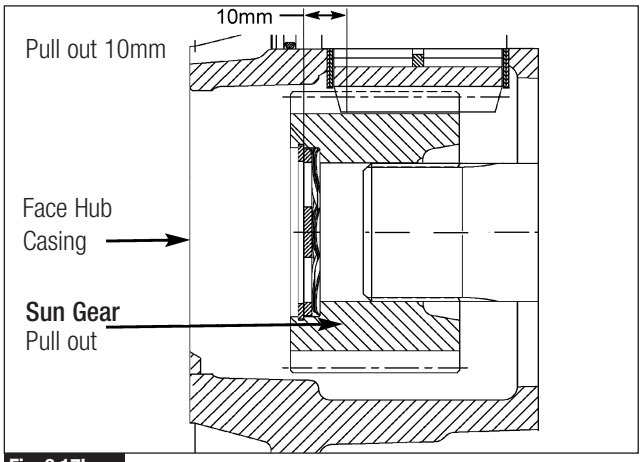


Fig. 3.17b

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

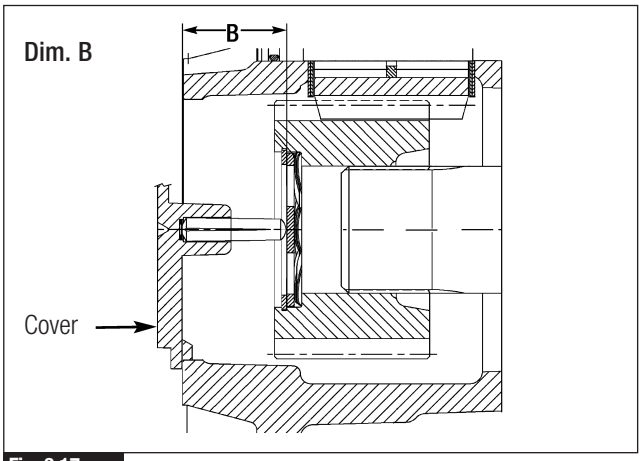


Fig. 3.17c

Dimension B

Offer up the cover plate into its position against the face of the hub casing pushing in the sun gear. Remove the cover, and remeasure the depth of the sun gear thrust washer, as previously record dimension B (mm) Fig. 3.17c with depth slide gear.

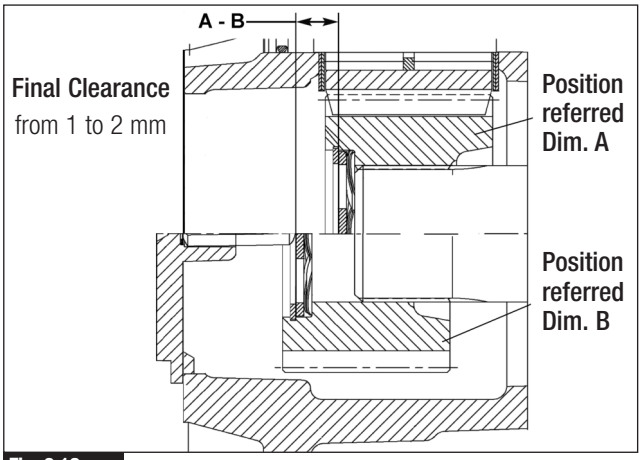


Fig. 3.18

Final Clearance calculation

Dimensions (A-B) between 1-2 mm

Fig. 3.18

If outside these limits, remove the grooved pin and change the number of washers under the pin. Fig. 3.19

Refit the magnetic washer over the grooved pin and retain in position with a new star lock fastener. Fig. 3.20

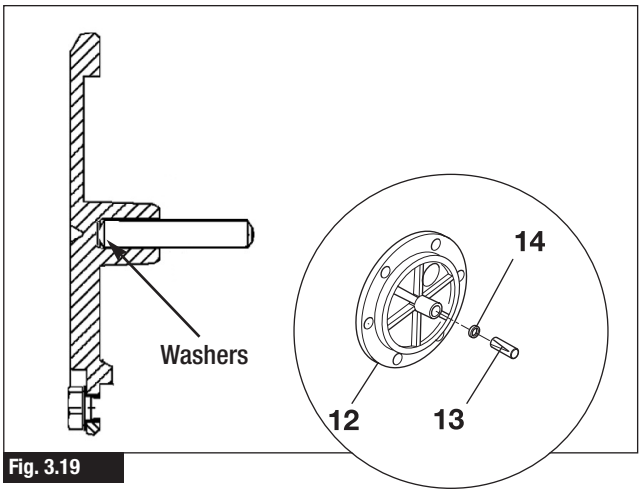


Fig. 3.19

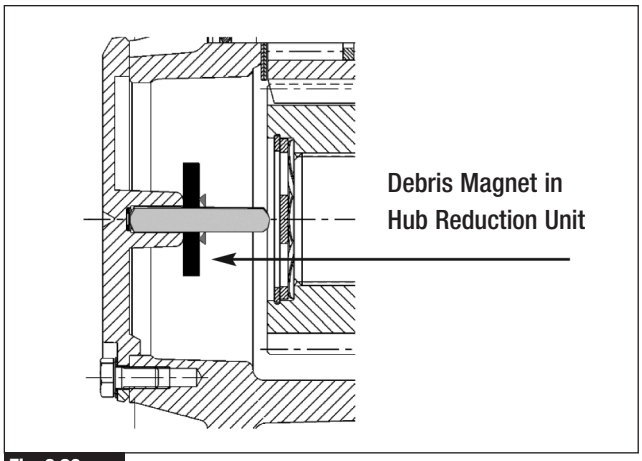


Fig. 3.20

3 Part 1 - Hub reduction with 3 - 4 planets
Wheel end with unitized bearing

Apply sealing compound in **approx. 6mm diameter.**

Bead (Dow Corning 7091) to the inner face of the cover plate in a continuous bead (as showed between internal circumference ribs and holes). Fig. 3.21

The components must be assembled immediately to permit the silicone gasket material to compress evenly between the mating surfaces. Refit the cover plate on the end of the hub casing and retain with screws. Torque: 20 ± 5Nm
Fig. 3.22

Fill hub with 2.5 litres of oil as specified by vehicle manufacturer. Fit new oil drain plug. Torque: 80Nm ± 20Nm
Fig. 3.23 - Hollow shaft
Fig. 3.24 - Solid shaft

NOTE: with new hub cap there is an oil level line that aligns with the bottom of the filler hole. When line is horizontal it is an indication of permitted oil capacity.

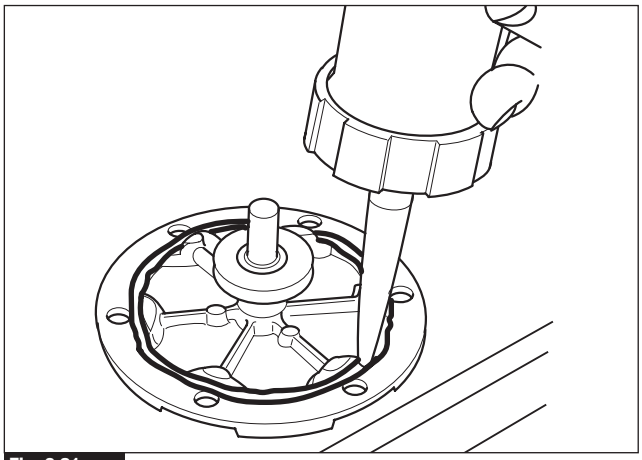


Fig. 3.21

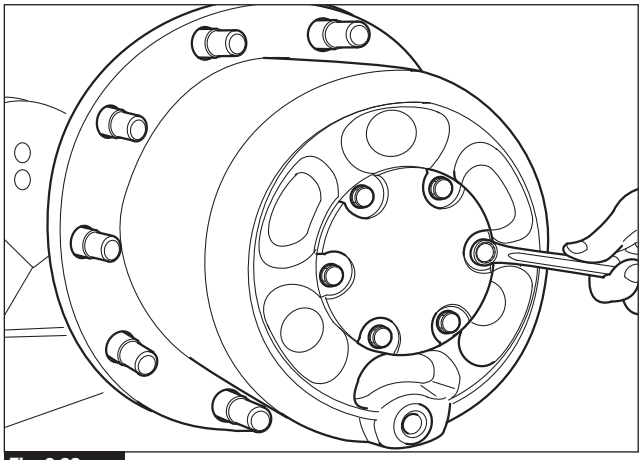


Fig. 3.22

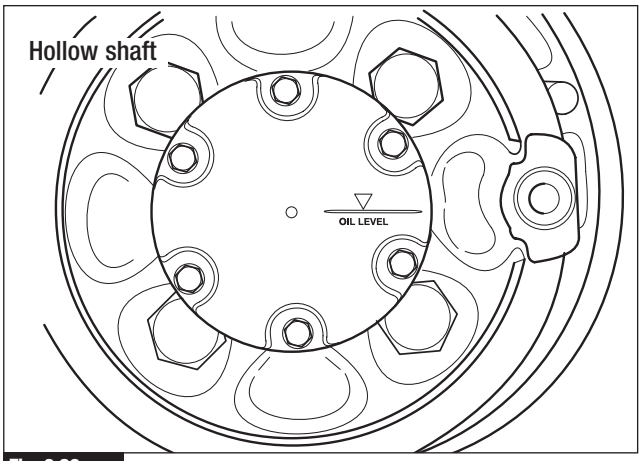


Fig. 3.23

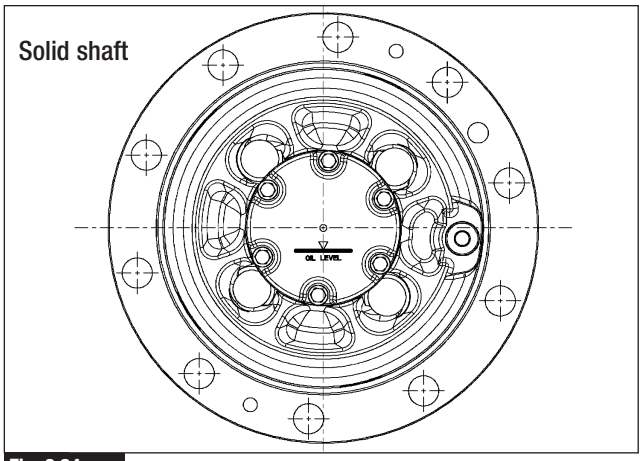


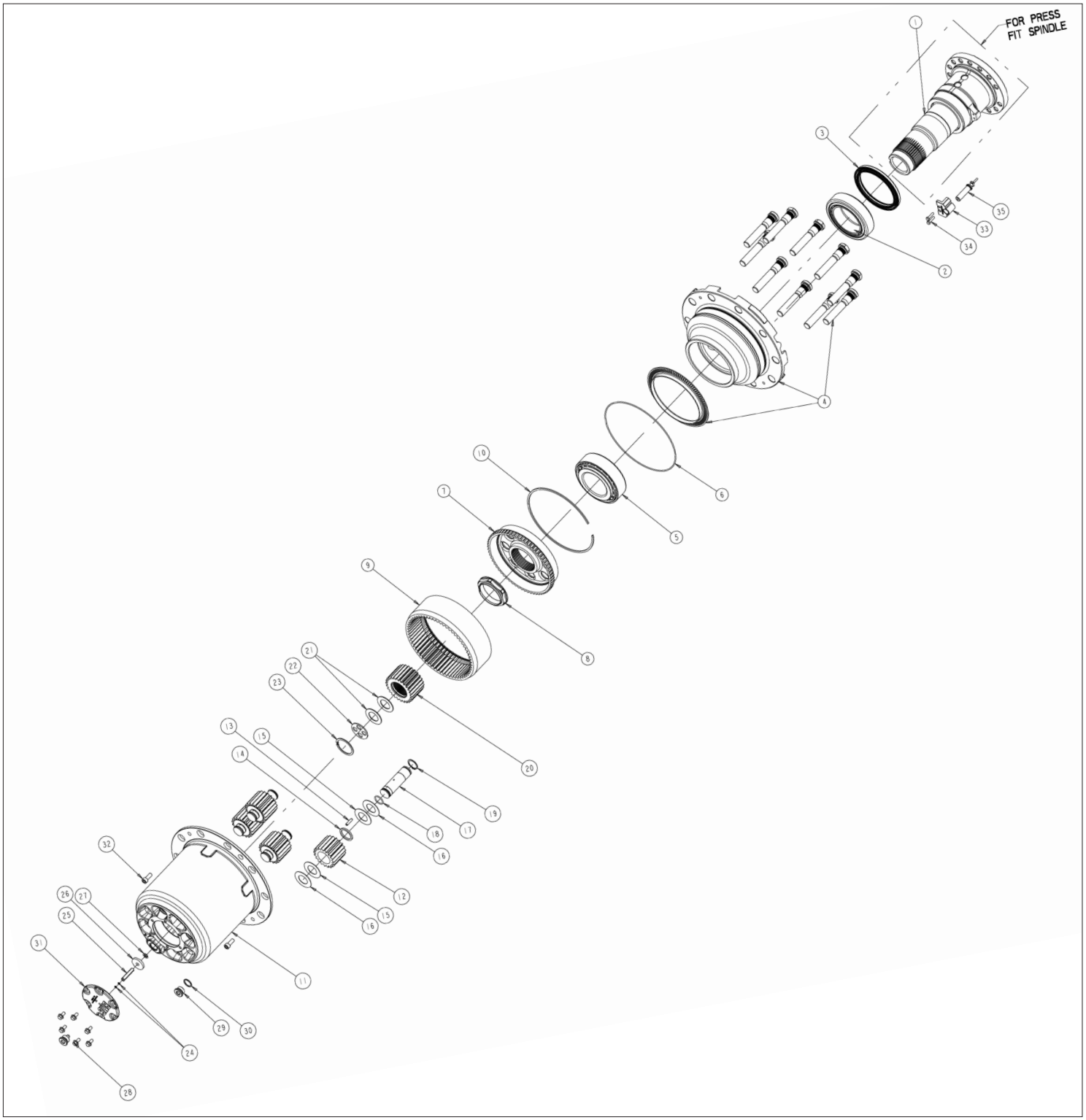
Fig. 3.24

Part 2
Traditional wheel end with 3-4 planets: Spindle fitted with interference

1

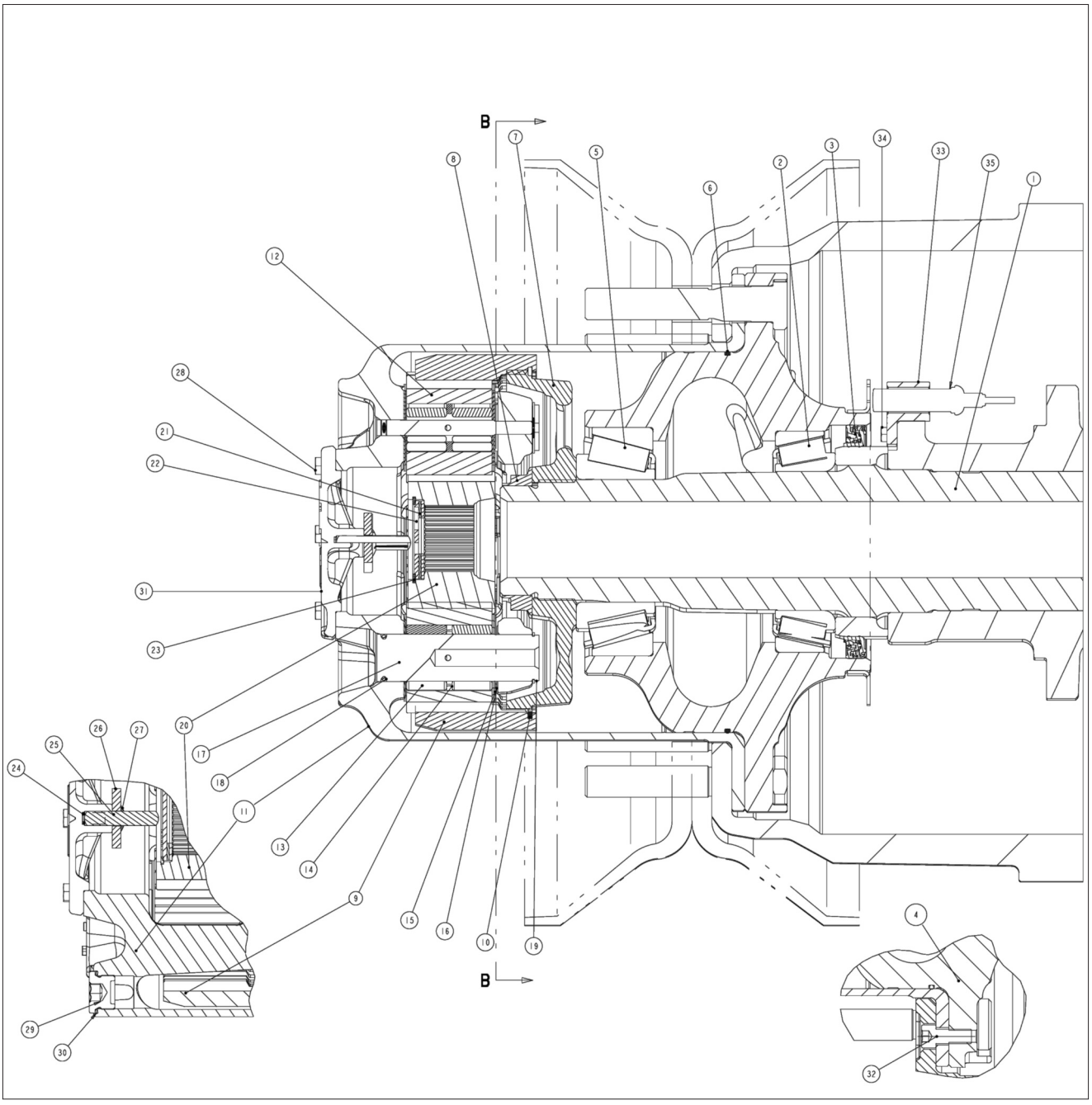
1 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

Exploded view



1 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

Cross-sectional view



1 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

Parts list

Item	Description
1	Spindle
2	Bearing-inner wheel
3	Seal assembly
4	Hub assembly
5	Bearing-outer wheel
6	O-ring
7	Carrier-planetary ring gear
8	Nut Wheel Bearing
9	Ring Gear
10	Retaining ring
11	Hub case
12	Gear planet
13	Needle
14	Spacer ring
15	Thrust washer (steel)
16	Thrust washer (brass)
17	Bearing spindle
18	O-ring
19	Retainer clip
20	Sun gear
21	Spring washer
22	Thrust washer
23	Retainer clip
24	Washers
25	Pin
26	Magnet
27	Retain clip
28	Hub cover screw
29	Plug - Magnet
30	Gasket / copper washer
31	Cover
32	Screw
33	Abs bracket (optional)
34	Bolts (optional)
35	Sensor assy (optional)

1 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

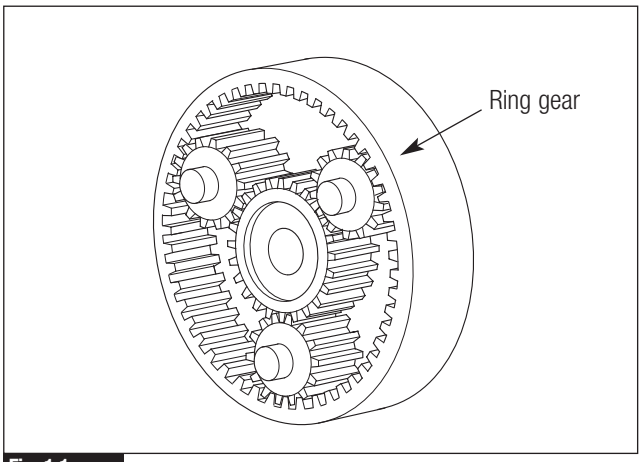


Fig. 1.1

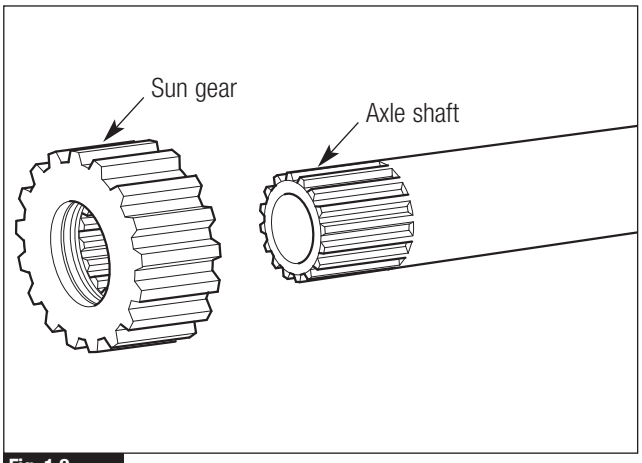


Fig. 1.2

Description

The hub reduction unit consists of a cylindrical planetary assembly in each hub, fig. 1.1. The reduction is made up of a sun gear, a number of planetary gears 3 or 4 which rotate round the sun gear and a ring gear which houses the planets gears.

The sun gear is located on the axle shaft by spline, fig. 1.2

The ring gear is jointly to the rear axle spindle by spline, fig. 1.3

The hub is carried on two tapered roller bearings.

When the drive shaft, and the sun gear rotates, the rotation is transmitted to the planets gears.

Because the ring gear is fixed to the rear axle spindle, the planets gears rotate inside the ring gear and the rotation movement is transmitted to the hub assy.

Ratio formula = 1+(Z Ring gear / Z Sun teeth), fig. 1.4

The hub reduction ration is 3.46:1 or 3.33:1
Ratio (3.46:1) - 3 or 4 planets 1+(64/26)=3.46
Ratio (3.33:1) - 3 or 4 planets 1+(63/27)=3.33

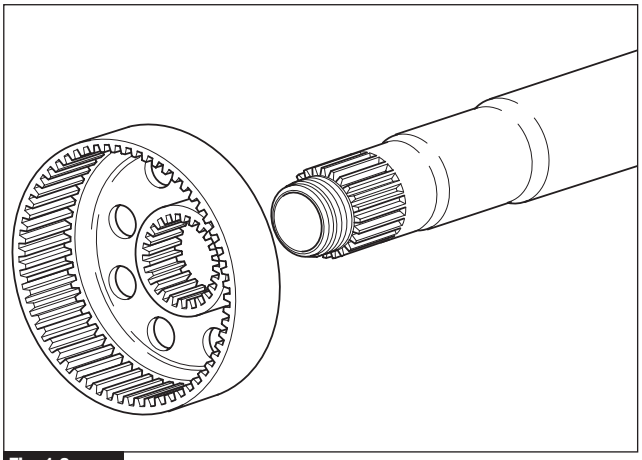


Fig. 1.3

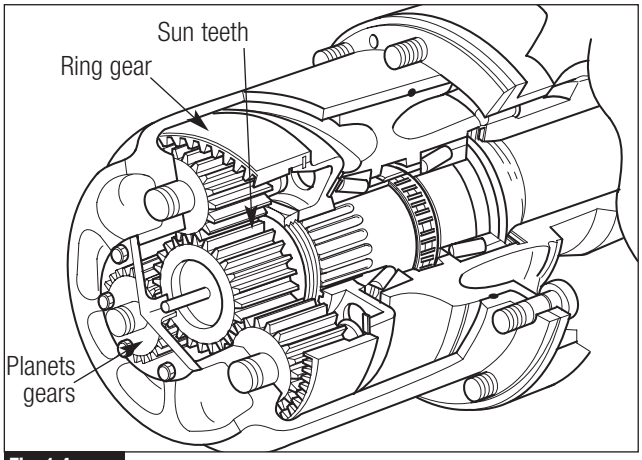


Fig. 1.4

1 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

Description

Hub reduction 3 planets - fig. 1.5a
Hub reduction 4 planets - fig. 1.5b

In order to ensure reliable and efficient wheel end assembly operation, maintenance intervals, use of lubricants and correct procedures specified by the manufacturer should be strictly observed (refer to Lubrication Maintenance Manual no. 1).

