

Service Manual

Axle
730/529
(AG 85 - 105)

ASM-0049
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The efficiency and continued operation of mechanical units depend on constant, correct maintenance and also on efficient repair work, should there be a break-down or malfunction. The instructions contained in this manual have been based on a complete overhaul of the unit. However, it is up to the mechanic to decide whether or not it is necessary to assemble only individual components, when partial repair work is needed. The manual provides a quick and sure guide which, with the use of photographs and diagrams illustrating the various phases of the operations, allows accurate work to be performed.

All the information needed for correct disassembly, checks and assembly of each individual component is set out below. In order to remove the differential unit from the vehicle, the manuals provided by the vehicle manufacturer should be consulted. In describing the following operations it is presumed that the unit has already been removed from the vehicle.

IMPORTANT: In order to facilitate work and protect both working surfaces and operators, it is advisable to use proper equipment such as: trestles or supporting benches, plastic or copper hammers, appropriate levers, pullers and specific spanners or wrenches.

Before going on to disassemble the parts and drain the oil, it is best to thoroughly clean the unit, removing any encrusted or accumulated grease.

INTRODUCTORY REMARKS: All the disassembled mechanical units should be thoroughly cleaned with appropriate products and restored or replaced if damage, wear, cracking or seizing have occurred.

In particular, thoroughly check the condition of all moving parts (bearings, gears, crown wheel and pinion, shafts) and sealing parts (O-rings, oil shields) which are subject to major stress and wear. In any case, it is advisable to replace the seals every time a component is overhauled or repaired. During assembly, the sealing rings must be lubricated on the sealing edge. In the case of the crown wheel and pinion, replacement of one component requires the replacement of the other one. During assembly, the prescribed pre-loading, backlash and torque of parts must be maintained.

CLASSIFICATION: This manual classifies units according to part numbers. For a correct interpretation, classification is indicated as follows:

▶▶ = up to the part number

▶▶ = from the part number on

When no classification is given, disassembly and assembly operations are the same for all versions.

SPECIFIC EQUIPMENT AND SPARE PARTS: The drawings of all specific tools required for maintenance and repair work can be found at the end of this manual ; spare parts may be ordered either from the vehicle manufacturer or directly from the Service Centers or Authorised Distributors of DANA ITALIA S.p.A..

II

Il rendimento e la continuità degli organi meccanici dipendono oltre che da una costante e corretta manutenzione, anche dal tempestivo intervento, nell'eventualità di guasti o anomalie.

Nel proporre questo manuale si è considerata l'ipotesi di una revisione generale del gruppo ma è il meccanico a valutare la necessità di montare solo i singoli componenti nel caso di riparazione. Il manuale è una guida rapida e sicura che consente interventi precisi, tramite le fotografie ed i disegni prospettici che illustrano le varie fasi delle operazioni. Di seguito sono riportate tutte quelle informazioni ed avvertenze necessarie al corretto disassemblaggio, alle relative verifiche ed all'assemblaggio dei singoli componenti. Per la rimozione del ponte differenziale dal veicolo, è necessario consultare i manuali forniti dal costruttore del veicolo. Nel descrivere le operazioni seguenti, si presuppone che il ponte sia già stato rimosso dal veicolo.

IMPORTANTE: In tutte le operazioni, è consigliabile usare attrezzature idonee quali cavalletti o banchi di sostegno, martelli in plastica o rame, leve appropriate estrattori e chiavi specifiche, al fine di facilitare il lavoro salvaguardando nel contempo le superfici lavorate e la sicurezza degli operatori. Prima di procedere al disassemblaggio delle parti e scaricare l'olio, è opportuno eseguire un'accurata pulizia del ponte, asportando incrostazioni ed accumuli di grasso.

PREMESSA: Tutti gli organi meccanici smontati, devono essere accuratamente puliti con prodotti appropriati, quindi ripristinati o sostituiti nel caso presentino danni, usura, incurvature, grippaggi, ecc. In particolare, verificare l'integrità di tutte quelle parti in movimento (cuscinetti, ingranaggi, coppia conica, alberi) e di tenuta (anelli OR, paraolio), soggette a maggiori sollecitazioni ed usura. È consigliabile, comunque, la sostituzione degli organi di tenuta ogni qualvolta si proceda alla revisione o riparazione dei componenti. Al momento del montaggio, gli anelli di tenuta devono essere lubrificati sui bordi di tenuta. Nel caso della coppia conica, la sostituzione di uno dei suoi ingranaggi comporta anche la sostituzione dell'altro. In fase di montaggio sono da rispettare scrupolosamente i giochi, i precarichi e le coppie prescritte.

VALIDITÀ: Il manuale fornisce le validità dei gruppi sotto forma di matricola. Al fine di una corretta interpretazione, le validità sono indicate come:

▶▶ = fino alla matricola

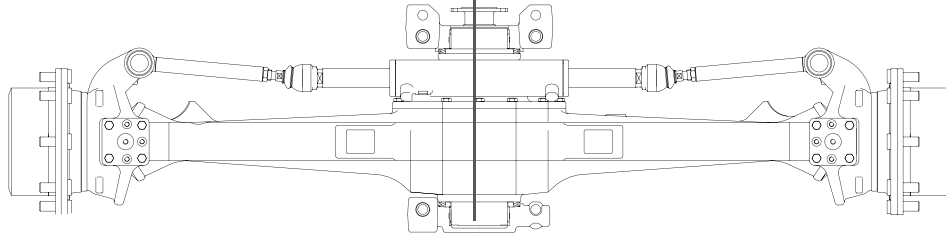
▶▶ = dalla matricola

Se non sono indicate validità, le operazioni di smontaggio ed assemblaggio sono comuni a tutte le versioni.

MANUTENZIONE E RIPARAZIONE: Al fine di facilitare interventi sui gruppi ponte differenziali e cambi di velocità la SPICER CLARK-HURTH, ha ritenuto opportuno compilare queste istruzioni di manutenzione e riparazione. I disegni delle attrezzature specifiche eventualmente necessarie per l'esecuzione di interventi di manutenzione e riparazione possono essere acquistati direttamente presso il costruttore; i ricambi possono essere ordinati tramite il costruttore della macchina o direttamente presso la DANA ITALIA S.p.A..

DEFINITION OF VIEWPOINTS - DEFINIZIONE VISTE

LEFT SIDE | RIGHT SIDE
LATO SINISTRO | LATO DESTRO



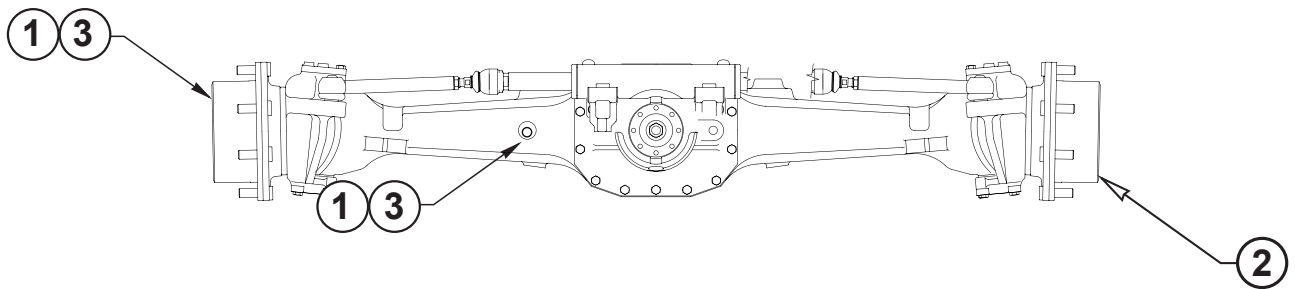
DIRECTION

DATA PLATE - TARGA MATRICOLA

TYPE		SERIAL No.	
①		②	
MODEL		RATIO	
③		④	
Kardan u.6 H9027 Györ MADE IN HUNGARY			

- ① Type
Tipo
- ② Serial number
Numero di serie
- ③ Model unit
Modello gruppo
- ④ Reduction ratio
Rapporto di riduzione

MAINTENANCE POINTS - PUNTI DI MANUTENZIONE



- ① Oil filling plug - Tappo di carico
- ② Oil draining plug - Tappo di scarico
- ③ Check level plug - Tappo controllo livello
- ④ Grease nipples - Ingrassatori

MAINTENANCE INTERVALS - INTERVALLI DI MANUTENZIONE

OPERATION - OPERAZIONE		FREQUENCY PERIODICITA'	LUBRICANTS - LUBRIFICANTI
<ul style="list-style-type: none"> • Check levels: • Controllo livelli: 	Differential Differenziale	monthly mensile	<ul style="list-style-type: none"> • SAE85W90 (API GL4 - MIL L-2105) With additives for oil-bath brakes Con additivi per freni a bagno d'olio • SAE85W90 (API GL5 - MIL 2105-B) With additives for oil-bath brakes, for units presenting hypoid crown wheel and pinion and /or self-locking differential gear Per esecuzioni con coppia conica ipoide e/o con differenziale autobloccante, con additivi per freni a bagno d'olio
	Planetary reduction Riduzione epicicloidale	every 200 hours ogni 200 ore	
<ul style="list-style-type: none"> • Oil change: • Cambio olio: 	Differential Differenziale	every 800 hours] ogni 800 ore	
	Planetary reduction Riduzione epicicloidale	every 1000 hours] ogni 1000 ore	
	Self-locking differential gear Differenziale autobloccante	every 700 hours] r ogni 700 ore	

* Initially after 100 working hours - Inizialmente dopo 100 ore di lavoro **When it starts sounding noisy - Anche ai primi cenni di rumorosità

OPERATION OPERAZIONE	MEMBER ORGANO	CONDITIONS CONDIZIONI	FREQUENCY PERIODICITA'	LUBRICANTS LUBRIFICANTI
Greasing Ingrassaggio	Articulations Snodi	Normal work Lavori normali	monthly mensile	MOLIKOTE
		Awkward work Lavori gravosi	Weekly Settimanale	

SCREW-LOCKING, SEALING AND LUBRICATING MATERIALS MATERIALI PER BLOCCAGGIO VITI, TENUTA E LUBRIFICAZIONE

1 - Locking, sealing and lubricating materials referred to in this manual are the same used in the shop-floor.
I materiali per il bloccaggio, tenuta e lubrificazione specifica indicati nel manuale, sono quelli usati in fabbrica.

2 - The table below gives an account of the typical applications of each single material, in order to facilitate replacement with similar products marketed by different brand names with different trade marks.
Di questi materiali, vengono riportate le applicazioni tipiche che li distinguono, in modo da poterli sostituire con prodotti similari commercializzati da altre marche e quindi con altre sigle.

DENOMINATION DENOMINAZIONE	APPLICATION - APPLICAZIONE
Loctite 242	<ul style="list-style-type: none"> • Anaerobic product apt to prevent the loosening of screws, nuts and plugs. Used for medium-strength locking. Before using it, completely remove any lubricant by using the specific activator. • Prodotto anaerobico adatto a prevenire l'allentamento di viti, dadi e tappi. Usato per la frenatura a media resistenza. Deve essere usato dopo aver asportato ogni traccia di lubrificante con l'attivatore specifico.
Loctite 270	<ul style="list-style-type: none"> • Anaerobic product for very-high strength locking of screws and nuts. Before using it, completely remove any lubricant by using the specific activator. To remove parts, it may be necessary to heat them at 80°C approx. • Prodotto anaerobico adatto per la frenatura ad altissima resistenza di viti e dadi. Deve essere usato dopo aver asportato ogni traccia di lubrificante con l'attivatore specifico. La rimozione delle parti, può richiedere un riscaldamento a circa 80°C.
Loctite 510	<ul style="list-style-type: none"> • Anaerobic product for the hermetic sealing of flanged units and screw holes communicating with fluids. Can seal clearances between flanges up to 0.2 mm. • Prodotto anaerobico adatto alla tenuta ermetica di fluidi tra assiemi flangiati e di viti a foro comunicante con i fluidi. Può sigillare giochi tra le flange fino a 0,2 mm.
(AREXONS) Jointing compound for seals Mastice per guarnizioni	<ul style="list-style-type: none"> • Solvent-based sealing compound for elastic seals, drying through evaporation. Used for sealing the outer diameter of sealing rings for rotating shafts with outer metal reinforcement. • Mastice sigillante per guarnizioni elastiche a base di solvente, essicante per evaporazione. Viene utilizzato per la tenuta sul diametro esterno di anelli di tenuta per alberi rotanti con armatura metallica esterna.
Molikote	<ul style="list-style-type: none"> • Lubricating compound containing molybdenum disulphide, used to lubricate articulation pins and to prevent sticking and oxidation of parts that are not lubricated on a regular basis. • Composto lubrificante contenente bisolfuro di molibdeno, usato per la lubrificazione di perni snodo e per prevenire incollamenti ed ossidazioni di particolari non lubrificati in modo continuo.
(Lithium-based) Grease Grasso (al Litio)	<ul style="list-style-type: none"> • Applied to bearings, sliding parts and used to lubricate seals or parts during assembly • Applicato a cuscinetti, parti scorrevoli e per lubrificare guarnizioni o pezzi in fase di montaggio.

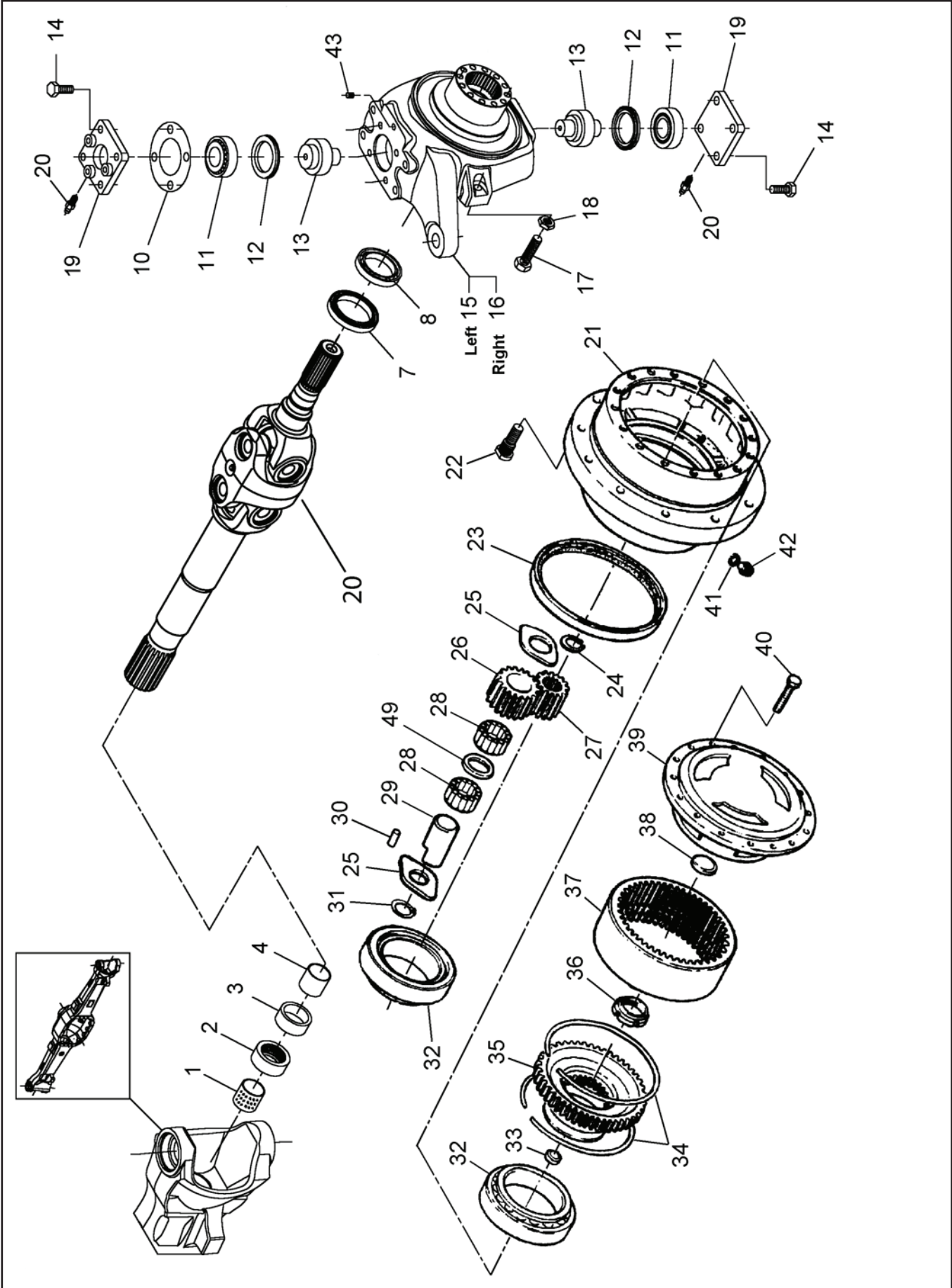
NOTES ON SAFETY PRECAUTIONS - NOTE RIGUARDANTI LA SICUREZZA

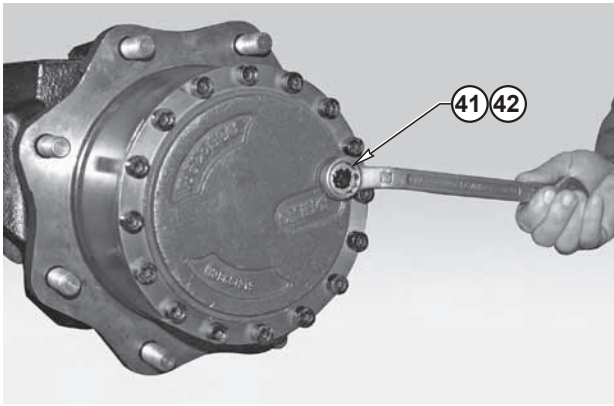
GB

- 1 - During all operations described in this manual, the axle should be fastened onto a trestle, while the other parts mentioned should rest on supporting benches.
- 2 - When removing one of the arms, an anti-tilting safety trestle should be placed under the other arm.
- 3 - When working on an arm that is fitted on the machine, make sure that the supporting trestles are correctly positioned and that the machine is locked lengthways.
- 4 - Do not admit any other person inside the work area; mark off the area, hang warning signs and remove the ignition key from the machine.
- 5 - Use only clean, quality tools; discard all worn, damaged, low-quality or improvised wrenches and tools. Ensure that all dynamometric wrenches have been checked and calibrated.
- 6 - Always wear gloves and non-slip rubber shoes when performing repair work.
- 7 - Should you stain a surface with oil, remove marks straight away.
- 8 - Dispose of all lubricants, seals, rags and solvents once work has been completed. Treat them as special waste and dispose of them according to the relative law provisions obtaining in the country where the axles are being overhauled.
- 9 - Make sure that only weak solvents are used for cleaning purposes; avoid using turpentine, dilutants and toluol-, xylol-based or similar solvents; use light solvents such as Kerosene, mineral spirits or water-based, environment friendly solvents.
- 10 - For the sake of clarity, the parts that do not normally need to be removed have not been reproduced in some of the diagrams.
- 11 - The terms RIGHT and LEFT in this manual refer to the position of the operator facing the axle from the side opposite the drive.
- 12 - After repair work has been completed, accurately touch up any coated part that may have been damaged.

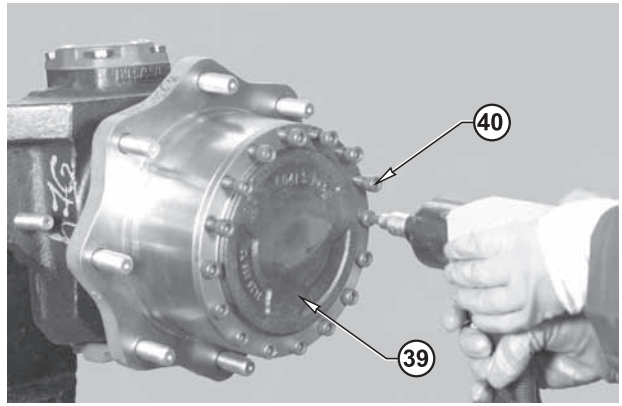
I

- 1 - Le operazioni descritte sono riferite all'assale bloccato su cavalletto ed alcuni particolari appoggiati su un banco di lavoro.
- 2 - Quando si asporta un braccio dell'assale, sistemare sotto l'altro braccio un cavalletto di sicurezza antiribaltamento.
- 3 - Se si opera su un'assale montato sulla macchina, assicurarsi di aver sistemato dei cavalletti di sostentamento e di aver immobilizzato longitudinalmente la macchina.
- 4 - Non permettere che persone estranee entrino nella zona di lavoro; delimitare questa zona, appendere dei cartelli di avviso di lavori in corso ed asportare le chiavi di avviamento della macchina.
- 5 - Usare solo ed esclusivamente attrezzi puliti e di buona qualità; scartare chiavi od attrezzi usurati o danneggiati, di bassa qualità od improvvisati. Assicurarsi che le chiavi dinamometriche siano state controllate e tarate.
- 6 - Durante le operazioni di riparazione, indossare sempre guanti e scarpe antiscivolo.
- 7 - Pulire immediatamente le zone eventualmente imbrattate d'olio.
- 8 - I lubrificanti, le guarnizioni, gli eventuali stracci di pulizia ed i solventi usati devono essere smaltiti come rifiuti speciali e comunque secondo le normative vigenti nel Paese ove vengono revisionati gli assali.
- 9 - Per la pulizia, usare solo solventi deboli escludendo categoricamente trielina, diluenti e solventi a base di toluolo, xilolo, ecc.; usare solo solventi leggeri quali cherosene, ragie minerali o solventi ecologici a base d'acqua.
- 10 - Per chiarezza di illustrazione ed esposizione, sulle figure di alcuni gruppi mancano dei particolari che, normalmente, possono essere lasciati montati. Rimuovere solo i particolari descritti.
- 11 - I termini DESTRA e SINISTRA usati nel manuale sono riferiti alla persona che guarda l'assale dal lato opposto alla presa di moto.
- 12 - Al termine delle riparazioni, per evitare dannose ossidazioni, ritoccare con cura le parti verniciate eventualmente danneggiate.

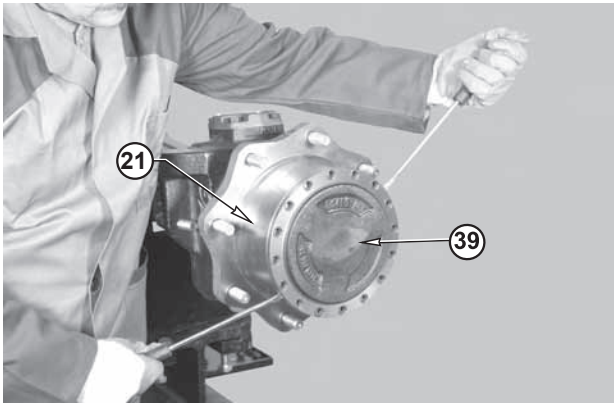




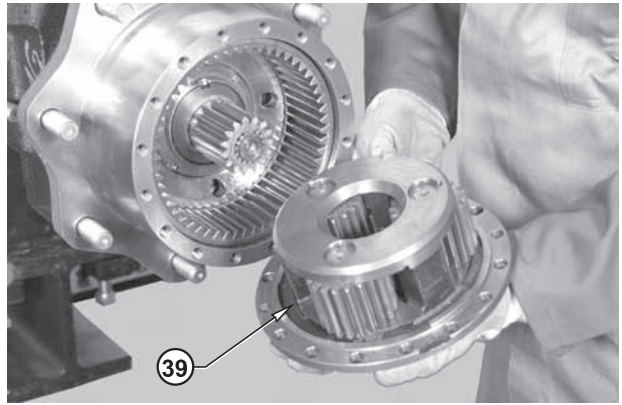
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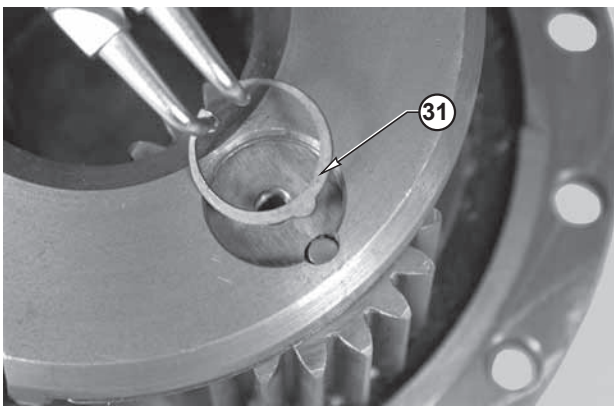
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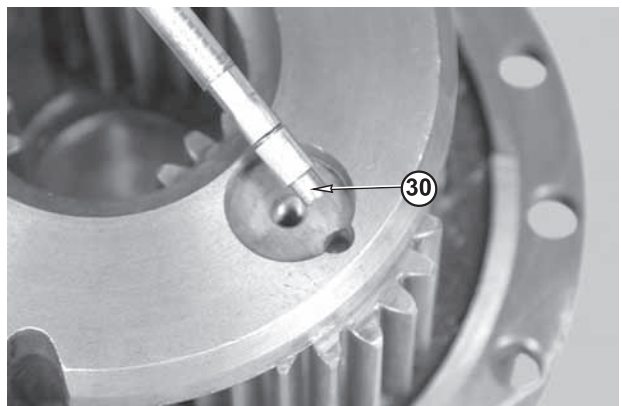
c



d



e



f

a

I ATTENZIONE!
Eeguire tutte le operazioni per i due bracci.
Asportare il tappo di livello olio (41)(42).

GB CAUTION! Perform all operations on both arms.
Remove the oil-level plug (41)(42).

b

I Asportare le viti (40) di fissaggio del coperchio portasatelliti (39).

GB Remove the securing screws (40) from the spider cover (39).

c

I Utilizzando due cacciaviti o due leve inserite nelle cave predisposte, staccare il supporto satelliti (39) dal mozzo portaruota (21).

GB Using two screwdrivers or two levers inserted in the slots provided, pry the planetary gear carrier (39) away from the wheel hub (21).

d

I Asportare il supporto satelliti (39) completo.

GB Remove the complete planetary gear carrier (39).

e

I Rimuovere l'anello elastico (31).

GB Remove snap ring (31).

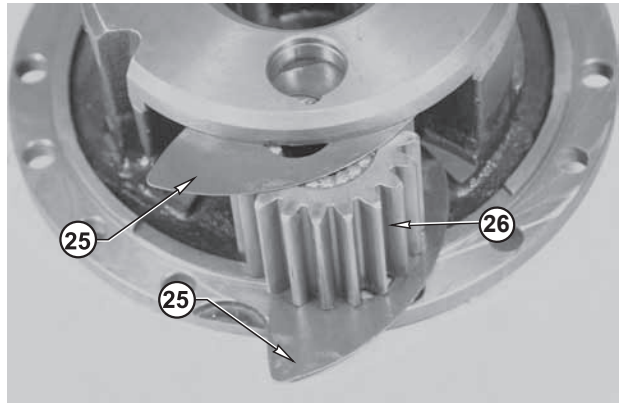
f

I Utilizzando una calamita asportare dal coperchio portasatelliti (39) il rullo (30).

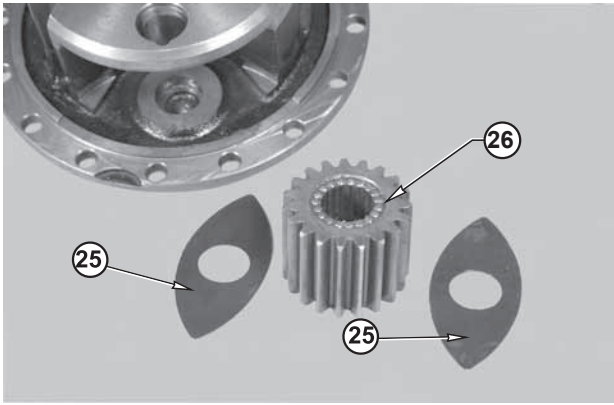
GB Remove the pin (30) from the spider cover (39) by using a magnetic tool.



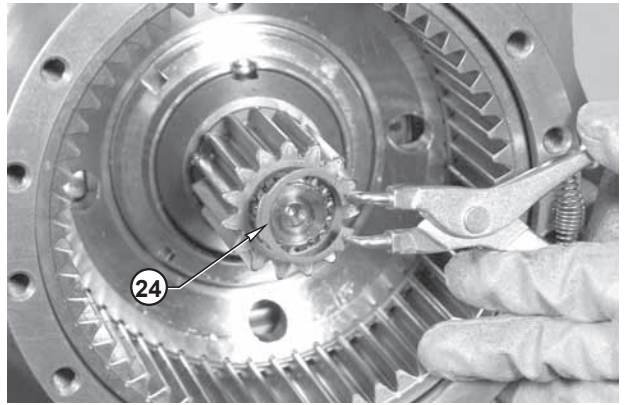
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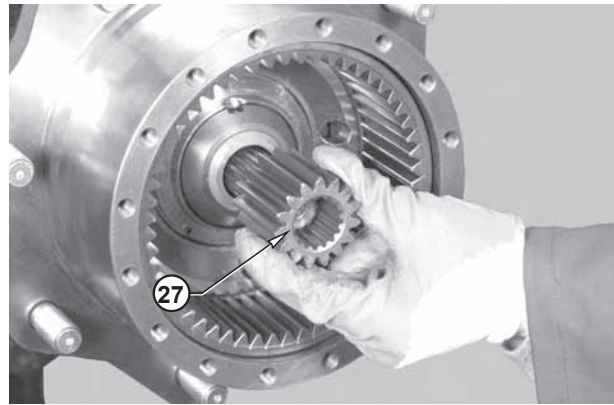
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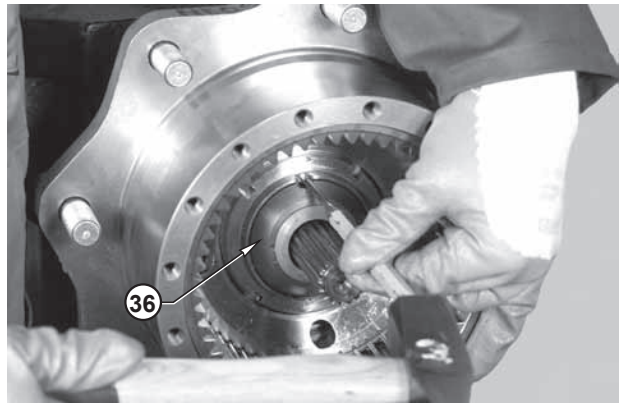
c



d



e



f

I Avvitare una vite M6 nei perni (29) ed estrarre.

a

GB Using a screw M6 remove all bolts (29).

I Rimuovere i satelliti (26) e le rondelle di spallamento dei satelliti (25).

b

GB Remove the planet wheel gear (26) and the spherical washer (25).

I

c

GB

I Rimuovere l'anello elastico (24).

d

GB Remove the snap ring (24).

I Rimuovere il pignone (27).

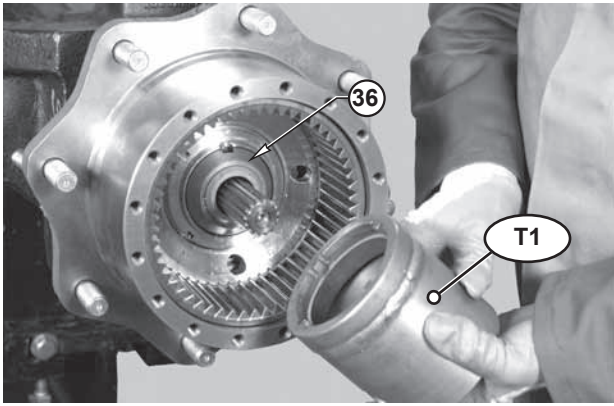
e

GB Remove the pinion (27).

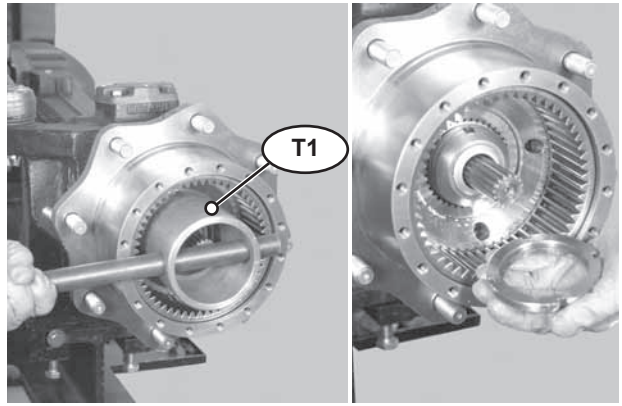
I Rimuovere totalmente la cianfrinatura, onde evitare lo sfillemento dell'albero durante la rimozione della ghiera (36).

f

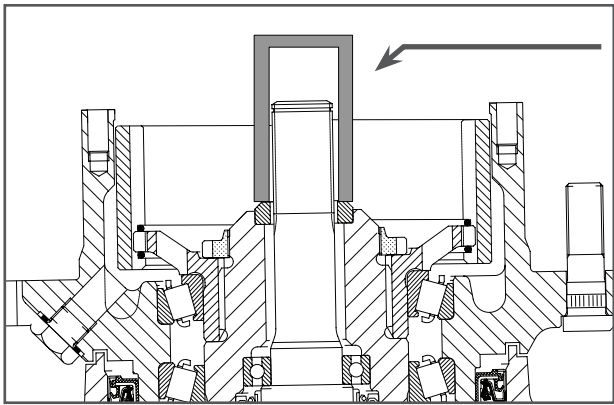
GB Remove the calking in order to preserve the screw cutting of the arm during the ring nut (36) removal.