For further information contact the manufacturer's engineering department or refer to the Meritor Web site at www.meritor.com (technical library - manuals).

⚠ WARNING

Only original Meritor spare parts should be used. Use of non-recommended lubricants will adversely affect performance and service life. Use of non-original parts could seriously affect wheel end assembly performance.

Torque chart specifications and data

Hub gear:

Type	Cylindrical planetary gear
Designation	3 or 4 Planets (19 teeth)
Ratio (3.46:1)	1+(64/26)=3.46
Ratio (3.33:1)	1+(63/27)=3.33

Tightening torques:

Pos.	Tightening torques	Nm
28	Hub cover screws	20±5
29	Oil plugs (level and draining)	80 ± 20
32	Hub casing screws	40 ± 10
8	Hub nut *	64 ± 20
	* For all details see the next chapter 8	

Lubricants

Oil type: See carrier oil specification or contact the engineering reference.

Oil quantity: 2.5 liters for each-hub

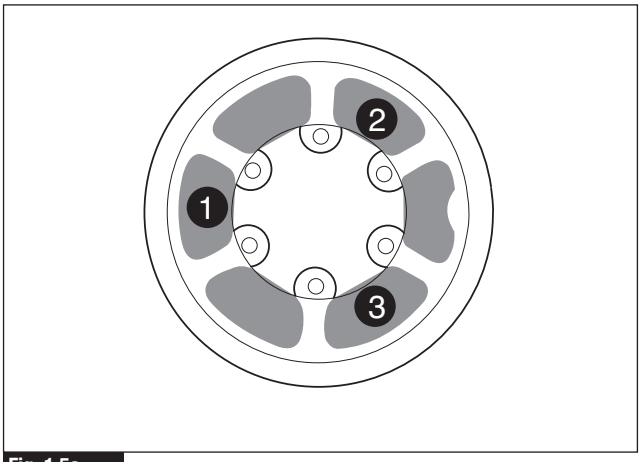


Fig. 1.5a

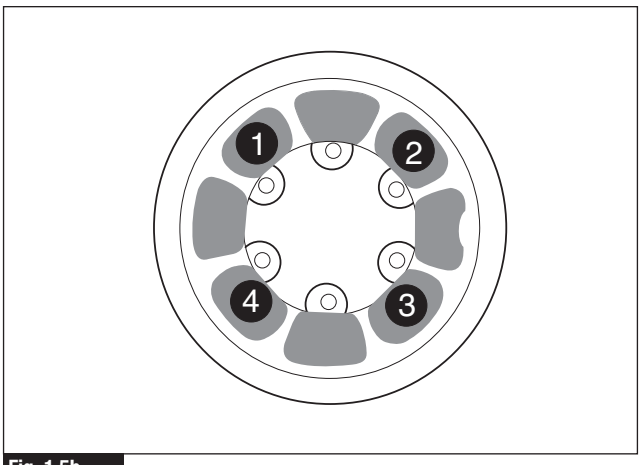


Fig. 1.5b

1 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

Description

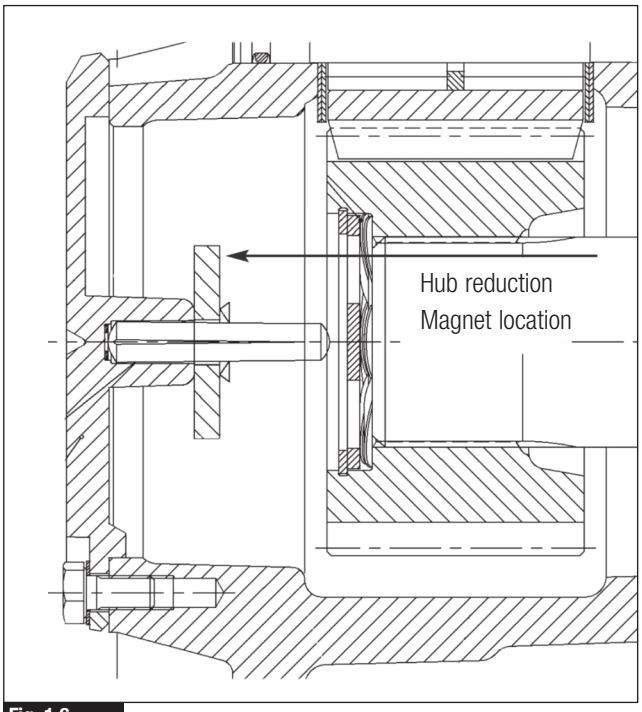


Fig. 1.6

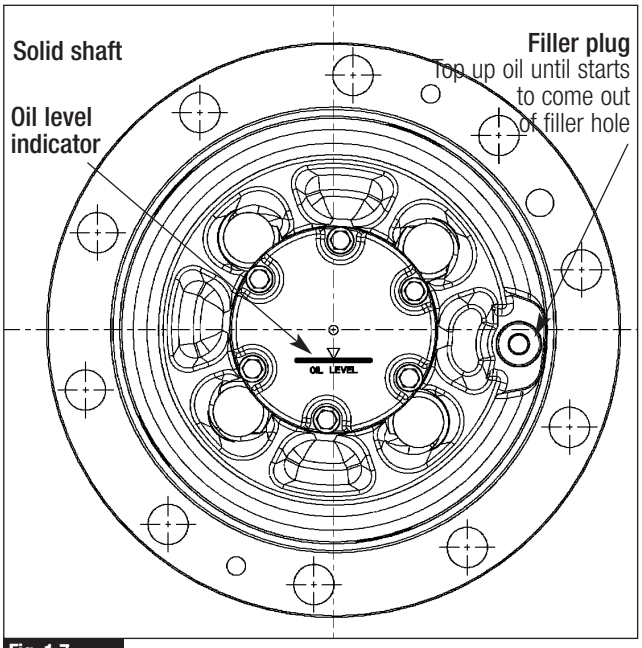


Fig. 1.7

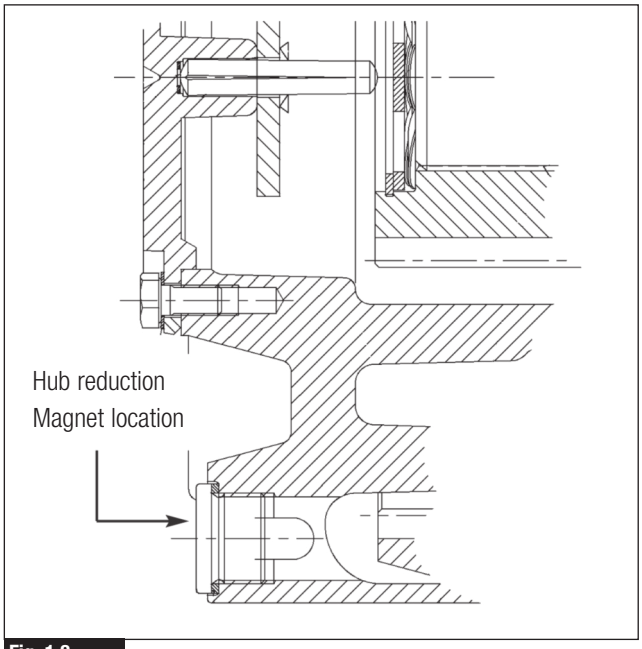


Fig. 1.8

Part 2
Wheel end disassembly

2

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

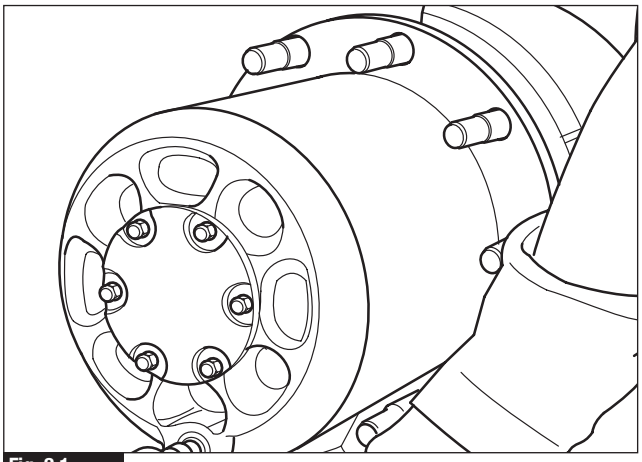


Fig. 2.1

Wheel end disassembly

Remove the wheel nuts and retain. Pull off the wheels using a wheel trolley. Remove the air inflation valve from its retainer in the inside wheel.

Jack up the rear axle of the vehicle to vehicle manufacturers recommendations and drain the oil from the axle(s). Fig. 2.2

Remove the hub drain plug and discard.
Drain oil from wheel end. Fig. 2.3

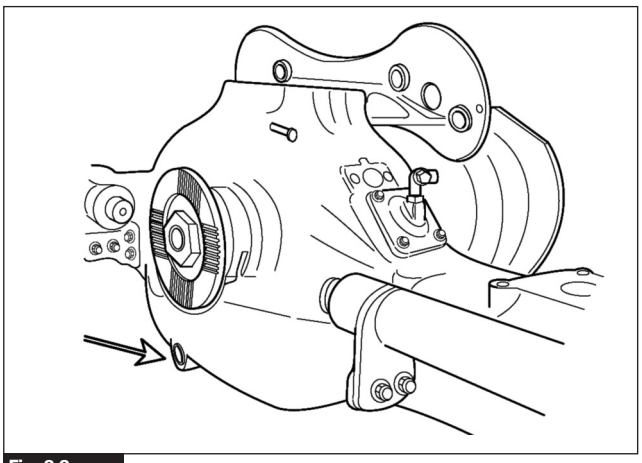


Fig. 2.2

Tighten in dedicated holes the tool's screws equally and simultaneously, and avoid using excessive force as this could damage the drum. Fig. 2.4

A soft-faced mallet may be used on the drum to loosen and ease withdraw.

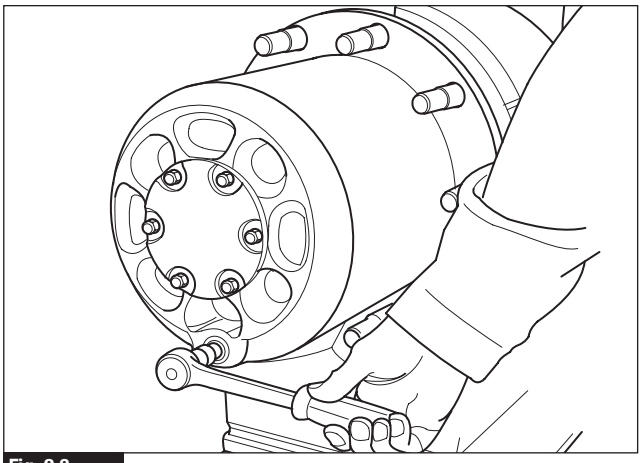


Fig. 2.3

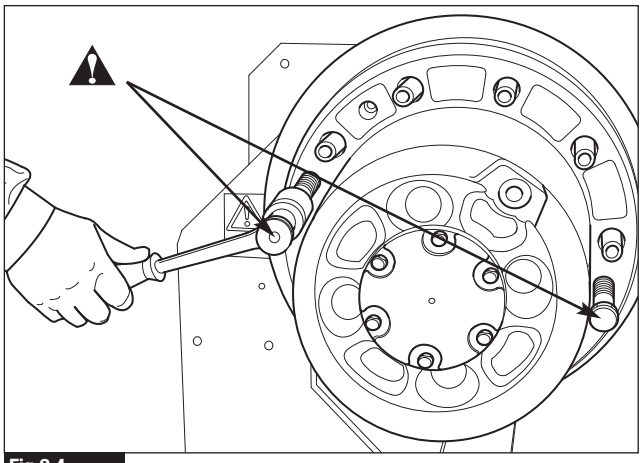


Fig.2.4

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

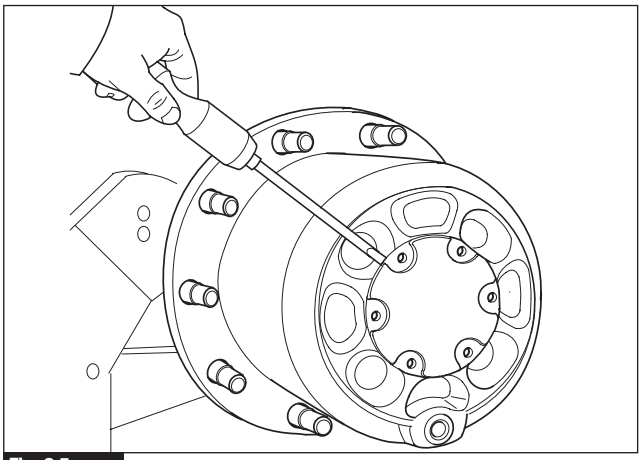


Fig. 2.5

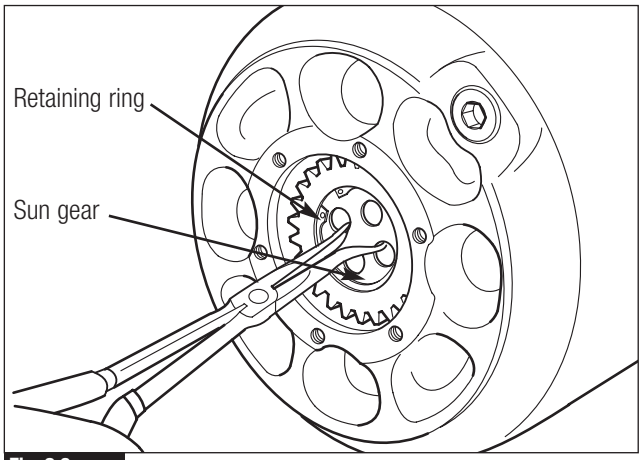


Fig. 2.6

Remove cover retainer screws with suitable sized wrench and remove the hub cover from the end of the hub casing - Fig. 2.5

Remove the retaining ring sun gear and spring washers from axle shaft - Fig. 2.6

Remove the 2 sunk head screws M10X25 - Fig. 2.7

Remove the hub casing group and remove axle shaft - Fig. 2.8

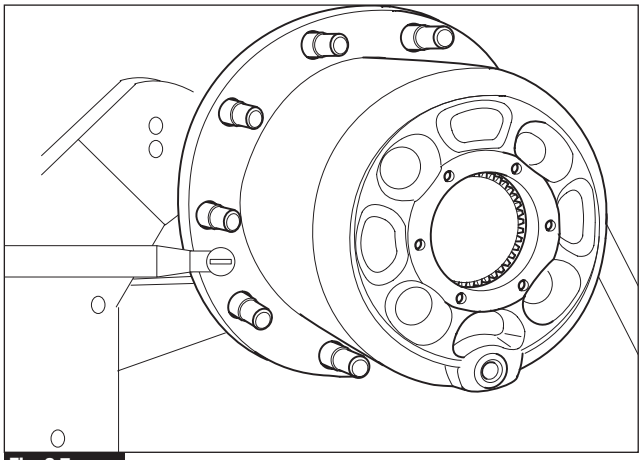


Fig. 2.7

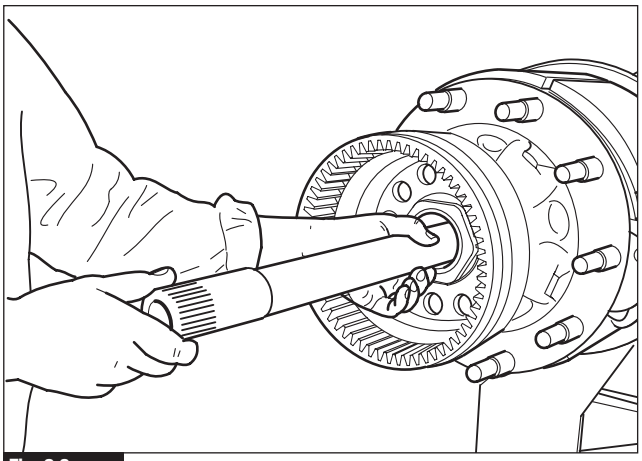


Fig. 2.8

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

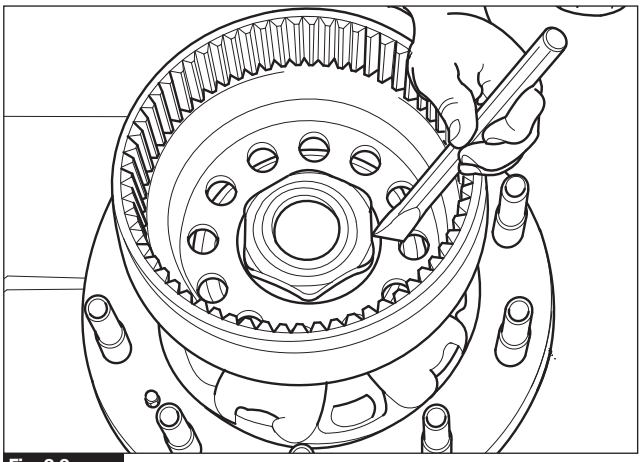


Fig. 2.9

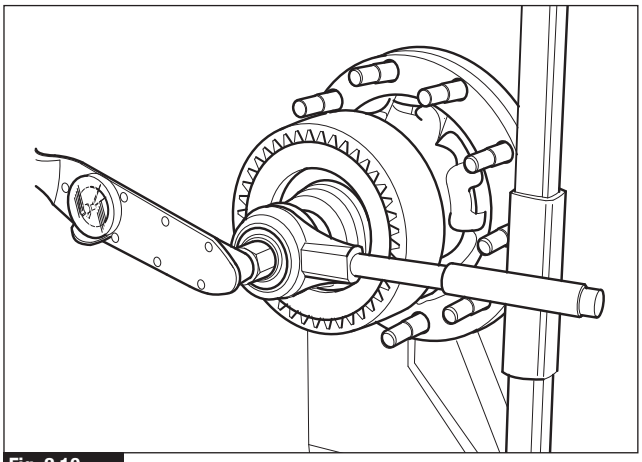


Fig. 2.10

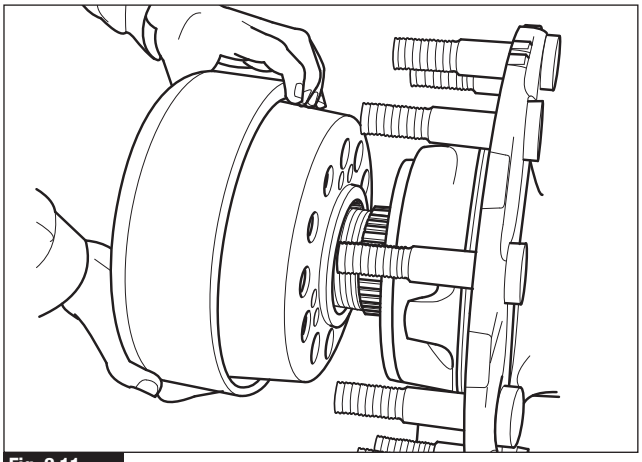


Fig. 2.11

1. Use a punch to remove locking indent on wheel hub nut collar. Fig. 2.9
2. Undo the nut using a wrench. Remove the hub nut and discard. - Fig. 2.10
3. Remove the ring gear group. - Fig. 2.11

NOTE: If available, use a lifting tool.

⚠ WARNING:

Do not damage the thread of the wheel end spindle.

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

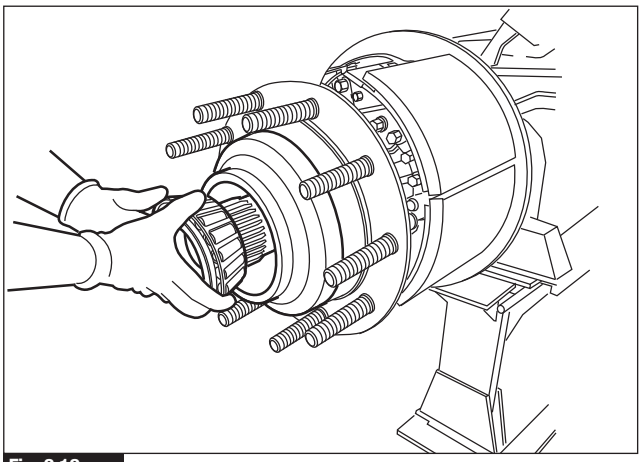


Fig. 2.12

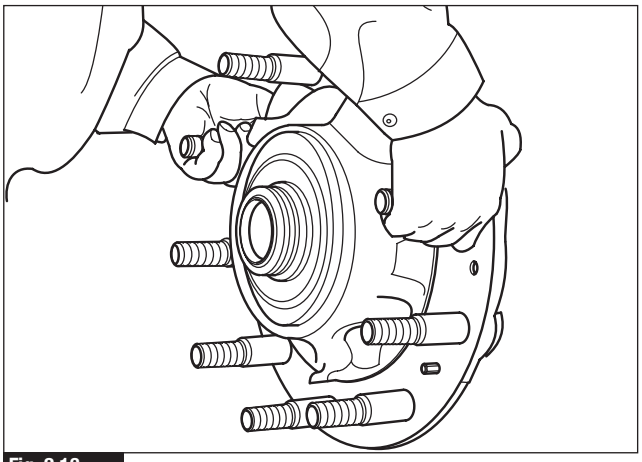


Fig. 2.13

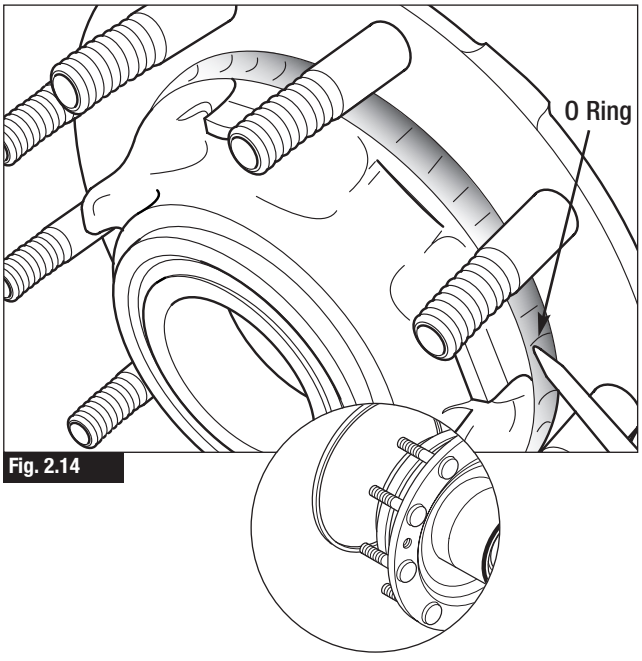


Fig. 2.14

4. Remove the external wheel bearing. Fig. 2.12

5. Remove the hub (Fig. 2.13) and check the green o-ring in the back side. - Fig. 2.14

NOTE: If available, use a lifting tool.

⚠ WARNING:
Do not damage the thread of the wheel end spindle

⚠ WARNING:
If the green o-ring has a mark, discard and scrap it.