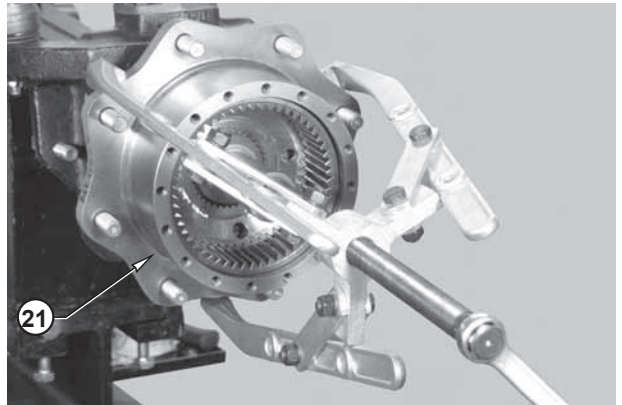
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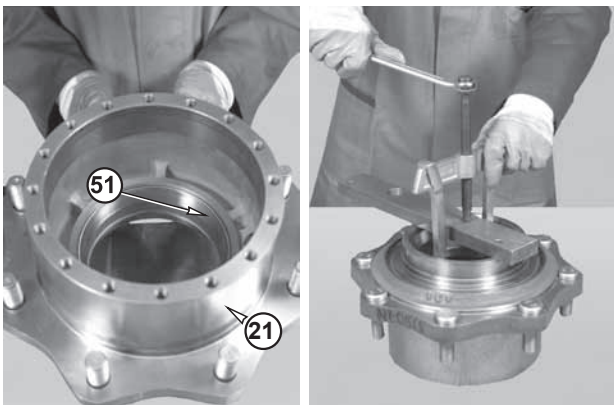
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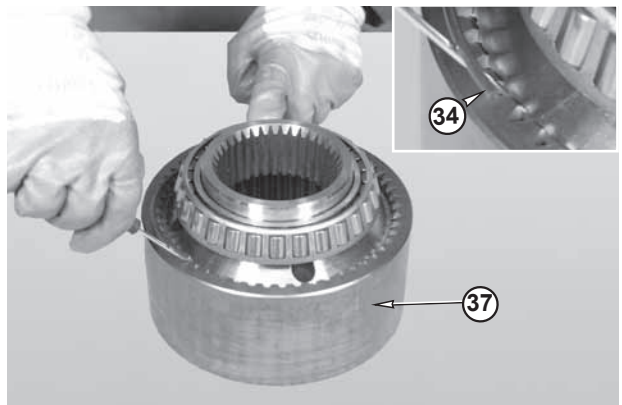
c



d



e



f

a

I Utilizzando l'attrezzo T1 speciale rimuovere la ghiera (36).

GB Using special tool T1 remove the ring nut (36).

b

I

GB

d

I Utilizzando un estractore sfilare il mozzo portaruota (26) installando sulla scatola snodo un punzone cavo. ATTENZIONE: Proteggere il semiassie con punzone cavo per non agire direttamente sul semiassie.

GB Using an extractor remove complete hub (21) positioning on the steering case a closed-pipe. CAUTION: do not point the extractor on the u-joint.

e

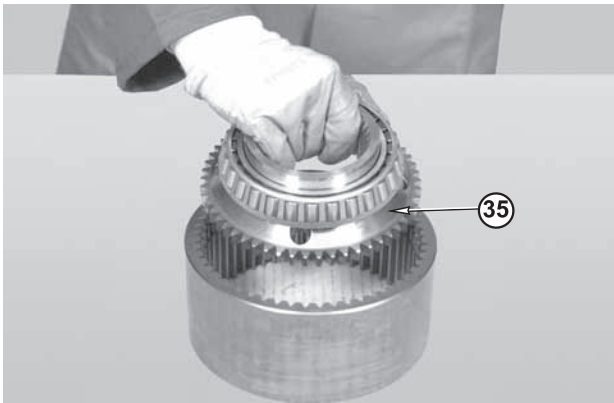
I Rimuovere la ralla interna ed esterna (32) dal mozzo portaruota (21).

GB Remove the internal and external thrust blocks (32) from the hub (21).

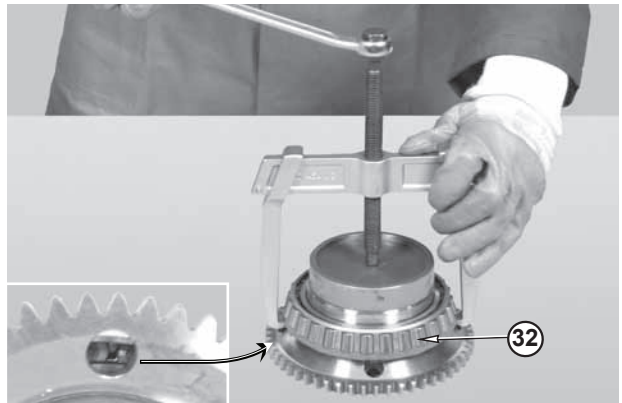
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I Asportare l'anello elastico (34) di ritegno della corona (37).

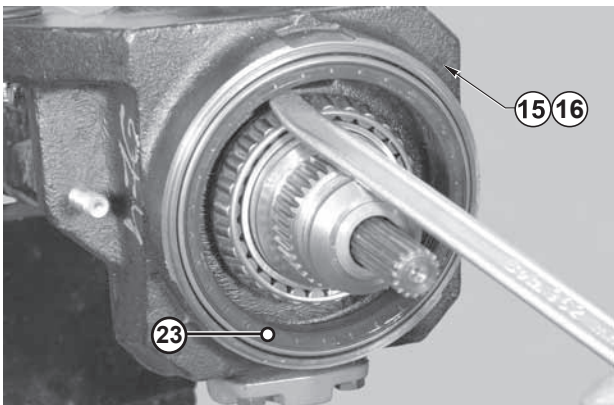
GB Remove the snap ring (34) from the crown (37).



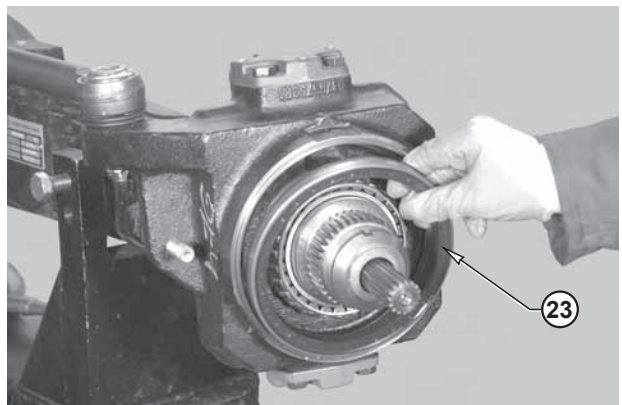
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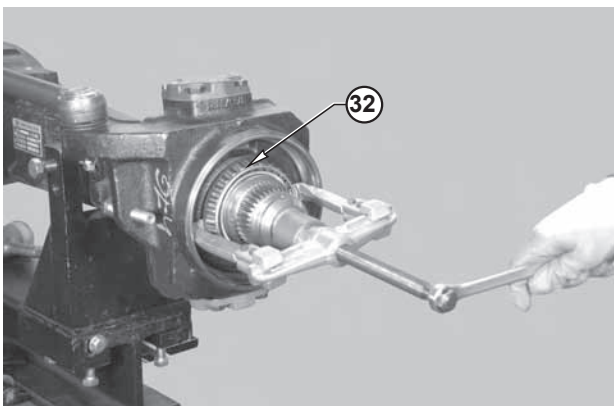
b



c



d



e

a

I Rimuovere la flangia portacorona (35).

GB Remove the crown flange (35).

b

I Rimuovere il cuscinetto (32).

GB Remove the bearing (32).

c

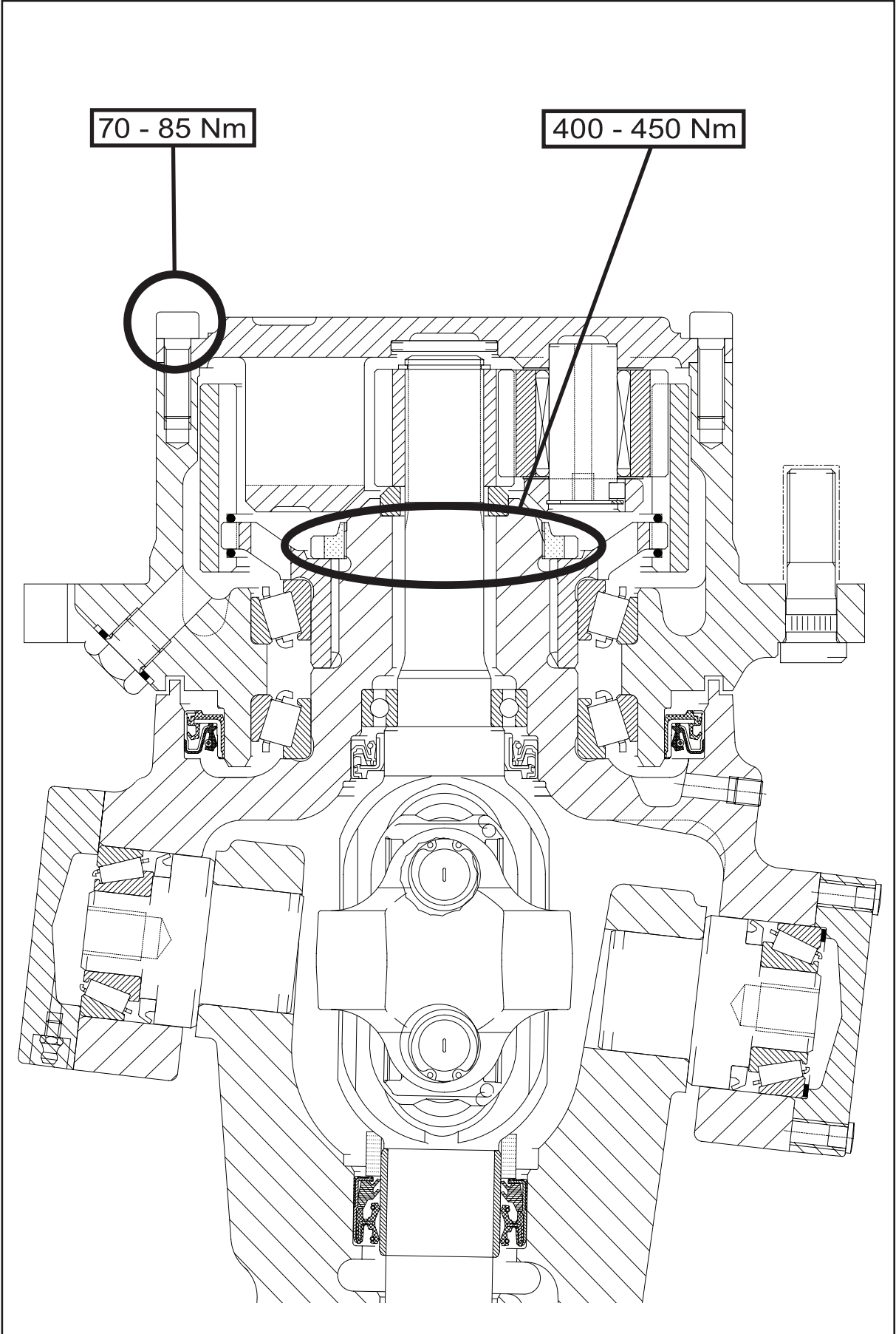
I Rimuovere dalla scatola snodo (15)(16) l'anello di tenuta (23).

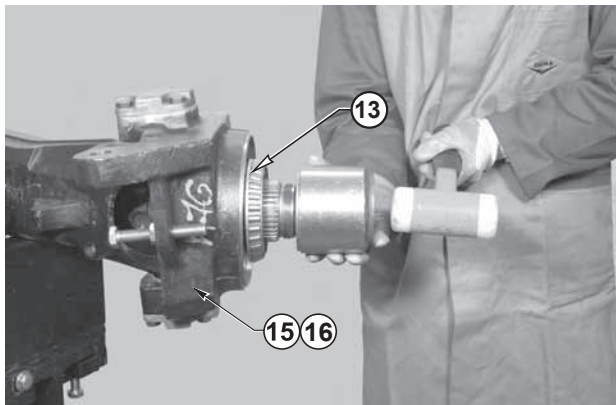
GB Remove the sealing ring (23) from the steering case (15)(16).

e

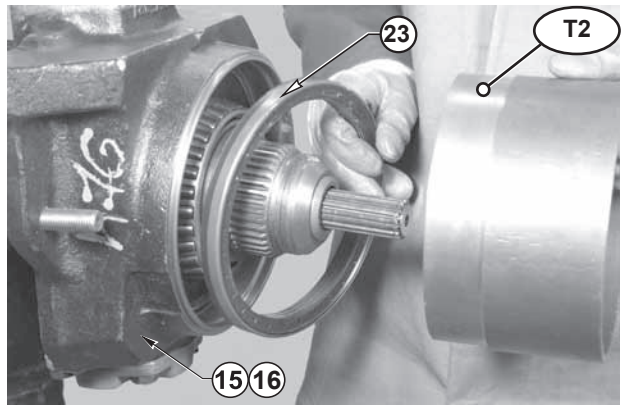
I Rimuovere il cuscinetto interno (32).

GB Remove the internal bearing (32).

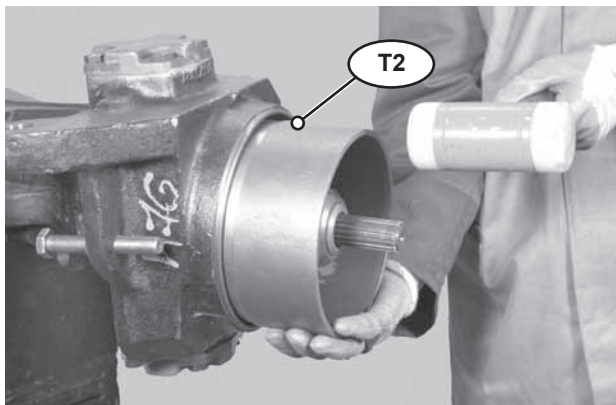




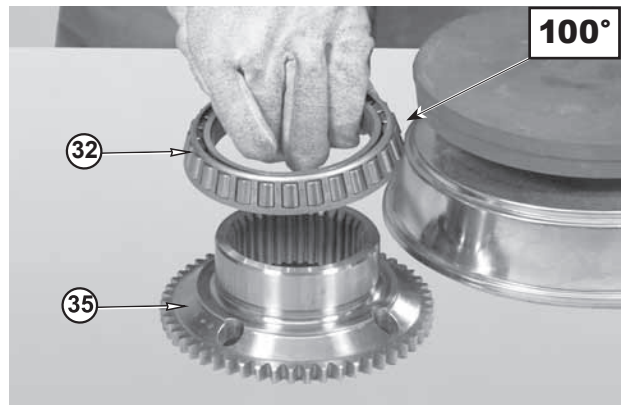
a



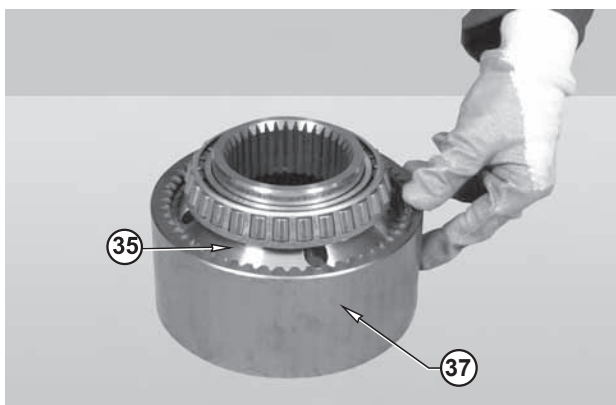
b



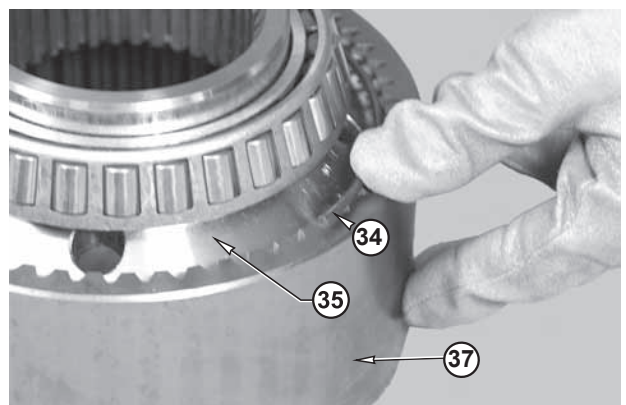
c



d



e



f

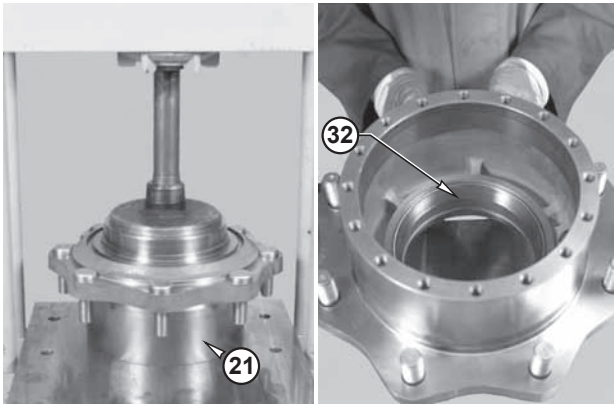
- a**
- I** Inserire il cuscinetto conico (13) del mozzo portaruota sulla scatola snodo.
 - GB** Install the hub conical bearing (13) onto the steering case

- b**
- I** Utilizzando l'attrezzo speciale T2 inserire l'anello di tenuta (7) nella scatola snodo (15)(16)
 - GB** Using special tool install the sealing ring T2 (23) into the steering case (15)(16).

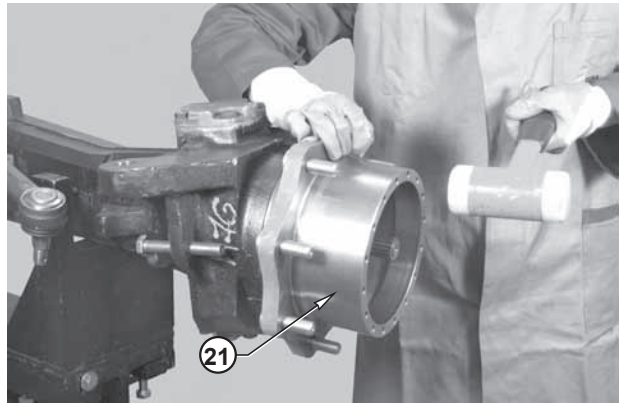
- d**
- I** Montare il cuscinetto (41).
 - GB** Install the bearing (32).

- e**
- I** Montare la flangia portacorona (35)
 - GB** Install the crown flange (35).

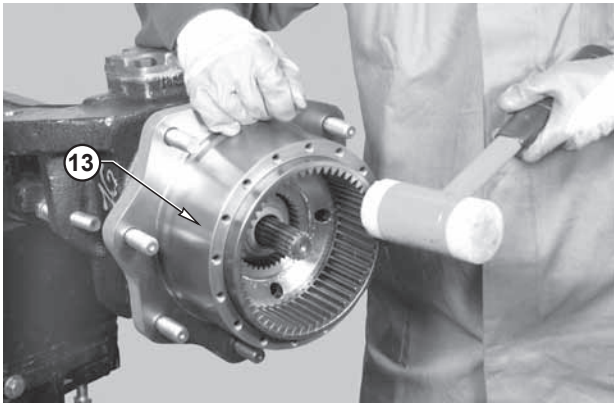
- f**
- I** Inserire l'anello elastico (34) per fissare la posizione della flangia (35) nella corona (37).
 - GB** Insert the snap ring (34) in order to fix the crown flange (35) in the crown (37).



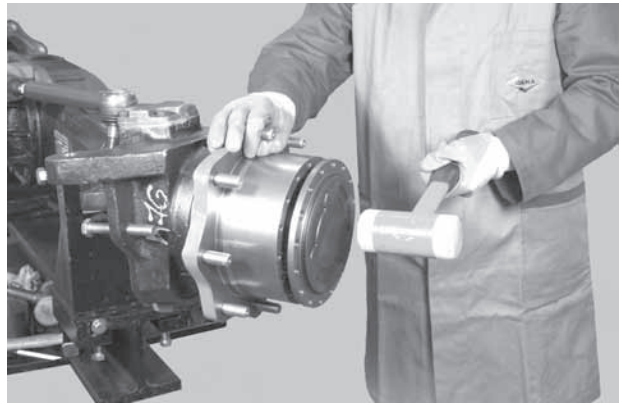
a



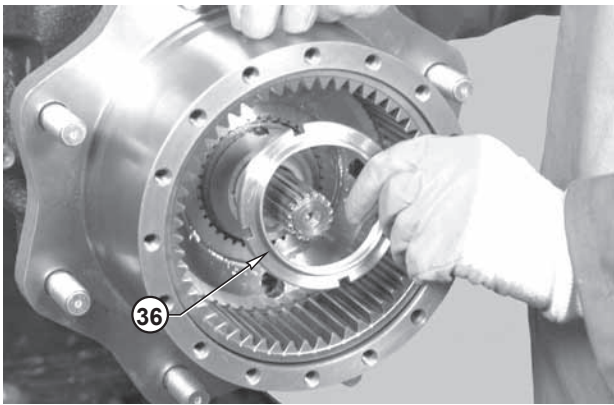
b



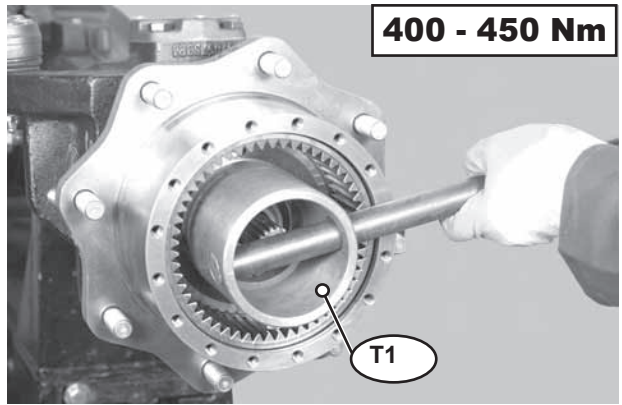
c



d



e



f

a

I Posizionare la parte superiore dell'attrezzo e pressare a fondo le ralle (32) nel mozzo portaruota (21).

GB Position the upper part of tool and press the thrust blocks (32) into the hub (21) all the way down.

b

I Montare il mozzo portaruota (21).

GB Fit the hub (21).

c

I Per mandare in battuta la flangia, usare un mazzuolo in materiale plastico battuto alternativamente in più punti equidistanti.

GB In order to fasten the flange, use a plastic hammer and alternately hammer on several equidistant points.

d

I Utilizzare il coperchio portasatelliti per inserire il mozzo portaruota.

GB Use spider cover without gears for insert to end joke the hub.

e

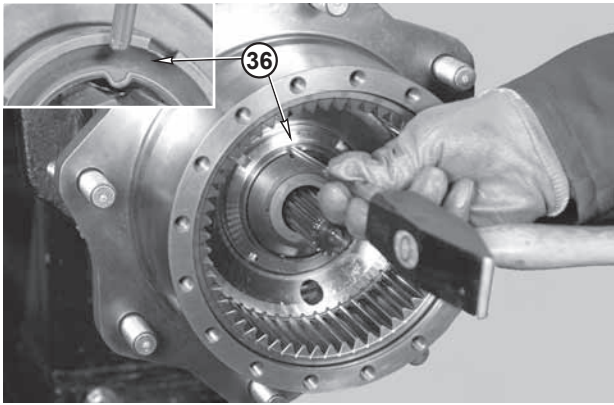
I Utilizzando l'attrezzo speciale T1 inserire la ghiera (36) nel braccio.

GB Using special tool T1 install the ring nut (36) into the arm.

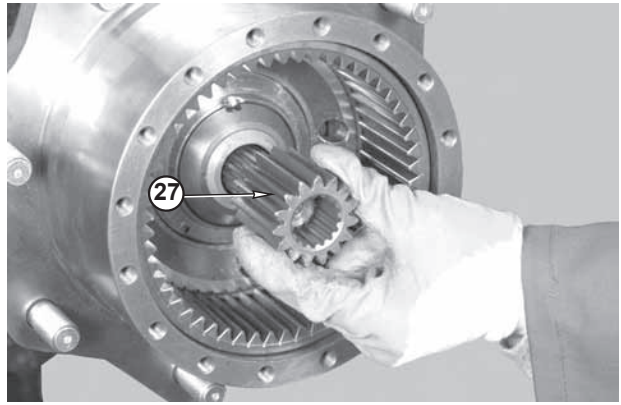
f

I Coppia di serraggio viti: 400 ± 450 Nm

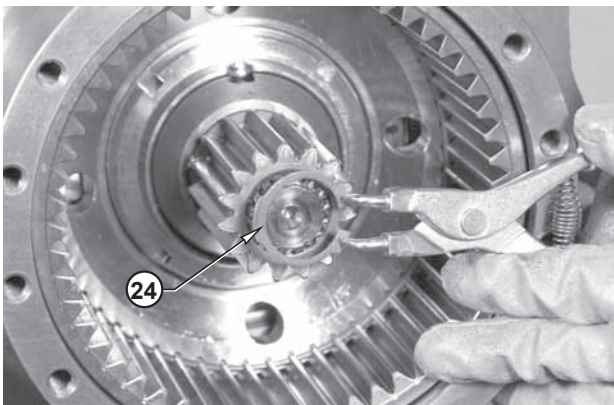
GB Torque wrench setting for screws: 400 ± 450 Nm



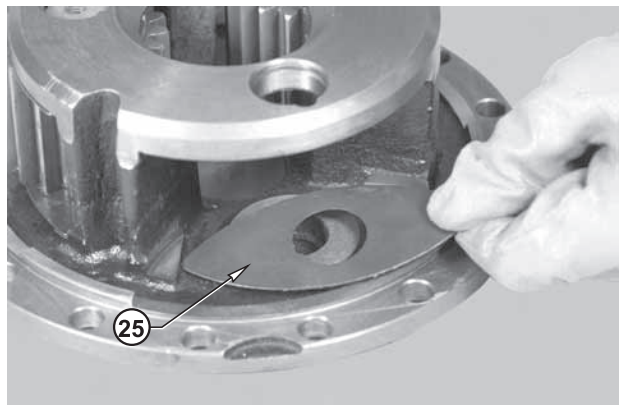
a



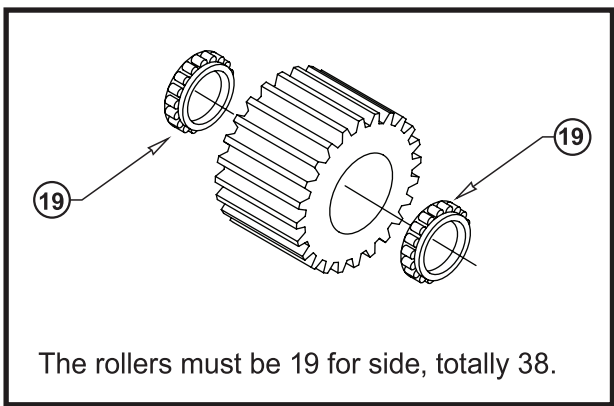
b



c



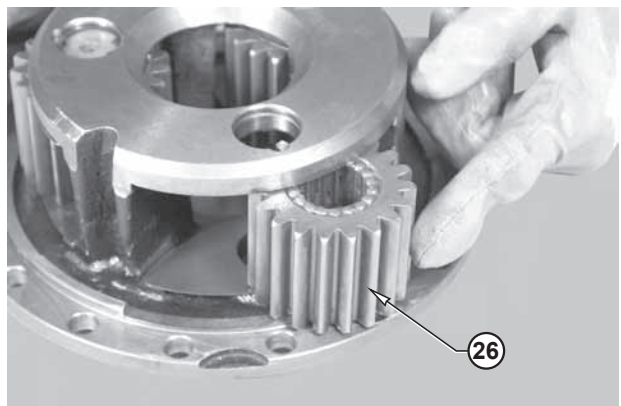
d



The rollers must be 19 for side, totally 38.



e



f

I
a Cianfrinare la ghiera (36).
ATTENZIONE! Se la ghiera (36) viene riutilizzata,
cianfrinare la seconda posizione.
Non ripetere la cianfrinatura sopra quella precedente.

GB
Caulk the ring nut (36).
CAUTION! If the ring nut (36) is re-used, caulk the second
position. Do not re-caulk the same portion.

I
b Montare il pignone (27).

GB
Install the pinion (27).

I
c Montare l' anello elastico (24).

GB
Install the snap ring (24).

I
d Posizionare le rondelle di rasamento dei satelliti (25).

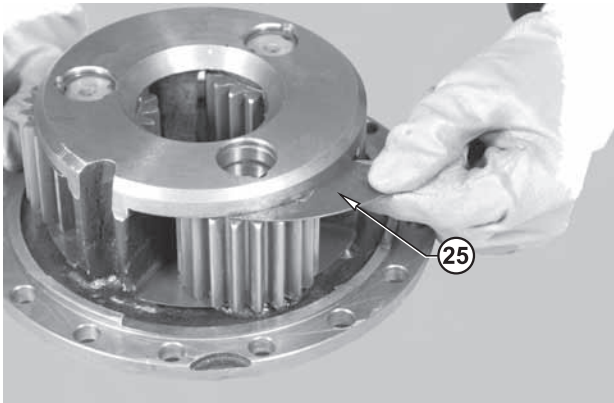
GB
Install the friction washes (25).

I
e Controllare il corretto riempimento dei rullini del
cuscinetto.
NOTA: I rullini devono essere in totale 38.

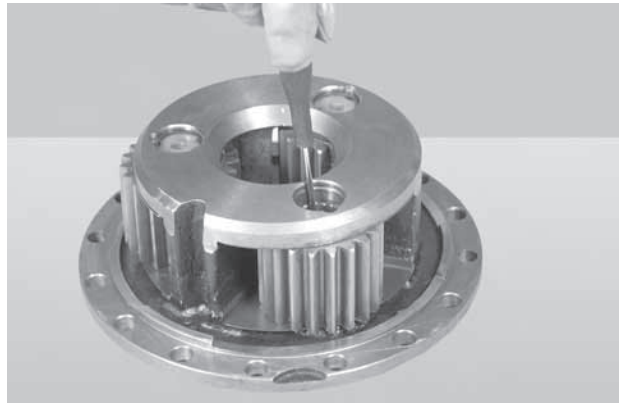
GB
Check that the rollers is correctly inserted in the gear.
NOTE: The number of rollers must be 38.

I
f Uno ad uno inserire i satelliti completi di cuscinetti a
rulli (26).

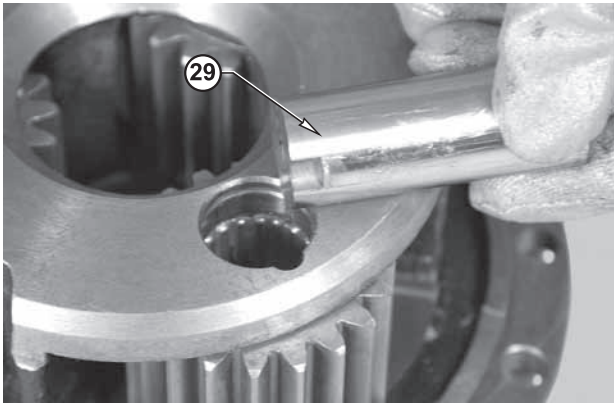
GB
Install planetary gears (26) complete with the roller
bearing.



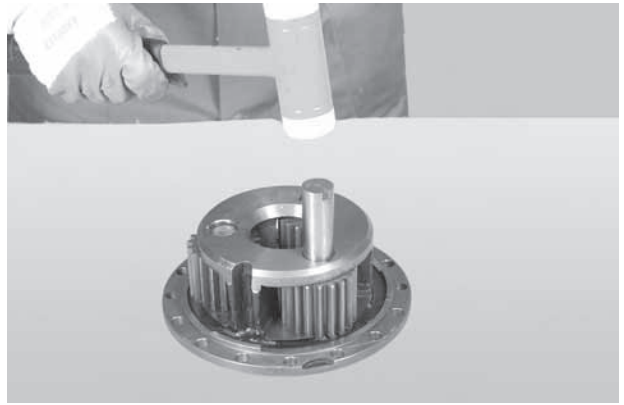
a



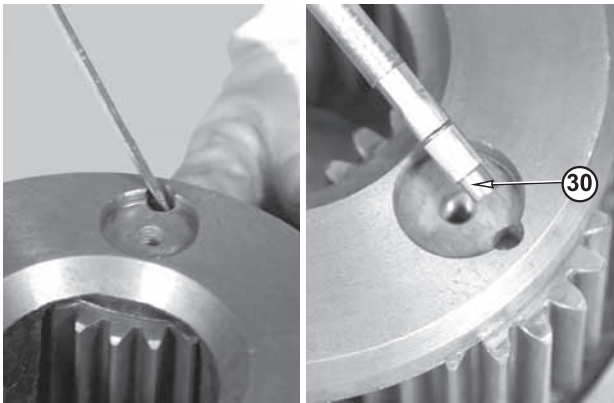
b



c



d



e



f

a

I Montare le altre rondelle di rasamento (25).
NOTA: per ogni satellite ci sono due rondelle.

GB Install the others friction washers (25).
NOTE: Two friction washers for every planetary gear.

b

I Verificare la concentricità del satellite con il foro e le rondelle.

GB Check the concentricity of the planetary gear, the seat and friction washers.

c

I Con l'aiuto di una vite M6 montare il perno(29).

GB Using a screw M6 install the pin (29).

d

I

GB

e

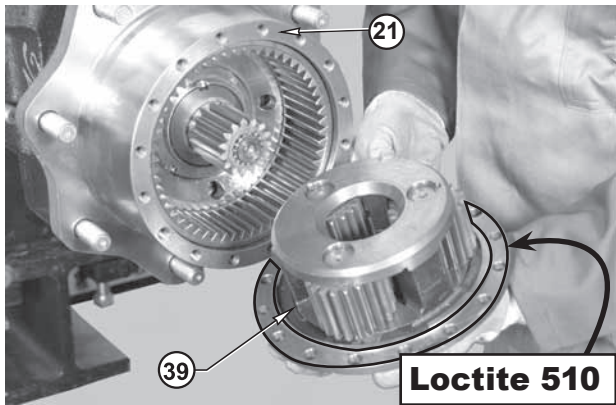
I Utilizzando una calamita installare dalla scatola differenziale il rullo (30).

GB Install the roller (30) from the planetary cover by using a magnetic tool.

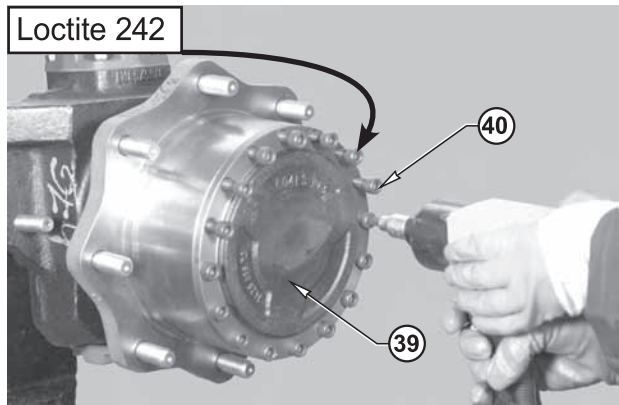
f

I Montare l' anello elastico (24).

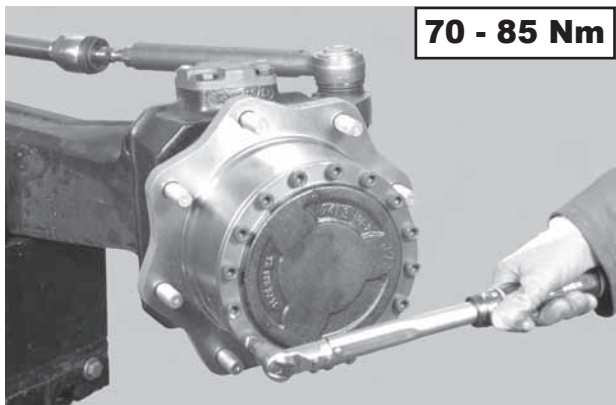
GB Install the snap ring (24).



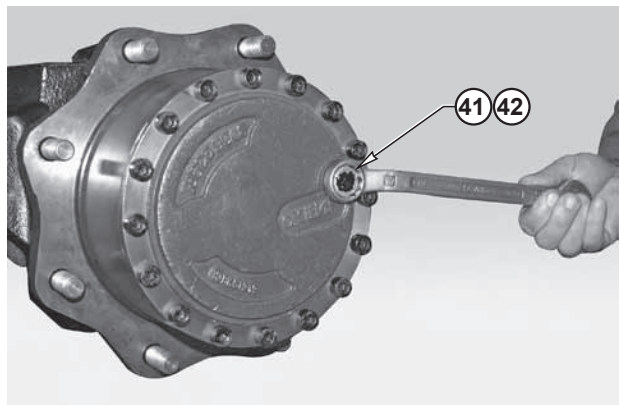
a



b



c



d

I
a Spalmare viti e filetti con **LOCTITE 242**. Spalmare la superficie del supporto satelliti con **Loctite 510** ed installare il coperchio.
NOTA. Assicurarsi che il sigillante crei un velo continuo attorno ai fori di fissaggio.

GB
Apply **Loctite 242** to the thread and screw.
Coat the surface of the planetary gear carrier with **Loctite 510** and install the reduction gear complete with pinion.
NOTE. Make sure that a continuous layer of sealant runs around the locking holes.

I
b Bloccare il supporto satelliti (39) con le viti (4).

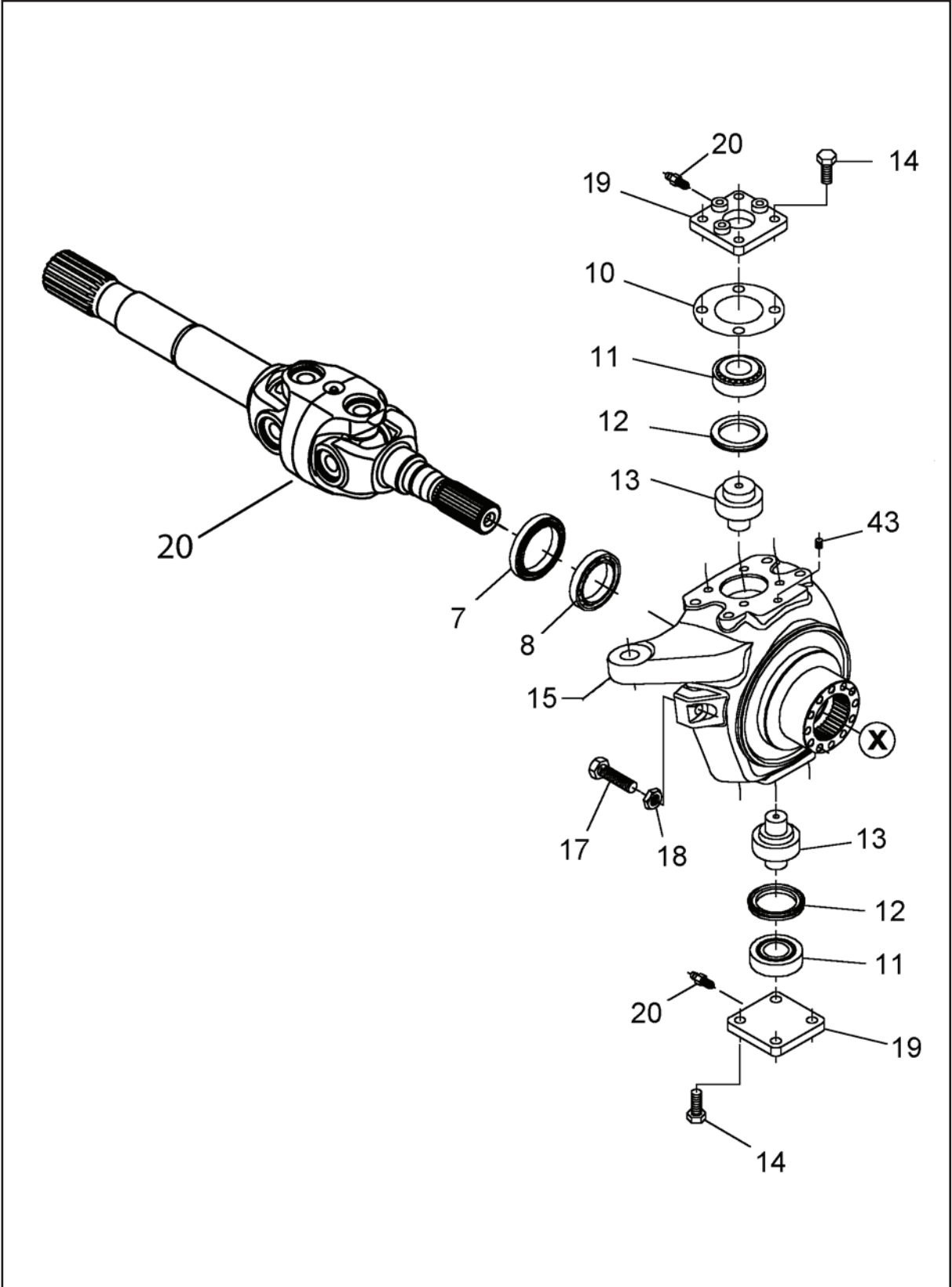
GB
Lock the planetary gear carrier (39) by tightening the screws (4).

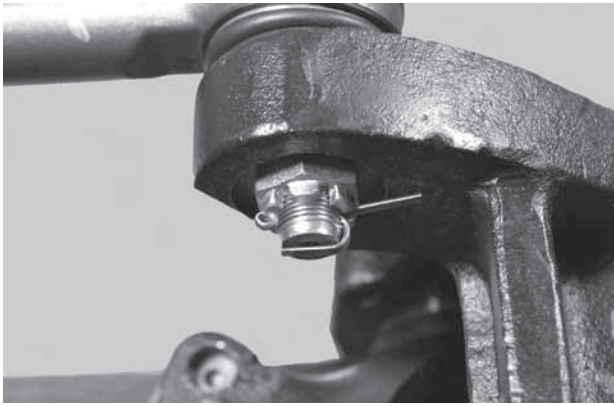
I
c Coppia di serraggio viti: 70 ± 85 Nm

GB
Torque wrench setting for screws: 70 ± 85 Nm

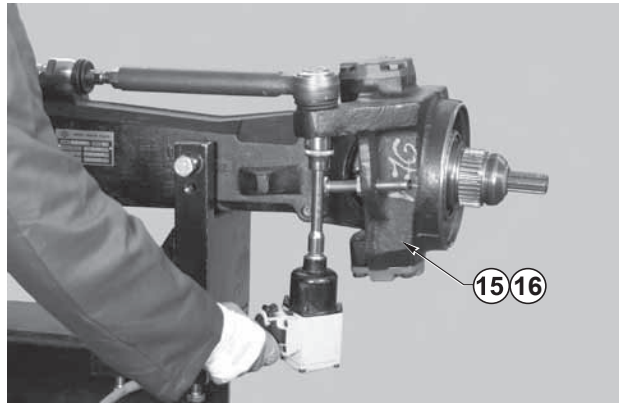
I
d Riempire di olio e avvitare il tappo.

GB
Fill with oil and screw the oli plug.

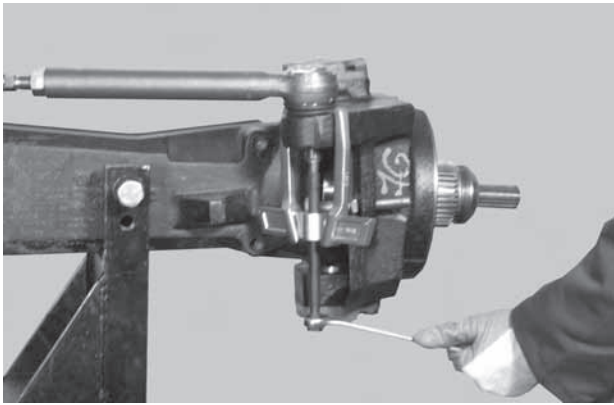




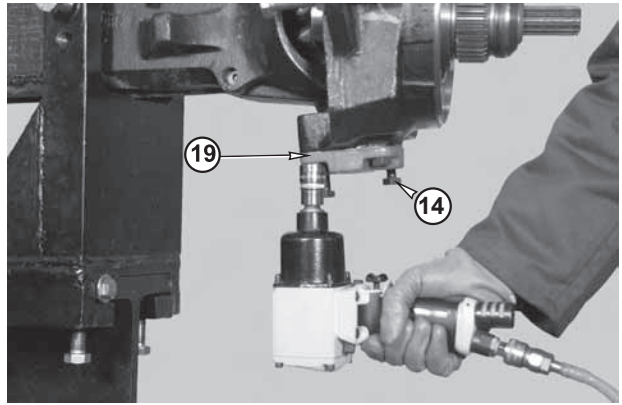
a



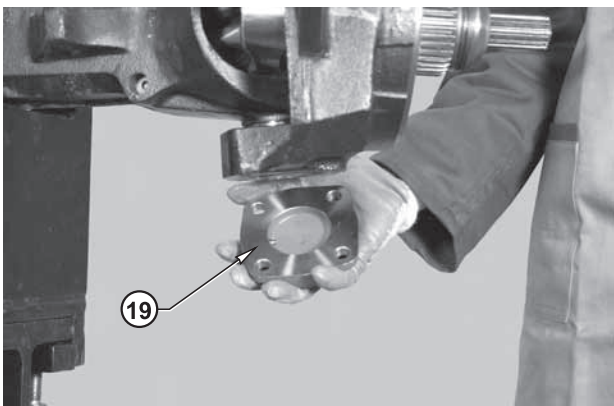
b



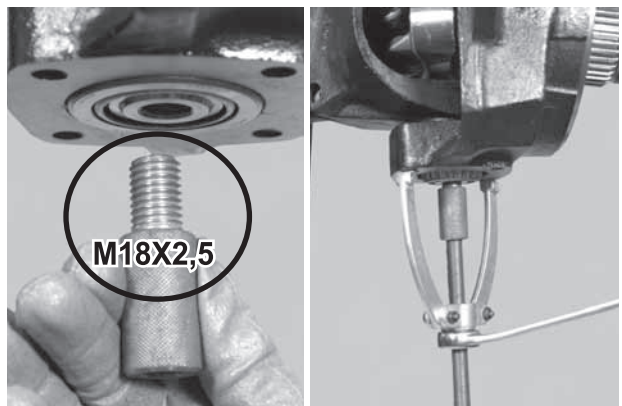
c



d



e



f

a

I Asportare le copiglie di sicurezza.

GB Remove the safety cotter pins.

b

I Rimuovere i dadi di ritegno perni snodo (15)(16).

GB Remove the nuts that lock the articulation pins (15)(16).

c

I Utilizzando un estractore, scollegare i perni conici dello snodo sterzo dalla scatola snodo.

GB Disconnect the tapered pins of the articulation from the steering case by means of a puller.

d

I Allentare ed asportare le viti di ritegno (14) del coperchio (19).

GB Unloose and remove the fittin screws (14) from the cover (19).

e

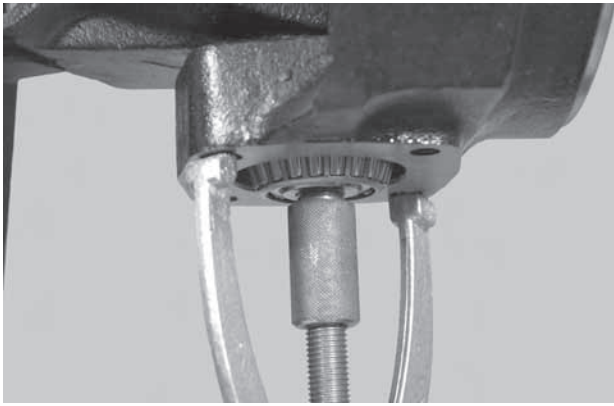
I Rimuovere il coperchio (19).

GB Remove the cover (19).

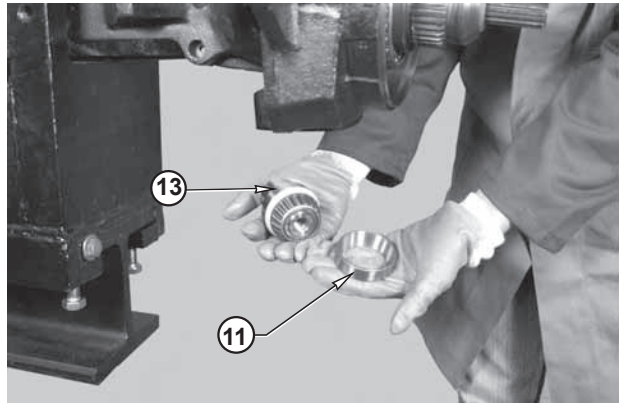
f

I Avvitare una barra filettata **M18X2,5** su un estractore e rimuovere il perno snodo.

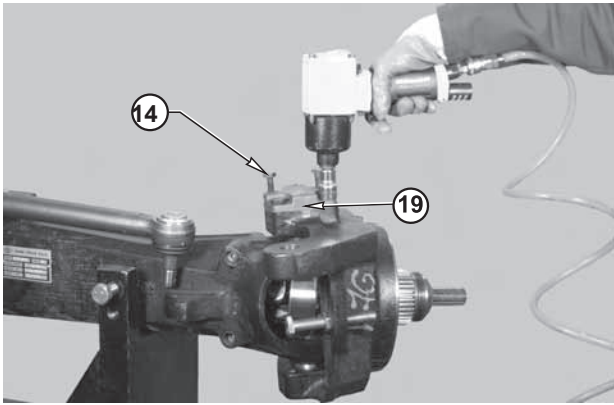
GB Screw a threaded bar **M18X2,5** on a extractor, end remove the pivot pin.



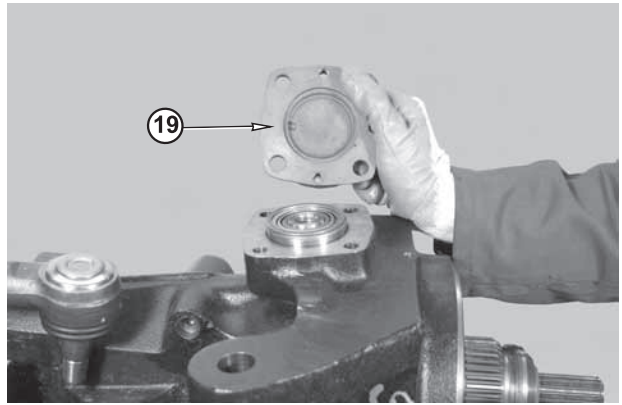
a



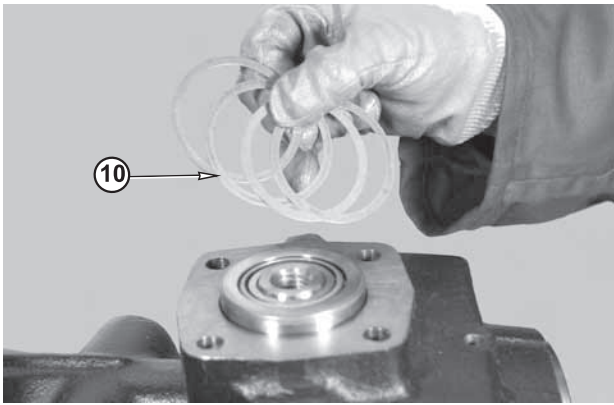
b



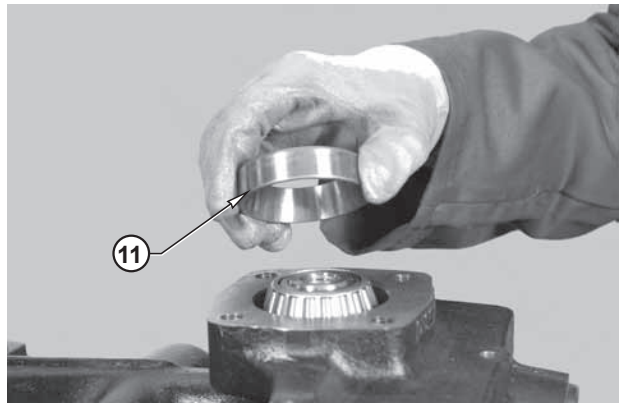
c



d



e



f

I Rimuovere la ralla (11) ed il perno snodo (13).

b

GB Remove the thrust block (11) and the pivot pin (13).

c

I Allentare ed asportare le viti di ritegno (14) del coperchio (19).

GB Unloose and remove the fittin screws (14) from the cover (19).

d

I Rimuovere il coperchio (19).

GB Remove the cover (19).

e

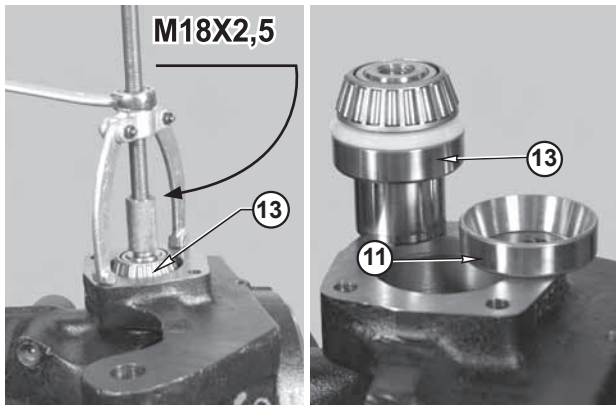
I Asportare gli spessori (10).

GB Remove the shims (10).

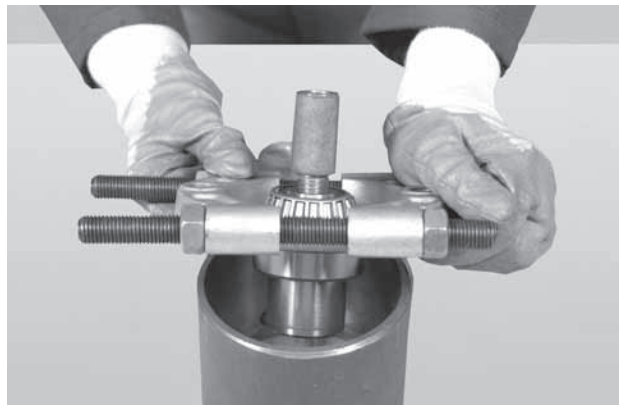
f

I Rimuovere la ralla (11).

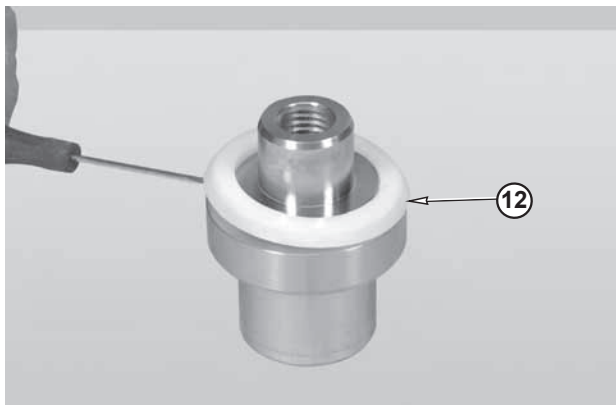
GB Remove the thrust block (11).



a



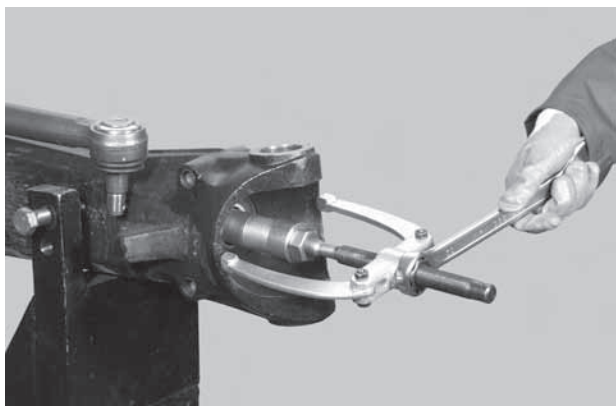
b



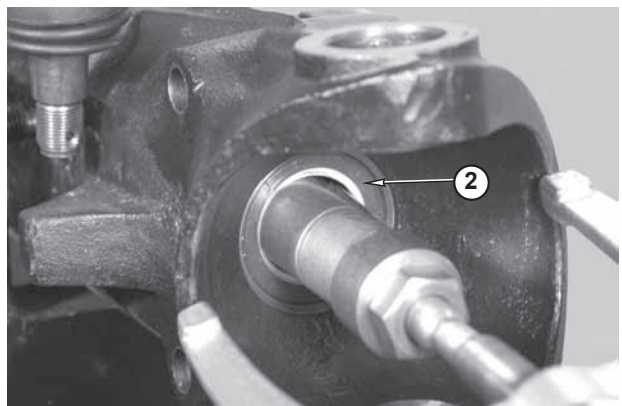
c



d



e



f

a

I Avvitare una barra filettata **M18X2,5** su un estrattore e rimuovere il perno (13).

GB Screw a threaded bar **M18X2,5** on a extractor, and remove the pivot pin (13).

b

I Utilizzando un estrattore ed una pressa, rimuovere dal perno il cuscinetto (11).

GB Using a puller and a press, remove the bearing (11) from the pivot pin (8).

c

I Rimuovere l'anello di tenuta frontale (12).

GB Remove the front sealing ring (12).

d

I Rimuovere il gruppo snodo completo (15)(16).

GB Remove the complete steering case (15)(16).

e

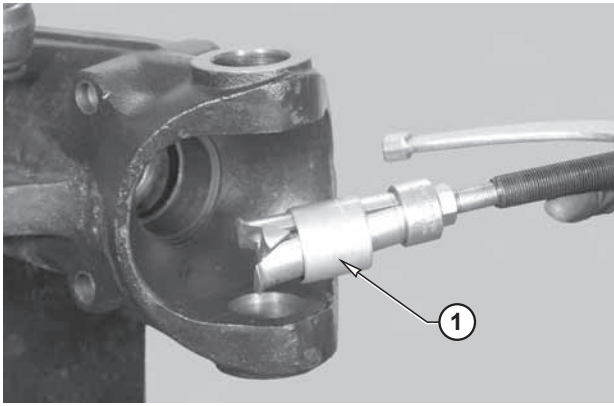
I Utilizzando un estrattore, rimuovere l'anello di tenuta (2).

GB Using an extractor, remove the seal ring (2).

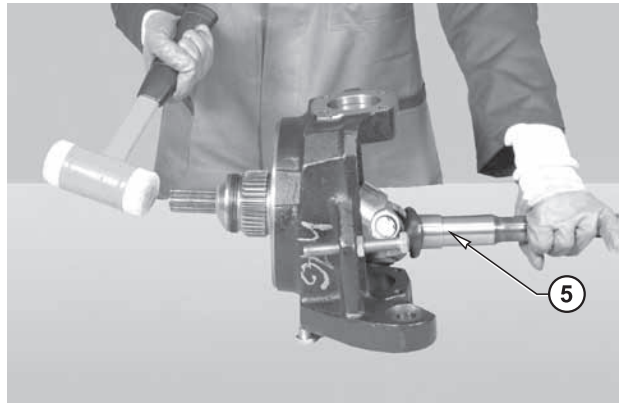
f

I

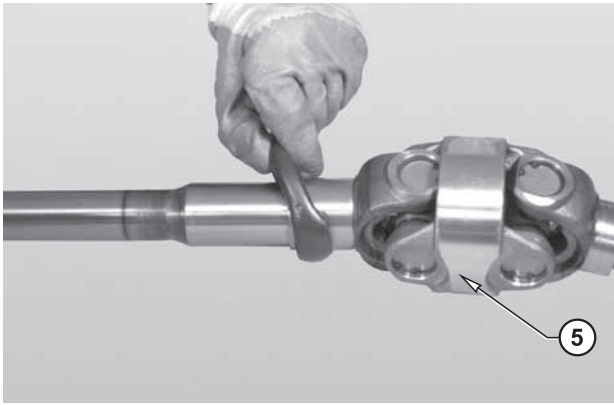
GB



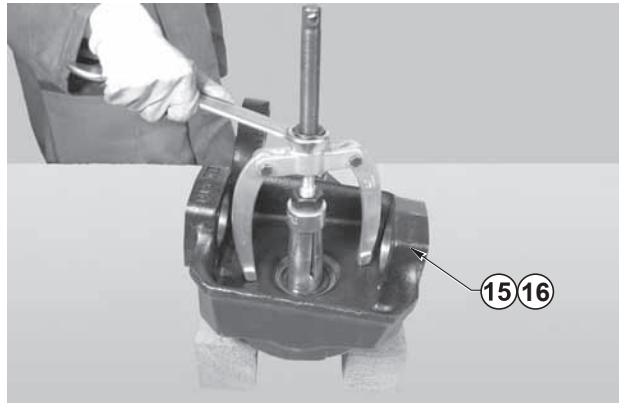
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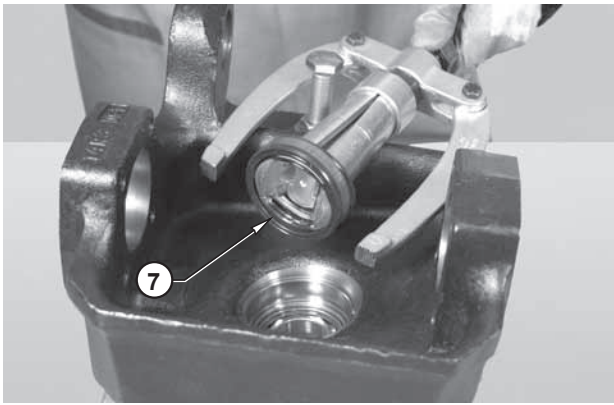
b



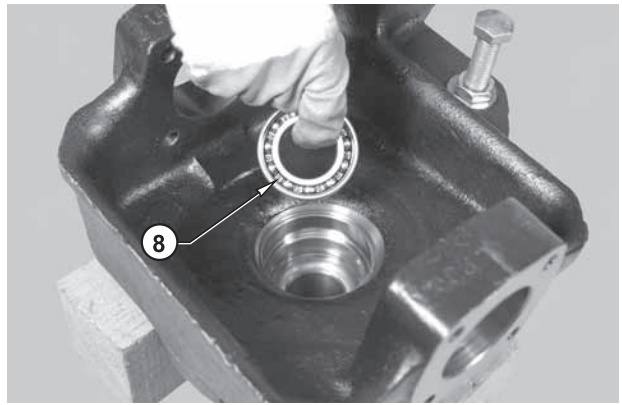
c



d



e



f

a

I Utilizzando un estrattore, rimuovere la bronzina (1).

GB Using an extractor, remove the bushing (1).

b

I Asportare il doppio giunto cardanico (23).

GB Remove the u-joint (5).

c

I Rimuovere anello parapolvere .

GB Remove dust seal ring.

d

I Utilizzando un estrattore, asportare dalla scatola snodo (15)(16) l'anello di tenuta (7).

GB Using a puller, take off the sealing ring (7) from the steering case (15)(16).

f

I Rimuovere cuscinetto (8).

GB Remove the bearing (8).