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

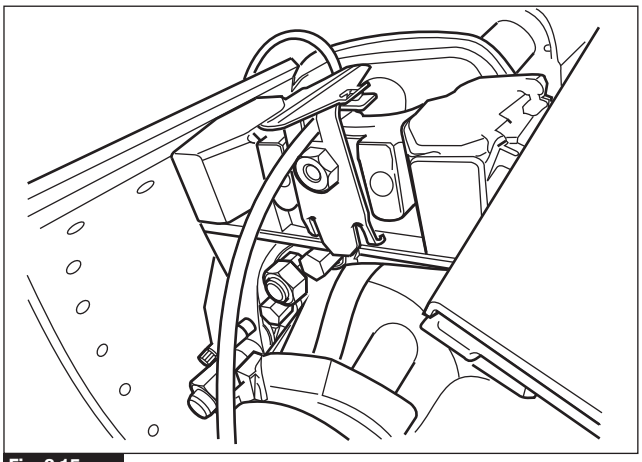


Fig. 2.15

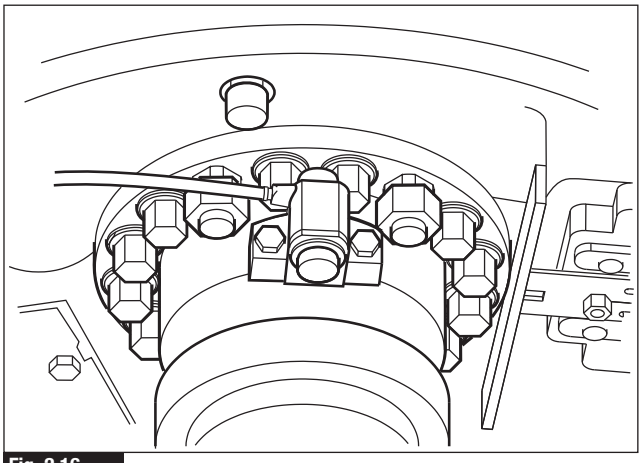


Fig. 2.16

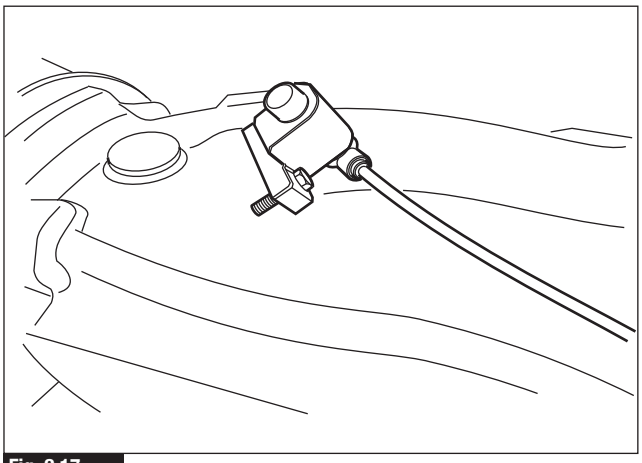


Fig. 2.17

6. If the axle has an ABS sensor proceed as shown here below otherwise move to point 10.
7. Disconnect ABS sensor cable completely and remove it.
8. Untighten the brackets. Fig. 2.15
9. If needed, replace the ABS sensor. Figg. 2.16 - 2.17

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

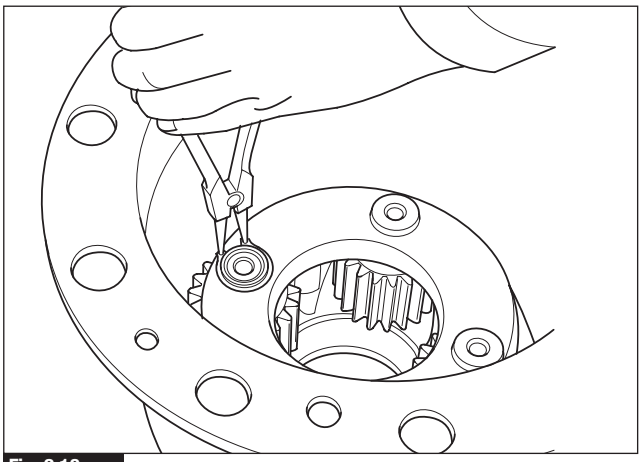


Fig. 2.18

Remove the circlips from the planets gear journal pins Fig. 2.18

Hubs can contain 3 or 4 planetary gears.

A: 3 planets version

B: 4 planets version (showed)

Press out the journal pins using a suitable drift.

Remove the planet gears, washers and needle rollers. Fig. 2.19

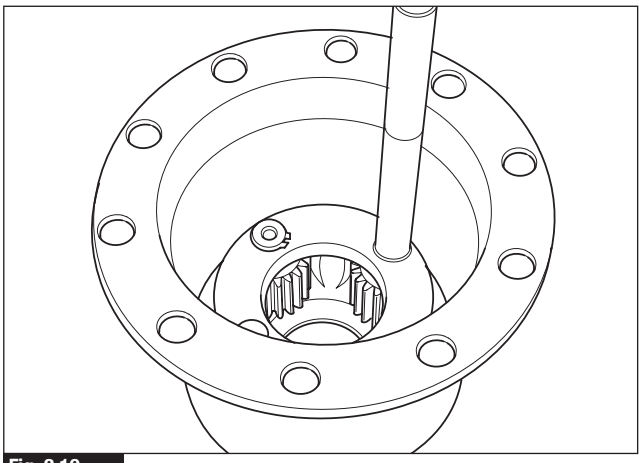


Fig. 2.19

Remove the O-ring seals from the journal pins, and discard. Fig. 2.20

WARNING:

⚠ Do not reuse these O-Ring seals as old seals cannot protect against oil leaks when rebuilt.

Remove the ring gear locking ring (internal circlip), and separate the ring gear from its carrier - Fig. 2.21

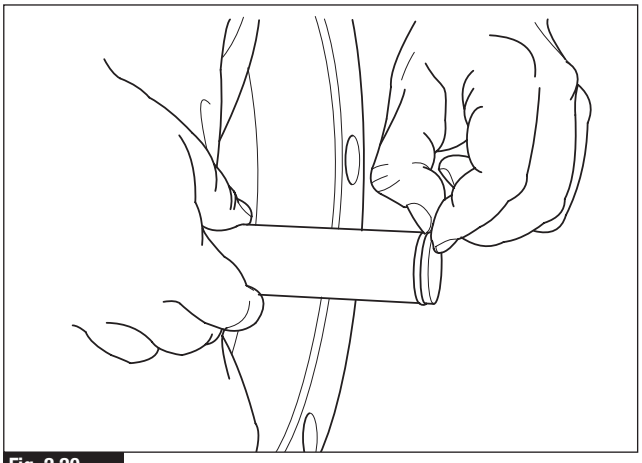


Fig. 2.20

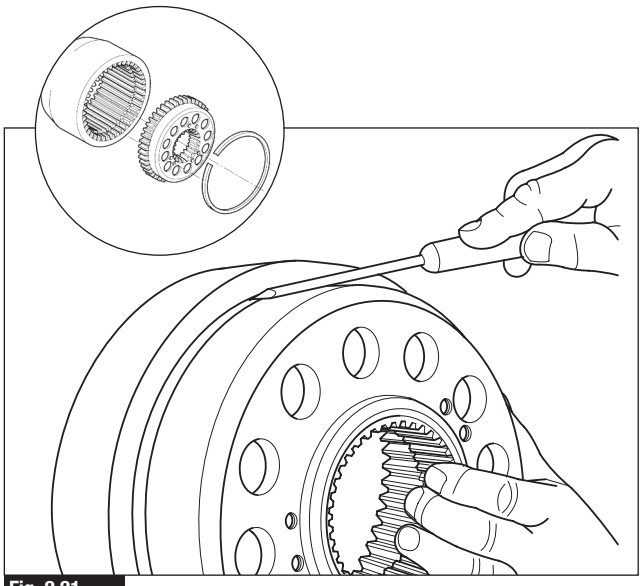


Fig. 2.21

2 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

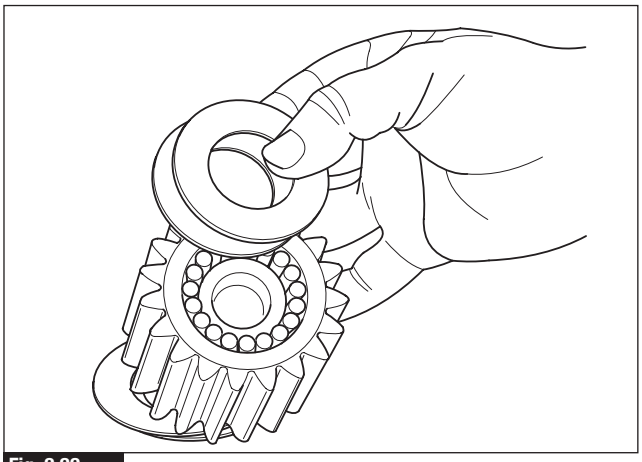


Fig. 2.22

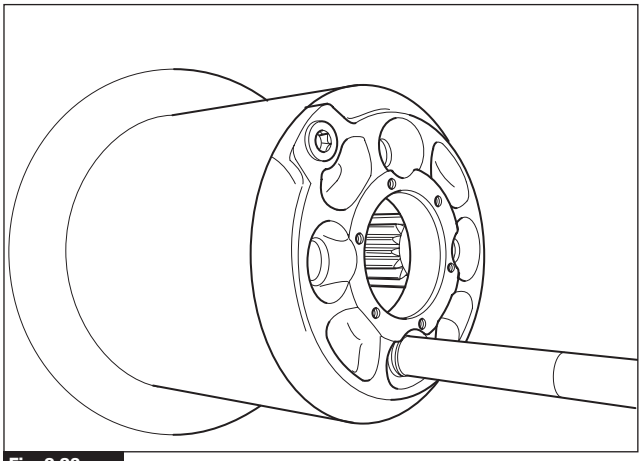


Fig. 2.23

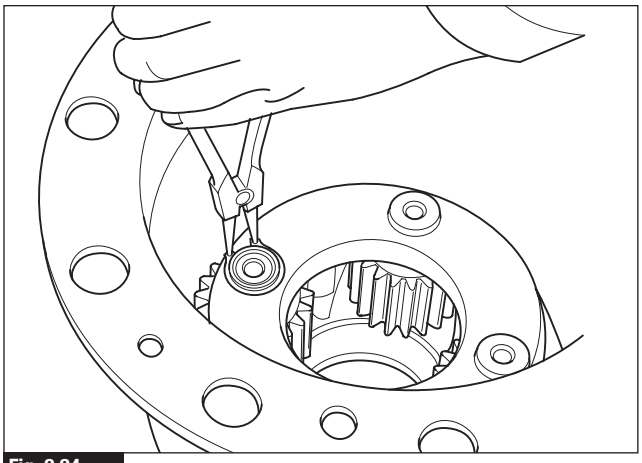


Fig. 2.24

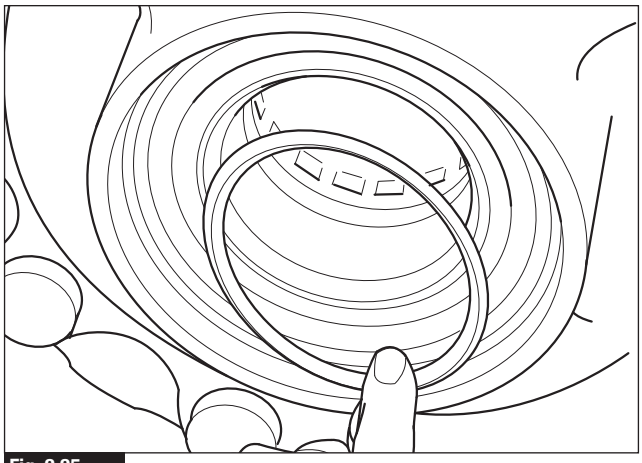


Fig. 2.25

Checking and replacing parts

1. Thoroughly clean all the hub parts.
2. Check all the parts for wear, deformation or other damage.
3. Check needle rollers, gears and all bearing surfaces.
4. If a planetary gears is damaged, all the planetary gear journals and rollers must also be replaced at the same time since they are matched within the same tolerance class for optimally smooth operation.
5. Also check the contact surface of the seal on the drive shaft.
6. Replace damaged parts. Grease the rollers of the planets gears and assemble them in the gears, with the spacer sleeve. Fig. 2.22

NOTE: each gear must have 38 needle rollers.

Place the planets gears and thrust washers in the hub casing, aligning with the journal pin bore, and ensuring that the brass washers are in contact with the hub casing. Fit new O-rings on the journal pins and grease thoroughly with GLEITMO 805 grease. Press in the journal pins using a drift. The pins should be pressed in sufficiently to allow the retaining circlips to be fitted inside. Fig. 2.23

Fit the retaining circlips on the journal pins. Fig. 2.24

If damaged: remove the old inner seal and lubricate and press into position by hand a new inner hub seal. Fig.2.25

Part 2
Wheel end assembly

3

3 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

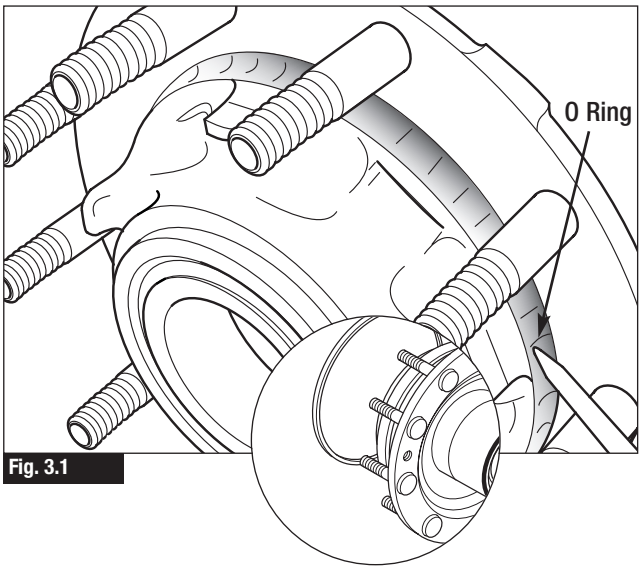


Fig. 3.1

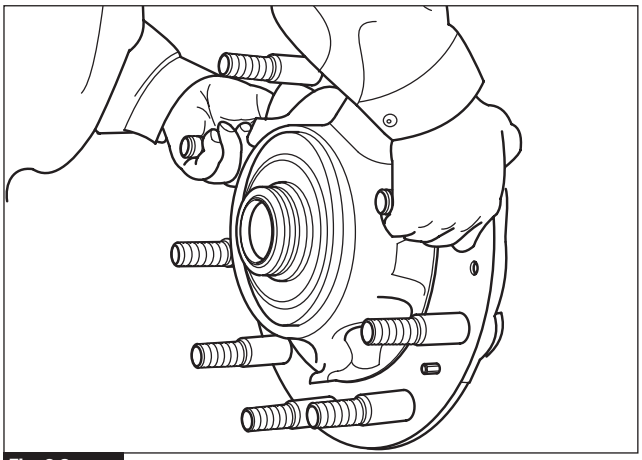


Fig. 3.2

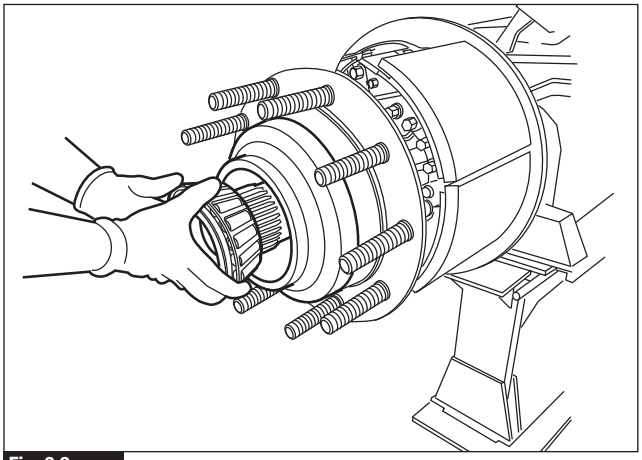


Fig. 3.3

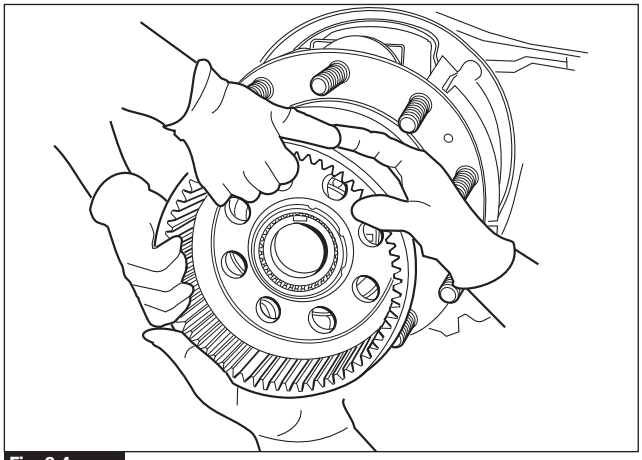


Fig. 3.4

Wheel end assembly

NOTE: Ensure mating surfaces of hub and axle shaft have been cleaned thoroughly

1. Refit a new outer O-ring on the hub using grease as lubricant. Fig. 3.1

Refit the hub assembly.

2. Thoroughly grease the spindle bearing journals and locate the hub in position on the spindle without the external bearing. Fig. 3.2

NOTE: If available, use a lifting tool.

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

3. Fit the external wheel bearing. Fig.3.3
4. Locate the ring gear carrier into position. Assembly ring gear group. - Fig. 3.4 - 3.5

3 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

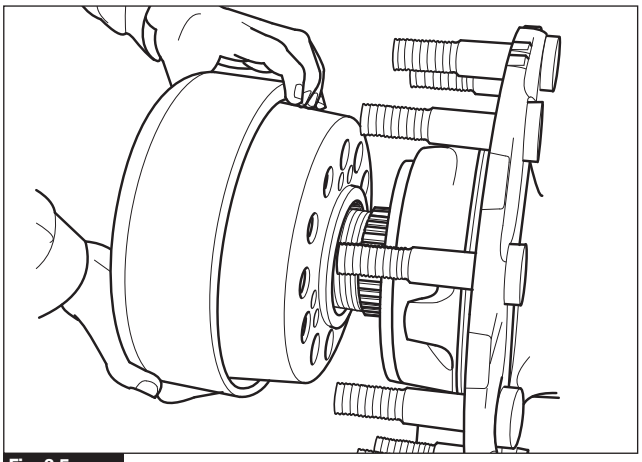


Fig. 3.5

NOTE: If available, use a lifting tool.

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

5. Install and tighten wheel-bearing nut, while rotating wheel back & forth. Further rotate wheel (3) revolutions each direction alternating fwd/rev. Mark nut position and retighten it.
   If nut turns, repeat previous step until nut no longer turns when retightened. Use a torque wrench on wheel end.
   The torque of the new nut wheel should be 64 ± 20Nm.
   Fig. 3.6

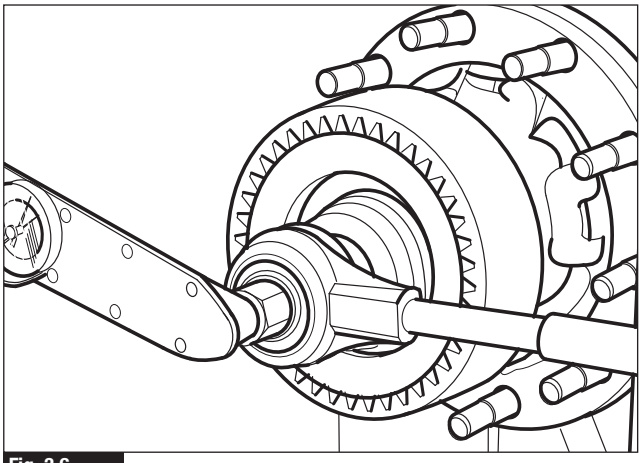


Fig. 3.6

Alternative method: applied as shown in the picture here below. In this test modality, the linear force range should be 10 ÷ 28N. - Fig. 3.7

NOTE: If the torque is outside the spec, return at the previous point and readjust it.

6. When the wheel end torque is in the specification use a staking tool to stake nut lip into keyway in spindle.
   Fig. 3.8

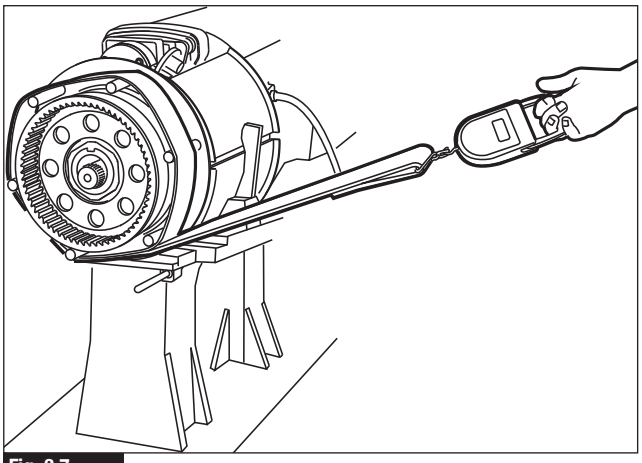


Fig. 3.7

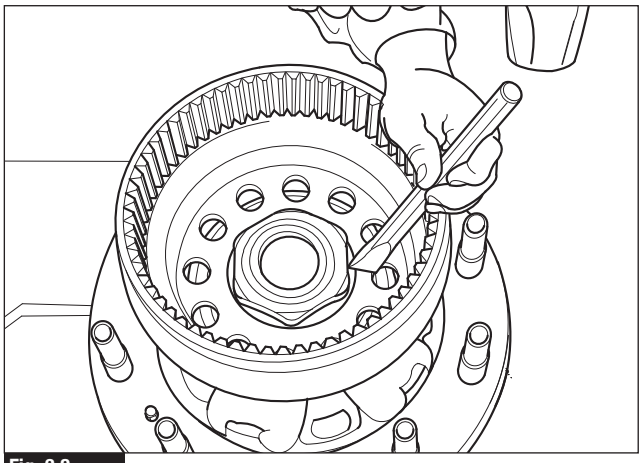


Fig. 3.8

3 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

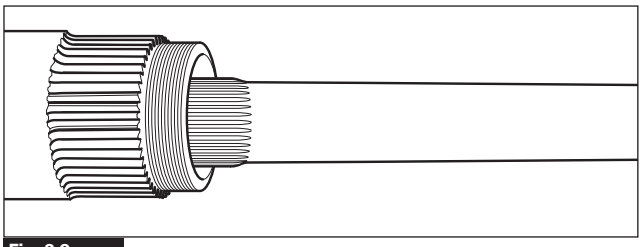


Fig. 3.9

7. Introduce the axle shaft into the housing Fig. 3.9

Hub assembly

Fit the sun gear with spring washers and thrust washer and retain with an internal circlip. Fig. 3.10

Fit the hub casing onto the hub ensuring that the hub external O-ring is thoroughly lubricated using hub oil. Fig. 3.11

Retain the hub casing in position with two socket bolts using thread locking compound (Loctite 243). Fig. 3.12