King pin Preload Drw = 0,3 - 0,4 mm

EXAMPLE

First step Shim = 1,6 mm

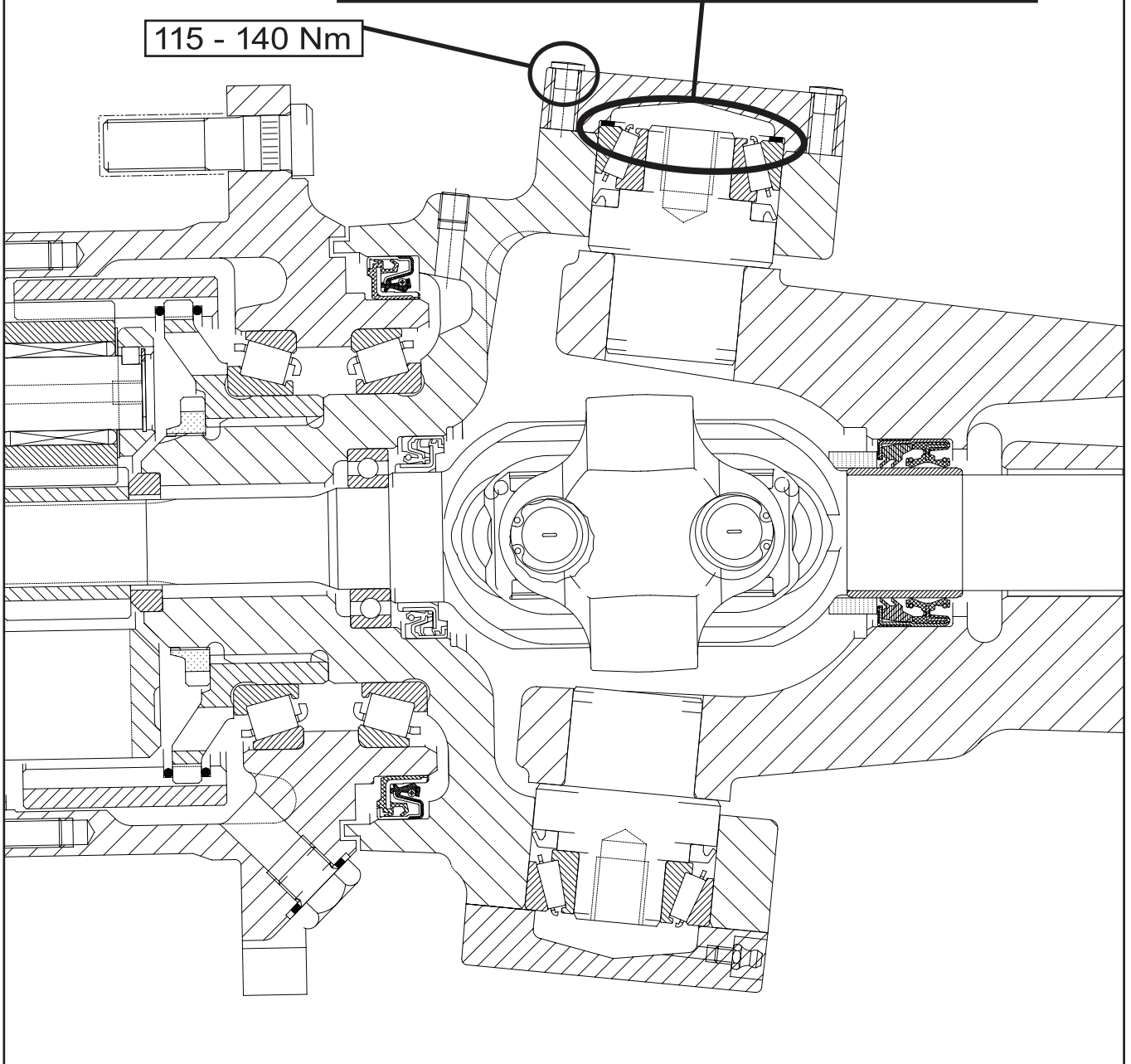
Measured Backlash = 0,5 mm

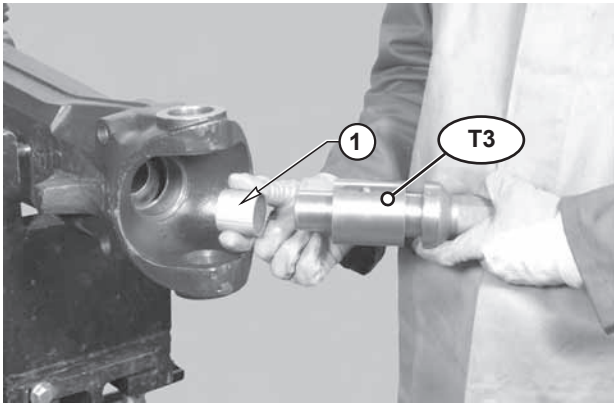
S = First step shim + Measured Backlash + Preload Drw =

S = 1,6 mm + 0,5 mm + 0,4 mm = 2,5 mm

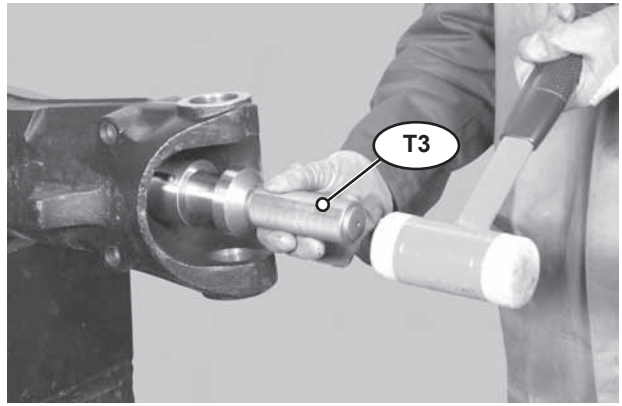
S = 2,5 mm

115 - 140 Nm

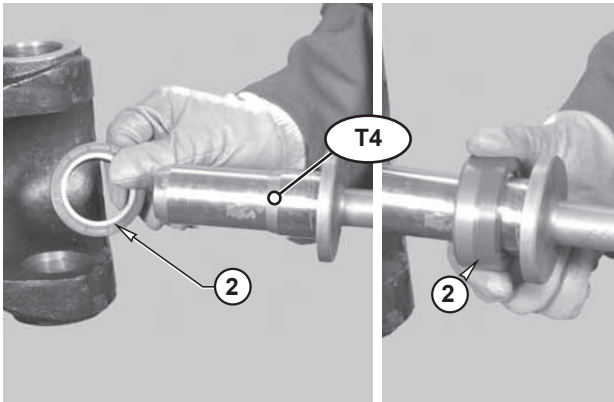




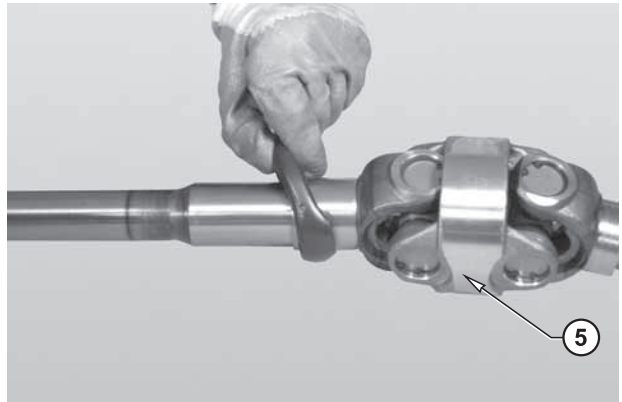
a



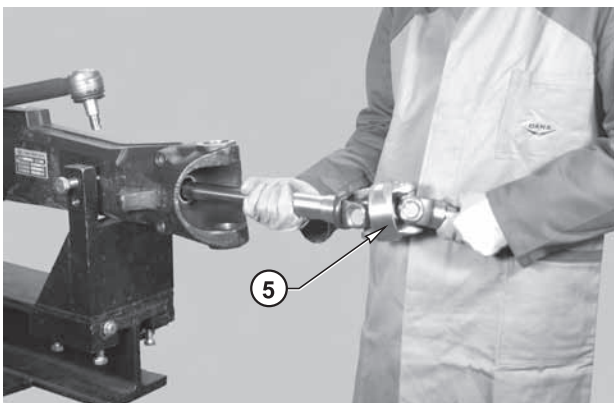
b



c



d



e



f

a

I Utilizzando l'attrezzo T3 montare la bronzina (1).

GB Install the bushing (1), using tool T3.

c

I Lubrificare e montare sull'attrezzo T4 l'anello di tenuta (2); inserire gli anelli nel braccio.

GB Lubricate and fit the sealing ring (2) onto tool T4; install the rings into the arm.

d

I Montare l'anello parapolvere (14).

GB ASSEMBLY the dust sealing ring (14).

e

I Lubrificare il terminale del doppio giunto cardanico (5) e montare nel braccio.

GB Lubricate the terminal of the u-joint (5) and install in the arm.

f

I Lubrificare ed inserire il cuscinetto

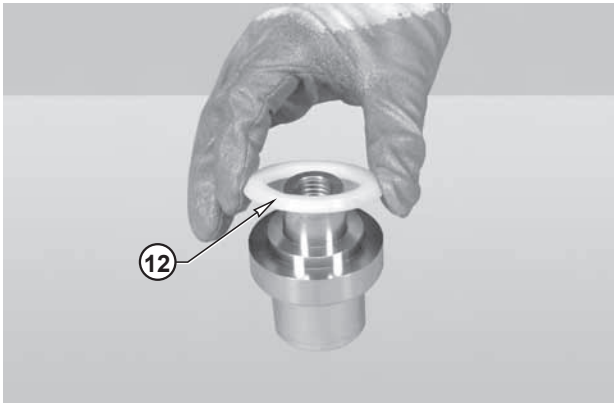
GB Lubricate and install the bearing.



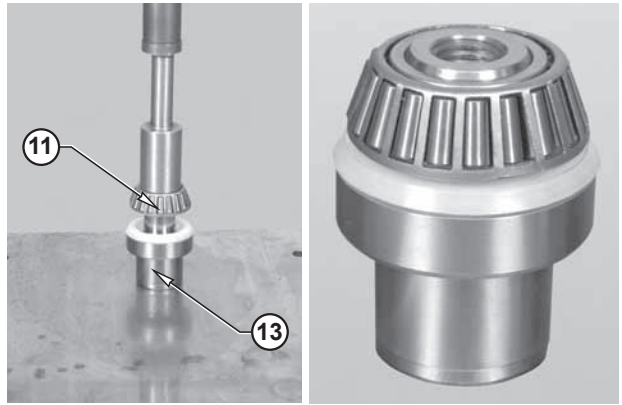
a



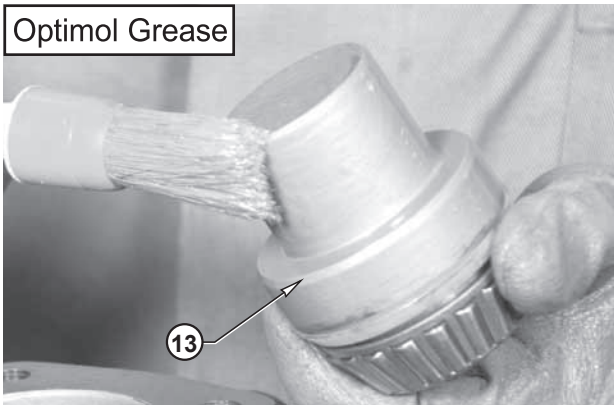
b



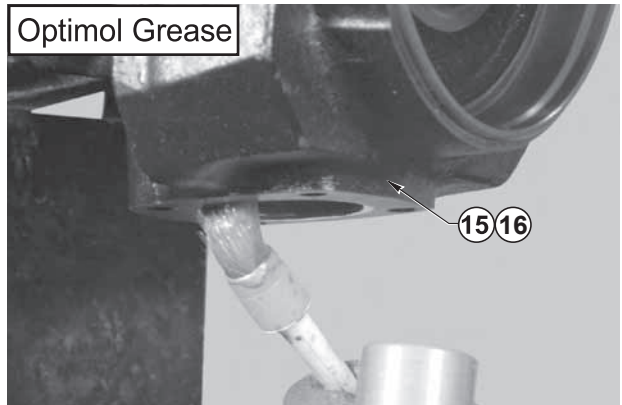
c



d



e



f



a

I Utilizzando un punzone dal diametro adatto, installare nella scatola snodo l'anello di tenuta.

GB Using a suitable diameter tool, install in the steering case the seal ring.

b

I Prestare molta attenzione per non danneggiare gli anelli parapolvere e di tenuta. Installare la scatola snodo (15)(16).

GB Pay attention don't damage the dust cover rings and the sealing rings. Install the steering case (15)(16).

c

I Montare l'anello di tenuta frontale (12).

GB Install the front sealing ring (12).

d

I Pressare a fondo il cuscinetto (11) nel perno snodo (13).

GB Press the bearing (11) on the pivot pin (13).

e

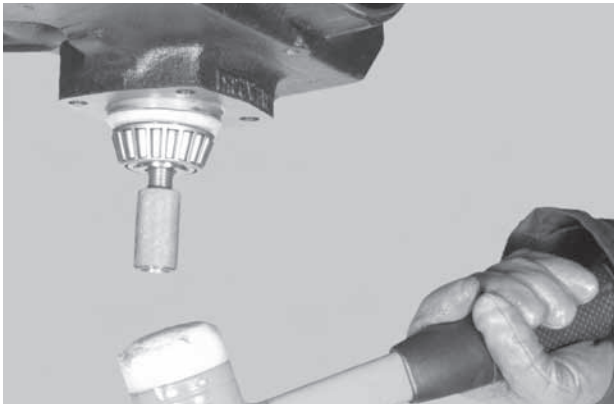
I Lubrificare il perno snodo (13).

GB Lubricate the pivot pin (13).

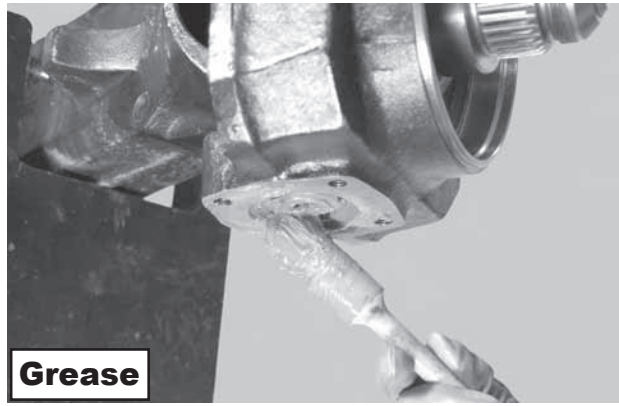
f

I Lubrificare la scatola snodo (15)(16).

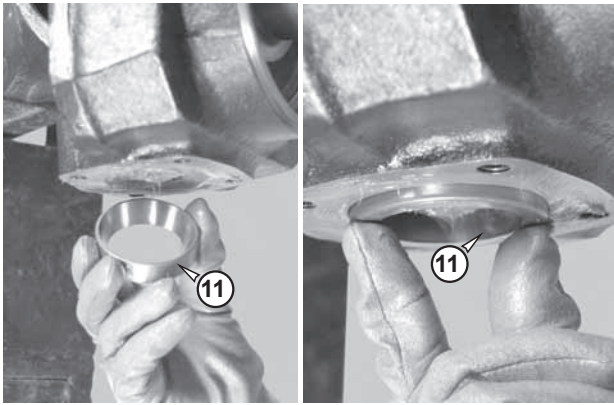
GB Lubricate the steering case (15)(16).



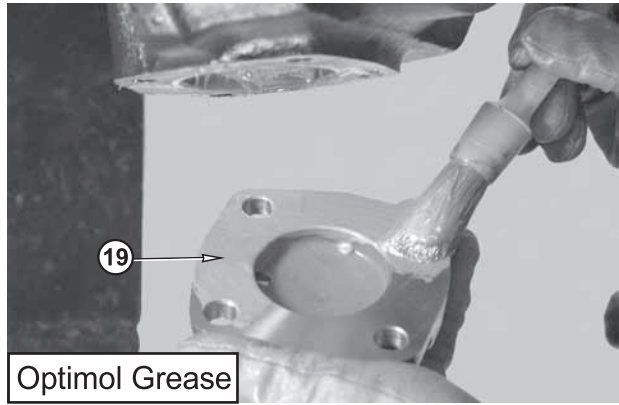
a



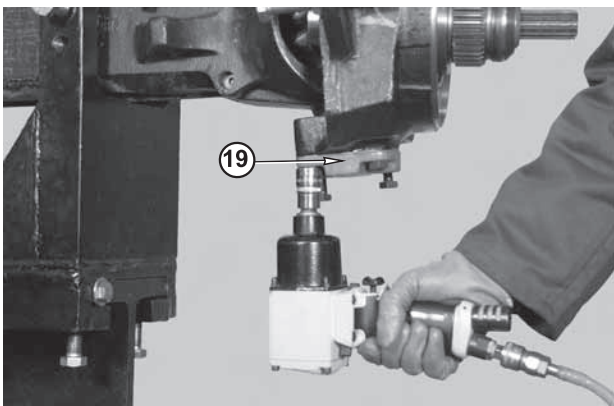
b



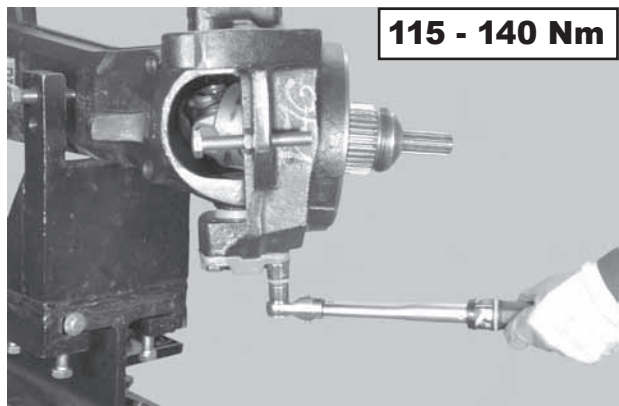
c



d



e



f

a

I Avvitare una barra filettata su un estrattore e montare il perno snodo (13).

GB Screw a threaded bar on a extractor, and install the articulation pin.

b

I Lubrificare con grasso.

GB Lubricate with grease.

c

I Installare la ralla (11).

GB Install the thrust block (11).

d

I Lubrificare il coperchio (19).

GB Lubricate the cover (19).

e

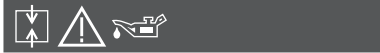
I Montare il coperchio (19).

GB Install the cover (19).

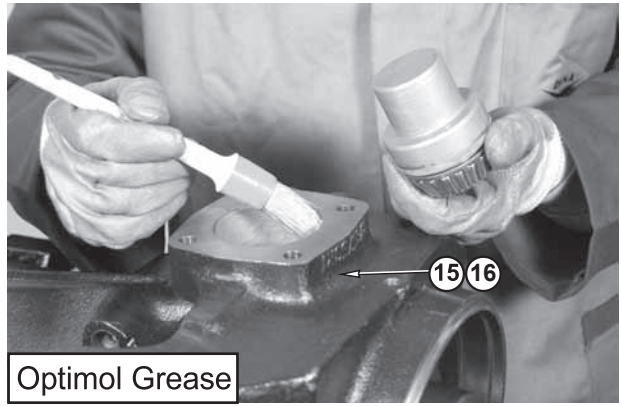
f

I Coppia di serraggio viti: 115 ± 140 Nm

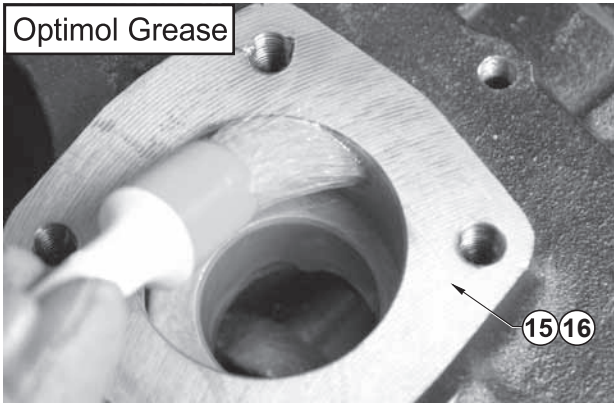
GB Torque wrench setting for screws: 115 ± 140 Nm



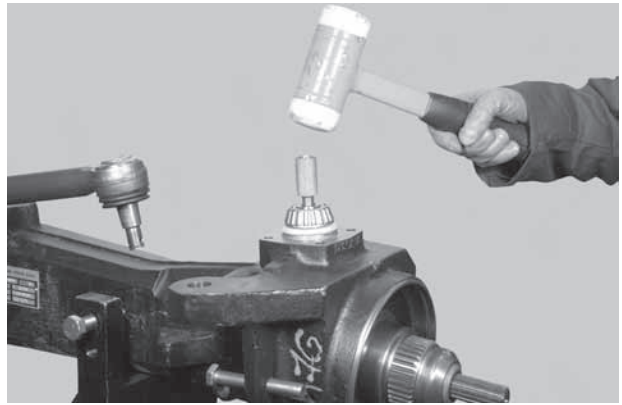
a



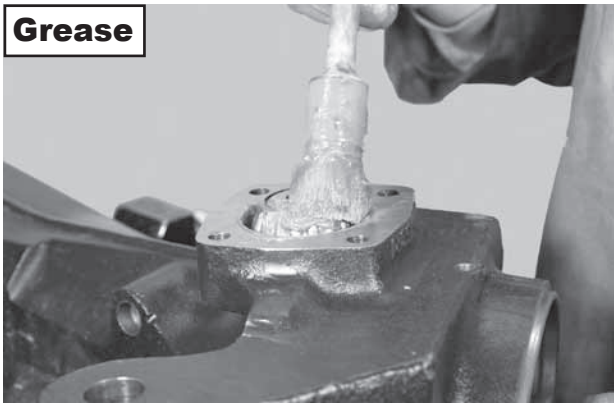
b



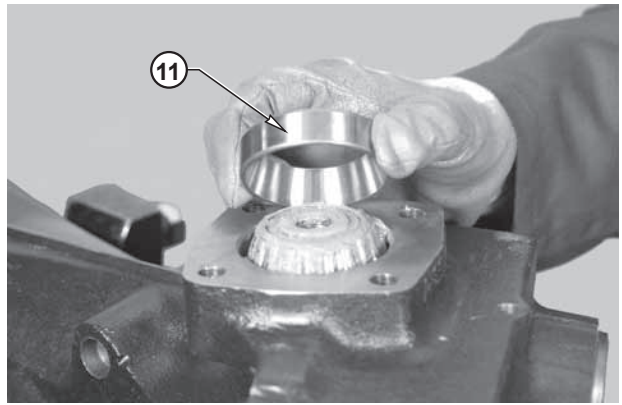
c



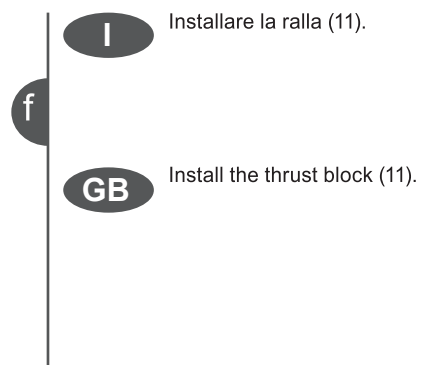
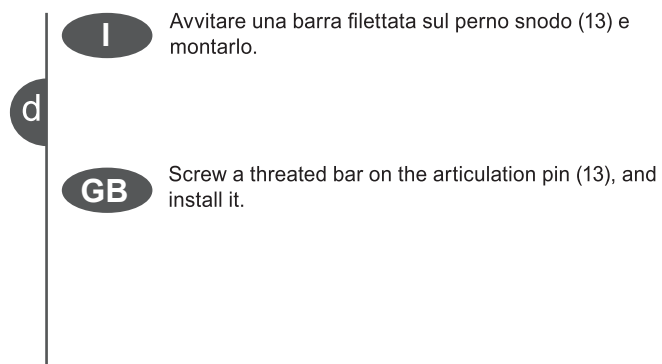
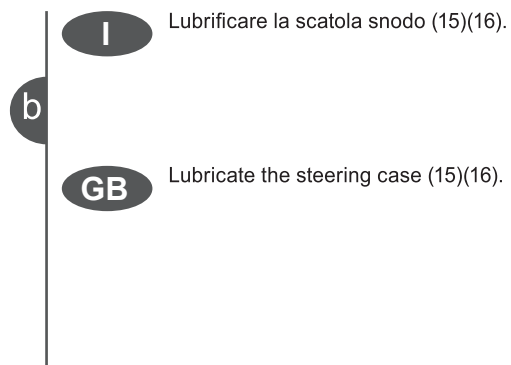
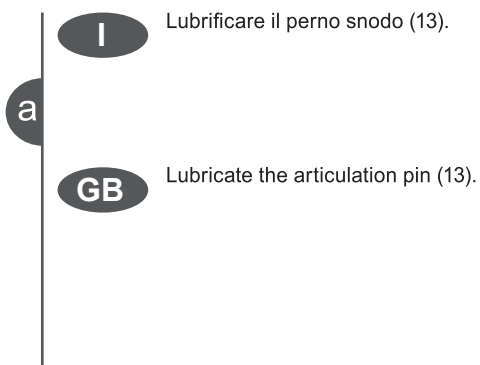
d

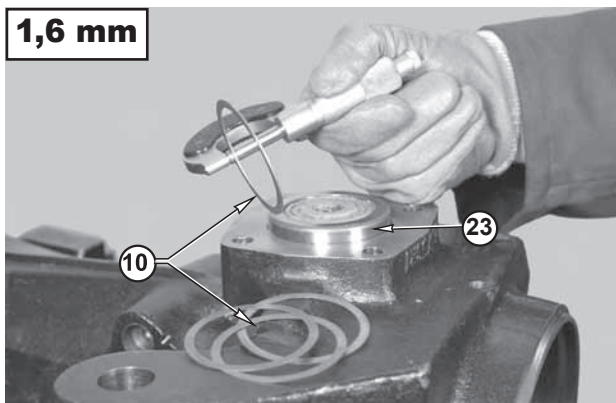


e

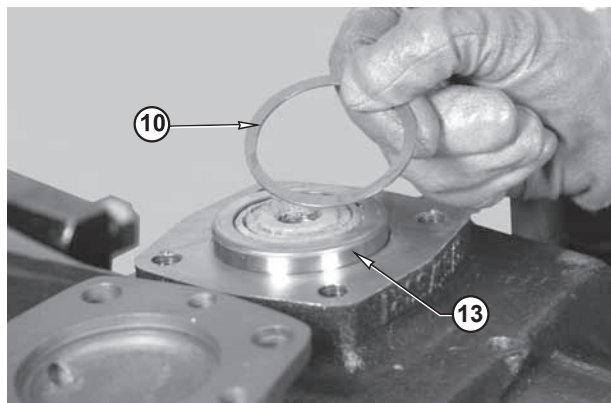


f

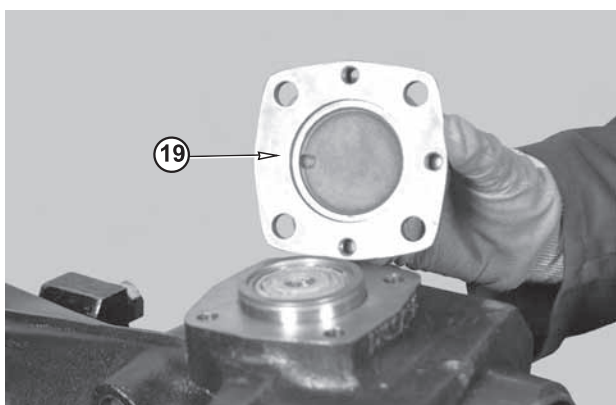




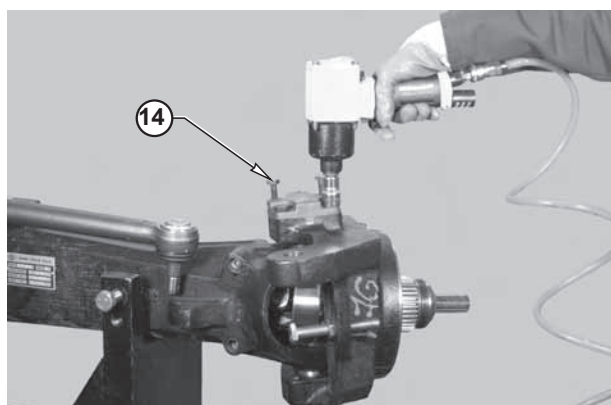
a



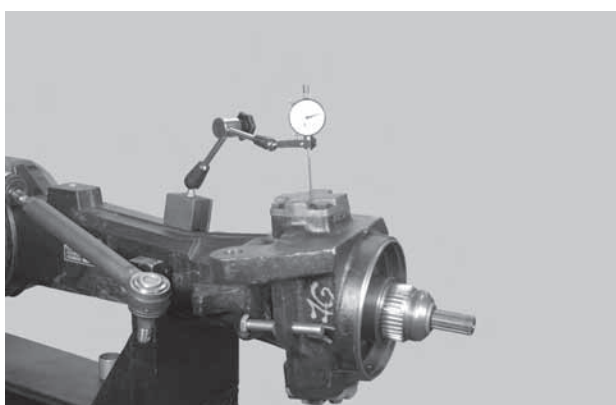
b



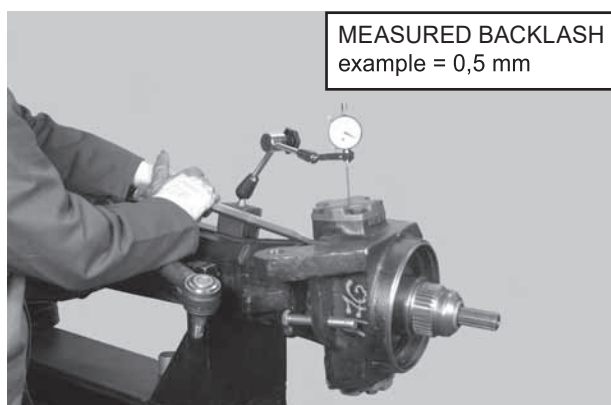
c



d



e



f

- a**
- I** Preparare una serie di spessori da 1,6 mm (10) da montare sopra il perno superiore (13).
 - GB** Prepare a series of shims (10) of 1,6 mm. to be ASSEMBLYd above the upper pin (13).

- c**
- I** Montare il coperchio (19).
 - GB** Install the cover (19).

- d**
- I** Fissare le viti (14).
 - GB** Fix the screws (14).

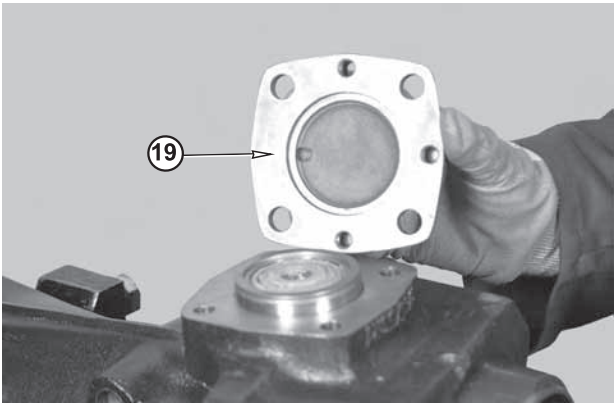
- e**
- I** Posizionare un comparatore a tasto orientabile.
 - GB** Position comparator.

- f**
- I** Con l'aiuto di una leva verificare il gioco.
 - GB** Check by means of a lever the vertical gap.

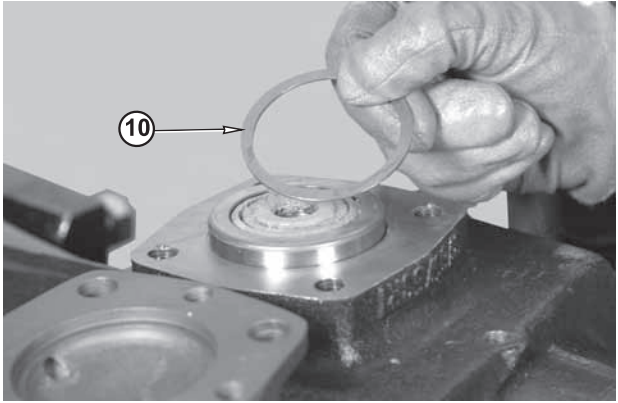
King pin Preload Drw = 0,3 - 0,4 mm
EXAMPLE
First step Shim = 1,6 mm
Measured Backlash = 0,5 mm
S = First step shim + Measured Backlash + Preload Drw =
S = 1,6 mm + 0,5 mm + 0,4 mm = 2,5 mm
S = 2,5 mm



a



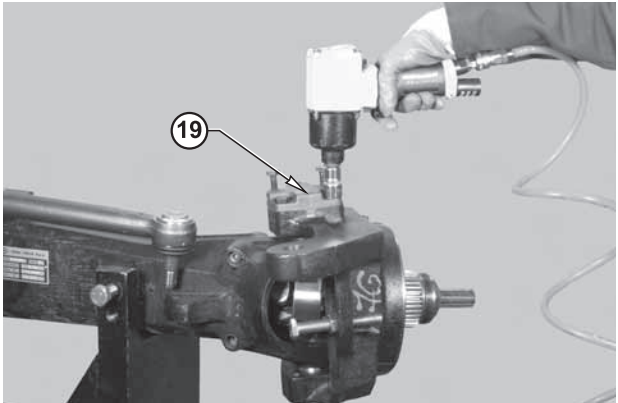
b



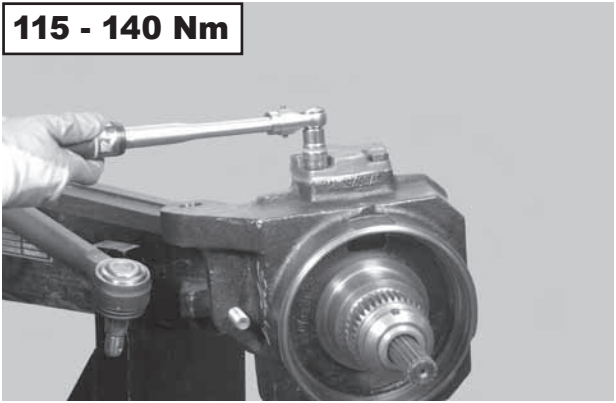
c



d



e



f

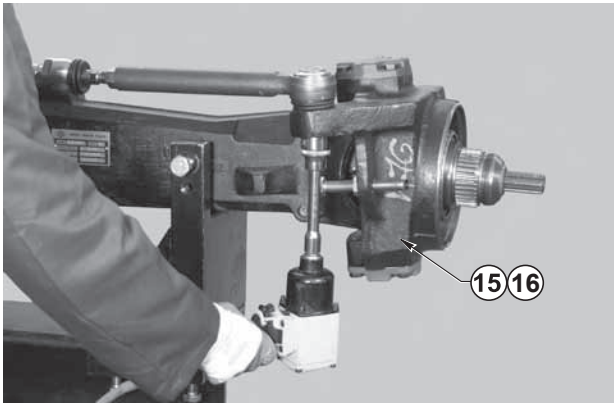
- a
- I Eseguire la somma delle misure **"First step shim"**, **"Measured Backlash"** e **Preload Drw** per stabilire la misura "S" dello spessore (10) da inserire.
 - GB Calculate the sum between sizes **"First step shim"**, **"Measured Backlash"** and **"Preload Drw"** so as to obtain the size "S" of the shim (10) that will go under the king pin.

- b
- I Rimuovere il coperchio (19).
 - GB Remove the cover (19).

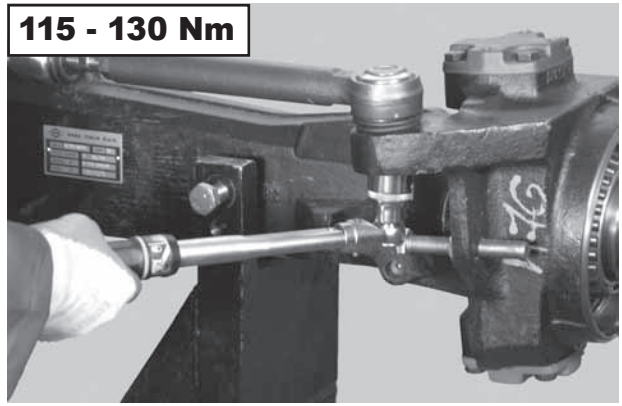
- c
- I Montare gli spessori S (10).
 - GB Install the shims S (10).

- e
- I Montare il coperchio (19).
 - GB Install the cover (19).

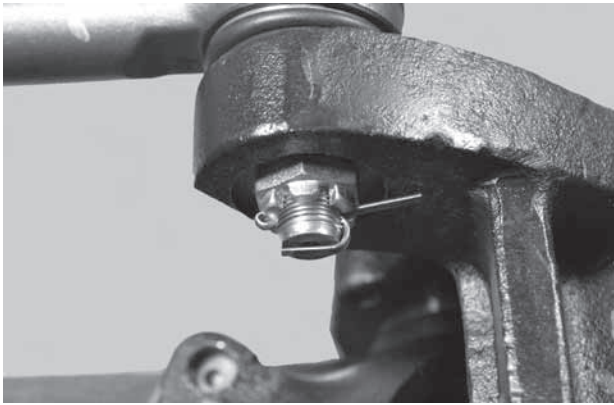
- f
- I Coppia di serraggio viti: 115 ± 140 Nm
 - GB Torque wrench setting for screws: 115 ± 140 Nm



a



b



c

a

I Fissare i dadi di ritegno della scatola snodo (15)(16).