Tighten bolts to a torque of: 40 ± 10 Nm - Fig. 3.13

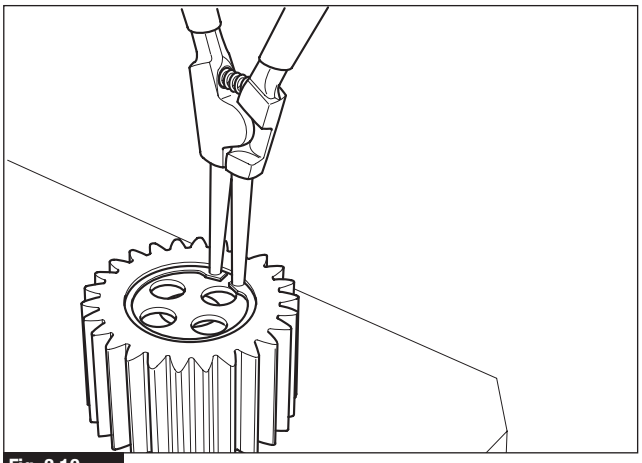


Fig. 3.10

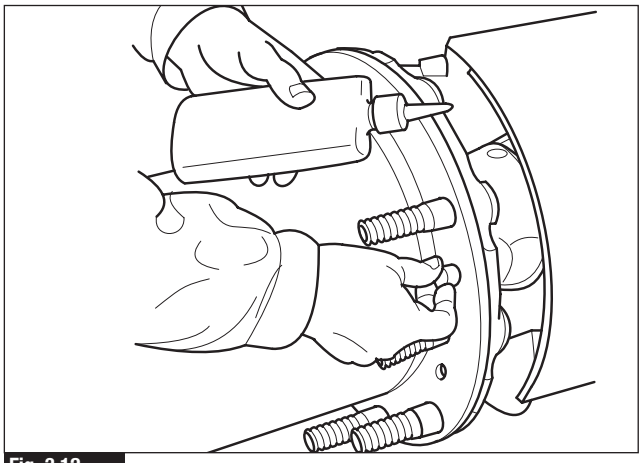


Fig. 3.12

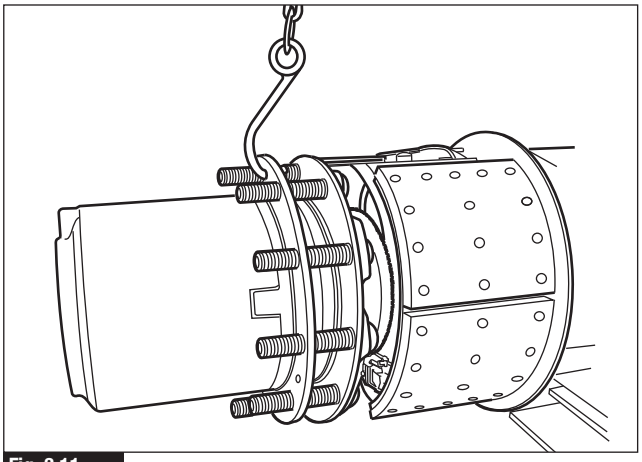


Fig. 3.11

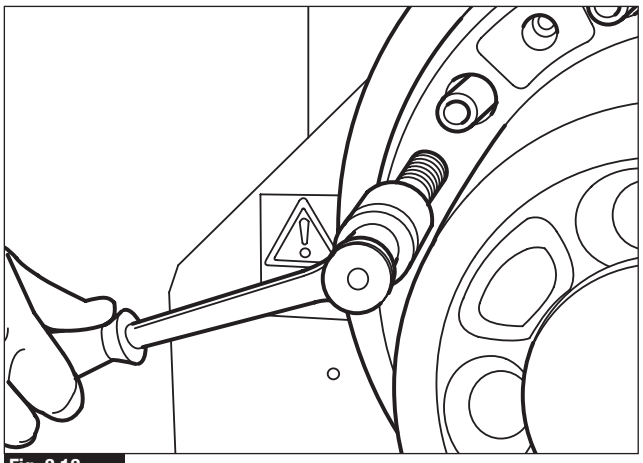


Fig. 3.13

3 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

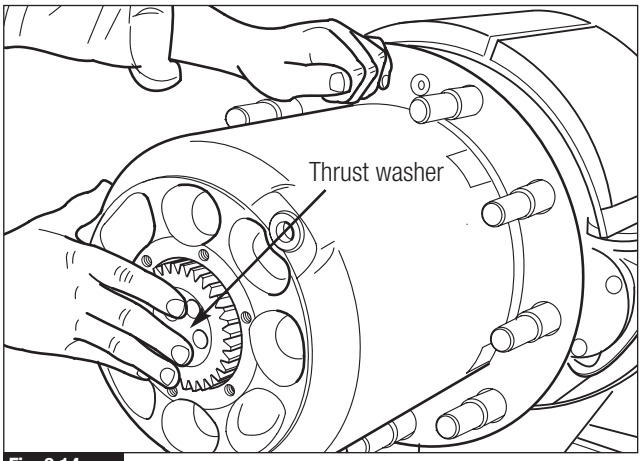


Fig. 3.14

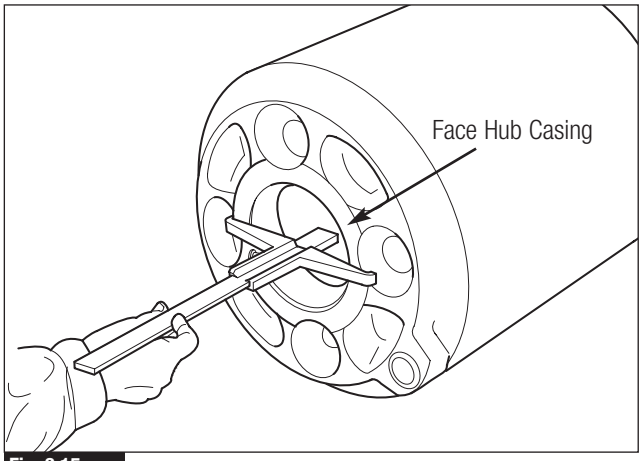


Fig. 3.15

Insert the sun gear.

Rotate the hub to engage the sun gear with axle shaft spline and ensure that the sun gear and the axle shaft are completely pressed in. Fig. 3.14

Dimension A
With the depth slide gauge measure the distance between the sun gear thrust washers and the face of the hub casing. Fig. 3.15

Record Dimension A (mm) - Fig. 3.16a

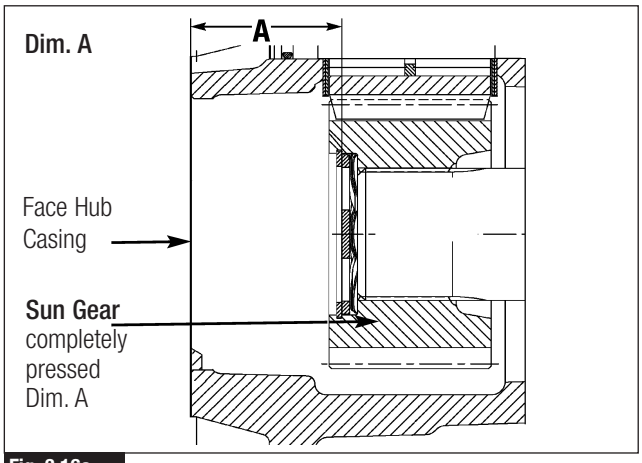


Fig. 3.16a

Pull out the sun gear approximately 10 mm. Fig. 3.16b

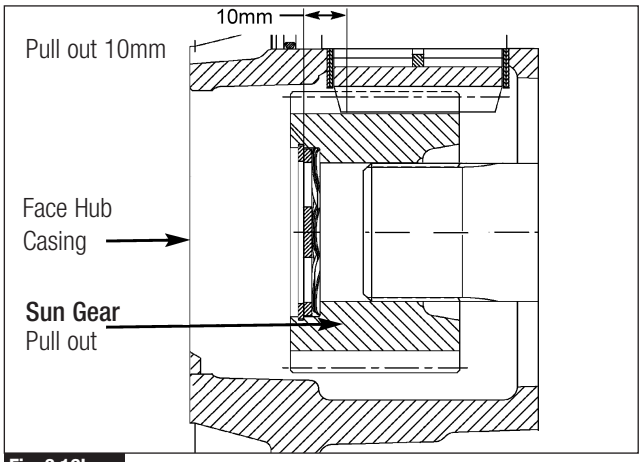


Fig. 3.16b

3 Part 2 - Traditional wheel end with 3-4 planets
Spindle fitted with interference

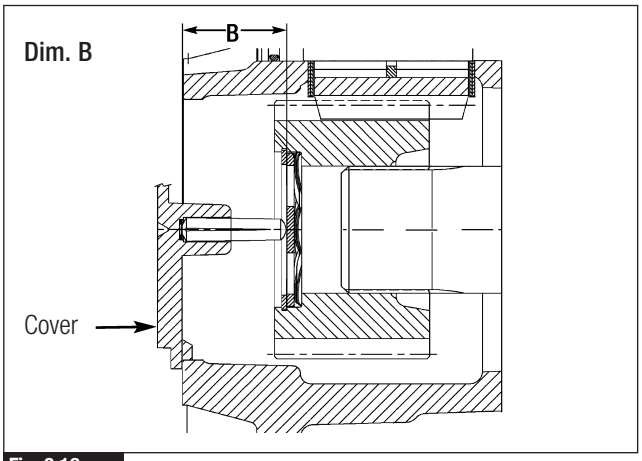


Fig. 3.16c

Dimension B

Offer up the cover plate into its position against the face of the hub casing pushing in the sun gear. Remove the cover, and remeasure the depth of the sun gear thrust washer, as previously record dimension B (mm) Fig. 3.16c with depth slide gear.

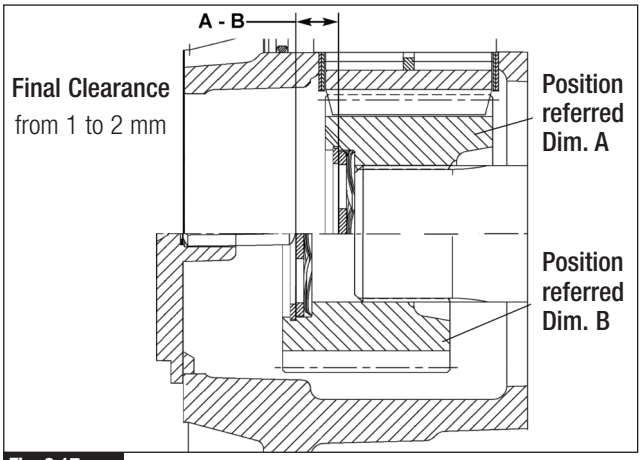


Fig. 3.17

Final Clearance calculation

Dimensions (A-B) between 1-2 mm

Fig. 3.17

If outside these limits, remove the grooved pin and change the number of washers under the pin. Fig. 3.18

Refit the magnetic washer over the grooved pin and retain in position with a new star lock fastener. Fig. 3.19

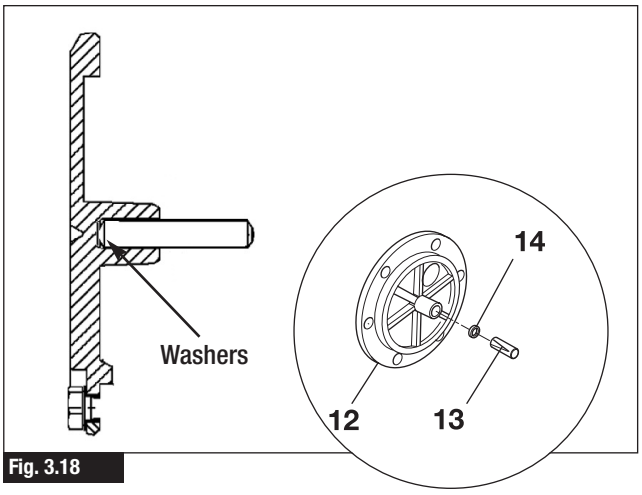


Fig. 3.18

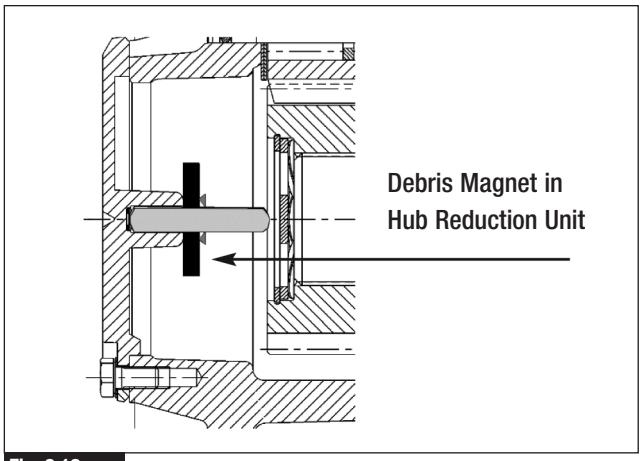


Fig. 3.19

3 Part 2 - Traditional wheel end with 3-4 planets Spindle fitted with interference

Apply sealing compound in **approx. 6mm diameter.**

Bead (Dow Corning 7091) to the inner face of the cover plate in a continuous bead (as showed between internal circumference ribs and holes). Fig. 3.20

The components must be assembled immediately to permit the silicone gasket material to compress evenly between the mating surfaces. Refit the cover plate on the end of the hub casing and retain with screws. Torque: 20 ± 5Nm
Fig. 3.21

Fill hub with 2.5 litres of oil as specified by vehicle manufacturer. Fit new oil drain plug. Torque: 80Nm ± 20Nm

Fig. 3.22 - Solid shaft

NOTE: with new hub cap there is an oil level line that aligns with the bottom of the filler hole. When the line is horizontal this indicates the allowed oil capacity.

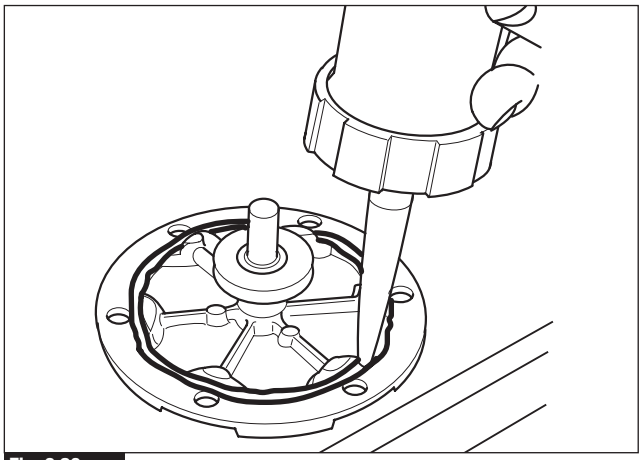


Fig. 3.20

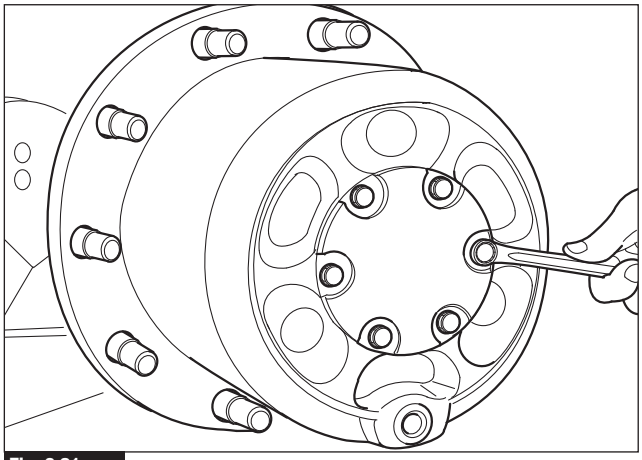


Fig. 3.21

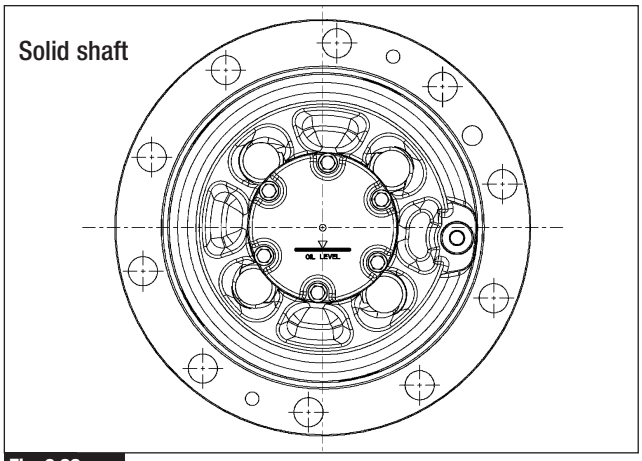
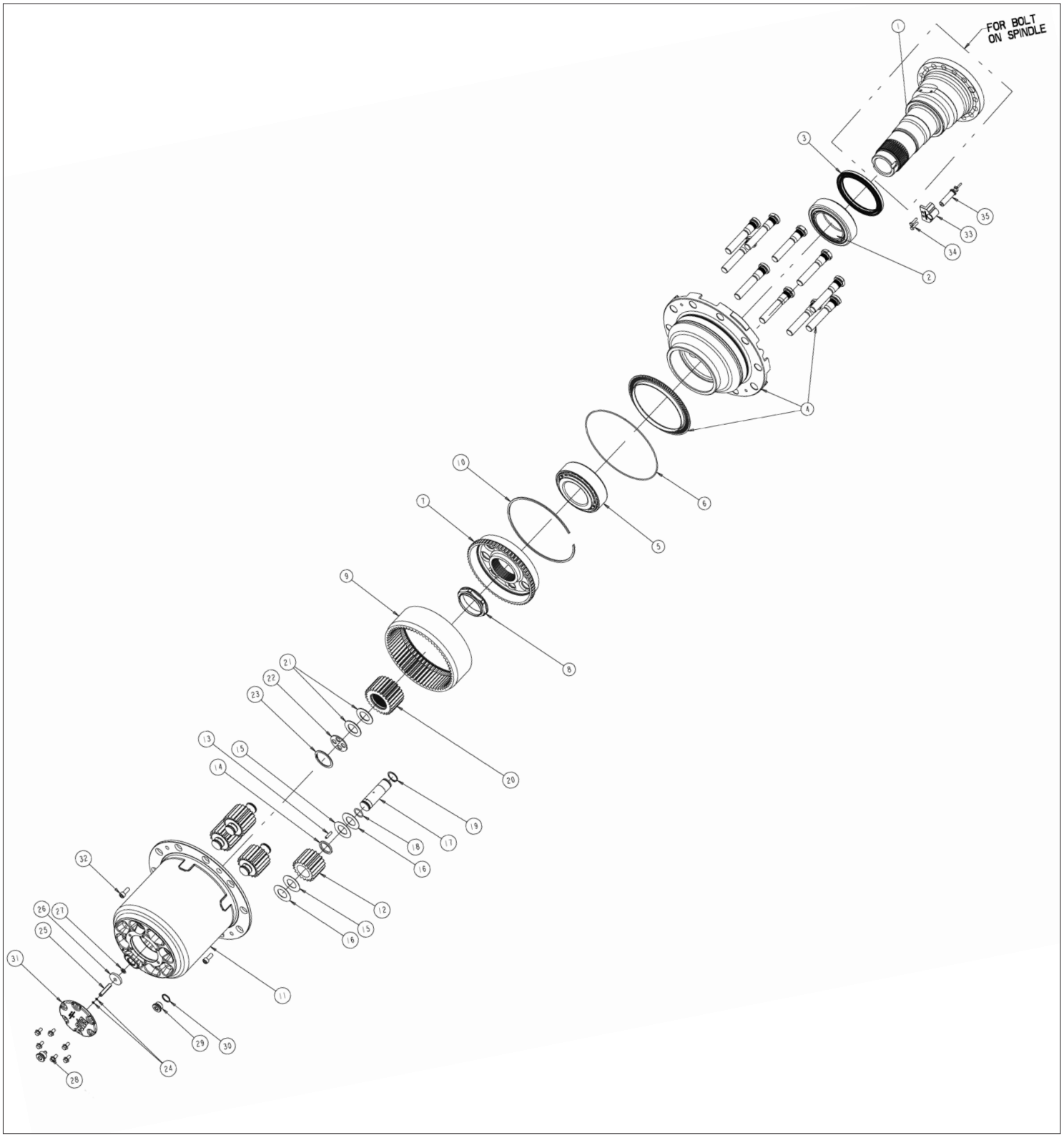


Fig. 3.22

Part 3
Traditional wheel end with 3-4 planets: Spindle fitted with screws

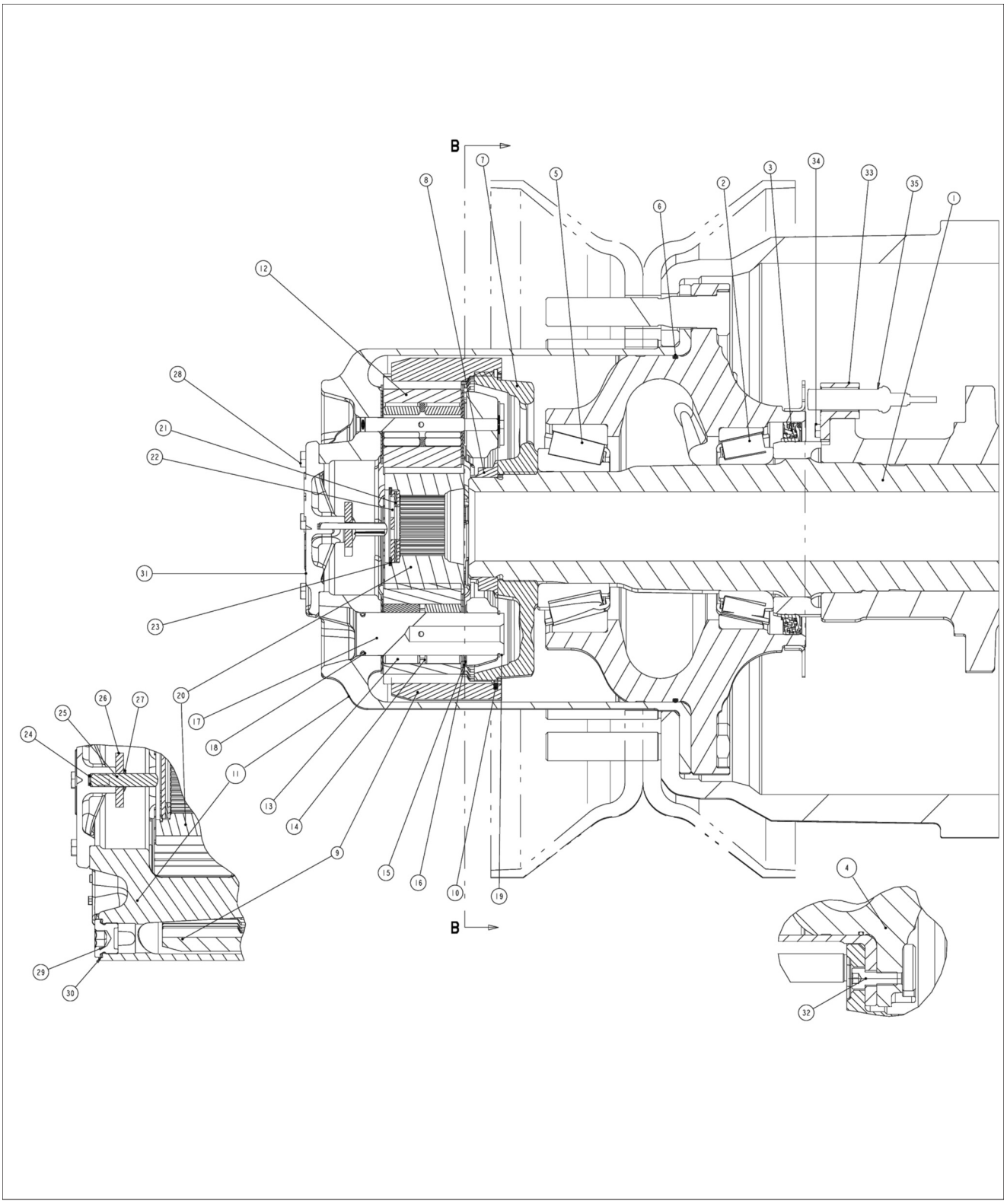
1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Exploded view