GB Fix the nuts that lock the steering case (15)(16).

b

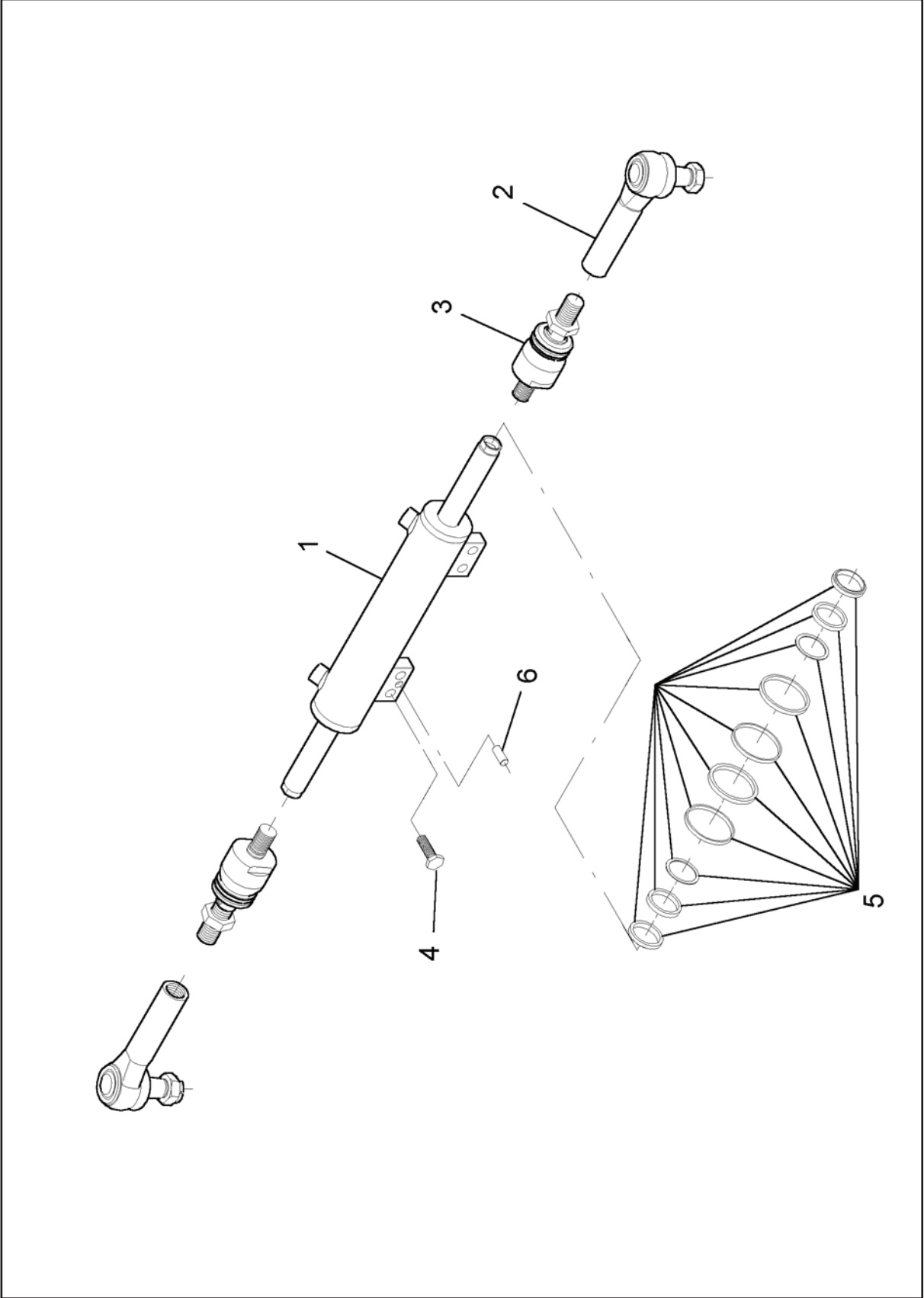
I Coppia serraggio: 115 ± 130 Nm

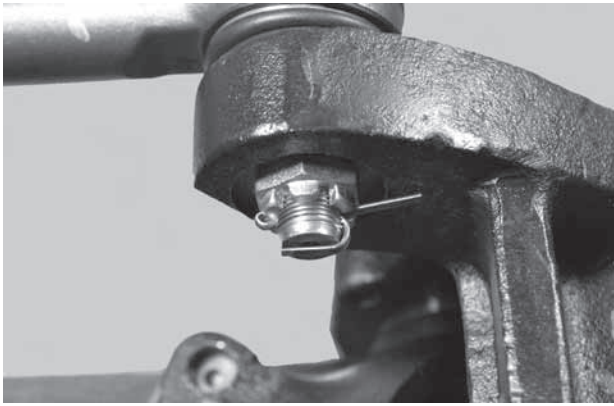
GB Torque wrench setting: 115 ± 130 Nm

c

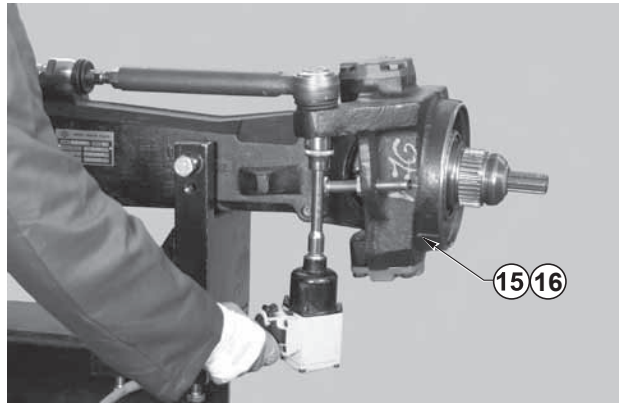
I Montare le copiglie di sicurezza.

GB Insert the safety cotter pins.

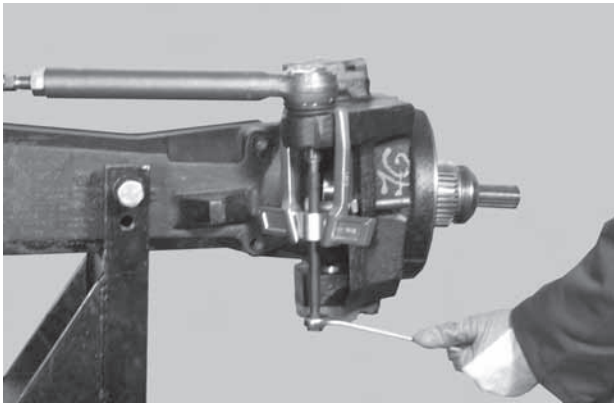




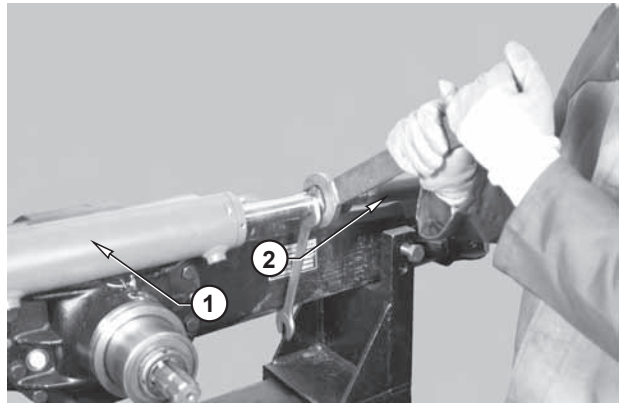
a



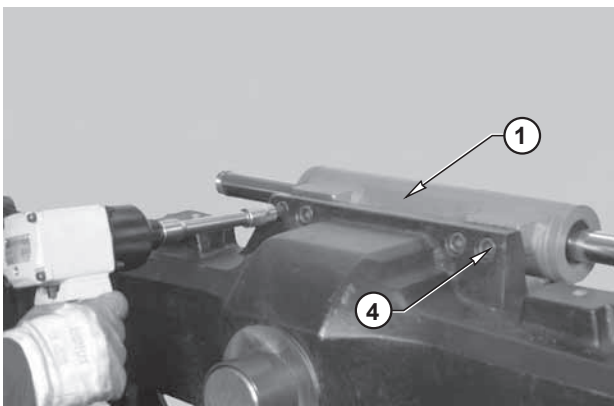
b



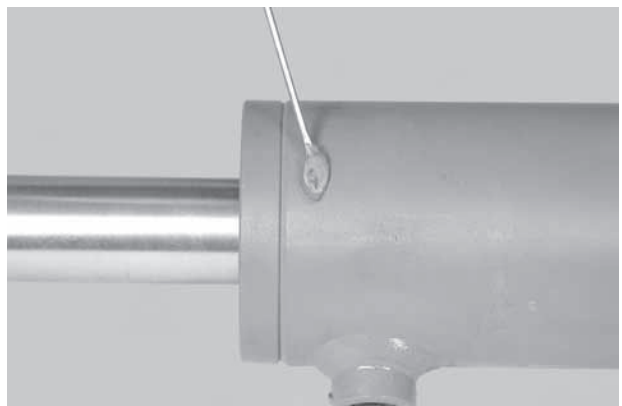
c



d



e



f

a

I Asportare le coppie di sicurezza.

GB Remove the safety cotter pins.

b

I Rimuovere i dadi di ritegno perni snodo (15)(16).

GB Remove the nuts that lock the steering case (15)(16).

c

I Utilizzando un estrattore, scollegare i perni conici dello snodo sterzo dalla scatola snodo.

GB Disconnect the tapered pins of the articulation from the steering case by means of a puller.

d

I Scollegare dal pistone (1) le barre di sterzata (3) .

GB Disconnect steering bars (2) from the piston (1).

e

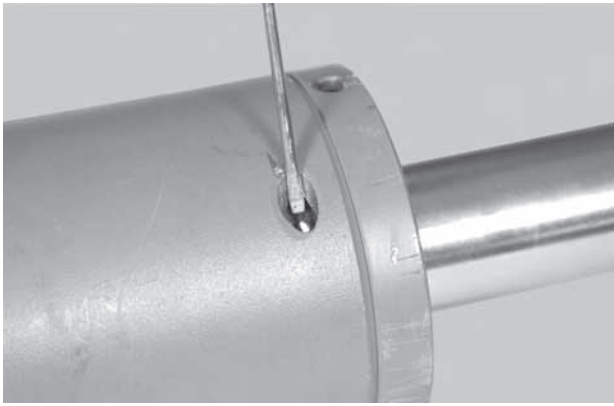
I Asportare le viti (4) di fissaggio del cilindro di sterzata (1).

GB Remove the securing screws (4) from the steering cylinder (1).

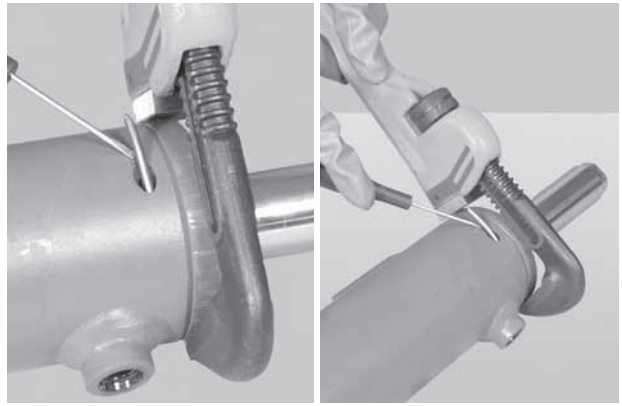
f

I Rimuovere il sigillante.

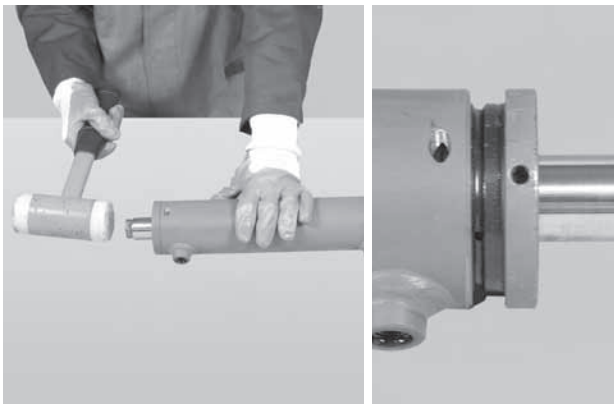
GB Remove the sealant.



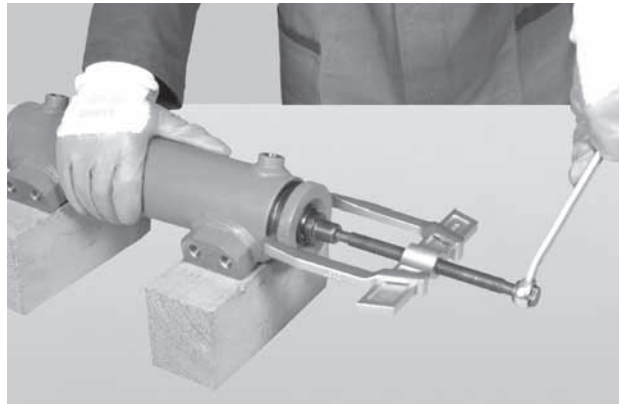
a



b



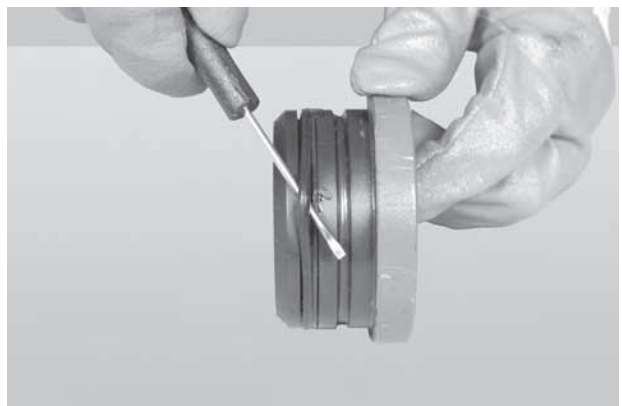
c



d



e



f

a

I Posizionare un cacciavite sul foro di installazione per aiutare l' uscita dell' anello di fermo.

GB Position a screw drive on the installation hole.

b

I Utilizzando una chiave inglese, ruotare la testata fino alla completa fuoriuscita dell' anello di fermo.

GB Using a universal screw wrench, rotate the cylinder head for remove the snap ring.

c

I Con un mazzuolo in materiale plastico, mandare in battuta il pistone (5) a ridosso della testata (2). Proseguire fino all'espulsione della testata (2) dal cilindro (3).

GB Hammer the piston (5) on the rear of the head (2) using a plastic hammer. Continue hammering until the head (2) is ejected from the cylinder (3).

d

I Utilizzare un estrattore per rimuovere la testata.

GB Use an extractor for remove the cylinder head.

e

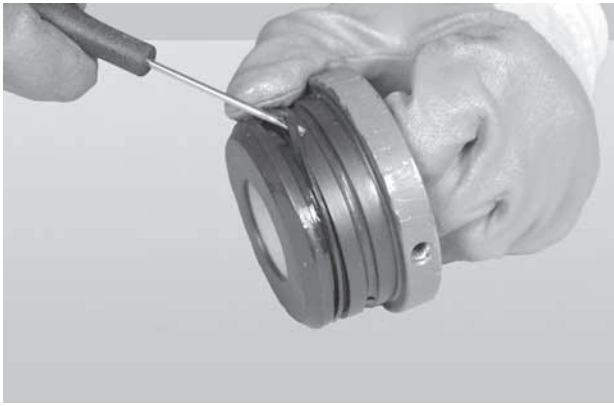
I Smontare la testata del cilindro (9).

GB Remove the cylinder head .

f

I Smontare l'anello esterno (14) della testata del cilindro.

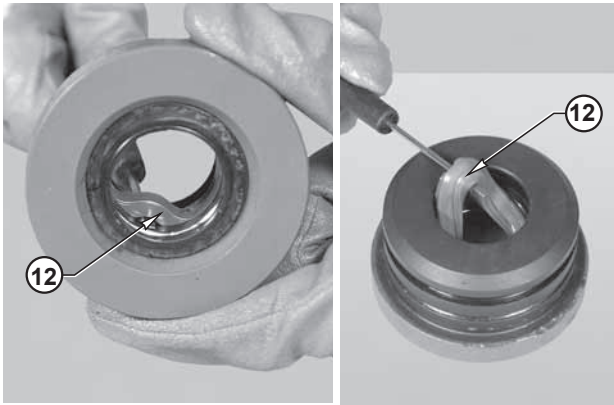
GB Remove the outer ring (14) of the cylinder head.



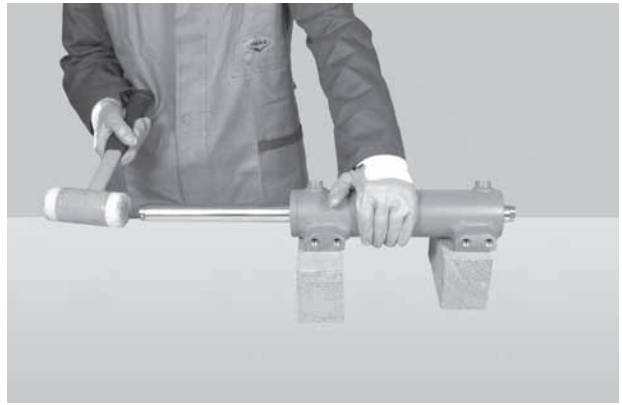
a



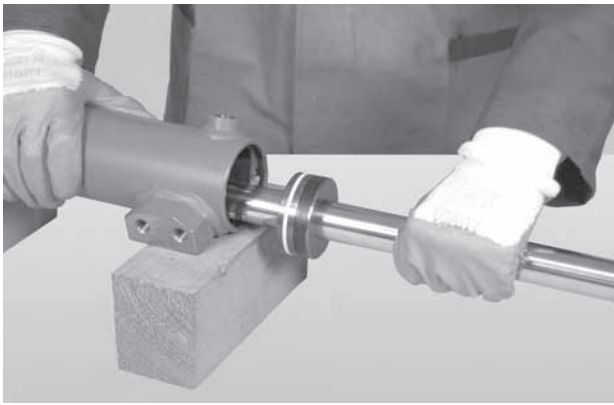
b



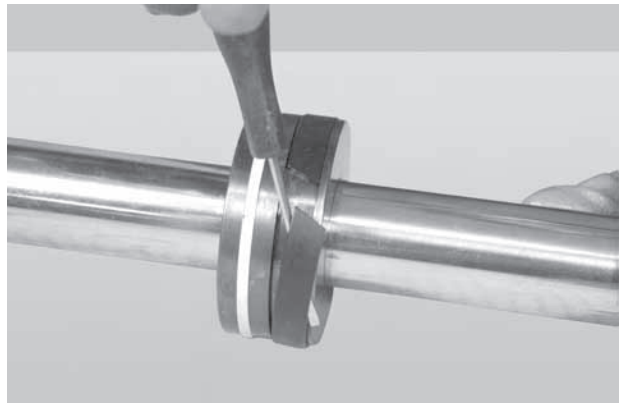
c



d



e



f

a

I Smontare l'anello anti-estrusione (14) della testata del cilindro.

GB Remove the back-up ring (14) of the cylinder head.

b

I Smontare l'anello guida (9) della testata del cilindro.

GB Remove the guiding ring (9) of the cylinder head.

c

I Smontare l'anello di tenuta interno (12) della testata del cilindro.

GB Remove the inner sealing ring (12) of the cylinder head.

d

I Con un mazzuolo in materiale plastico, mandare in battuta il pistone (18) a ridosso della testata (13).

GB Hammer the piston (18) on the rear of the head (13) using a plastic hammer.

e

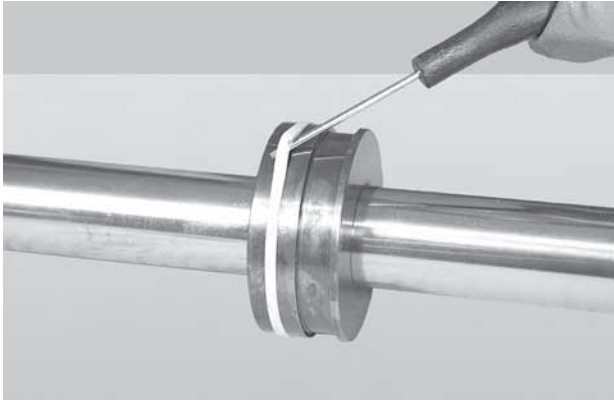
I Rimuovere dalla testata (2), dal cilindro (3) e dal pistone (5) tutte le guarnizioni, gli anelli antiestrusione e gli anelli raschiatori.

GB DisASSEMBLY the cylinder unit (3) by extracting first the head (2), then the piston (5).

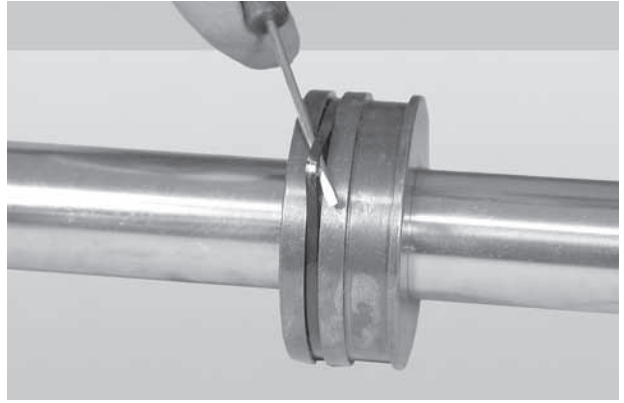
f

I Smontaggio anelli guida (20) e (21) dello stelo (13) del cilindro.

GB Removal of the guiding rings (20) of the cylinder rod (13).



a



b

a

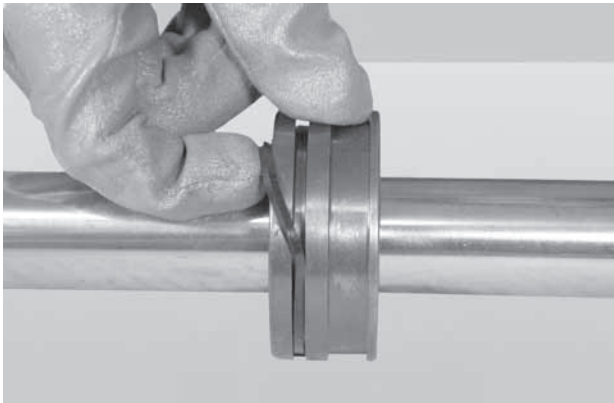
I Smontare gli anelli di tenuta (16) dello stelo.

GB Remove the rod sealing rings (16).

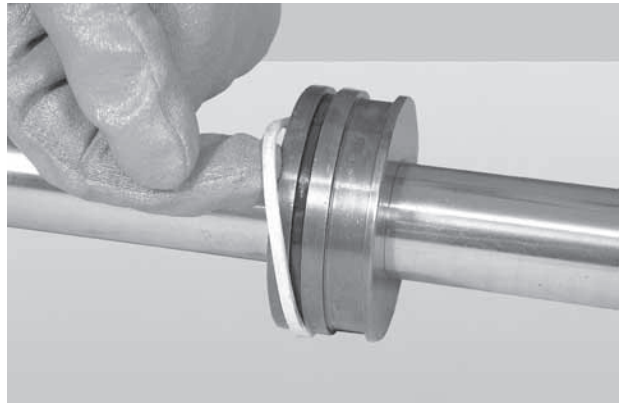
b

I Smontare gli anelli OR (17)

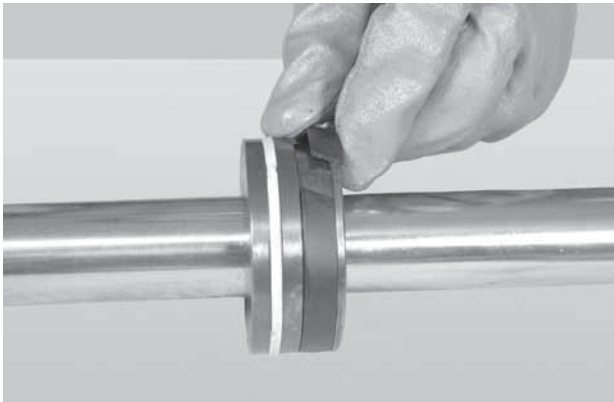
GB Remove the O-rings (17).



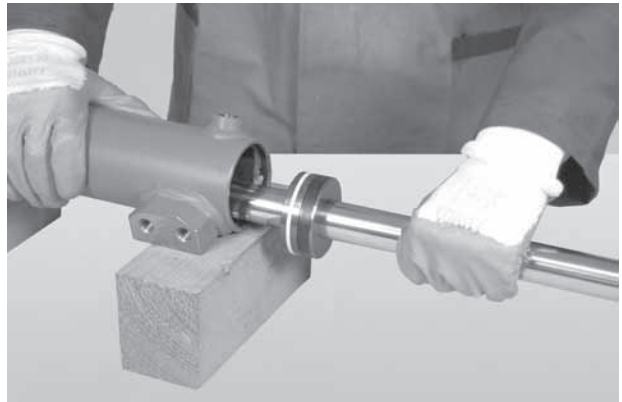
a



b



c



d



e



f

a

I Montare gli anelli OR (17)

GB Install the O-rings (17).

b

I Montare gli anelli di tenuta (16) dello stelo.

GB Install the rod sealing rings (16).

c

I Montare anelli guida (20) dello stelo (13) del cilindro.

GB Install of the guiding rings (20) of the cylinder rod (13).

d

I Con un mazzuolo in materiale plastico, inserire il pistone (18) nel cilindro.

GB Push the piston (18) into the cylinder using a plastic hammer.

e

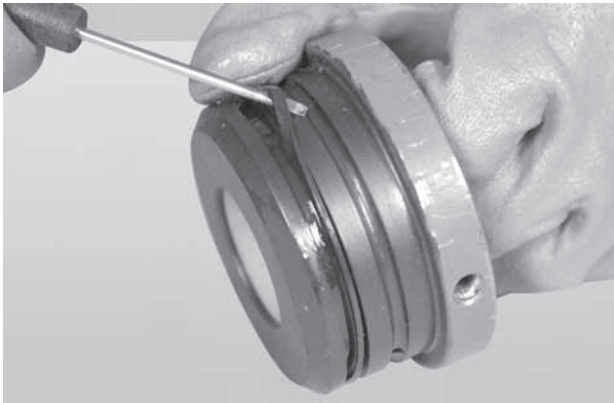
I Montare l'anello di tenuta interno (12) della testata del cilindro.

GB Install the inner sealing ring (12) of the cylinder head.

f

I Installare nella testata (13) l'anello guida (9). ATTENZIONE! Controllare attentamente il posizionamento dell'anello guida (9).

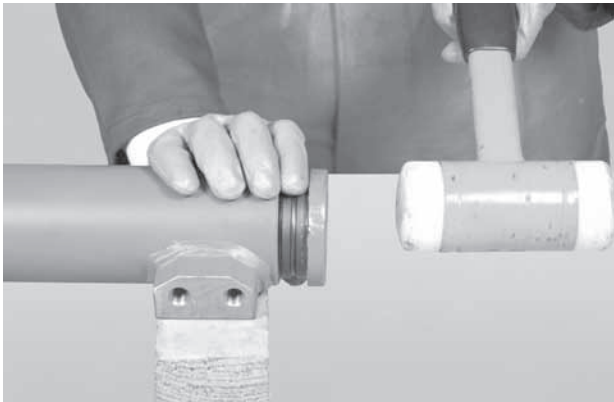
GB Install the guiding ring (9) inside in the head (13). CAUTION! Thoroughly check that positioning is correct.



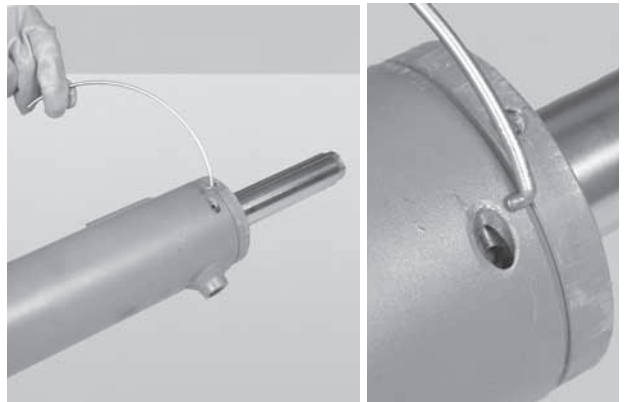
a



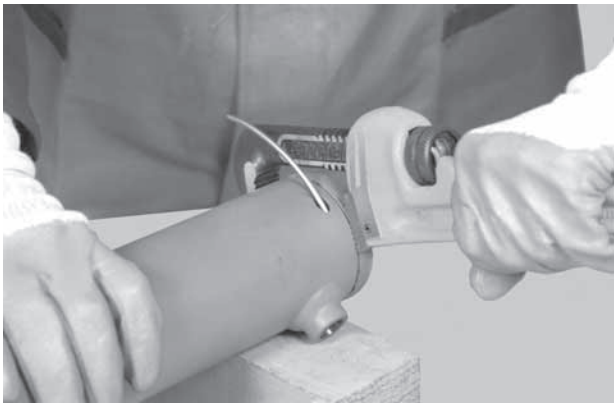
b



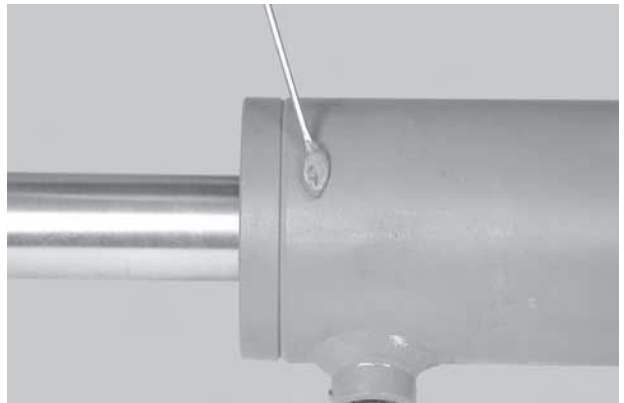
c



d



e



f

a

I Installare l' anello anti-estrusione sulla testata.

GB Install the back-up ring on the cylinder head.

b

I Installare l' OR.

GB Install the O-ring.

c

I Lubrificare con grasso le guarnizioni della testata (13), infilarla sul pistone (18) e, con un mazzuolo in materiale plastico, inserirla nel cilindro (15).

GB Apply grease to head (13) seals, fit the head onto the piston and push it into the cylinder (15) using a plastic hammer.

d

I Inserire l'anello di arresto (8) assicurandosi che si assesti nella sede della testata (15).

GB Introduce the stop ring (8) and ensure that it sets in the seat of the head (15).

e

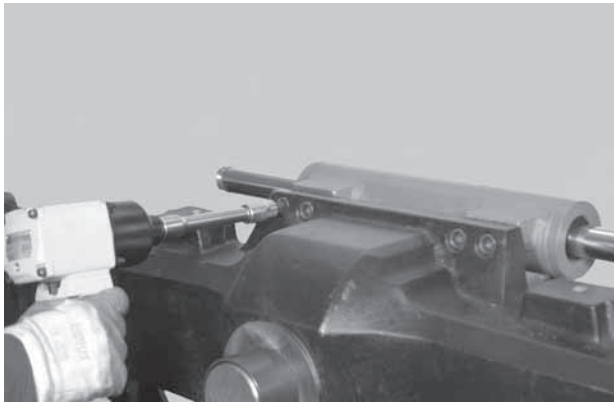
I Usando una chiave inglese, rotare la testata fino al completo inserimento dell' anello di fermo.

GB Using a universal screw wrench, rotate the cylinder head to complete the insertion of the snap ring.

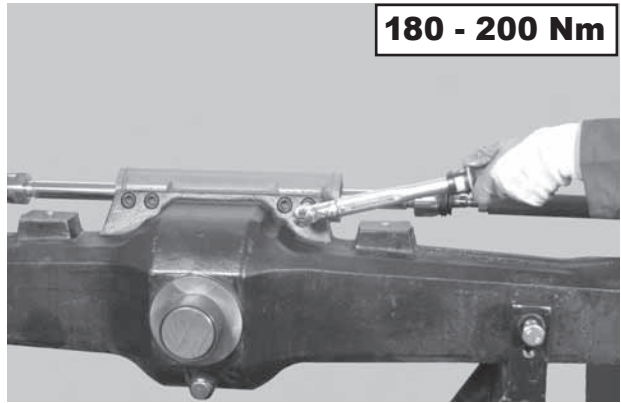
f

I Sigillare con silicone.

GB Seal the hole with silicon.



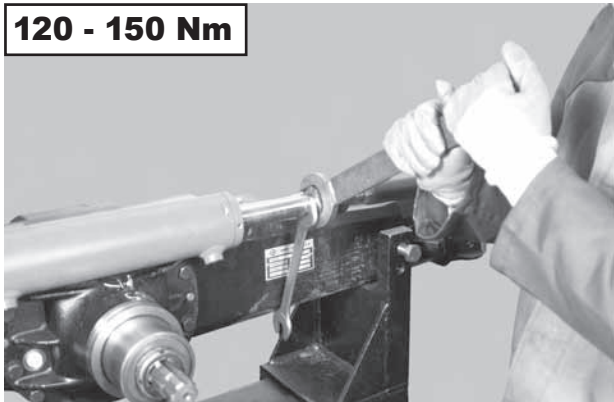
a



180 - 200 Nm



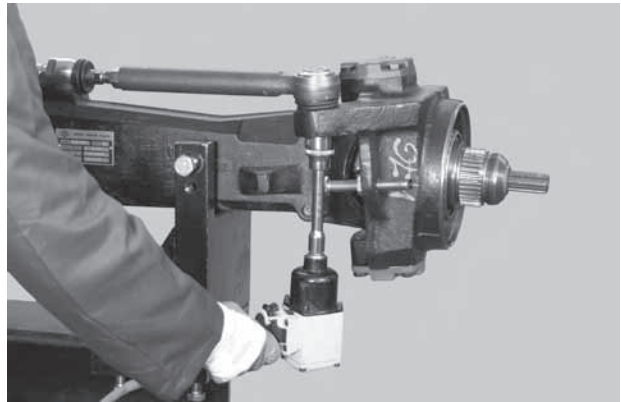
b



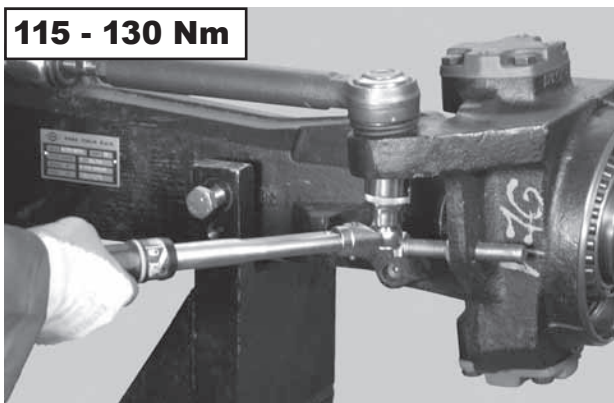
120 - 150 Nm



c



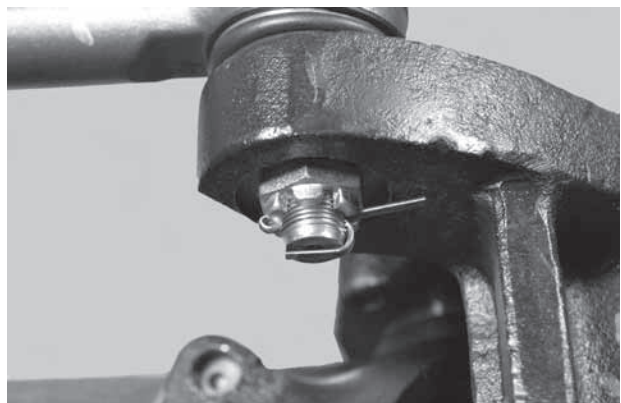
d



115 - 130 Nm



e



f

a

I Bloccare il cilindro con le viti (4) serrate con il metodo incrociato.

GB Lock the cylinder by cross-tightening the screws (4).

b

I Coppia di serraggio: 180 - 200 Nm

GB Torque wrench setting: 180 - 200 Nm

c

I Spalmare la filettatura con LOXEAL e collegare le barre di sterzata avvitando nello stelo del pistone i terminali.

Coppia di serraggio: 120 - 150 Nm Nm

GB Apply LOXEAL to the thread and connect the steering bars by screwing the terminals onto the piston stem.
Torque wrench setting: 120 - 150 Nm

d

I fissare i dadi di ritegno perni snodo.

GB Fix the nuts that lock the articulation pins.

e

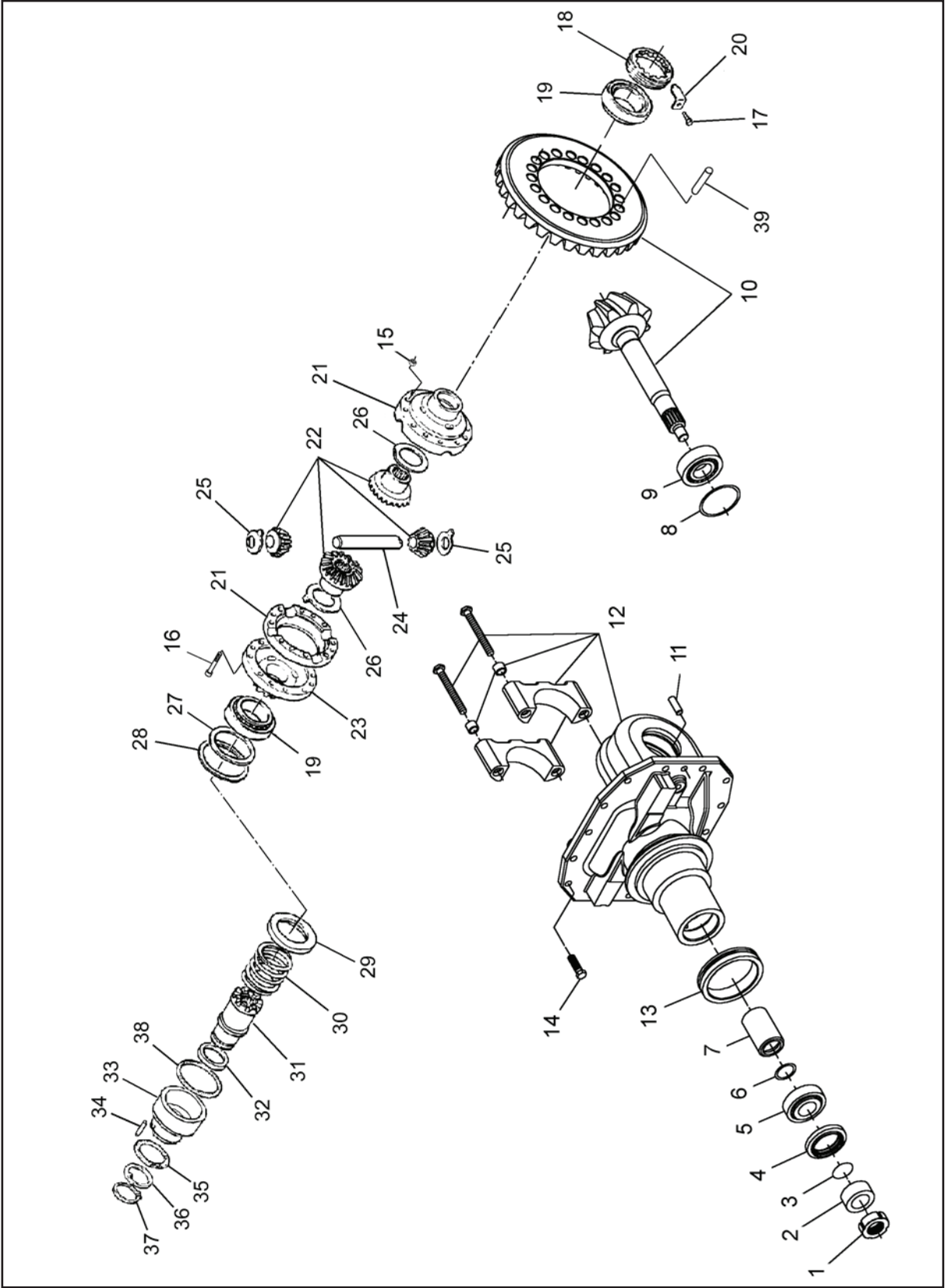
I Coppia serraggio: 115-130 Nm

GB Torque wrench setting: 115-130 Nm

f

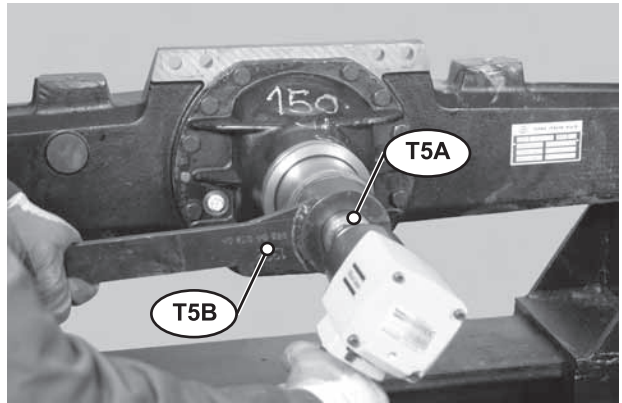
I Montare le copiglie di sicurezza.

GB Insert the safety cotter pins.

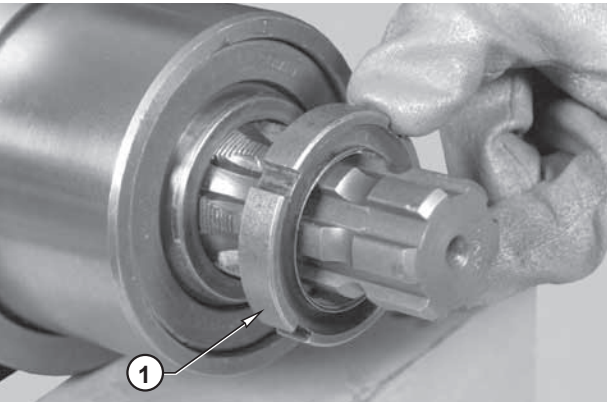




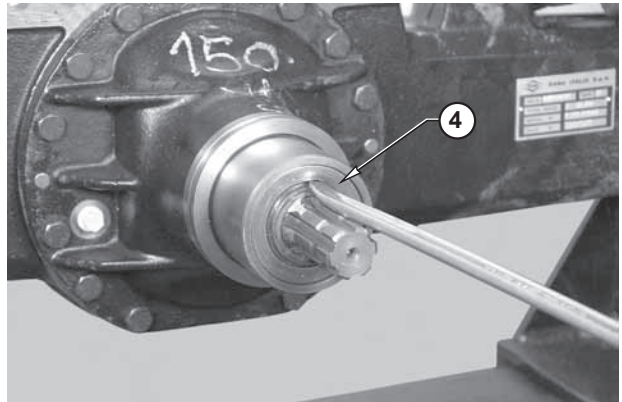
a



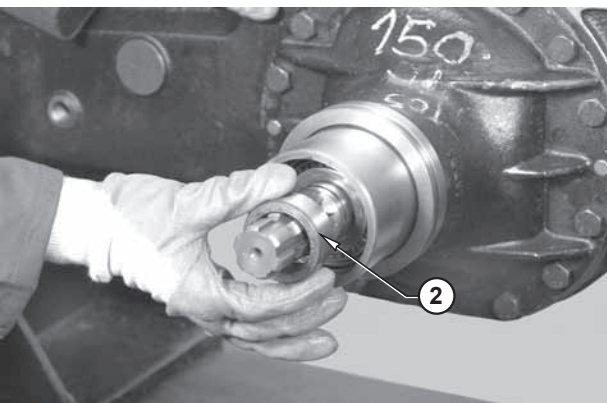
b



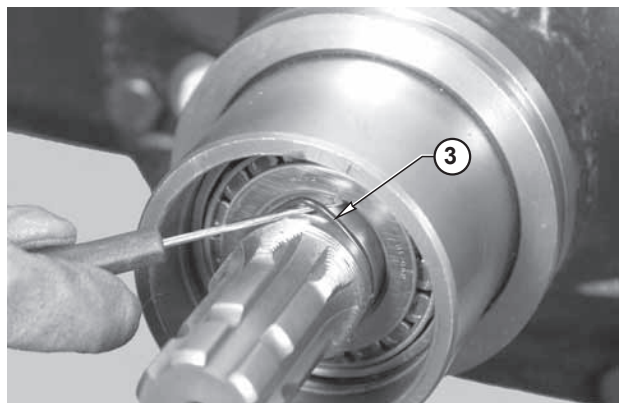
c



d



e



f



- a**
- I** Rimuovere totalmente la cianfrinatura, onde evitare lo sfilamento del pignone durante la rimozione della ghiera (36).
 - GB** Remove the calking in order to preserve the screw cutting of the pinion during the ring nut (36) removal.

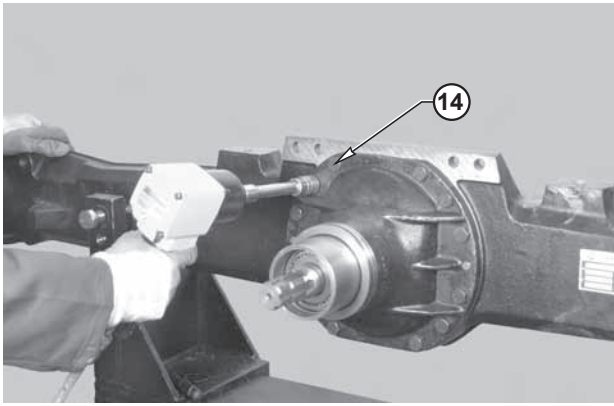
- b**
- I** Impegnare la chiave speciale T5B sulla ghiera (1) ed applicare sul pignone (10) il codolo T5A. Fermare la chiave T5A e ruotare il pignone per allentare ed asportare la ghiera (1).
NOTA. Se lo smontaggio risulta faticoso, scaldare la ghiera a circa 80C°.
 - GB** Position wrench T5B onto the ring nut (1) and apply bar hold T5A to the pinion (10). Stop wrench T5B and rotate the pinion so as to release and remove the ring nut (1). **NOTE.** If disassembly proves awkward, weld the ring nut at approx. 80C°.

- c**
- I** Rimuovere la ghiera (1).
 - GB** Remove the ring nut (1).

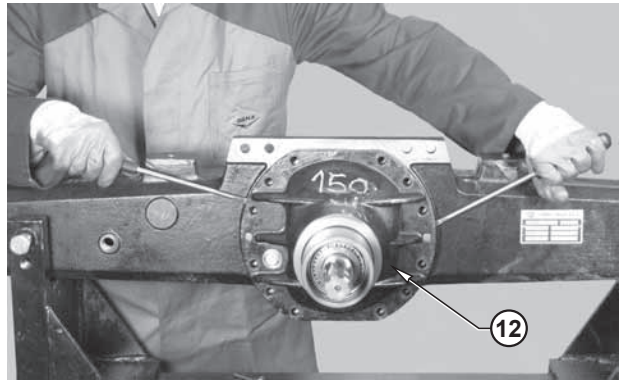
- d**
- I** Utilizzando una leva adatta, rimuovere l'anello di tenuta (4).
 - GB** Using a lever, remove the sealing ring (4).

- e**
- I** Rimuovere lo spessore (2)
 - GB** Remove the spacer (2).

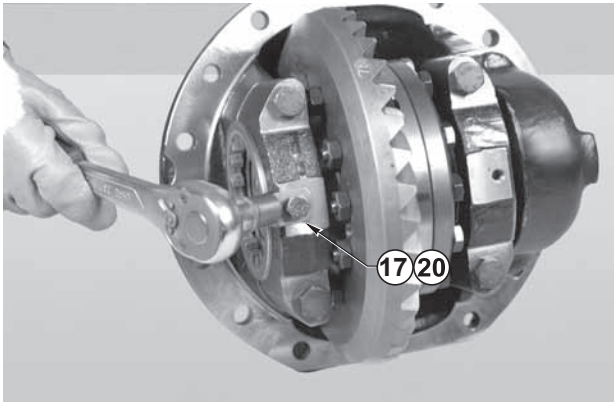
- f**
- I** Smontare l' anello OR (3)
 - GB** Remove the O-ring (3).



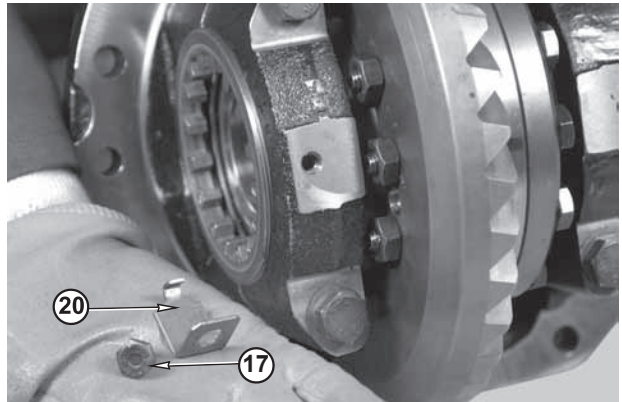
a



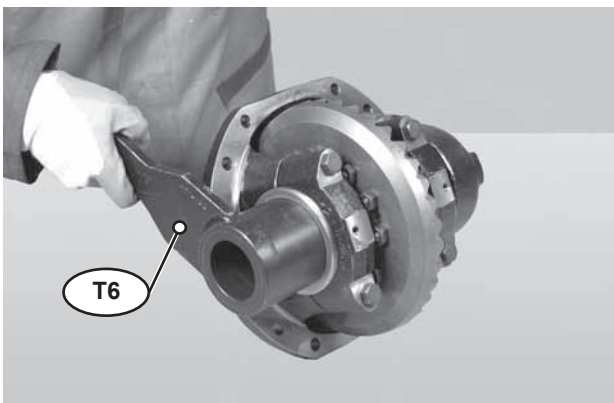
b



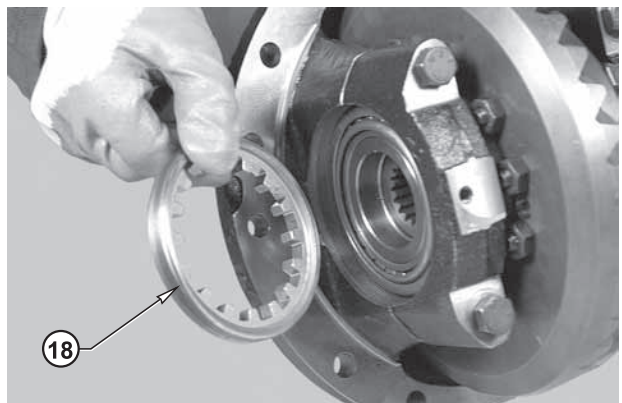
c



d



e



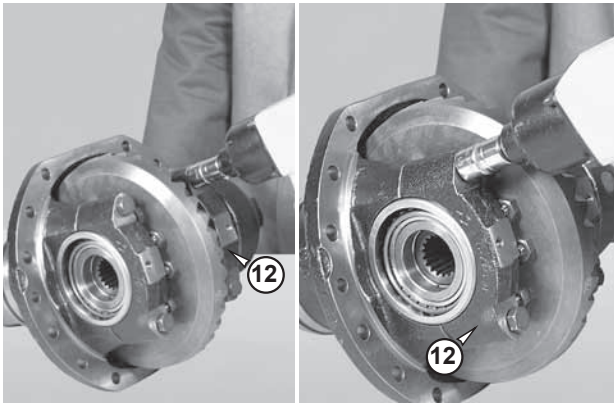
f

- a**
- I** Imbragare il gruppo completo (12) e collegarlo al mezzo di sollevamento mettendo in leggera tensione la fune.
 - GB** Sling the entire unit (12) and connect it to the hoist, putting the rod under light tension. Remove the screws (14).

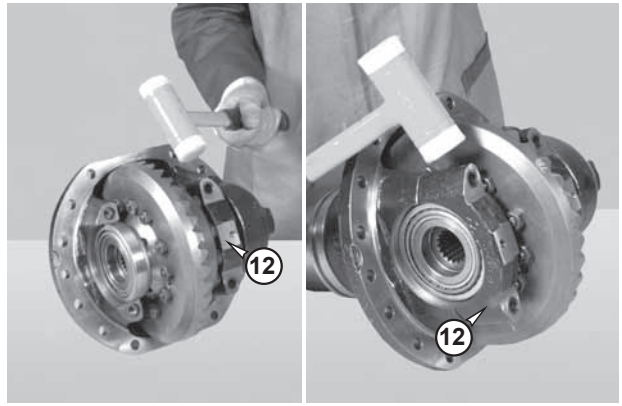
- b**
- I** Rimuovere coperchio (12) dal corpo centrale.
 - GB** Using two levers, remove the cover (12) from the central body.

- c**
- I** Rimuovere le viti di fissaggio della ghiera.
 - GB** Remove the screw (17)(20).

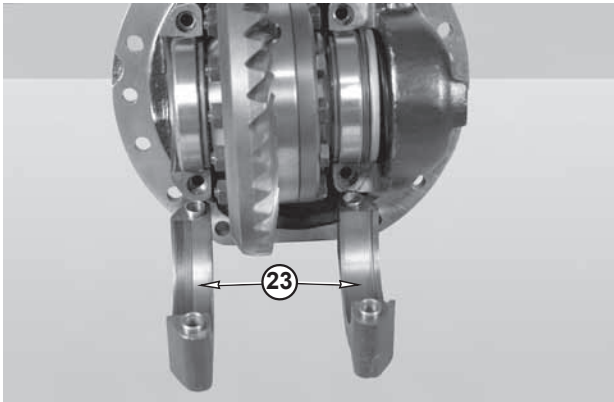
- e**
- I** Utilizzando l'attrezzo speciale T6 rimuovere la ghiera (18).
 - GB** Using special tool T6 remove the ring nut (18).



a



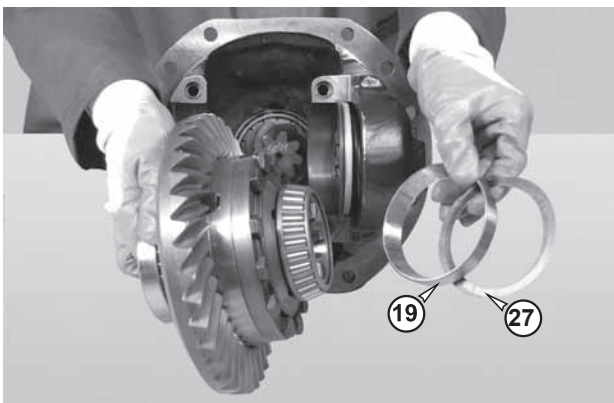
b



c



d



e



f

a

I Rimuovere i dadi (12).

GB Remove the bolts (12).

b

I Rimuovere i supporti differenziale (12).

GB Remove the differential support (12).

d

I Rimuovere il gruppo differenziale.
ATTENZIONE! non danneggiare la corona.

GB Remove the complete differential box.
ATTENTION! Do not damage the gearwheel.

e

I Rimuovere lo spessore (27) e la ralla (19).

GB Remove the spacer (27) and the thrust block (19).

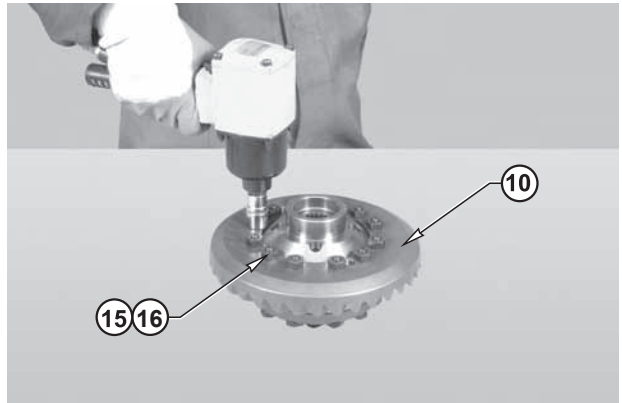
f

I Se si deve sostituire, estrarre il cuscinetto (19) dalla scatola differenziale.

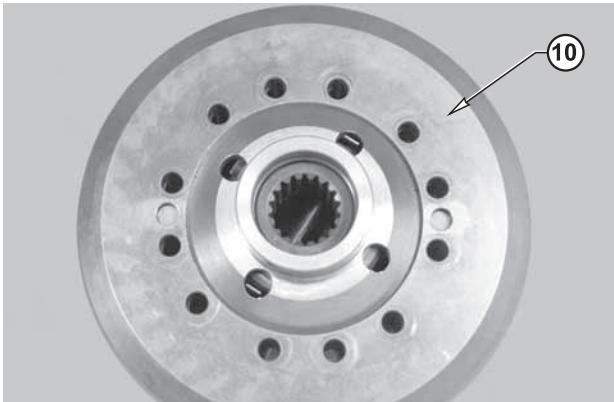
GB If the bearing need replacing, extract the bearing (19) from the differential carrier.



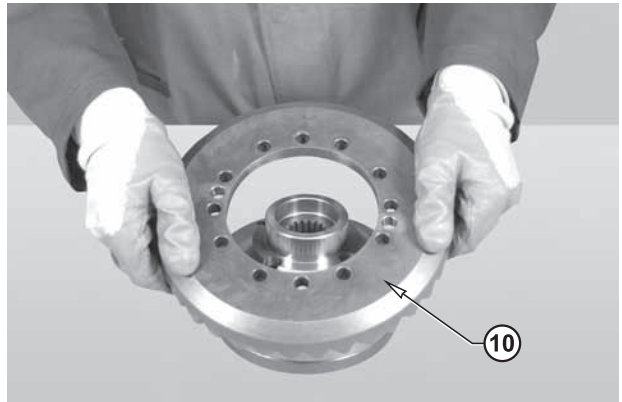
a



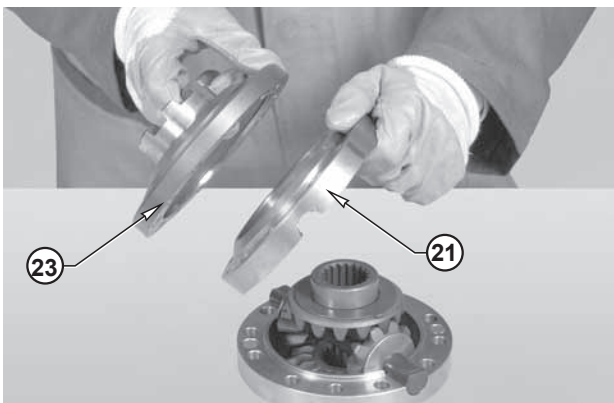
b



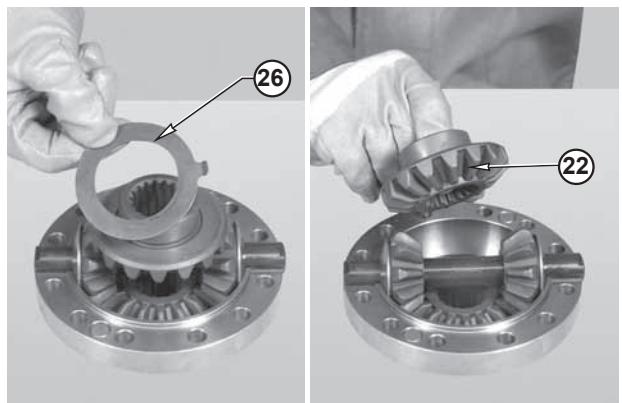
c



d



e



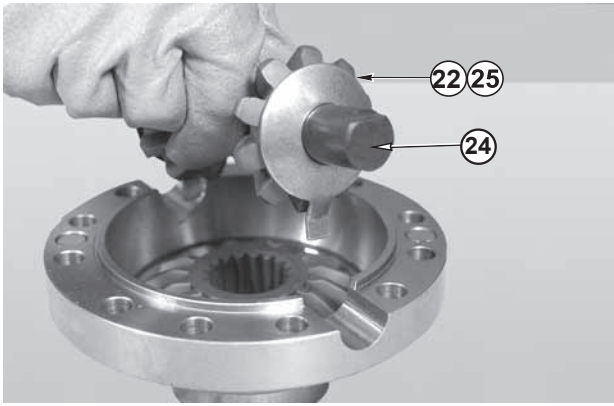
f

- b**
- I** Rimuovere le viti (15)(16) di ritegno della corona (10).
 - GB** Remove the fittin screws (15)(16) of the crown (10).

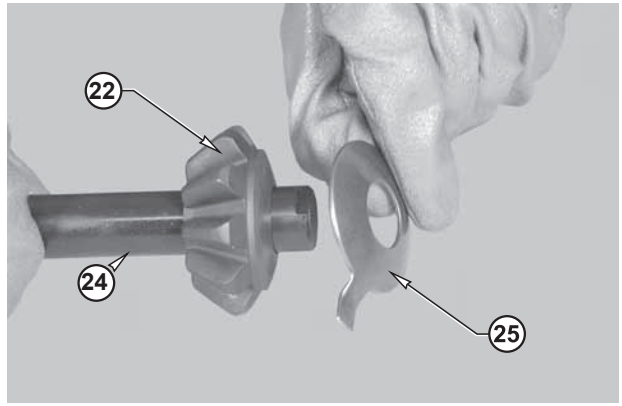
- d**
- I** Rimuovere la corona (10).
 - GB** Remove the crown (10).

- e**
- I** Utilizzando un mazzuolo in materiale plastico scomporre la semiscatola differenziale (21)(23).
 - GB** Using a plastic hammer, take the half box (21)(23) to pieces.

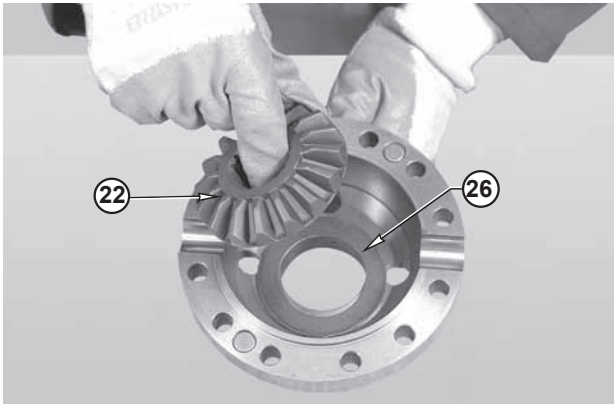
- f**
- I** Rimuovere la rondella di rasamento (26) e l'ingranaggio planetario (22).
 - GB** Remove the shim washer (26) and the planetary gear (22).



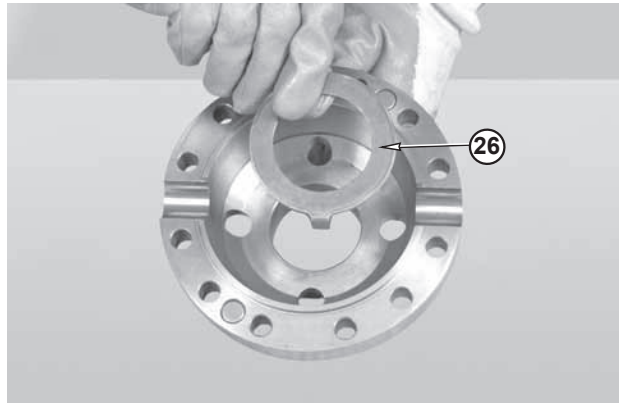
a



b



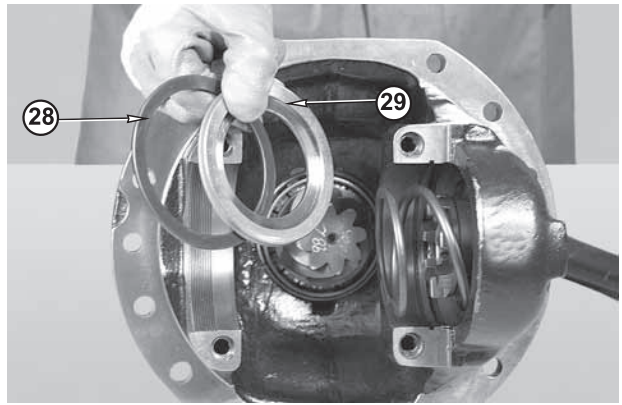
c



d



e



f

a

I

Asportare gli alberi (24) completi di satelliti (22) e rondelle sferiche (25) di spallamento.

GB

Remove shafts (24), complete with planet wheels (22) and spherical shoulder washers (25).

c

I

Rimuovere la rondella di rasamento (26) e l'ingranaggio planetario (22).

GB

Remove the shim washer (26) and the planetary gear (22).

e

I

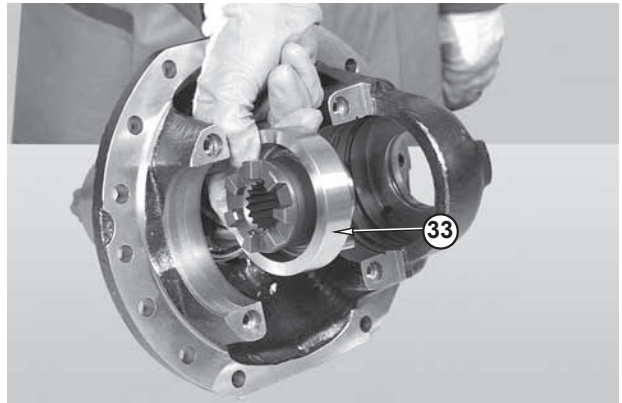
Rimuovere il distanziale (28) e lo spessore (29).
ATTENZIONE: molla caricata.

GB

Remove the washer (28) and the spacer (29).
ATTENTION: Spring preloaded.



a



b



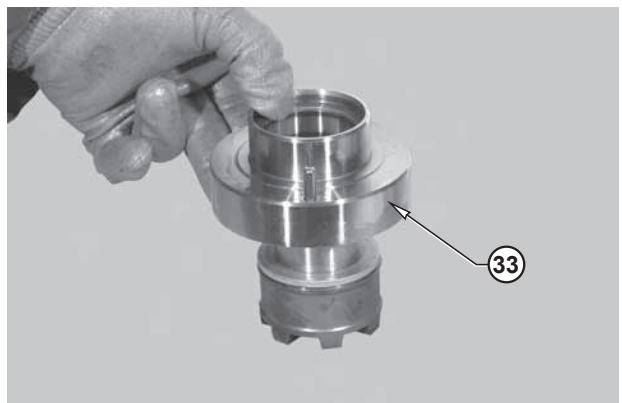
c



d



e



f

a

I Inserendo pressione, rimuovere pistone (33) blocco differenziale.

GB Applying pressure, remove the piston (33) of the differential block.

b

I Rimuovere il pistone (33).

GB Remove the piston (33).

c

I Estrarre l'anello di fermo (37).

GB Extract the snap ring (37).

e

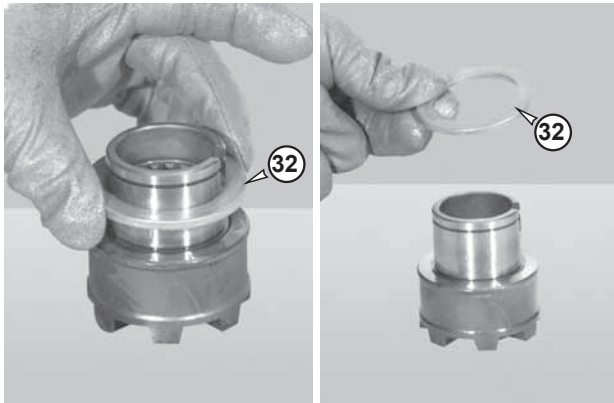
I Rimuovere l'anello sagomato (36)

GB Remove the locking ring (36).