1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Section view



1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Parts list

Item	Description
1	Spindle
2	Bearing-inner wheel
3	Seal assembly
4	Hub assembly
5	Bearing-outer wheel
6	O-ring
7	Carrier-planetary ring gear
8	Nut Wheel Bearing
9	Ring Gear
10	Retaining ring
11	Hub case
12	Gear planet
13	Needle
14	Spacer ring
15	Thrust washer (steel)
16	Thrust washer (brass)
17	Bearing spindle
18	O-ring
19	Retainer clip
20	Sun gear
21	Spring washer
22	Thrust washer
23	Retainer clip
24	Washers
25	Pin
26	Magnet
27	Retain clip
28	Hub cover screw
29	Plug - Magnet
30	Gasket / copper washer
31	Cover
32	Screw
33	Abs bracket (optional)
34	Bolts (optional)
35	Sensor assy (optional)

1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

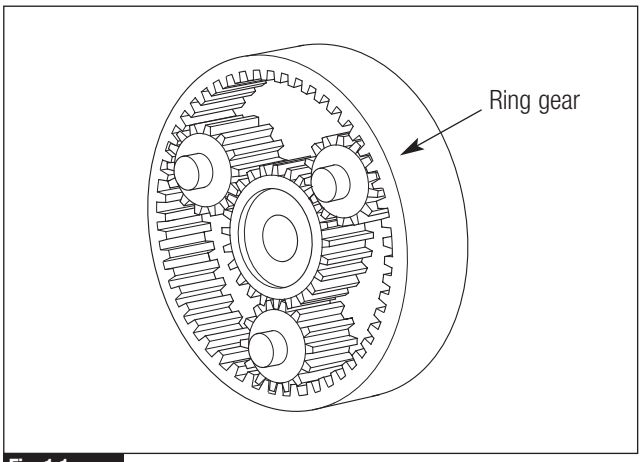


Fig. 1.1

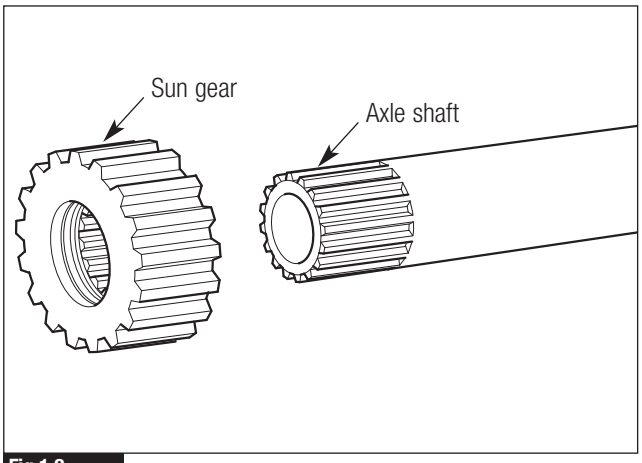


Fig.1.2

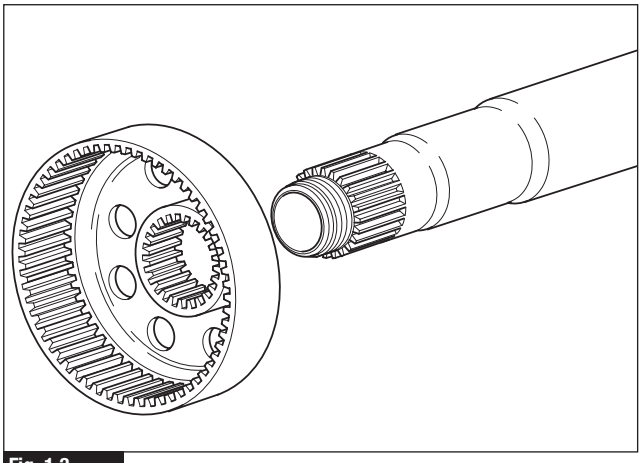


Fig. 1.3

Description

The hub reduction unit consists of a cylindrical planetary assembly in each hub, fig. 1.1. The reduction is made up of a sun gear, a number of planetary gears 3 or 4 which rotate round the sun gear and a ring gear which houses the planets gears.

The sun gear is located on the axle shaft by spline, fig. 1.2

The ring gear is jointly to the rear axle spindle by spline, fig. 1.3

The hub is carried on two tapered roller bearings.

When the drive shaft, and the sun gear rotates, the rotation is transmitted to the planets gears.

Because the ring gear is fixed to the rear axle spindle, the planets gears rotate inside the ring gear and the rotation movement is transmitted to the hub assy.

Ratio formula = 1+(Z Ring gear / Z Sun teeth), fig. 1.4

The hub reduction ration is 3.46:1 or 3.33:1

Ratio (3.46:1) - 3 or 4 planets 1+(64/26)=3.46
Ratio (3.33:1) - 3 or 4 planets 1+(63/27)=3.33

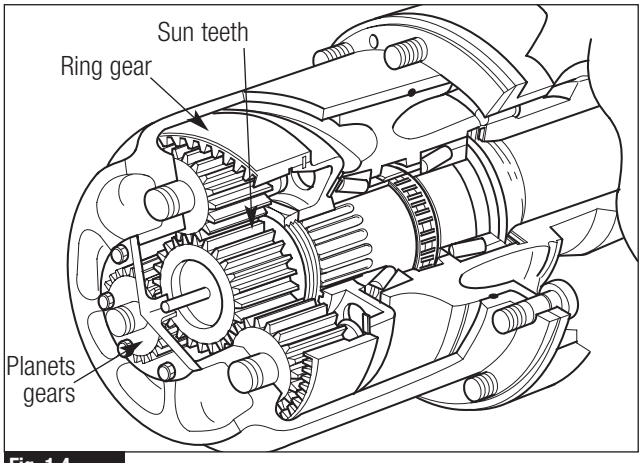


Fig. 1.4

1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Description

Hub reduction 3 planets - fig. 1.5a
Hub reduction 4 planets - fig. 1.5b

In order to ensure reliable and efficient wheel end assembly operation, maintenance intervals, use of lubricants and correct procedures specified by the manufacturer should be strictly observed (refer to Lubrication Maintenance Manual no. 1).

For further information contact the manufacturer's engineering department or refer to the Meritor Web site at www.meritor.com (Technical library - manuals).

⚠ WARNING

Only original Meritor spare parts should be used. Use of non-recommended lubricants will adversely affect performance and service life. Use of non-original parts could seriously affect wheel end assembly performance.

Torque chart specifications and data

Hub gear:

Type	Cylindrical planetary gear
Designation	3 or 4 Planets (19 teeth)
Ratio (3.46:1)	1+(64/26)=3.46
Ratio (3.33:1)	1+(63/27)=3.33

Tightening torques:

Pos.	Tightening torques	Nm
	Wheel end screws	225±20
	ABS Bracket	12Nm
28	Hub cover screws	20±5
29	Oil plugs (level and draining)	80 ± 20
32	Hub casing screws	40 ± 10
8	Hub nut *	64 ± 20
	* For all details see the next chapter 8	

Lubricants

Oil type: See carrier oil specification or contact the engineering reference.

Oil quantity: 2.5 liters for each-hub

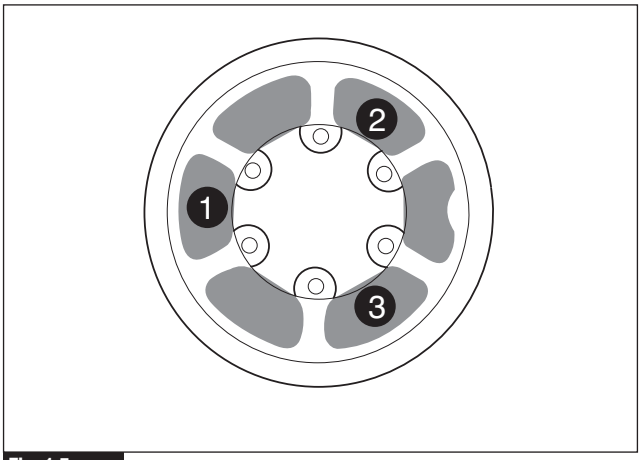


Fig. 1.5a

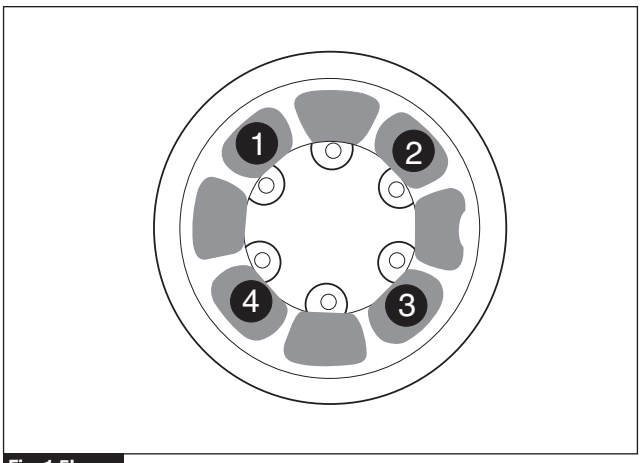


Fig. 1.5b

1 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Description

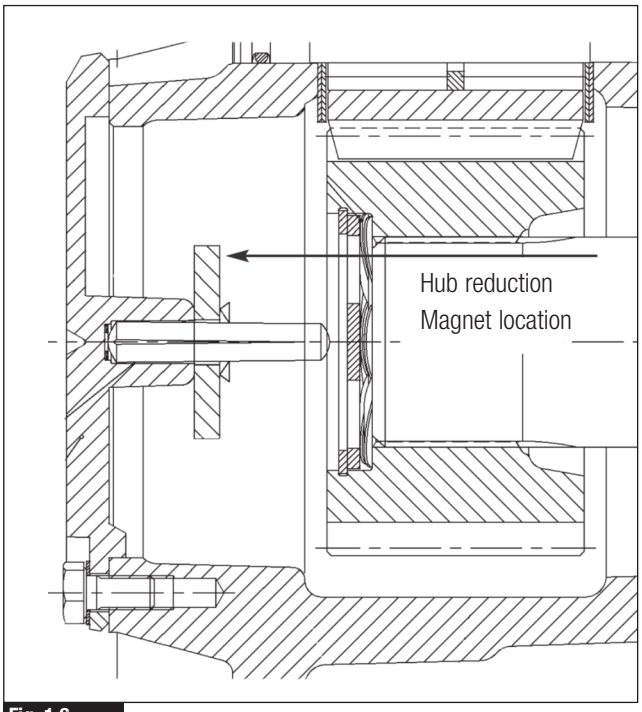


Fig. 1.6

Lubricant

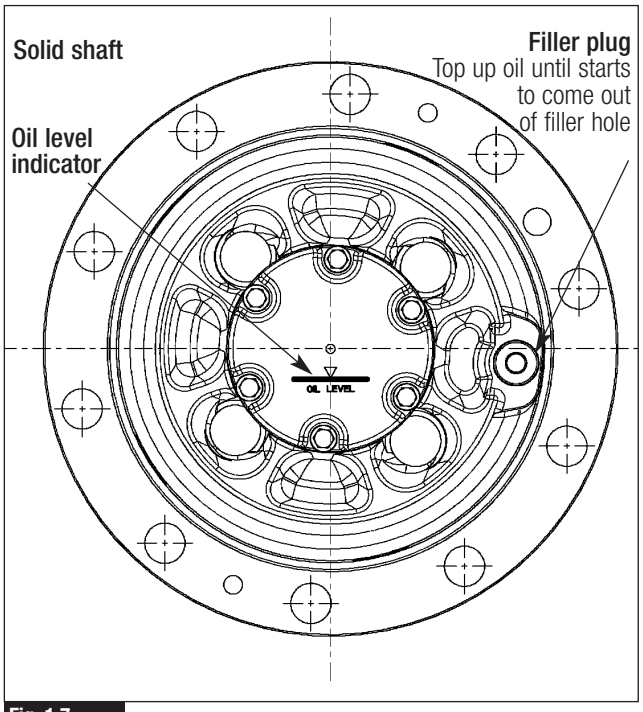


Fig. 1.7

Part 3
Wheel end disassembly

2

2 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

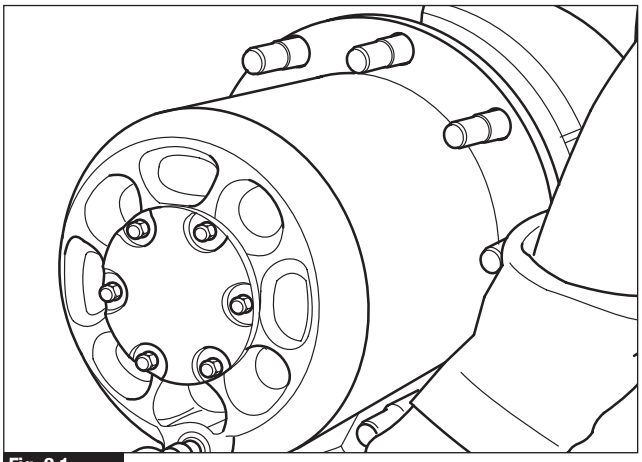


Fig. 2.1

Wheel end disassembly

Remove the wheel nuts and retain. Pull off the wheels using a wheel trolley. Remove the air inflation valve from its retainer in the inside wheel.

Jack up the rear axle of the vehicle to vehicle manufacturers recommendations and drain the oil from the axle(s). Fig. 2.2

Remove the hub drain plug and discard.
Drain oil from wheel end. Fig. 2.3

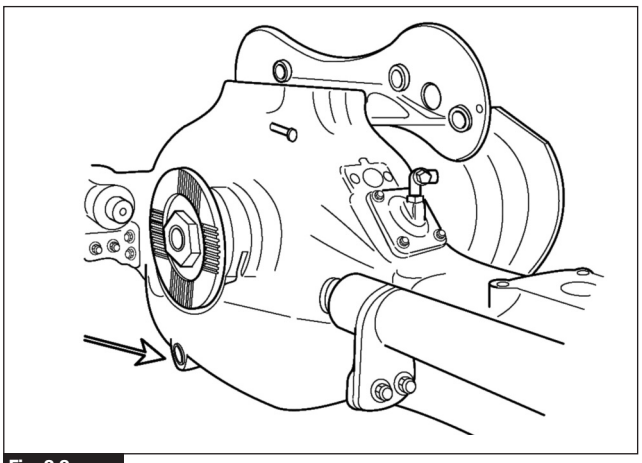


Fig. 2.2

Tighten in dedicated holes the tool's screws equally and simultaneously, and avoid using excessive force as this could damage the drum. Fig. 2.4

A soft-faced mallet may be used on the drum to loosen and ease withdraw.

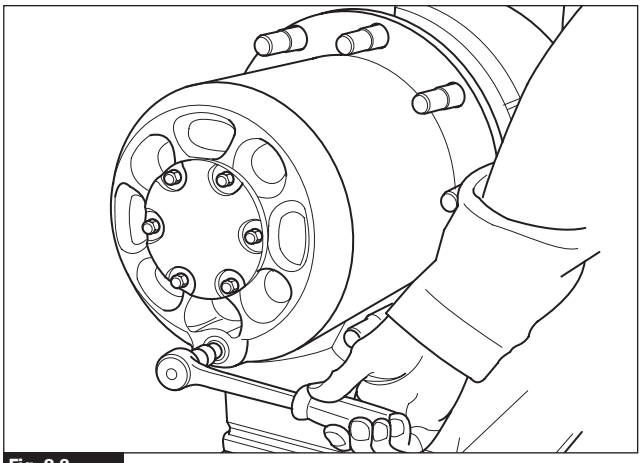


Fig. 2.3

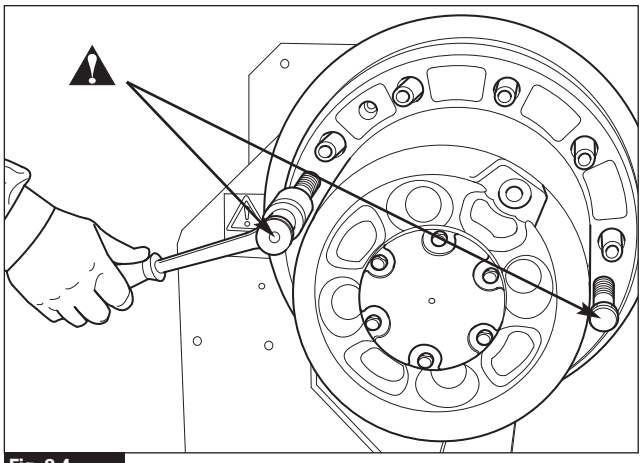


Fig. 2.4

2 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

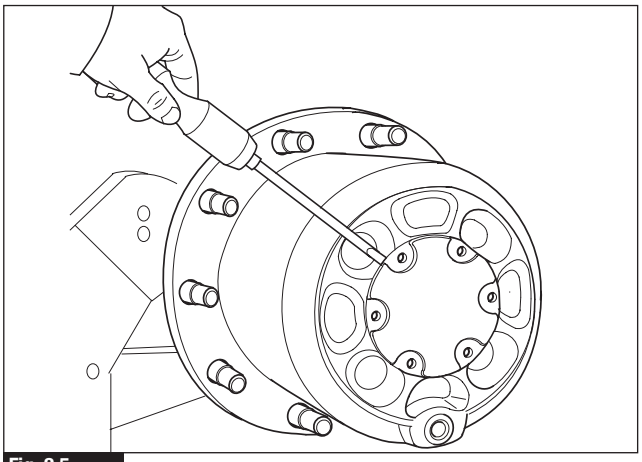


Fig. 2.5

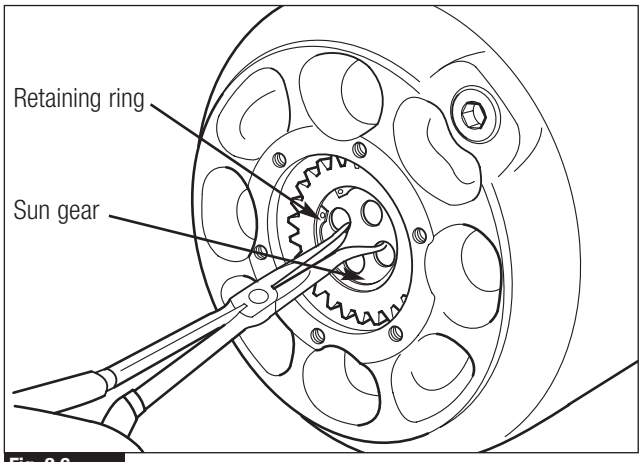


Fig. 2.6

Remove cover retainer screws with suitable sized wrench and remove the hub cover from the end of the hub casing - Fig. 2.5

Remove the retaining ring sun gear and spring washers from axle shaft - Fig. 2.6

Remove the 2 sunk head screws M10X25 - Fig. 2.7

Remove the hub casing group and remove axle shaft - Fig. 2.8

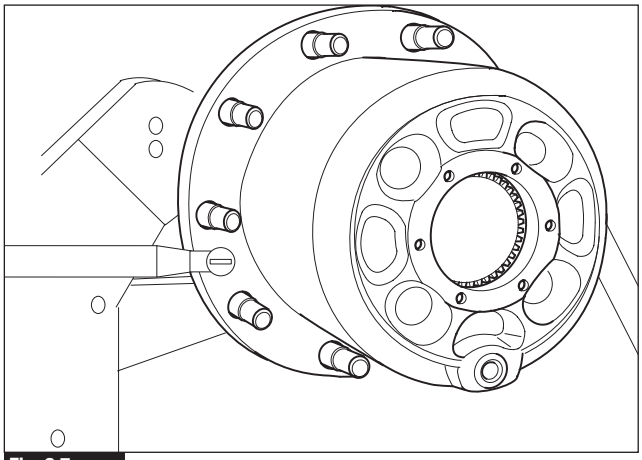


Fig. 2.7

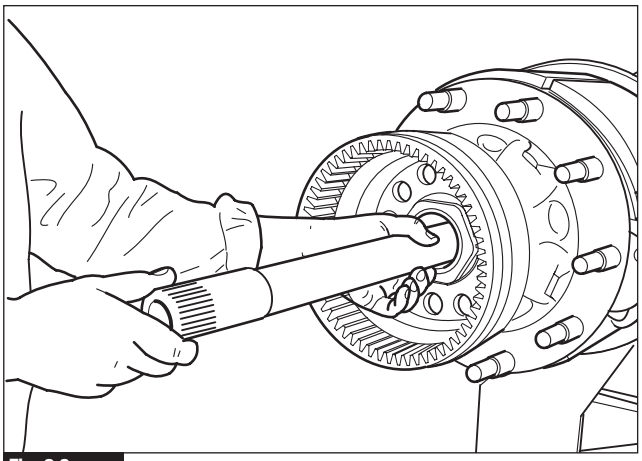


Fig. 2.8

2 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

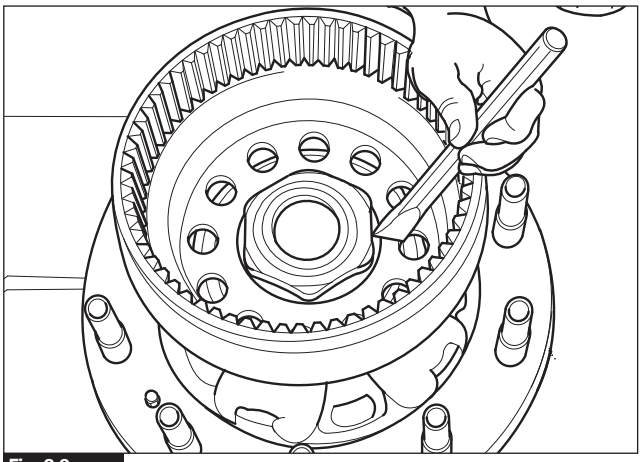


Fig. 2.9

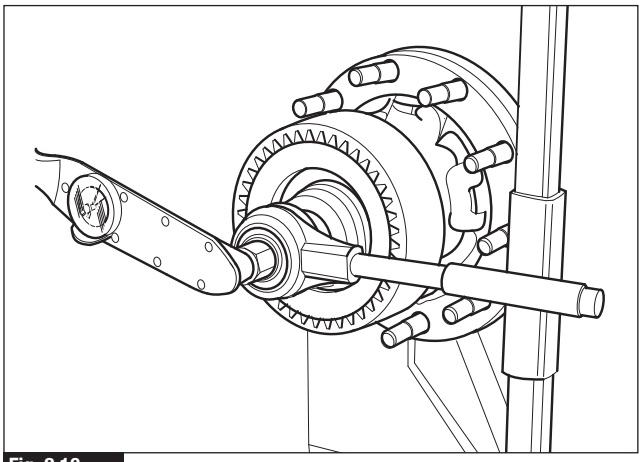


Fig. 2.10

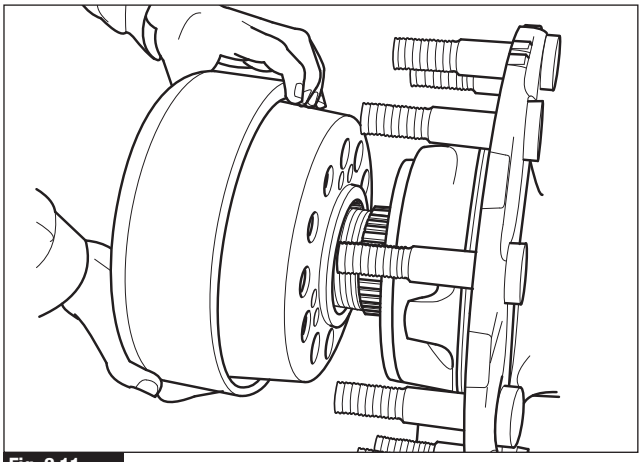


Fig. 2.11

1. Use a punch to remove locking indent on wheel hub nut collar. Fig. 2.9
2. Undo the nut using a wrench. Remove the hub nut and discard. - Fig. 2.10
3. Remove the ring gear group. - Fig. 2.11

NOTE: If available, use a lifting tool.

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

4. Remove the external wheel bearing. Fig. 2.12

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

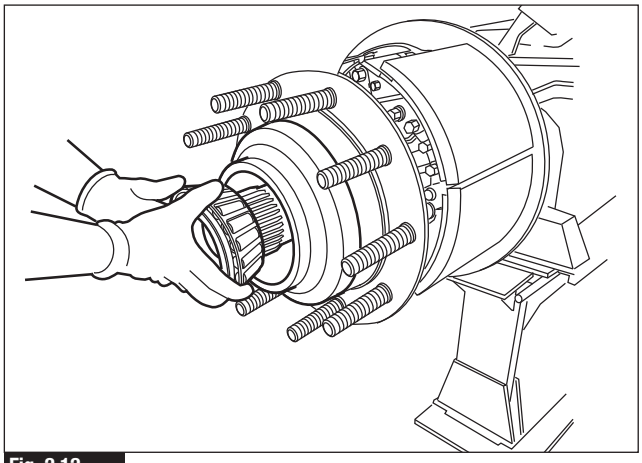


Fig. 2.12

2 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

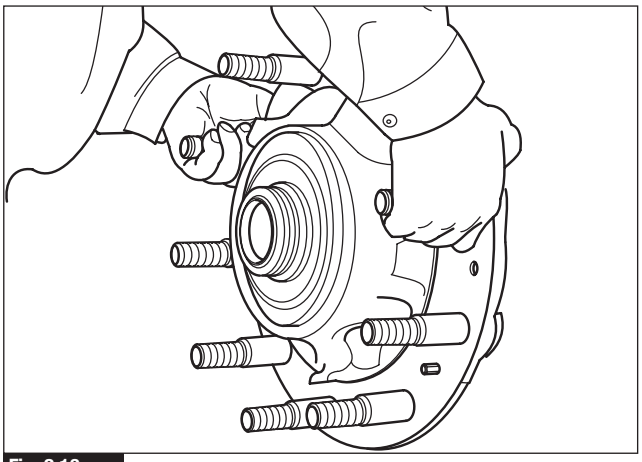


Fig. 2.13

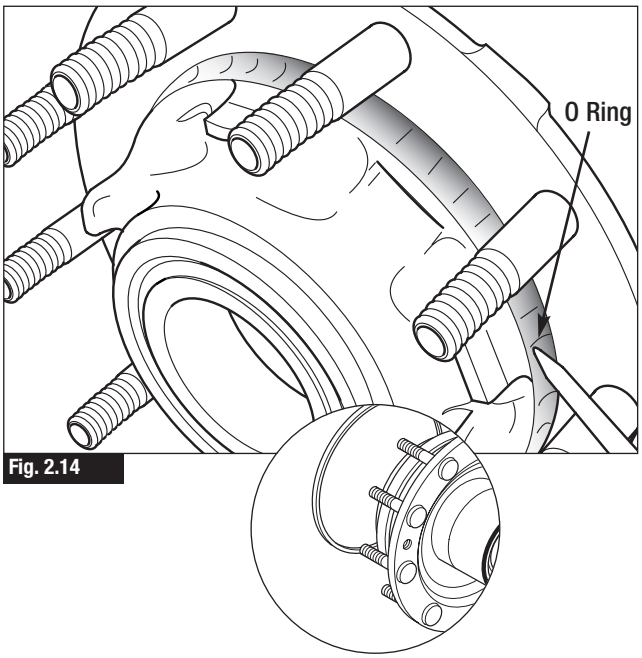


Fig. 2.14

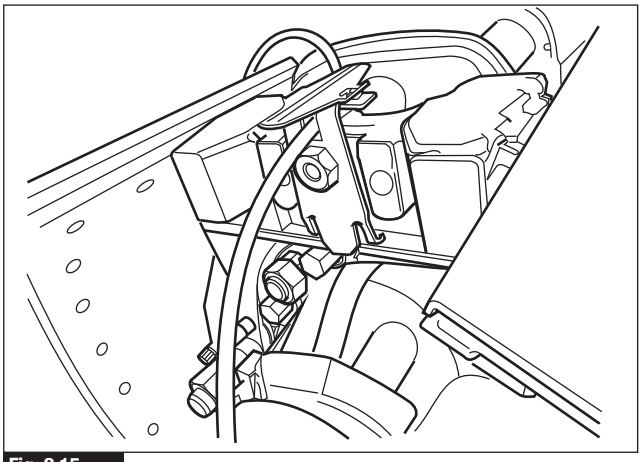


Fig. 2.15

5. Remove the hub Fig. 2.13 and check the green o-ring in the back side. - Fig. 2.14

NOTE: If available, use a lifting tool.

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

⚠ WARNING:
If the green o-ring has a mark, discard and scrap it.

6. If the axle has an ABS sensor proceed as shown here below otherwise move to point 10.
7. Disconnect ABS sensor cable completely and remove it.
8. Untighten the brackets. Fig. 2.15
9. If needed, replace the ABS sensor. Figg. 2.16-2.17

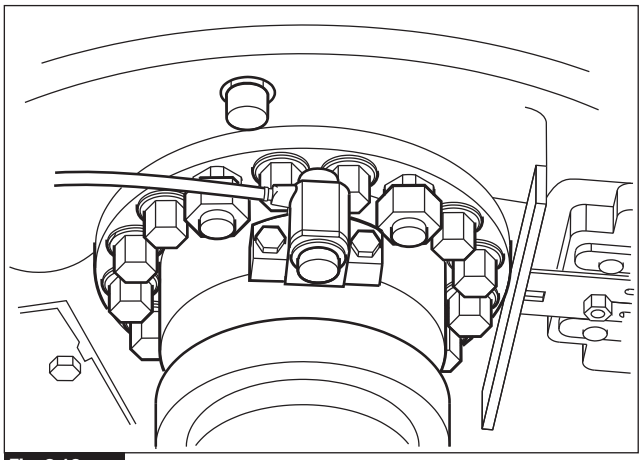


Fig. 2.16

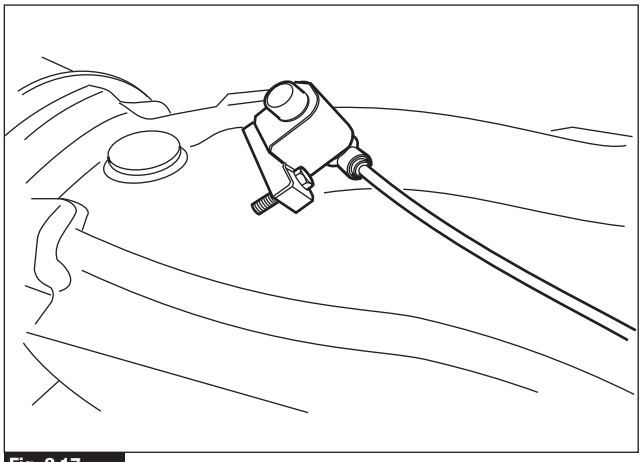


Fig. 2.17

2 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

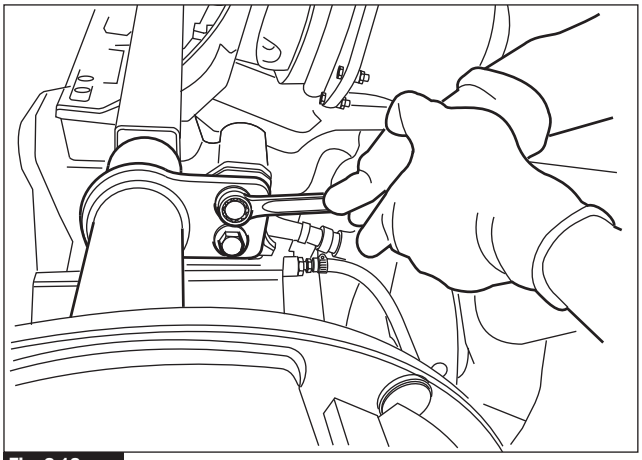


Fig. 2.18

10. Untighten the screws of "L" brackets (M14x2).
    Discard and Scrap - Fig. 2.18

⚠ WARNING:
To avoid any problems on the thread it is advised not to use any electric or pneumatic screwdrivers.

TIP & TRICK: to ease assembly and adjustment procedures, mark the position of the lever on the camshaft.

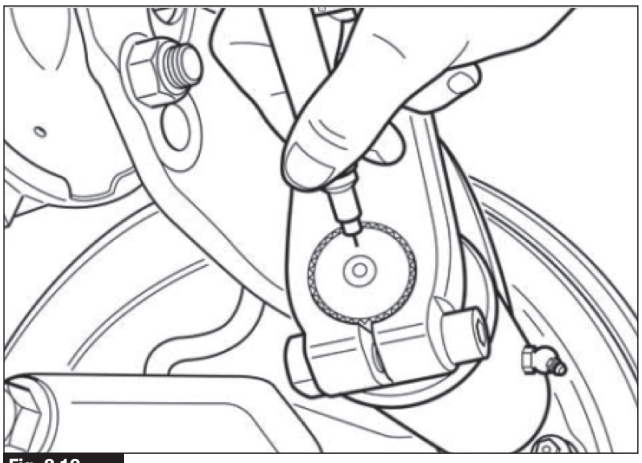


Fig. 2.19

TIP & TRICK: Just as before, mark the position of the clevis on the air chamber pushrod to help yourself during the assembly and adjustment procedures. - Fig. 2.20

NOTE: For further instructions on the brake setting, adjustment and operation – refer to service manual MM0267

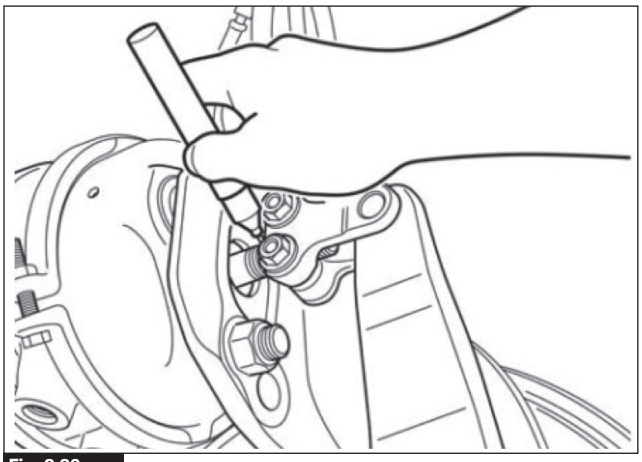


Fig. 2.20

2 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

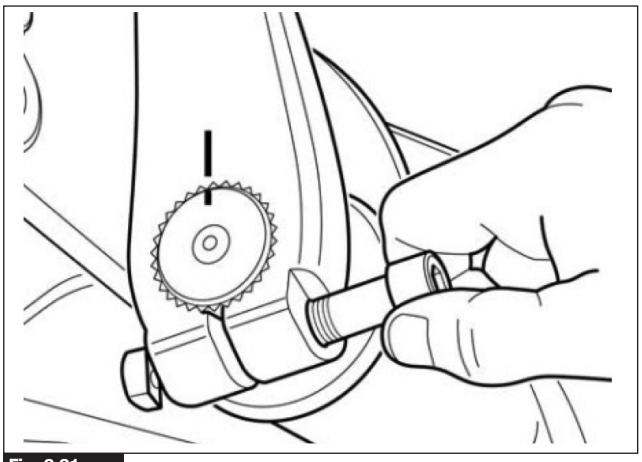


Fig. 2.21

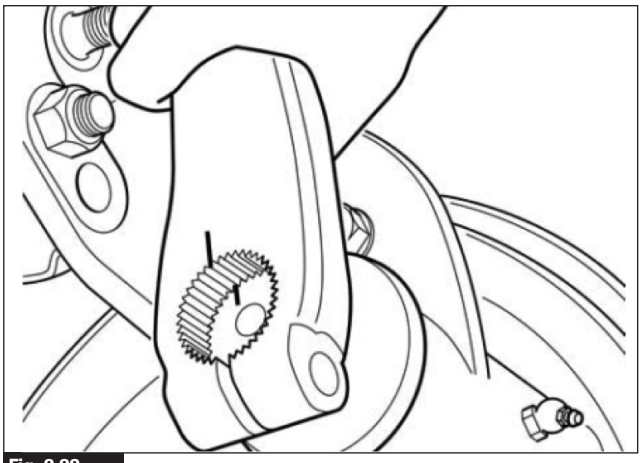


Fig. 2.22

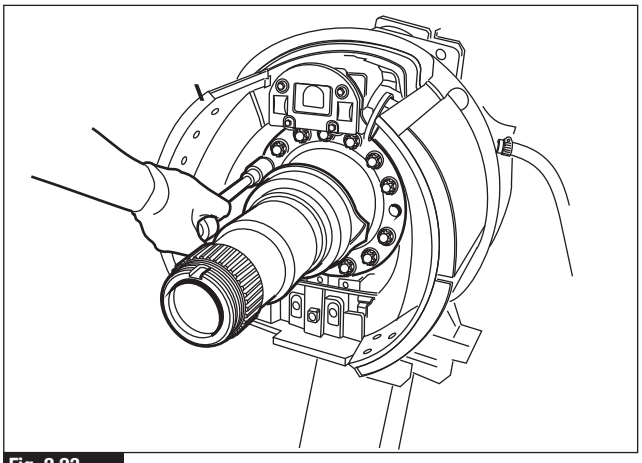


Fig. 2.23

11. Untighten the lever pinch bolt/nut from the lever. - Fig. 2.21
    Remove the clevis from the lever/pushrod (M10x1.5). Discard & Scrap the nut.

12 Remove the lever - Fig. 2.22

13. Remove the brake and the spindle. - Fig. 2.23

14. Untighten and remove the brake from the spindle.
    (Screw M16x2). Discard & Scrap the screw. - Fig. 2.24

⚠ WARNING:

To avoid any problems on the thread it is advised not to use any electric or pneumatic screwdrivers.

If the green o-ring has a mark, discard and scrap it.

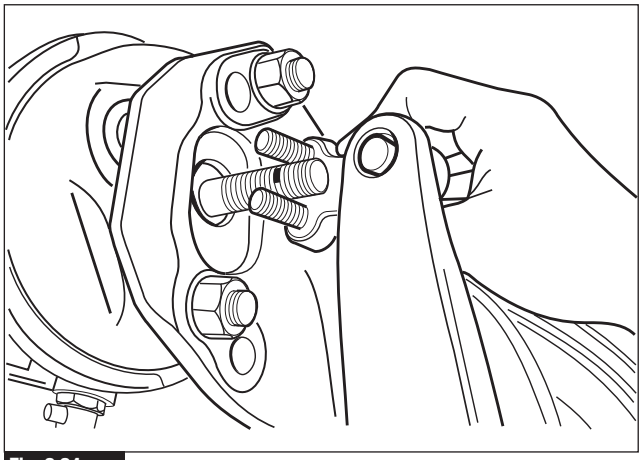


Fig. 2.24

2 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

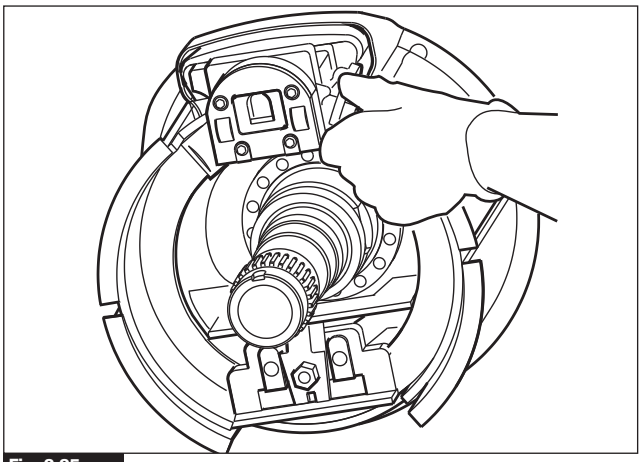


Fig. 2.25

15. Untighten and remove the spindle from the housing (Do not remove the stud). Figg. 2.25 and 2.26

⚠ WARNING:

During the spindle disassembly the spacer may fall out. To prevent any injury Meritor suggests to lock the spacer securely with a screw and nut to prevent it from coming out of the housing and falling accidentally.

16. The spacer (if present) is free and it's possible to remove it. (Do not remove the stud).

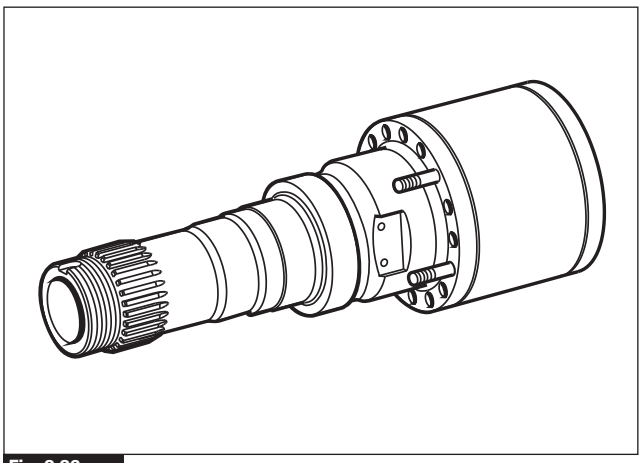


Fig. 2.26

NOTE: Scrap the original o-ring and fit a new one in the spindle and in the spacer if it was disassembled.

NOTE: Do not remove the three studs from the housing. The studs will be needed during the reassembly procedure.

NOTE: Check the threads on the housing. Use air flow to clean the surface and the threads. Check the threads on the housing again. If needed resablish the corrct functionality of the threads with the suitable tool.

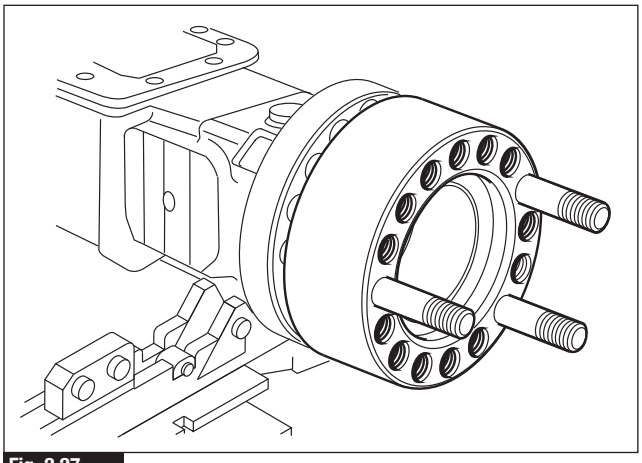


Fig. 2.27

Part 3
Wheel end assembly

3

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

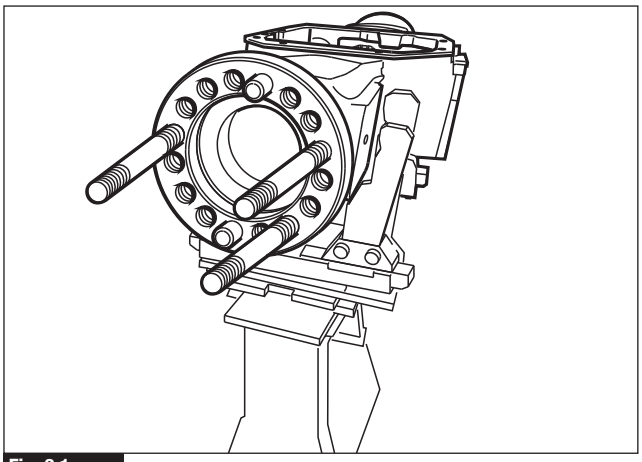


Fig. 3.1

Wheel end assembly

NOTE: Ensure that mating surfaces of hub and axle shaft have been cleaned thoroughly.

1. Tighten the stud on the axle.- Fig. 3.1

2. Assembly the new o-ring in the slot of the spacer - Fig. 3.2

3. Apply grease on the joint surface. - Fig. 3.3

4. Put the spacer (if needed according to the axle variant) in position - Fig. 3.4

⚠ WARNING:
Do not damage the o-ring present in the spacer.

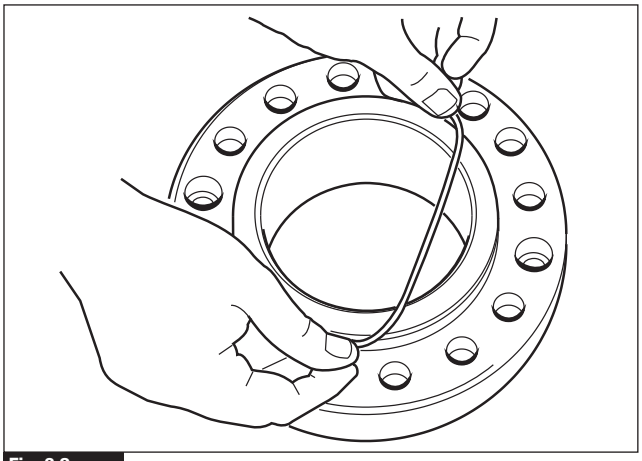


Fig. 3.2

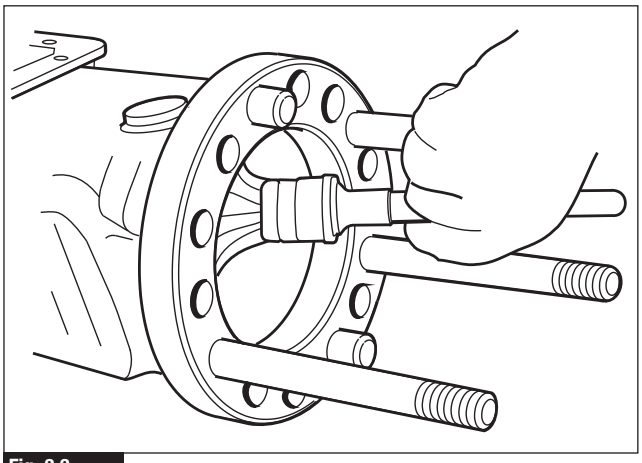


Fig. 3.3

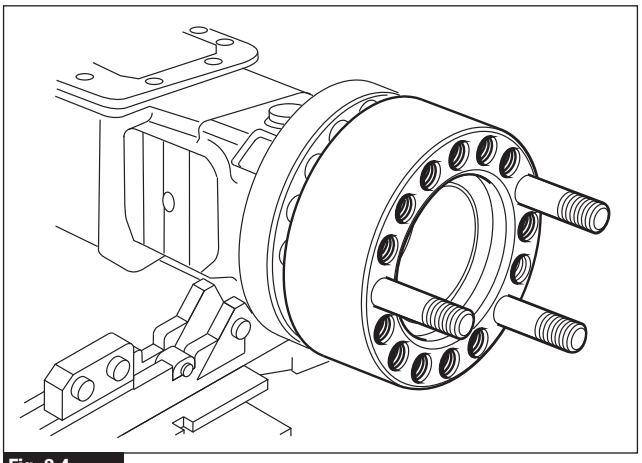


Fig. 3.4

3 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

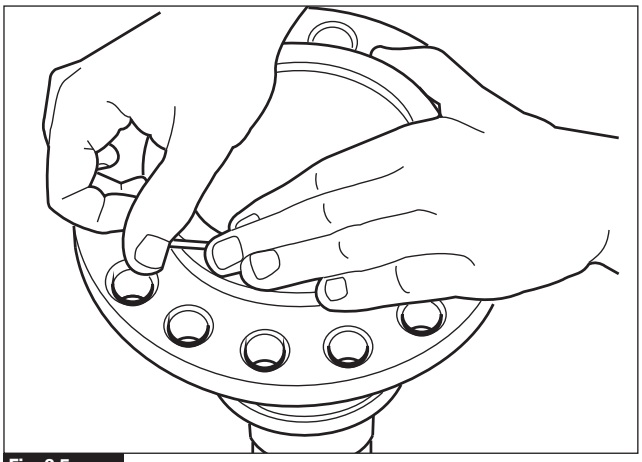


Fig. 3.5

5. Assembly the new o-ring in the slot of the wheel end Fig. 3.5

6. Apply grease on the joint surface. - Fig. 3.6

7. Put the wheel end in the position. - Fig. 3.7

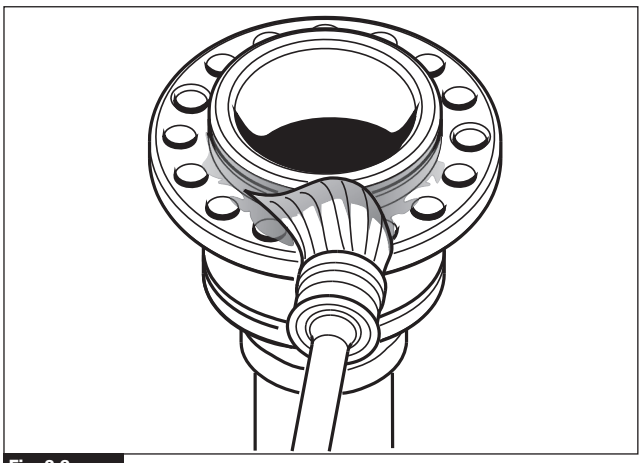


Fig. 3.6

WARNING:
Do not damage the o-ring present in the spacer.