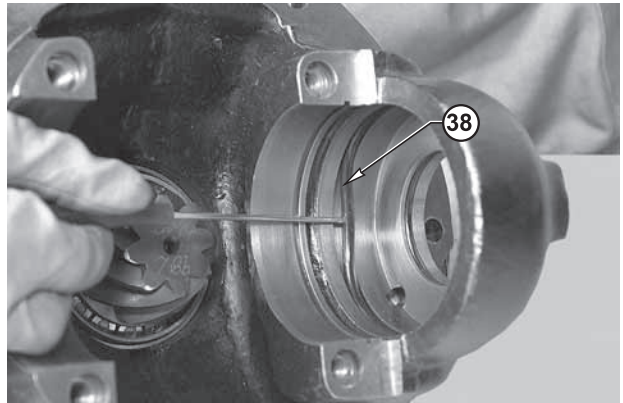
f

I Rimuovere il pistone (33).

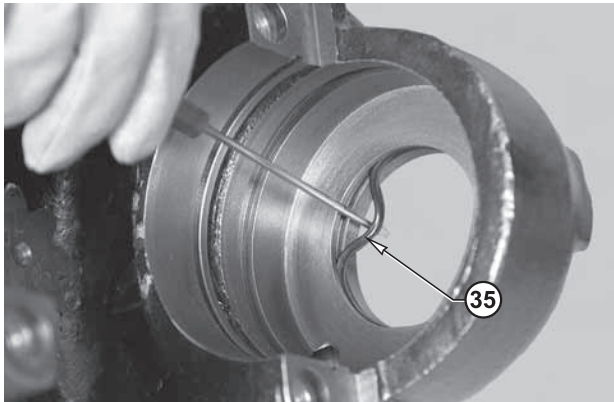
GB Remove the piston (33).



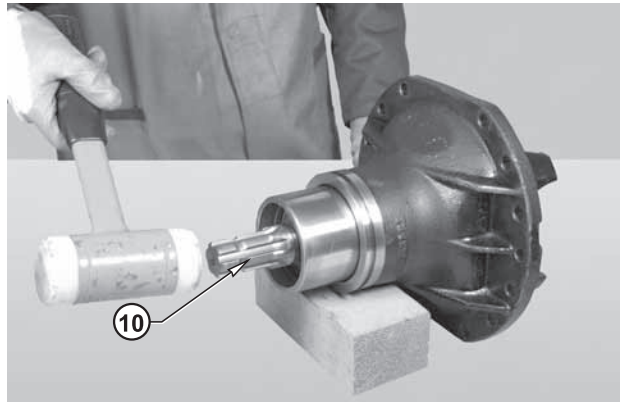
a



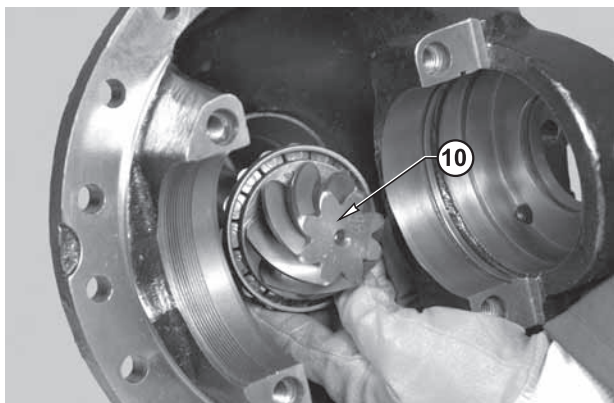
b



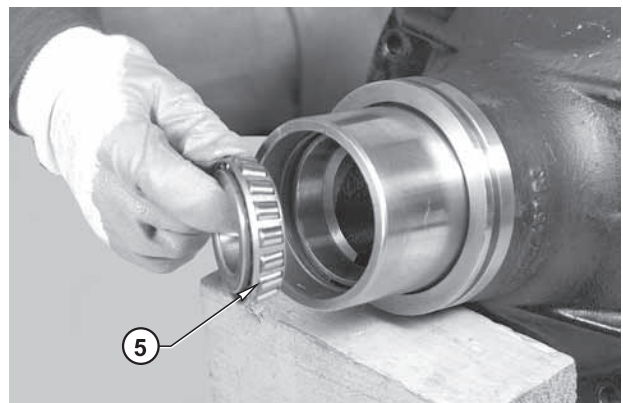
c



d



e



f

a

I Rimuovere la rondella di rasamento (32).

GB Remove the friction washer (32).

b

I Smontare gli anelli OR (38)

GB Remove the O-rings (38).

c

I Smontare gli anelli OR (35)

GB Remove the O-rings (35).

d

I Asportare il pignone (10).

GB Remove the pinion (10).

e

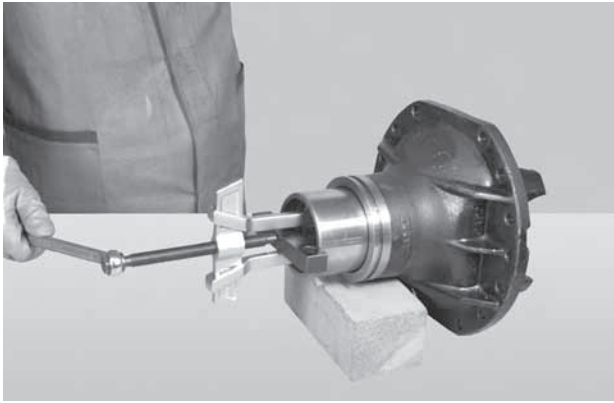
I Estrarre il pignone (10) completo del cuscinetto interno (9).
NOTA. Le ralle dei cuscinetti rimangono nel corpo centrale.

GB Extract the pinion (10) complete with the internal bearing (9).
NOTE. The thrust blocks of the bearings remain in the central body.

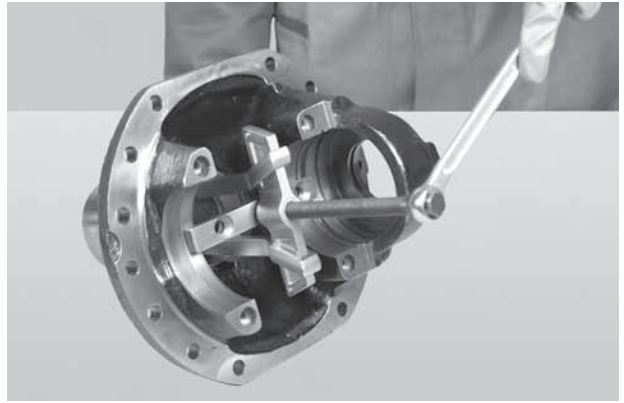
f

I Rimuovere il cuscinetto esterno (5).

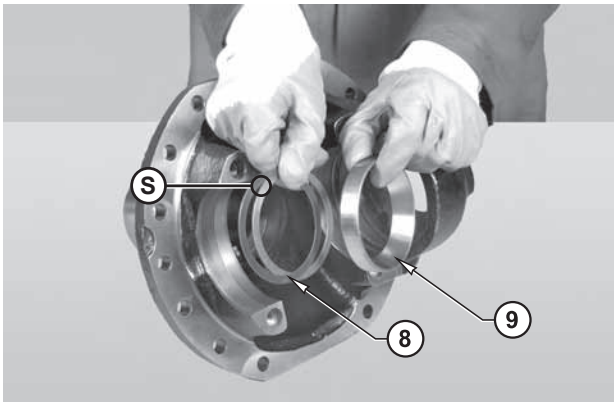
GB Remove the external bearing (5).



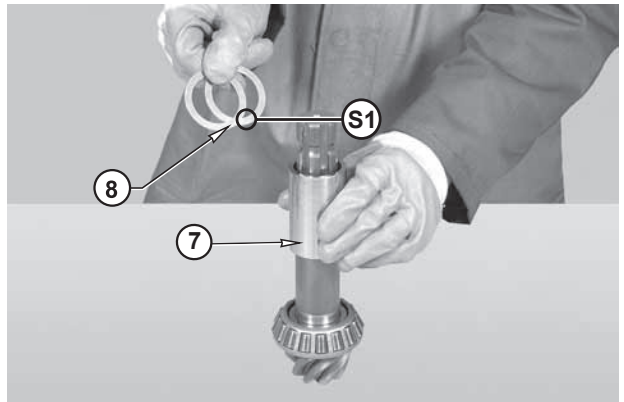
a



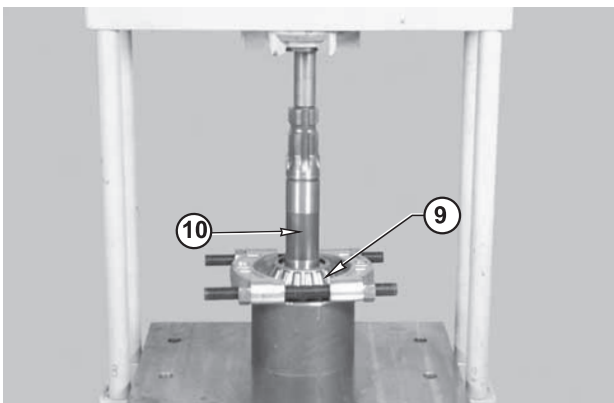
b



c



d



e

a

I Rimuovere la ralla del cuscinetto esterno (5).

GB Remove the thrust block of the external bearing (5).

b

I Rimuovere la ralla del cuscinetto interno (9).

D Remove the thrust block of the internal bearing (9).

d

E

F

c

I Rimuovere la ralla del cuscinetto interno (9) e gli spessori di rasamento (8).

GB Remove the thrust block of the internal bearing (9) as well as the shims washers (8).

d

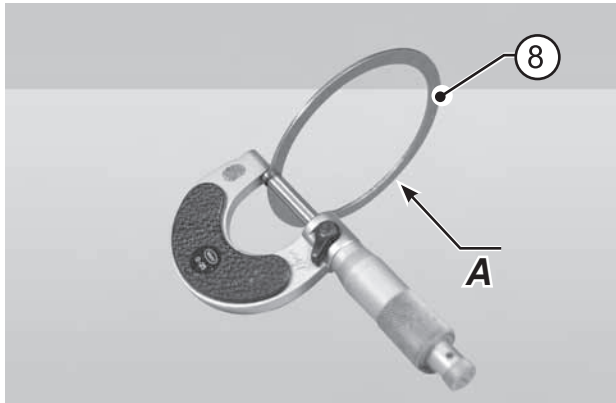
I Rimuovere il distanziale (7) e gli spessori di rasamento (8).

GB Remove the spacer (7) and the shims washers (8).

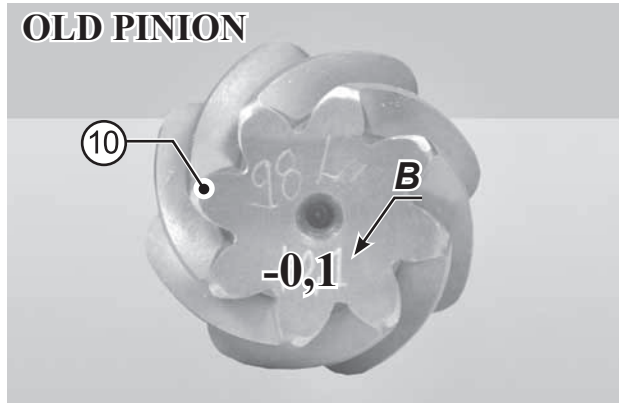
e

I Utilizzando un separatore ed una pressa, rimuovere dal pignone (10) il cuscinetto interno (9).

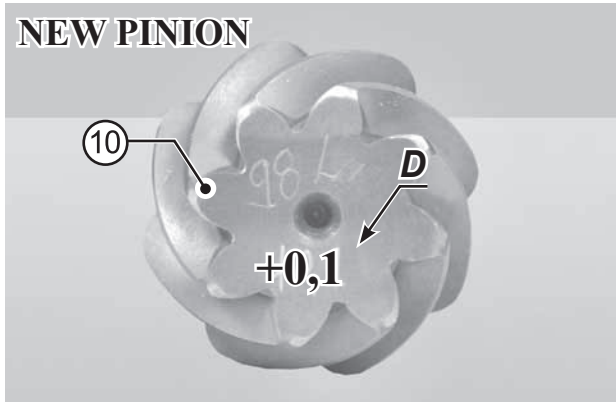
GB Using a puller and a press, remove the inner bearing (9) from the pinion (10).



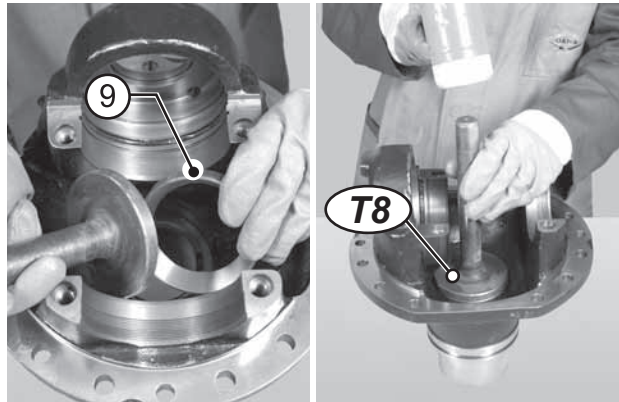
a



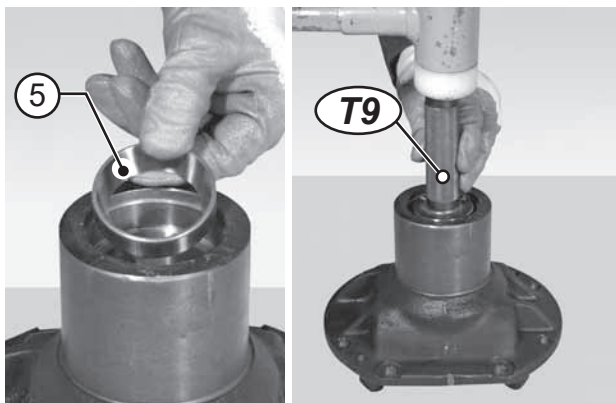
b



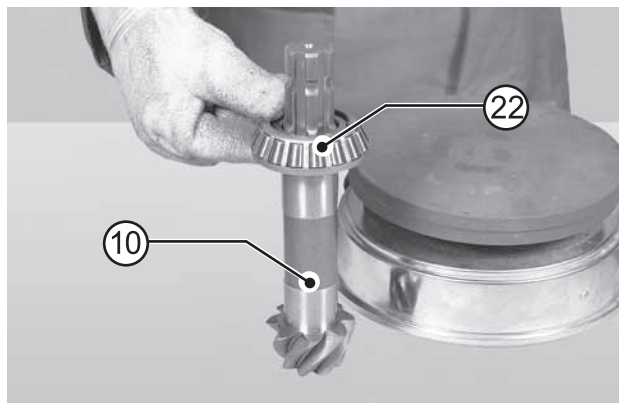
c



d



e



f

a

I Rilevare la quota degli spessori (8) del pignone installati in origine.
Esempio: A = 1,1 mm

GB Check the thickness of first step pinion shims (8).
Example: A = 1,1 mm

b

I Controllare la misura nominale "B" segnata sul pignone (10) di prima installazione (OLD PINION) ed eseguire il calcolo secondo la formula indicata per ottenere il valore necessario al calcolo successivo.
C = A ± B =
Esempio: C = 1,1 - 0,1 = 1 mm **C = 1 mm**

GB Check nominal dimension "B" as marked on the old pinion.
 Execute the calculation following the indicated formula to obtain the necessary value to the successive calculation.
C = A ± B =
EXAMPLE: C = 1,1 - 0,1 = 1 mm **C = 1 mm**

c

I Controllare la misura nominale "D" segnata sul pignone (13) nuovo (NEW PINION) ed eseguire il calcolo secondo la formula indicata per ottenere il valore degli spessori da inserire.
S = C - (D) =
Esempio: S = 1 - (+0,1) = 0,9 mm **S = 0,9 mm**

GB Check nominal dimension "D" as marked on the old pinion (13). Execute the calculation following the indicated formula to obtain the value of necessary shims.
S = C - (D) =
Example: S = 1 - (+0,1) = 0,9 mm **S = 0,9 mm**

d

I Inserire spessori (8) e ralla del cuscinetto interno (22) nel supporto pignone (29) ed utilizzando l'attrezzo speciale T8 mandare a fondo corsa.

GB Insert shims (8) and inner bearing thrust block (22) into pinion support (29) and move to end stroke using special tool T8.

e

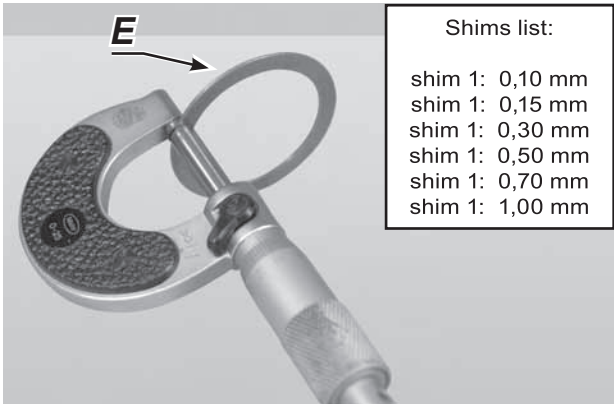
I Inserire la ralla del cuscinetto esterno (5) nel supporto pignone (29) ed utilizzando l'attrezzo speciale T9 mandare a fondo corsa.

GB Insert outer bearing thrust block (5) into pinion support (29) and move to end stroke using special tool T9.

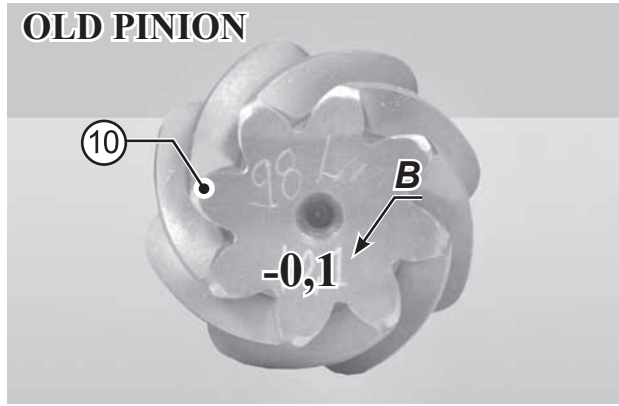
f

I Scaldare a circa 100 C° il cuscinetto interno (9) e montarlo sul pignone (10) e inserire.
 NOTA. Dopo il raffreddamento, lubrificare leggermente il cuscinetto (9) con olio SAE 85W90.

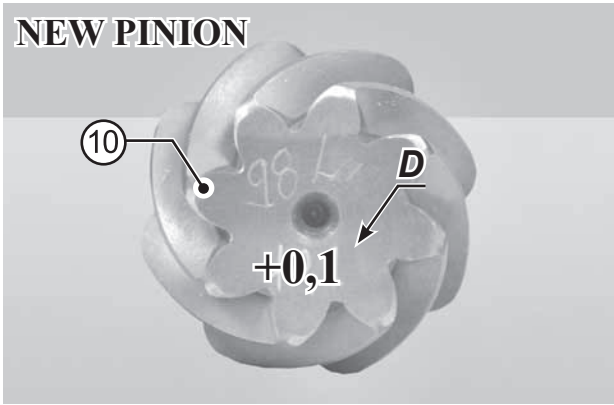
GB Heat the inner bearing (9) to about 100 C° and fit it to the pinion (10) and insert the pinion (10)
 NOTE. Once the bearing has cooled down, lightly lubricate bearing (9) with SAE85W90 oil.



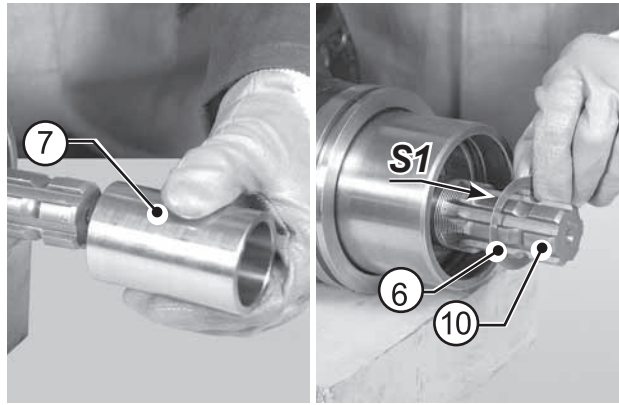
a



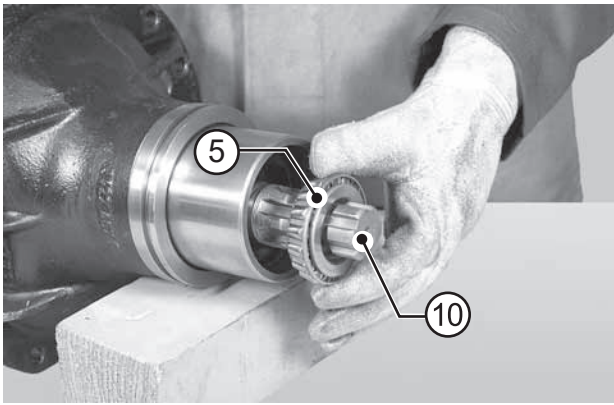
b



c



d



e



f

- a**
- I** Rilevare la quota degli spessori E (6) installati in origine.
Esempio: E = 1,6 mm
- GB** Check the thickness of first step pinion shims E (6).
Example: E = 1,6 mm

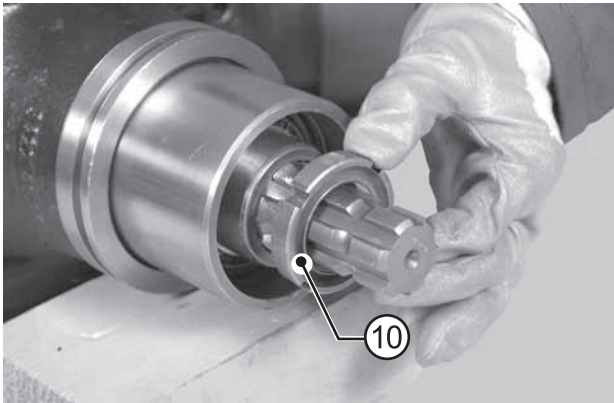
- b**
- I** Controllare la misura nominale "B" segnata sul pignone di prima installazione (OLD PINION) ed eseguire il calcolo secondo la formula indicata per ottenere il valore necessario al calcolo successivo.
D = E ± B =
Esempio: **D = 1,6 - 0,1 = 1,5 mm** **D = 1,5 mm**
- GB** Check nominal dimension "B" as marked on the old pinion.
Execute the calculation following the indicated formula to obtain the necessary value to the successive calculation.
D = E ± B =
Example: **D = 1,6 - 0,1 = 1,5 mm** **D = 1,5 mm**

- c**
- I** Controllare la misura nominale "D" segnata sul pignone nuovo (NEW PINION) ed eseguire il calcolo secondo la formula indicata per ottenere il valore degli spessori da inserire.
S1 = E - (D) =
Esempio: **S1 = 1,5 - (+0,1) = 1,4 mm** **S1 = 1,4 mm**
- GB** Check nominal dimension "D" as marked on the old pinion. Execute the calculation following the indicated formula to obtain the value of necessary shims.
S1 = E - (D) =
Example: **S1 = 1,5 - (+0,1) = 1,4 mm** **S1 = 1,4 mm**

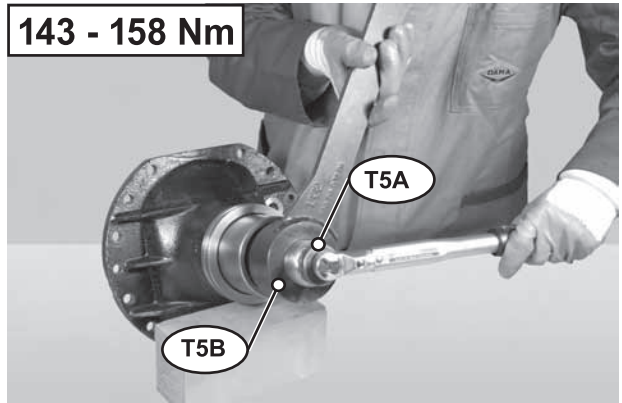
- d**
- I** Inserire nel supporto il pignone (10) completo di spessori S1 (6) e distanziale (7).
- GB** Insert in the support the pinion (10) complete with shims (6) S1 and distance piece (7).

- e**
- I** Scaldare a circa 80 C° il cuscinetto esterno (5) e montarlo sul pignone (10).
NOTA. Lubrificare leggermente con OLIO SAE 85W90 il cuscinetto.
- GB** Heat the external bearing (5) to a temperature of about 80C° and fit it on to the pinion (10).
NOTE. Lightly lubricate bearing (23) with SAE85W90 oil.

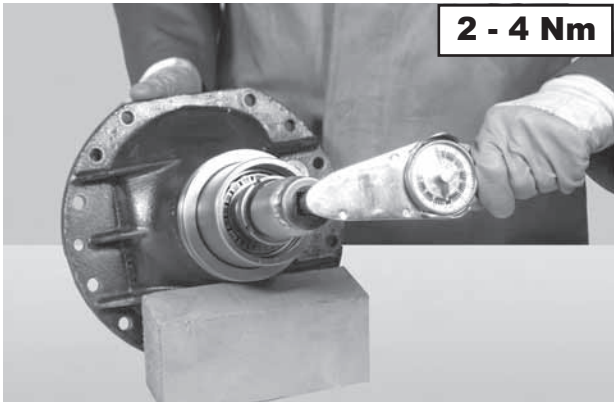
- f**
- I** Montare la il distanziale (2) sul pignone (10) senza anello di tenuta (5).
- GB** Install the distance piece (2) onto the pinion (10) without sealing ring (5).



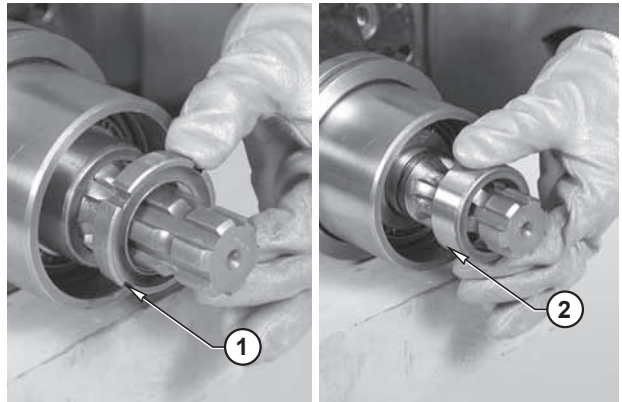
a



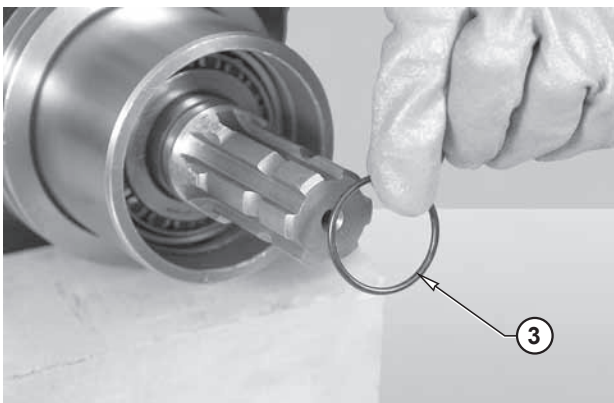
b



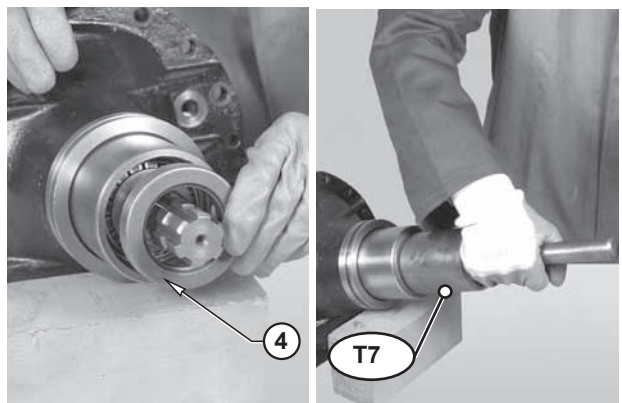
c



d



e



f

- a
- I Avvitare la ghiera fissaggio (1).
 - GB Screw the new fixing ring nut (1).

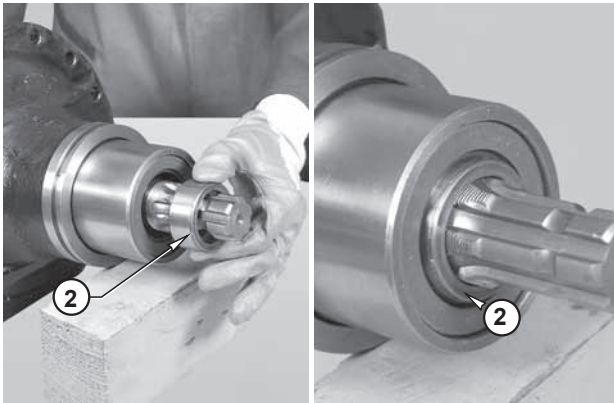
- b
- I Impegnare la chiave speciale T5B sulla ghiera (1) ed applicare il codolo T5A sul pignone (10). Fermare la chiave T5B e ruotare il pignone con una chiave dinamometrica fino alla coppia richiesta di 143 - 158 Nm.
 - GB Apply special wrench T5B to the ring nut (1) and bar-hold T5A to the pinion (10). Lock the wrench T5A and rotate the pinion using a dynamometric wrench, up to a required torque setting of 143 - 158 Nm.

- c
- I Applicare sul pignone (10) il codolo e con un torsiometro, controllare la coppia di rotazione del pignone.
Coppia di rotazione: 2 - 4 Nm
- ATTENZIONE!** Se la coppia di rotazione non raggiunge il valore minimo di 2Nm, è necessario diminuire lo spessore "S1" tra cuscinetto (5) e distanziale (7).
- ATTENZIONE!** Se la coppia supera il valore massimo di 4Nm, è necessario aumentare lo spessore "S1" tra cuscinetto (5) e distanziale (7).
- GB Apply onto the pinion (10) the bar-hold and with the help of a torque metre, check the torque of the pinion (10).
Torque: 2 - 4 Nm
- CAUTION!** If torque exceeds the maximum value, then the size of shim "S1" between the bearing (5) and the distance piece (7) needs to be increased.
- CAUTION!** If torque does not reach the minimum value, then the size of shim "S1" needs to be reduced.

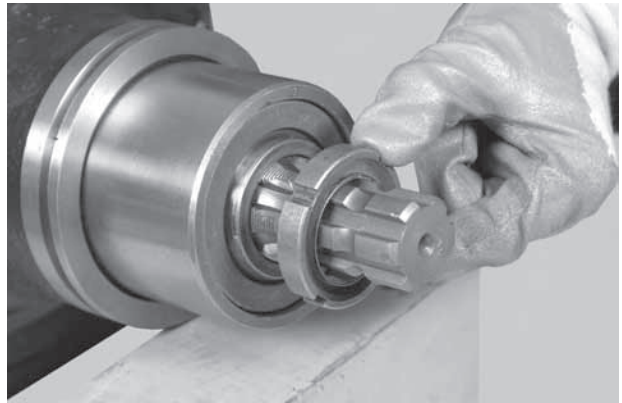
- d
- I Asportare la ghiera (1) e lo spessore (2).
 - GB Remove the ring nut (1) and the spacer (2).

- e
- I Montare gli anelli OR (3)
 - GB Insert the O-rings (3).

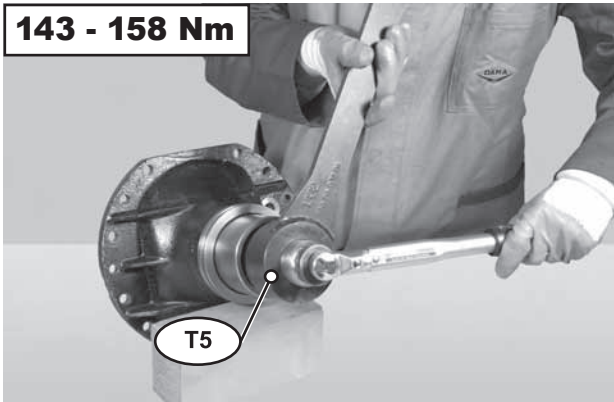
- f
- I Utilizzando l' attrezzo speciale T7, montare l'anello di tenuta (4).
 - GB Using special tool T7, install the sealing ring (4).



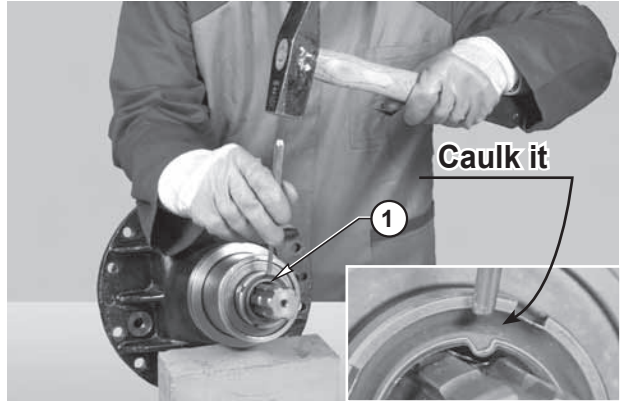
a



b



c



d



e



f

a

I Inserire lo spessore (2).