8. Put the brake in position. - Fig. 3.8

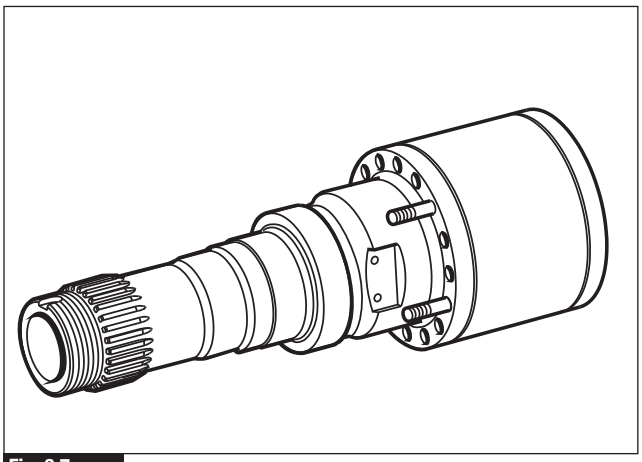


Fig. 3.7

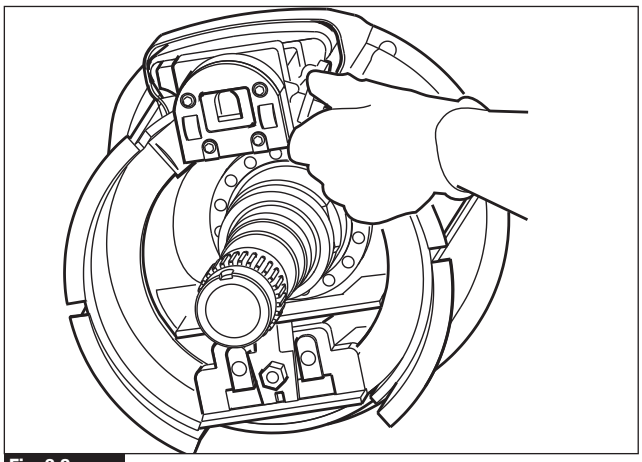


Fig. 3.8

3 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

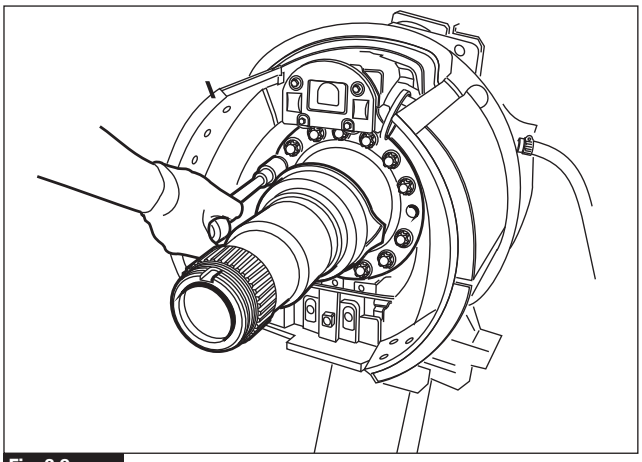


Fig. 3.9

9. Tighten the new brake screw manually (do not close at final torque). - Fig. 3.9
10. Insert the lever in correspondence of the previously marked done - Fig. 3.10
11. Insert the clevis in correspondence of the previously marked done - Fig. 3.11
12. If needed adjust the lever position but do not close the new screw yet. - Fig. 3.12
13. If needed, adjust the clevis position on the air chamber pushrod but do not close the new screw yet. - Fig. 3.13

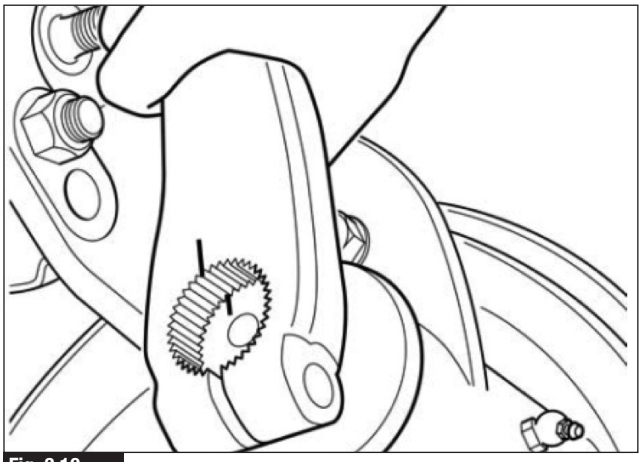


Fig. 3.10

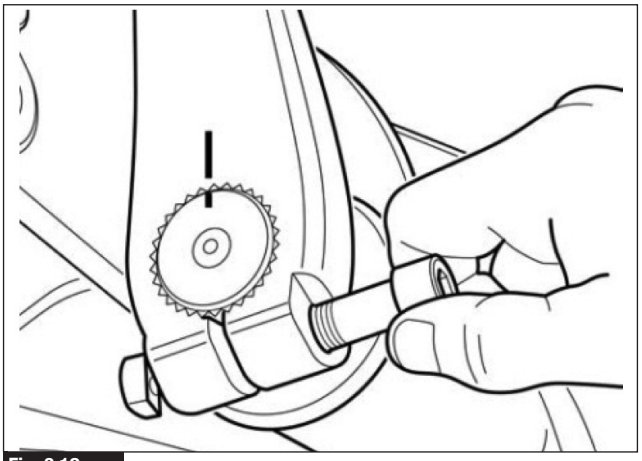


Fig. 3.12

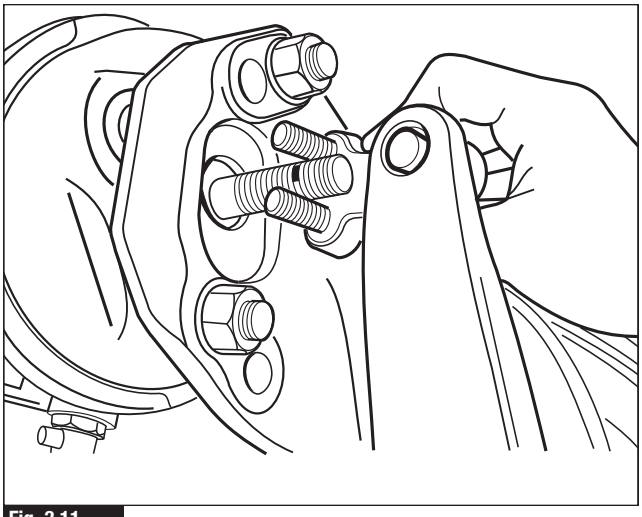


Fig. 3.11

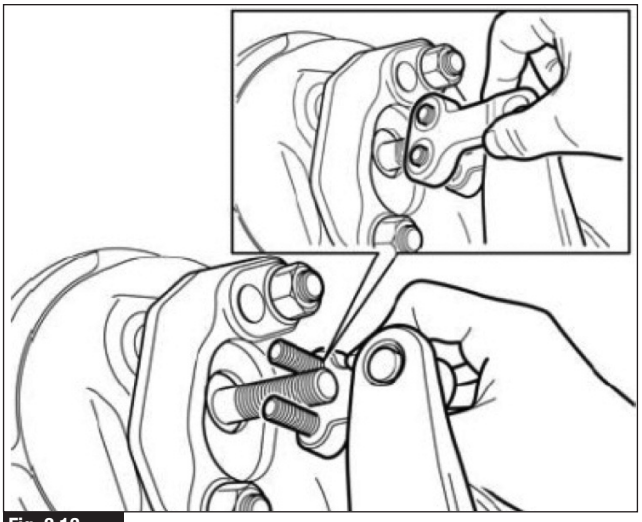


Fig. 3.13

3 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

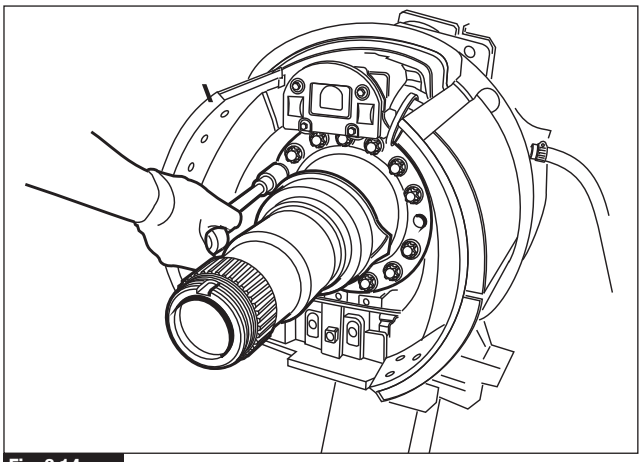


Fig. 3.14

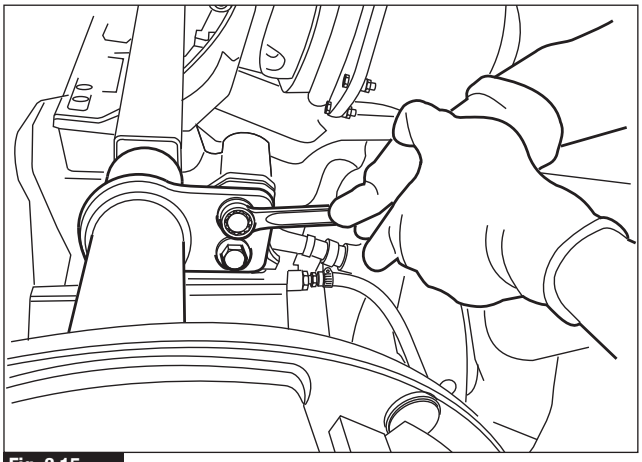


Fig. 3.15

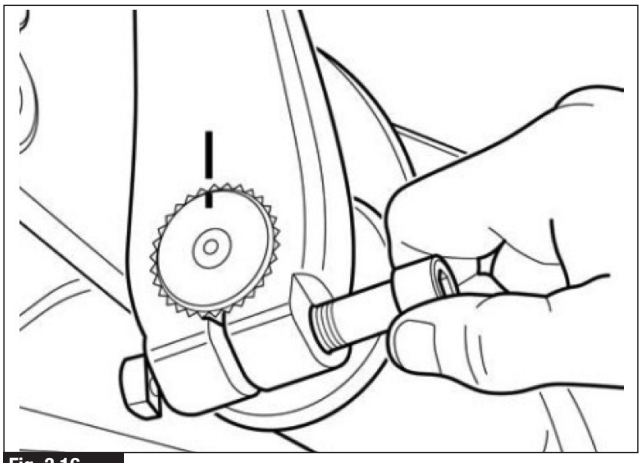


Fig. 3.16

14. When the clevis and the lever are correctly positioned, tighten the wheel and screws in cross with a torque wrench. Fig. 3.14 The torque of the new screw wheel should be 225 ± 20Nm.
15. Tighten the new screws of "L" brackets with a torque wrench. The torque of the new screw wheel should be 175 ± 25Nm. Fig. 3.15
16. Tighten the lever pinch bolt/nut. The torque of the new nut wheel should be 55 ± 75Nm. - Fig. 3.16
17. Tighten the lever on the camshaft. The torque of the new screw wheel should be 48 ± 8 Nm. - Fig. 3.17
18. Refit a new outer O-ring on the hub using grease as lubricant. Fig. 3.18

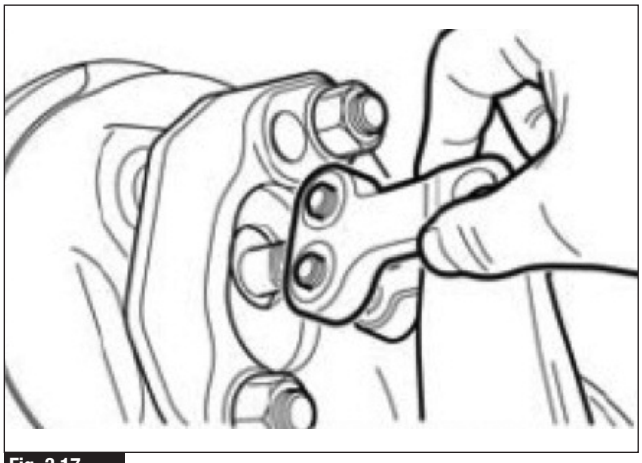


Fig. 3.17

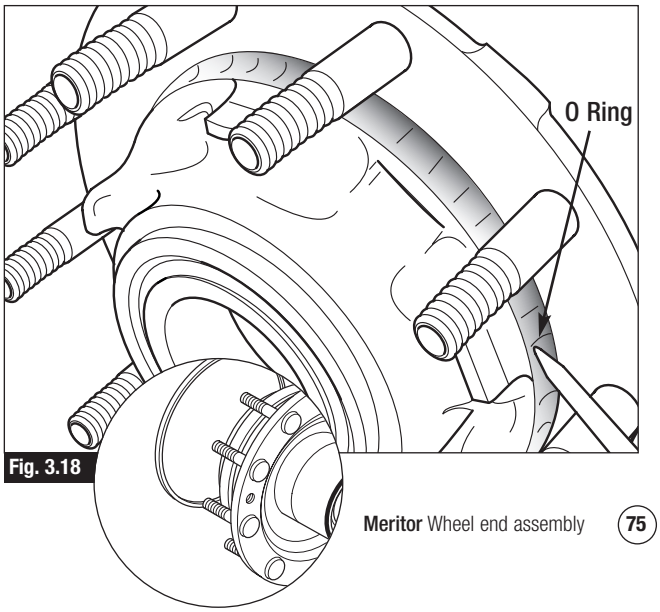


Fig. 3.18

3 Part 3 - Traditional wheel end with 3-4 planets
Spindle fitted with screws

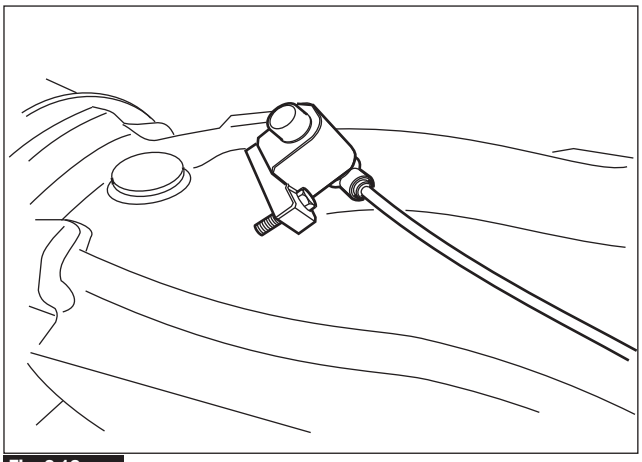


Fig. 3.19

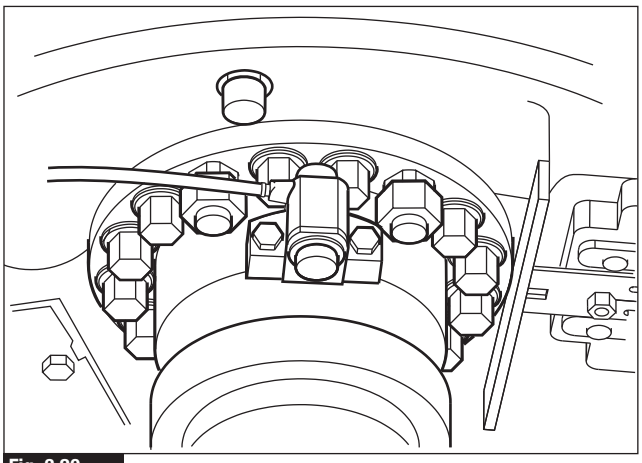


Fig. 3.20

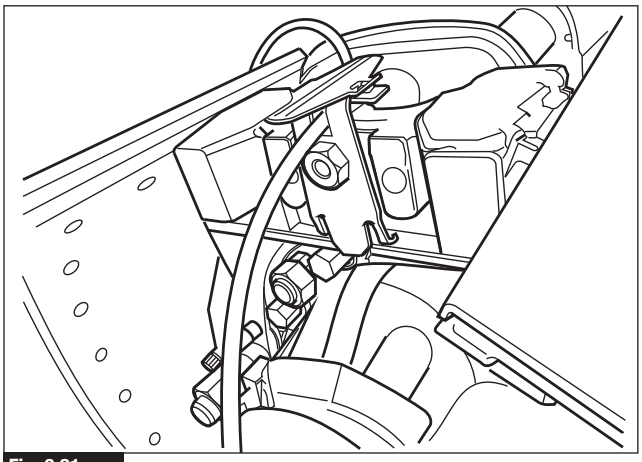


Fig. 3.21

19. If an ABS sensor is fitted on the axle, proceed as shown here below otherwise move to point 23.
20. Insert the ABS sensor completely in the bushing and after that in the appropriate bracket. - Fig. 3.19
21. Fit the bracket with the sensor in place. Fig. 3.20
22. Apply the appropriate brackets to guarantee the correct passages to the ABS cable. - Fig. 3.21
23. Thoroughly grease the spindle bearing journals and locate the hub in position on the spindle without the external bearing. Fig. 3.22

NOTE: If available, use a lifting tool.

⚠ WARNING:

Do not damage the thread of the wheel end spindle.

24. Fit the external wheel bearing. Fig. 3.23

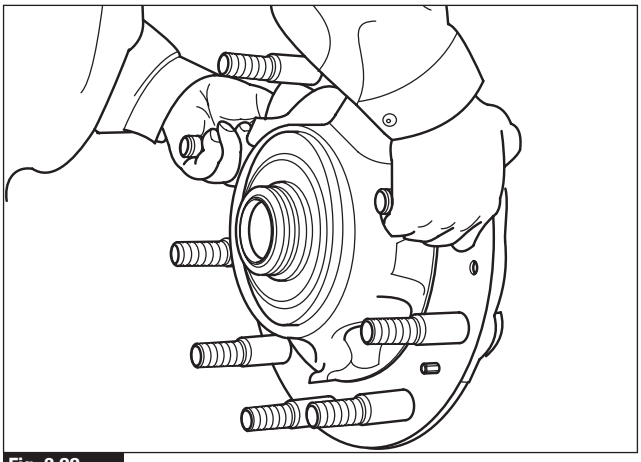


Fig. 3.22

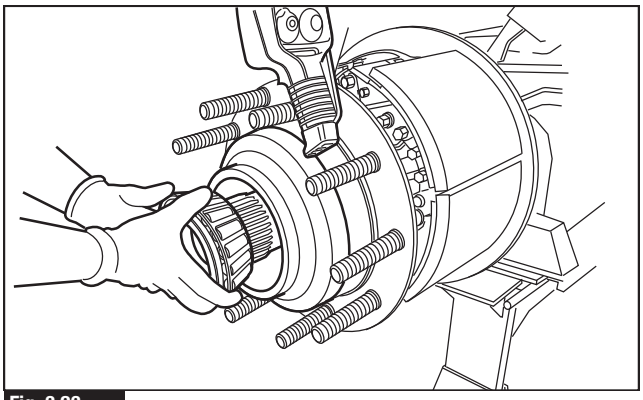


Fig. 3.23

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

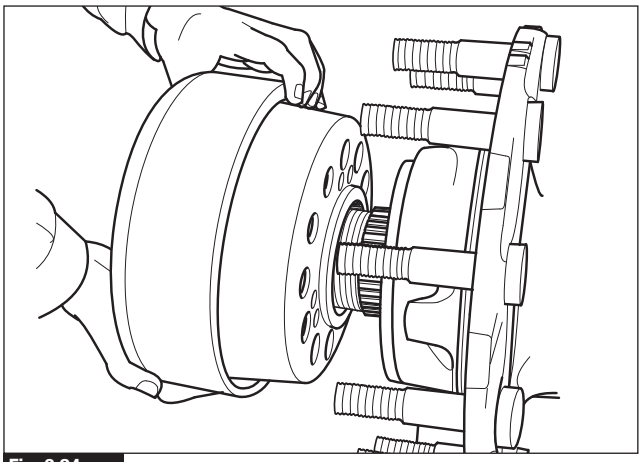


Fig. 3.24

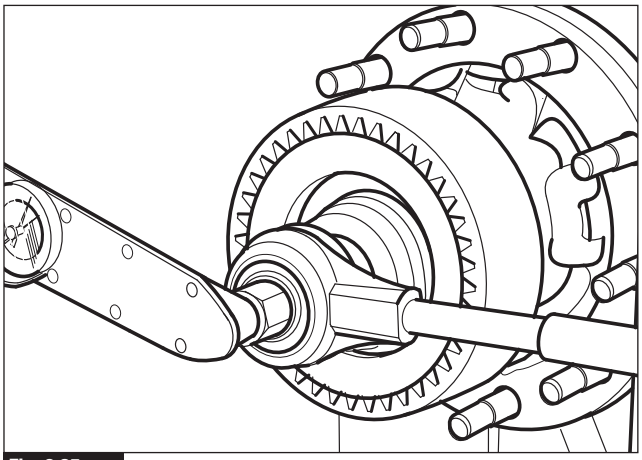


Fig. 3.25

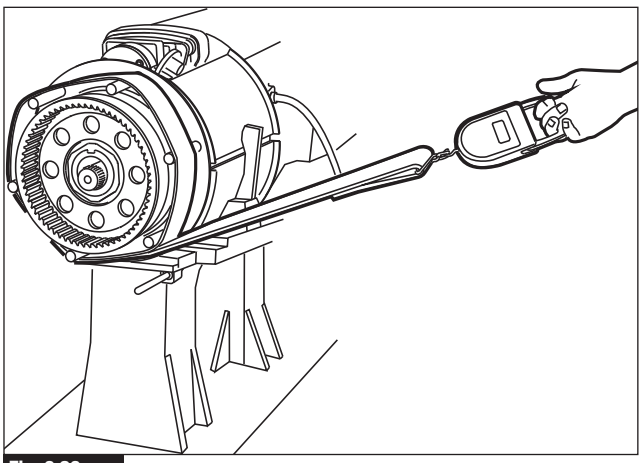


Fig. 3.26

25. Locate the ring gear carrier into position. Assembly ring gear group. - Fig. 3.24

NOTE: If available, use a lifting tool

⚠ WARNING:
Do not damage the thread of the wheel end spindle.

26. Install and tighten wheel-bearing nut, while rotating wheel back & forth. Further rotate wheel (3) revolutions each direction alternating fwd/rev. Mark nut position and retighten it.
    If nut turns, repeat previous step until nut no longer turns when retightened. Use a torque wrench on wheel end.
    The torque of the new nut wheel should be 64 ± 20Nm.
    Fig. 3.25

Alternative method: applied as present in the picture here below. In this test modality, the linear force range should be 10 ÷ 28N. - Fig. 3.26

NOTE: If the torque is outside the spec, return at the previous point and readjust it.

27. When the wheel end torque is in the specification use a staking tool to stake nut lip into keyway in spindle.
    Fig. 3.27

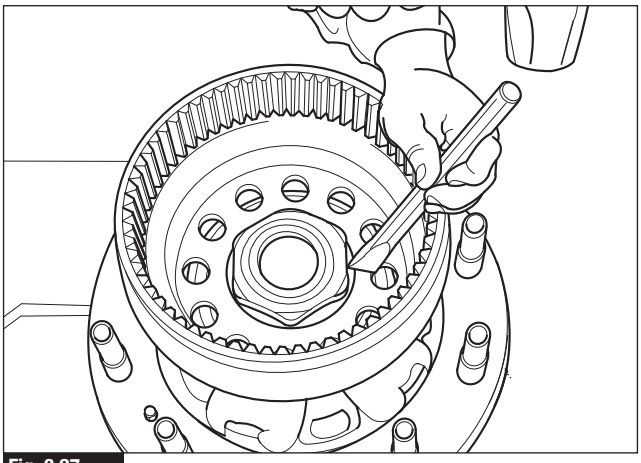


Fig. 3.27

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

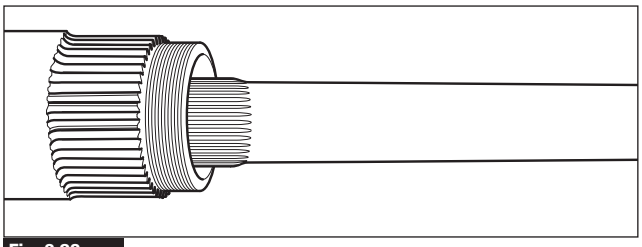


Fig. 3.28

28. Introduce the axle shaft into the housing

Hub assembly

Fit the sun gear with spring washers and thrust washer and retain with an internal circlip. Fig. 3.29

Fit the hub casing onto the hub ensuring that the hub external O-ring is thoroughly lubricated using hub oil. Fig. 3.30

Retain the hub casing in position with two socket bolts using thread locking compound (Loctite 243). Fig. 3.31

Tighten bolts to a torque of: 40 ± 10 Nm - Fig. 3.32

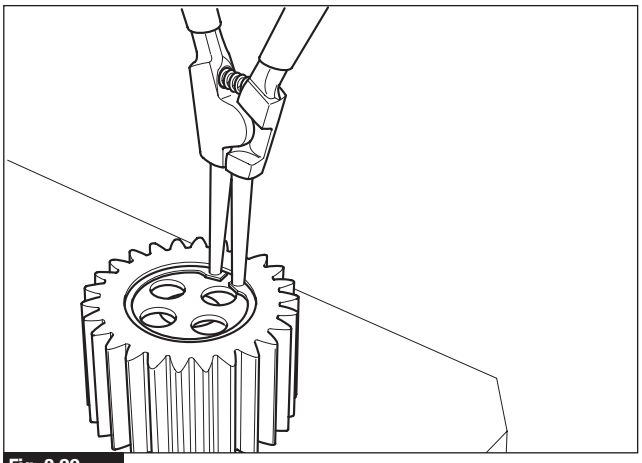


Fig. 3.29

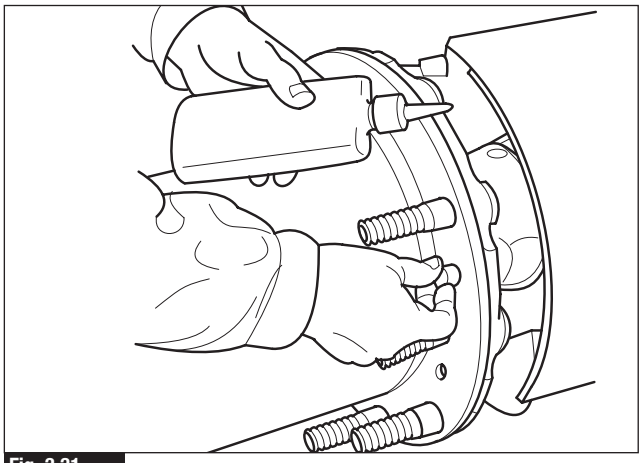


Fig. 3.31

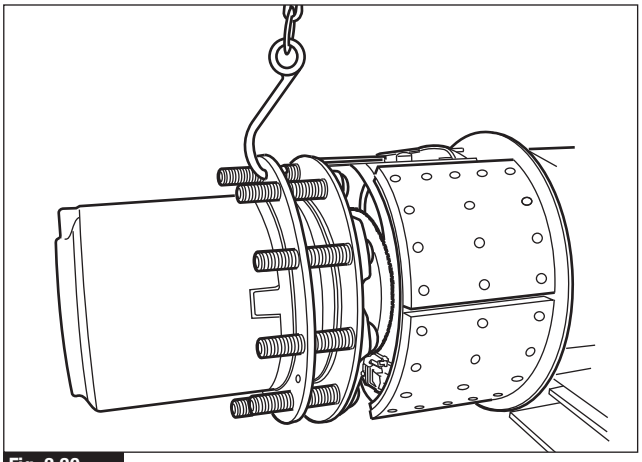


Fig. 3.30

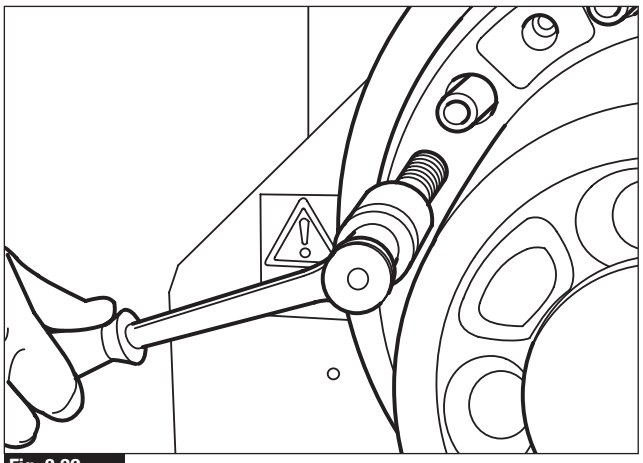


Fig. 3.32

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

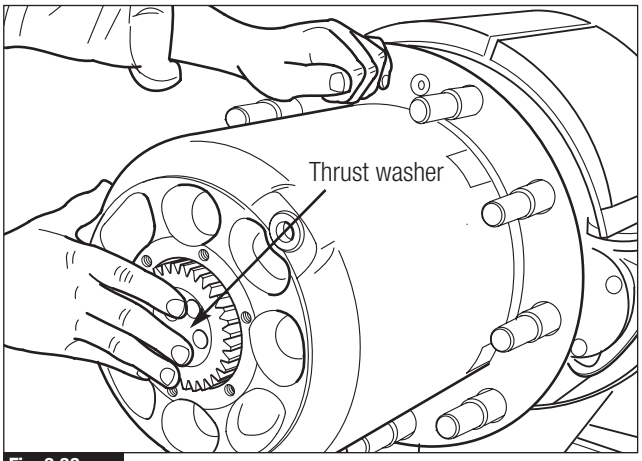


Fig. 3.33

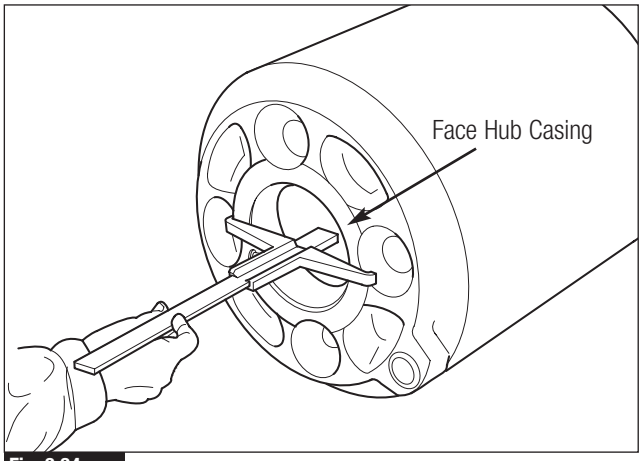


Fig. 3.34

Insert the sun gear.

Rotate the hub to engage the sun gear with axle shaft spline and ensure that the sun gear and the axle shaft are completely pressed in. Fig. 3.33

Dimension A
With the depth slide gauge measure the distance between the sun gear thrust washers and the face of the hub casing. Fig. 3.34

Record Dimension A (mm) - Fig. 3.35a

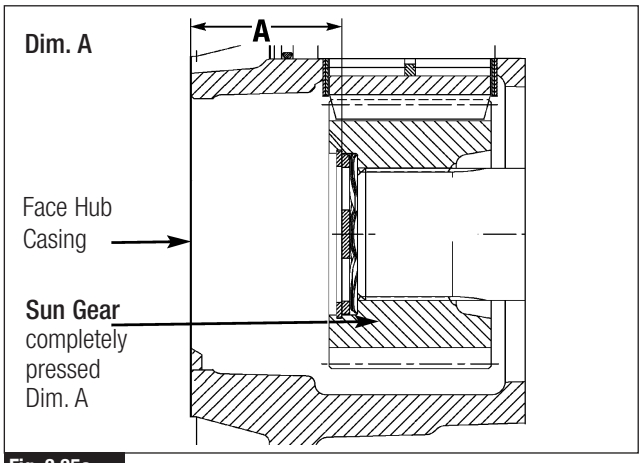


Fig. 3.35a

Pull out the sun gear approximately 10 mm. Fig. 3.35b

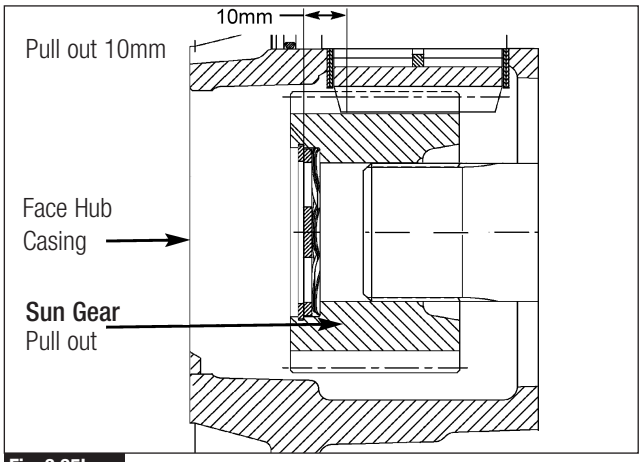


Fig. 3.35b

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

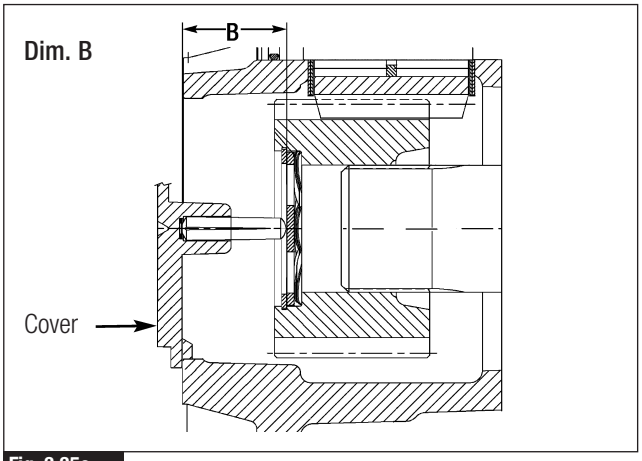


Fig. 3.35c

Dimension B

Offer up the cover plate into its position against the face of the hub casing pushing in the sun gear. Remove the cover, and remeasure the depth of the sun gear thrust washer, as previously record dimension B (mm) Fig. 3.35c with depth slide gear.

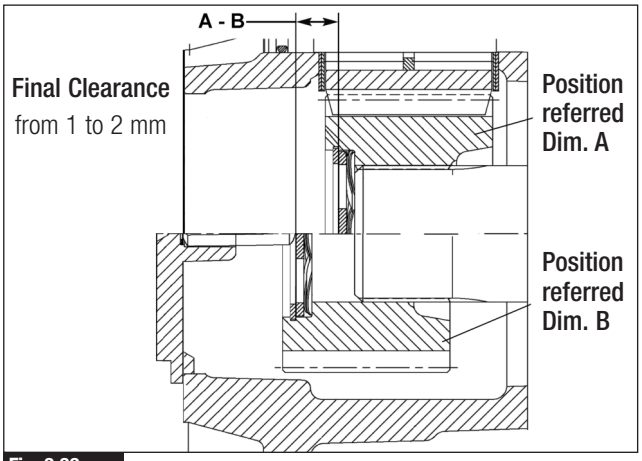


Fig. 3.36

Final Clearance calculation

Dimensions (A-B) between 1-2 mm

Fig. 3.36

If outside these limits, remove the grooved pin and change the number of washers under the pin. Fig. 3.37

Refit the magnetic washer over the grooved pin and retain in position with a new star lock fastener. Fig. 3.38

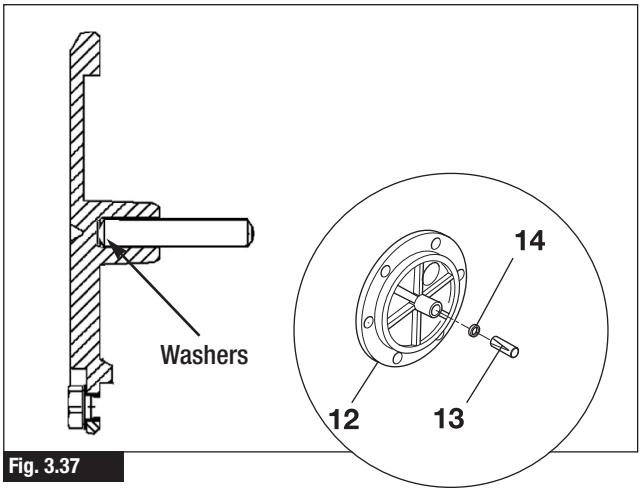


Fig. 3.37

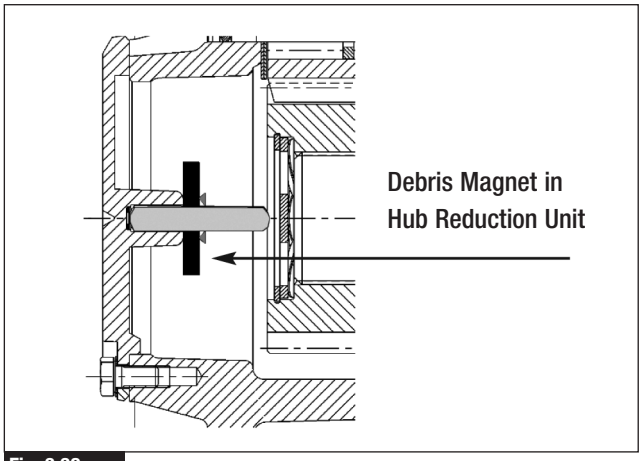


Fig. 3.38

3 Part 3 - Traditional wheel end with 3-4 planets Spindle fitted with screws

Apply sealing compound in **approx. 6mm diameter.**

Bead (Dow Corning 7091) to the inner face of the cover plate in a continuous bead (as showed between internal circumference ribs and holes). Fig. 3.39

The components must be assembled immediately to permit the silicone gasket material to compress evenly between the mating surfaces. Refit the cover plate on the end of the hub casing and retain with screws. Torque: 20 ± 5Nm
Fig. 3.40

Fill hub with 2.5 litres of oil as specified by vehicle manufacturer. Fit new oil drain plug. Torque: 80Nm ± 20Nm

Fig. 3.41 - Solid shaft

NOTE: with new hub cap there is an oil level line that aligns with the bottom of the filler hole. When line is horizontal it is an indication of permitted oil capacity.

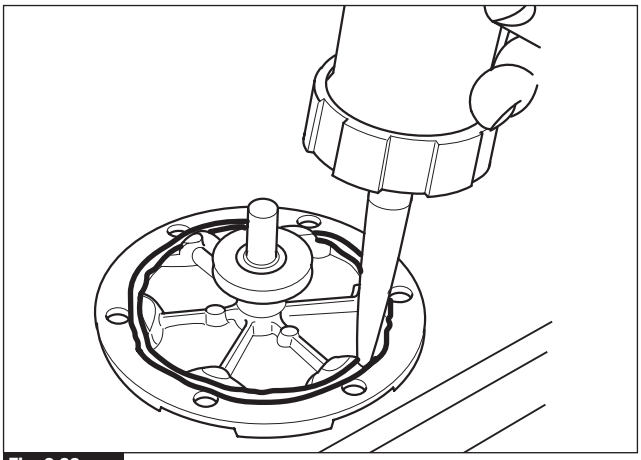


Fig. 3.39

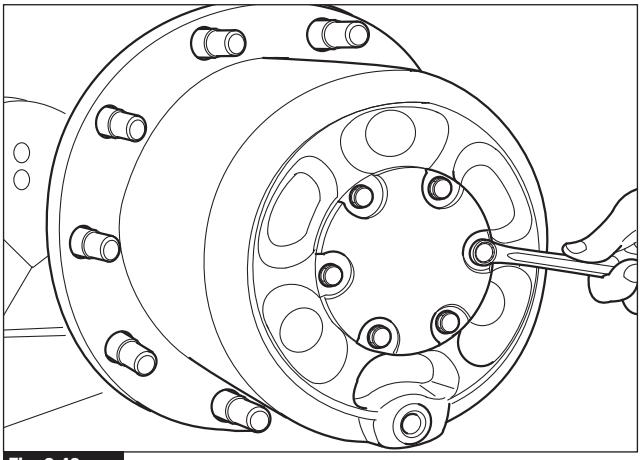


Fig. 3.40

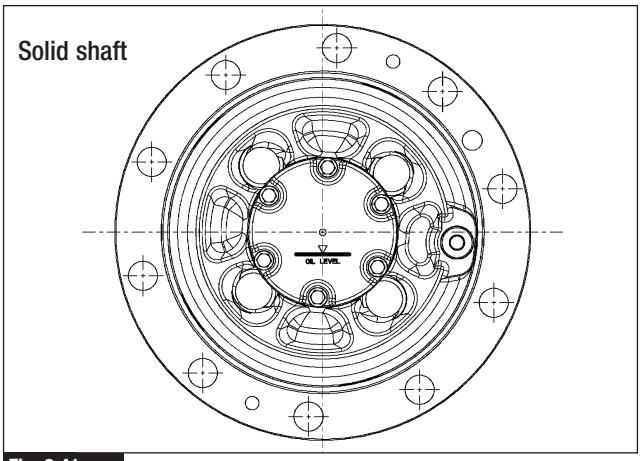


Fig. 3.41

Troubleshooting and Service Tools

4

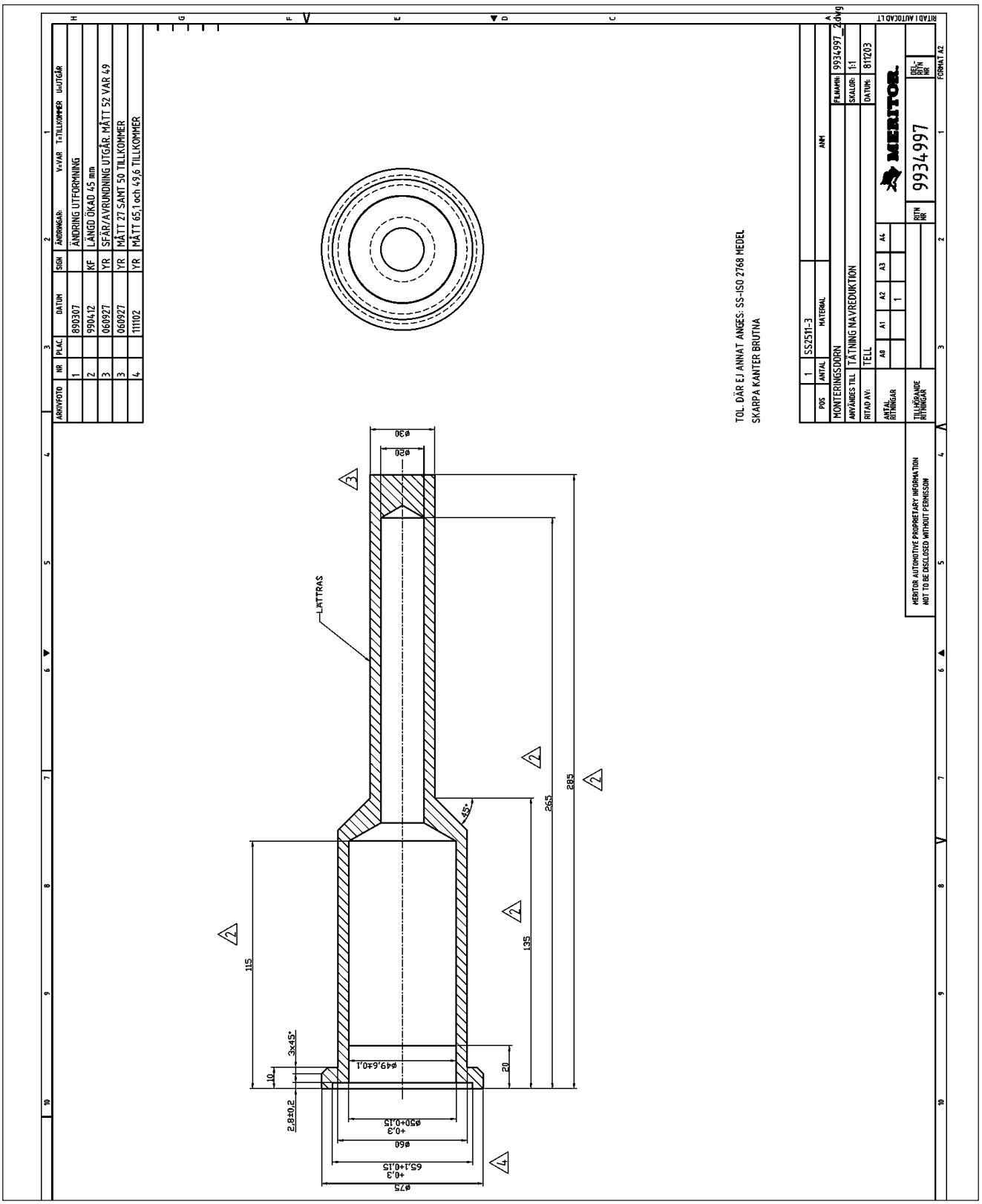
4 Troubleshooting and Service Tools

Shown below is a chart of the most common faults occurring to hub assemblies.

Condition	Possible Causes	Checks	Actions Required
Hub oil loss	Wheel bearing damaged	Oil loss coming from hub outwards	Remove wheel end assembly and replace bearing and any other damaged parts
Oil loss between hub cover and hub	Knocks/Sealant distributed incorrectly during a previous overhaul		Remove hub cover and correctly reapply sealant. Check the driveshaft and hub for integrity and that they are in working order.
Excessive hub clearance	Slackening	Check: - hub nut	Check bearings for integrity. Ensure hub nut is correctly tightened. Ensure correct tighten and locked by screw or staking.
Abnormal ABS sensor signal	Abnormal impulses	Follow instructions from vehicle manufacturer	

4 Troubleshooting and Service Tools

Mounting tool



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