GB Insert the spacer (2)
NOTE: Check the using of the friction washers.

b

I Inserire la ghiera (1).

GB Insert the ring nut (1).

c

I Coppia serraggio: 143-158 Nm

GB Torque wrench setting: 143-158 Nm

d

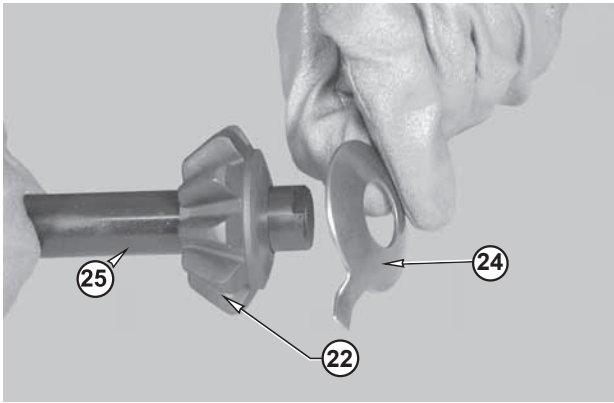
I Cianfrinare la ghiera (1).
ATTENZIONE! Se la ghiera (1) viene riutilizzata,
cianfrinare la seconda posizione.
Non ripetere la cianfrinatura sopra quella precedente.

GB Caulk the ring nut (1).
CAUTION! If the ring nut (1) is re-used, caulk the
second position. Do not re-caulk the same portion.

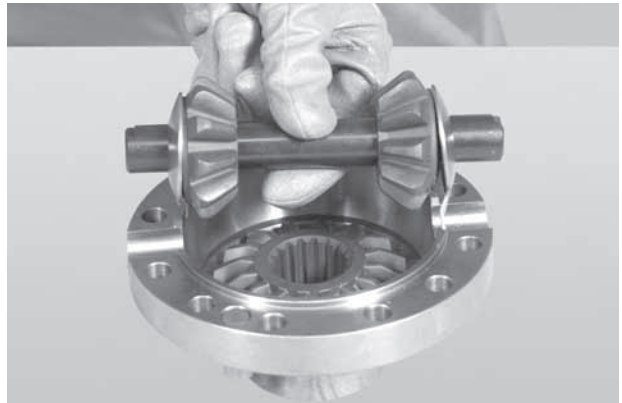
e

I Montare il planetario (22) completo di rondella di
spallamento (26).

GB Insert planetary gear wheel (22) together with washer
(26).



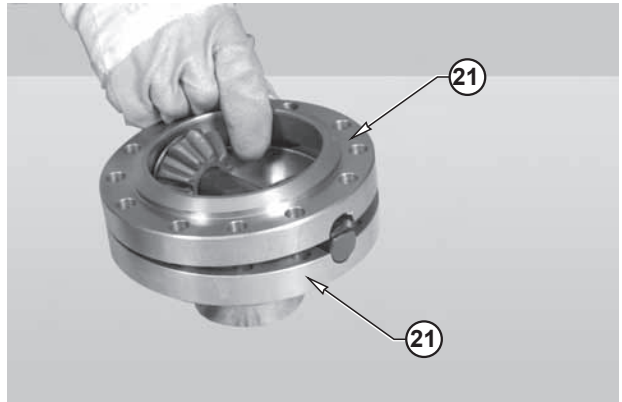
a



b



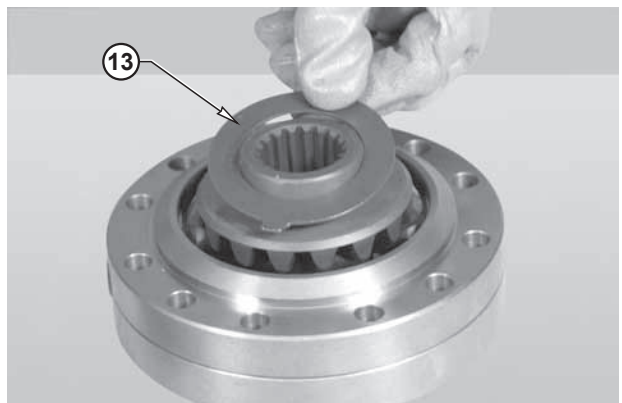
c



d



e



f

a

I

Montare sugli alberi (24) gli ingranaggi satelliti (22) e le rondelle sferiche di spallamento (25).

GB

Install the planetary gears (22) and spherical shoulder washers (25) onto the shafts (24).

d

I

Montare sulla semiscatola (21) la semiscatola di chiusura (21).
ATTENZIONE! Far coincidere i contrassegni delle due semiscatole.

GB

Mount the locking half-box (21) onto the half-box (21).
ATTENTION! The match marks on the two half-boxes must correspond.

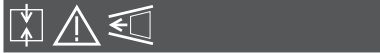
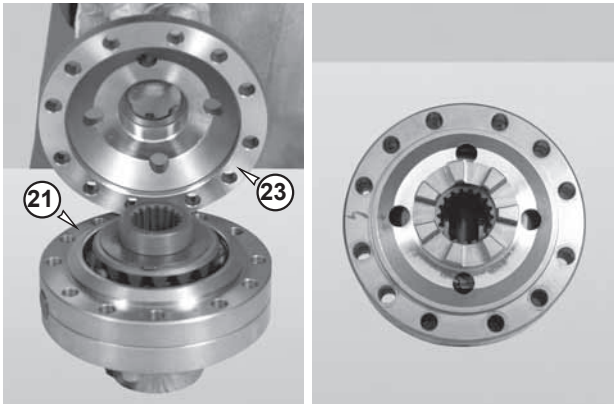
e

I

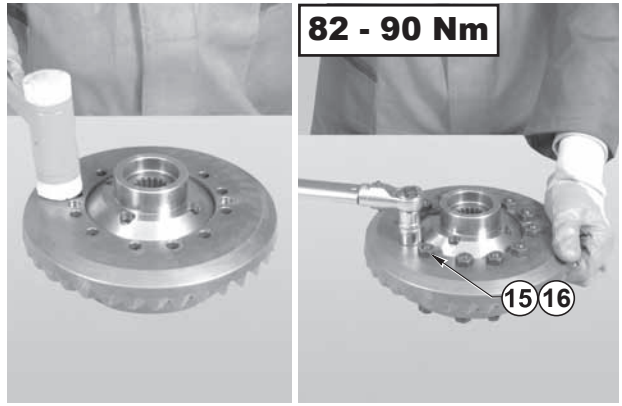
Montare il planetario (22) completo di rondella di spallamento (26).

GB

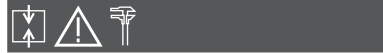
Insert planetary gear wheel (22) together with washer (26).



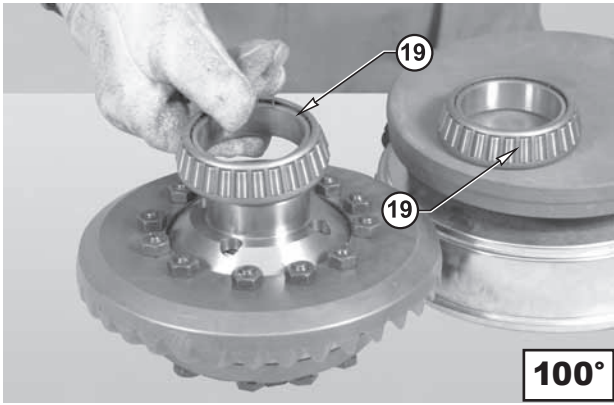
a



82 - 90 Nm



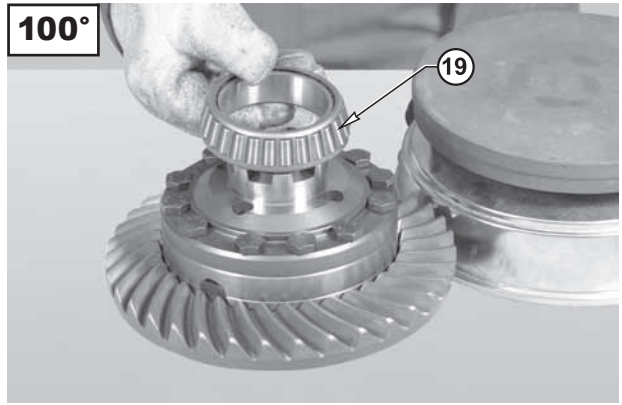
b



100°



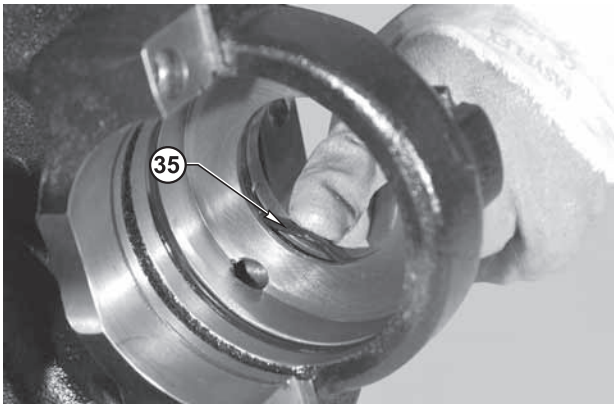
c



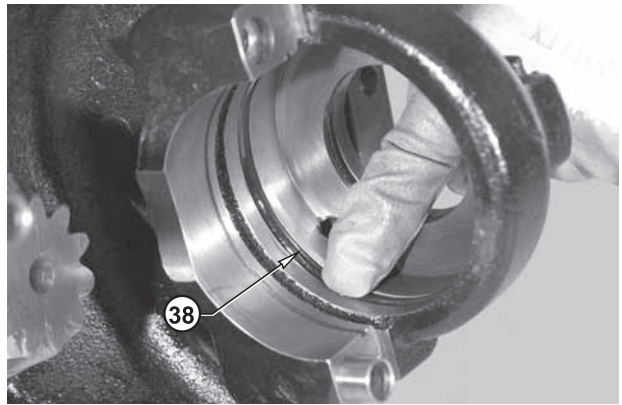
100°



d



e



f

a

I Montare sulla semiscatola (43) la semiscatola di chiusura (23).
ATTENZIONE! Far coincidere i contrassegni delle due semiscatole.

GB Mount the locking half-box (23) onto the half-box (21).
ATTENTION! The match marks on the two half-boxes must correspond.

b

I Serrare le viti di bloccaggio (15)(16) della corona (10) con il metodo incrociato.
Coppia serraggio: 82 - 90 Nm

GB Tighten the screws (15)(16) of the crown (10) wheel using the criss cross method.
Torque wrench setting: 82 - 90 Nm

c

I Montare il cuscinetto (19).

GB Install the bearing (19).

d

I Montare il cuscinetto (19).

GB Install the bearing (19).

e

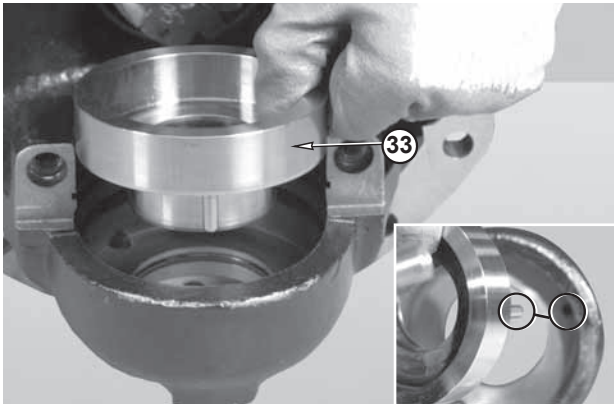
I Installare anello O-Ring (35).

GB Install O-Ring (35).

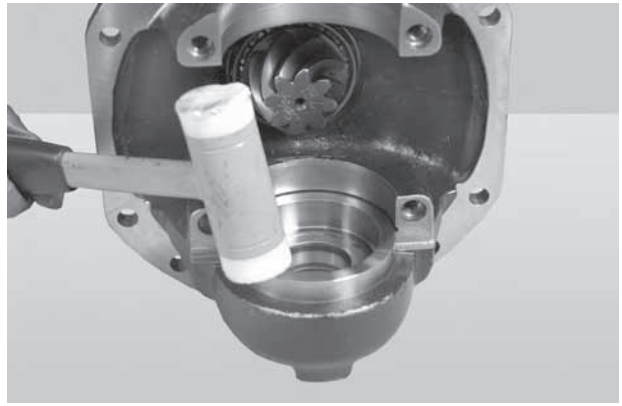
f

I Installare anello O-Ring (38).

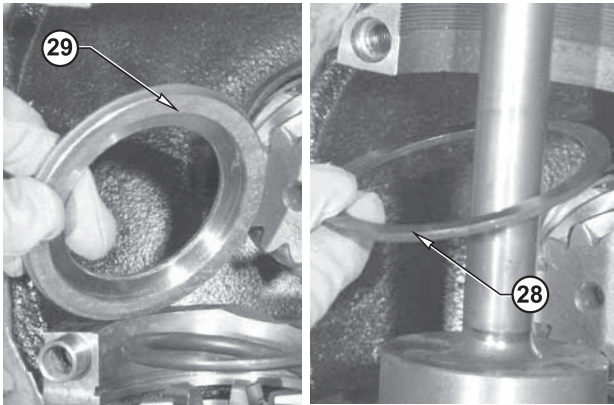
GB Install O-Ring (38).



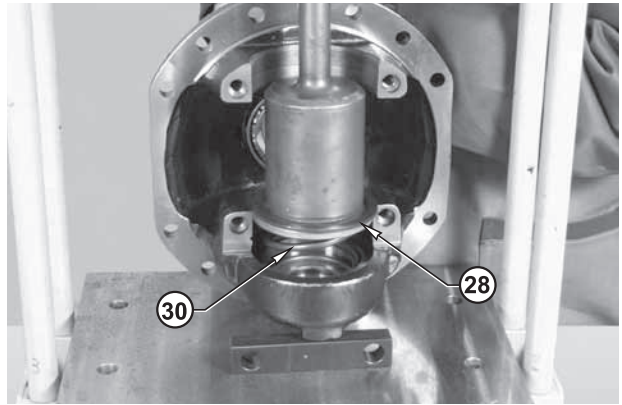
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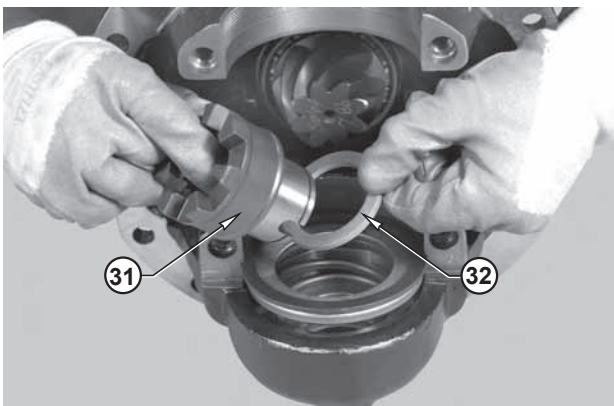
b



c



d



e



f

a **I** Rispettare la posizione di montaggio.
Installare il gruppo pistone (33).

GB Mind the position of assemblage.
Install the piston (33).

c **I** Montare l'anello elastico di fermo (28) e distanziale (29).

GB Install the snap ring (28) and spacer (29).

d **I** Utilizzando l'attrezzo speciale T8 precaricare le molle (30).
Posizionare l'anello di fermo (28).

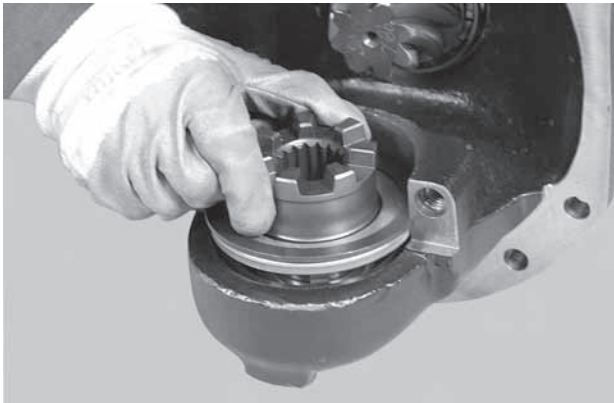
GB Using special tools T8 preload the springs (30).
Positioning the snap ring (28).

e **I** Inserire il manicotto (31) e la rondella di rasamento (32).

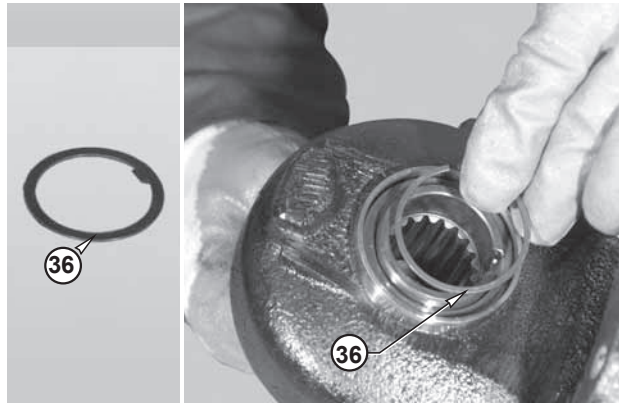
GB Install the friction washer (32) and the selector (31).

f **I** NOTA. Assicurarsi che l'anello elastico sia perfettamente in sede.

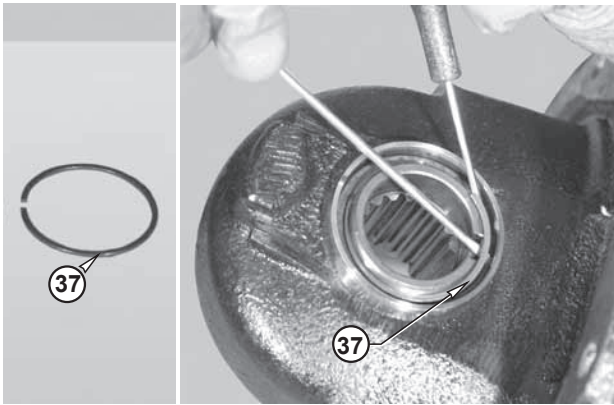
GB NOTE. Make sure that the ring is properly set in its seat.



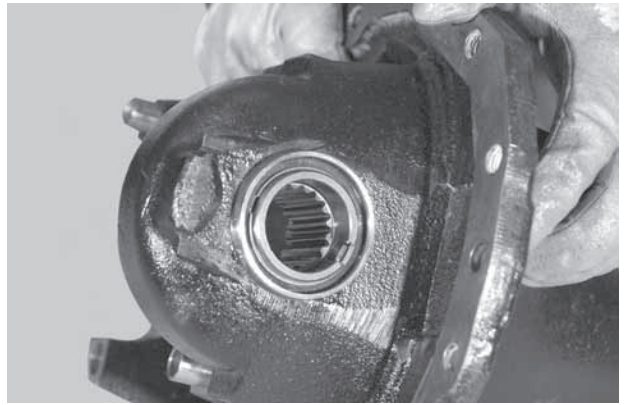
a



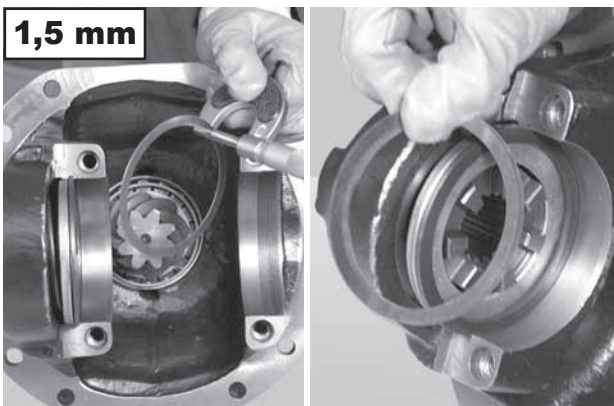
b



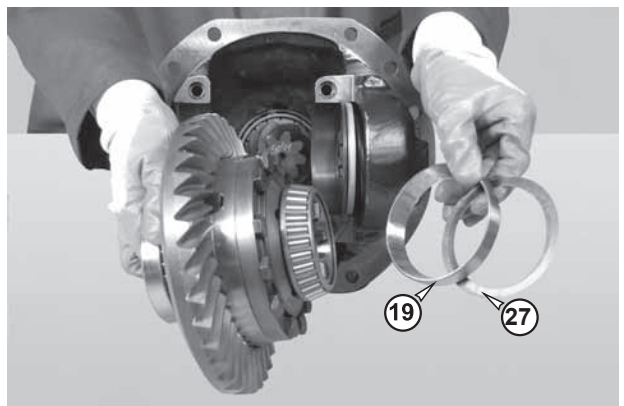
c



d



e



f

a

I Rispettare la posizione di montaggio.
Installare il gruppo pistone.

GB Mind the position of assemblage.
Install the piston pack

b

I Montare il distanziale (36).

GB Install the spacer (36).

c

I Posizionare l'anello di fermo (37).

GB Positioning the snap ring (37).

e

I REGISTRAZIONE COPPIA CONICA
Inserire sotto la ralla del cuscinetto lato opposto
(9) corona una quantità di spessori iniziali 1,5 mm
circa.

GB SETTING OF THE CROWN WHEEL AND PINION
Insert the thrust block of the bearing (9) opposit side
of the crown wheel shims 1,5 mm about.

f

I Inserire lo spessore (27) e la ralla (19).

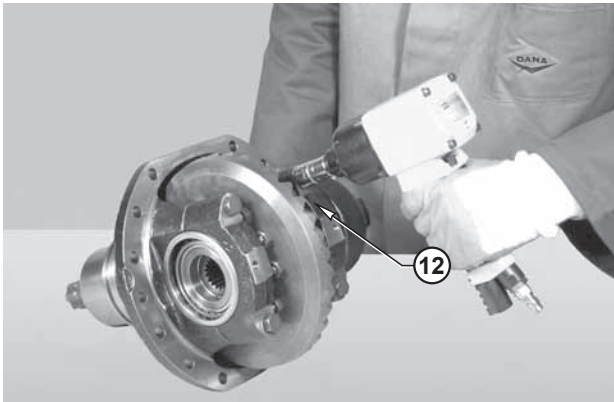
GB Install the shim (27) and the thrust block (19).



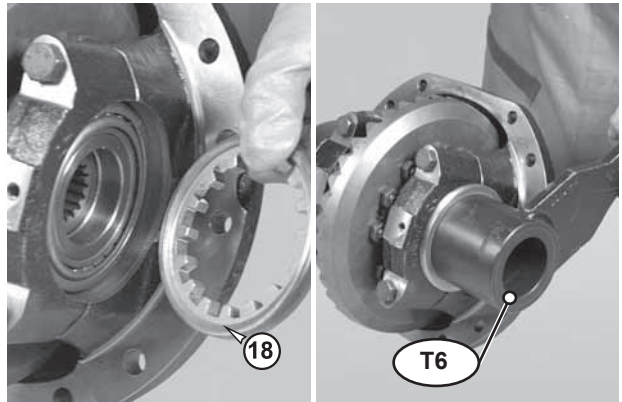
a



b



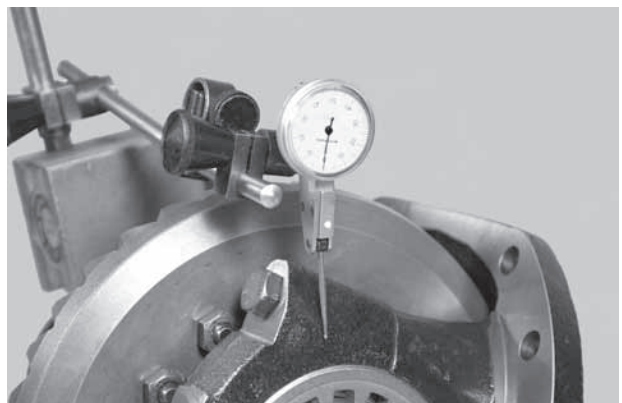
c



d



e



f

a

I Inserire il differenziale completo (5).
ATTENZIONE! non danneggiare la corona.

GB Insert complete differential.
ATTENTION! Do not damage the gearwheel.

b

I Montare i supporti differenziale (12).
NOTE: Assicurarsi che siano in battuta.

GB Install the differential support (12).
NOTE: Check to be at end of stroke.

c

I Avvitare i dadi (12).

GB Screw the bolt (12).

d

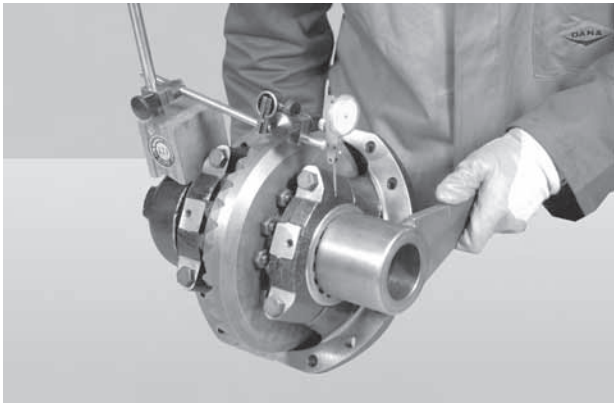
I Utilizzando l' attrezzo speciale, avvitare la ghiera (18) a fine corsa.

GB Using special tool, screw the ring nut (18) to way down.

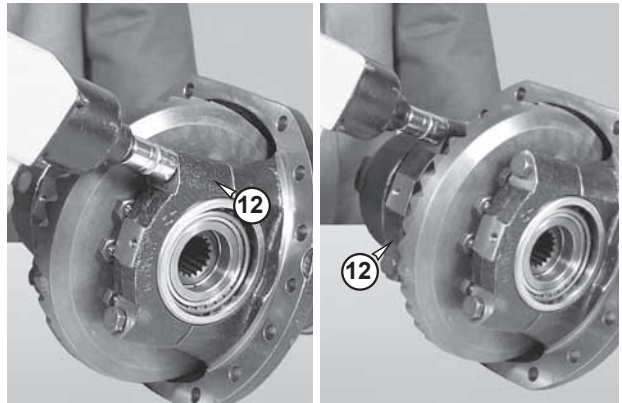
e

I Posizionare un comparatore a tasto orientabile ed azzerarlo.

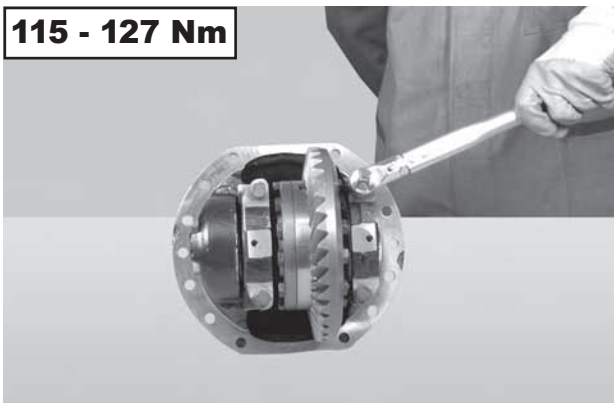
GB Position the comparator and reset it.



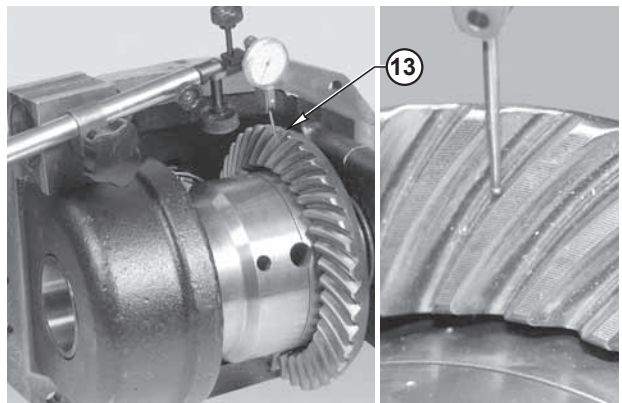
a



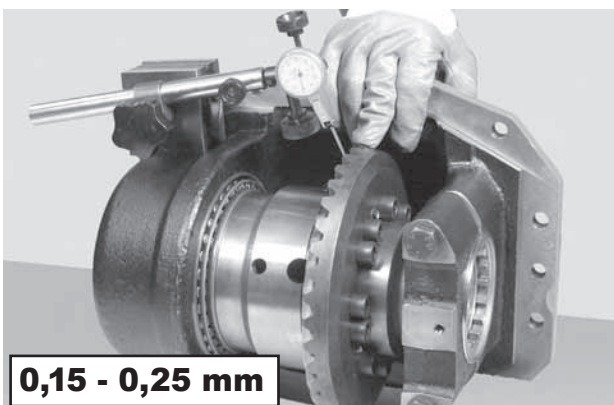
b



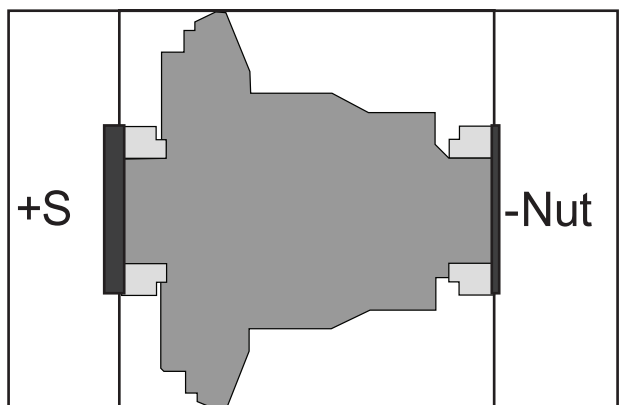
c



d



e



f

a

I Avvitare la ghiera fino ad ottenere un allargamento di 0,15 mm dei supporti differenziale.

GB Set the preload, screwing the ring nut to increase the distance from the two differential support until to 0,15 mm

b

I Montare i supporti differenziale (12).
NOTA: Assicurarsi che siano in battuta.

GB Install the differential support (12).
NOTE: Check to be at end of stroke.

c

I Coppia serraggio: 115 - 127 Nm

GB Torque wrench setting: 115 - 127 Nm

d

I Posizionare un comparatore a tasto orientabile. Posizionarlo sul centro di un dente della corona (12), precaricarlo di circa 1 mm ed azzerarlo.

GB Position the comparator on the centre of one of the teeth of the crown (12), pre-set it to 1mm and reset it.

e

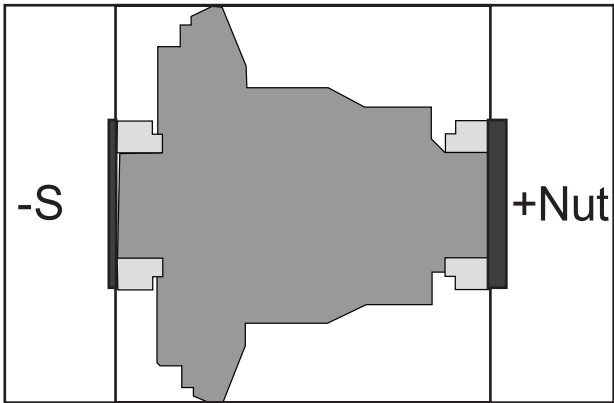
I Muovere manualmente nei due sensi la corona (12) per controllare il gioco esistente tra pignone e corona.

GB Manually move the crown (10) in both directions in order to check the existing backlash between the pinion and the crown.

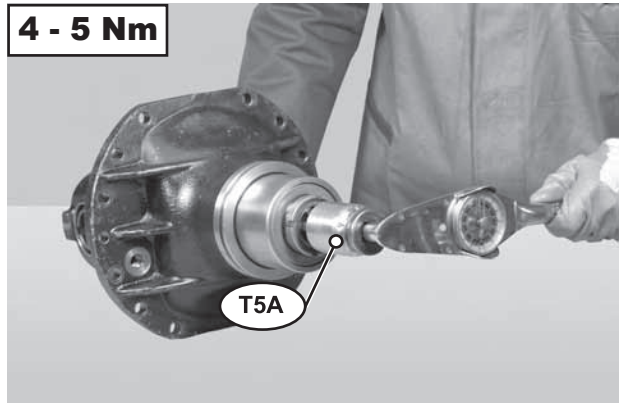
f

I + Shims (14) - Nut (26) = riduzione gioco corona - pignone

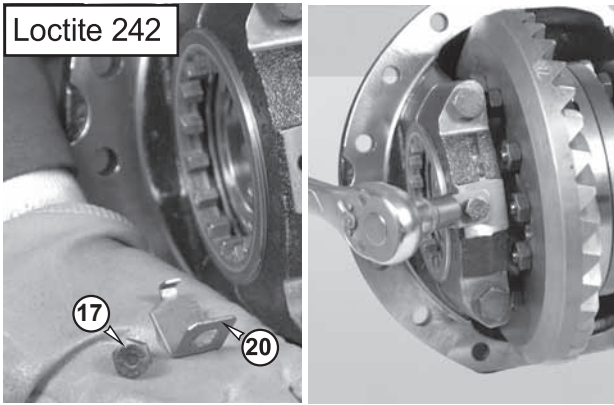
GB + Shims (14) - Nut (26) = reduction clearance crown and pinion



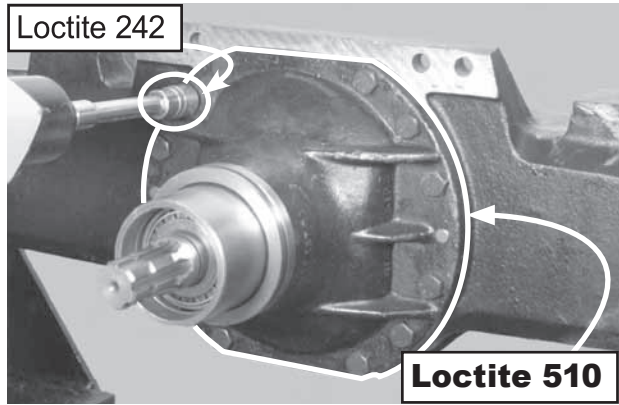
a



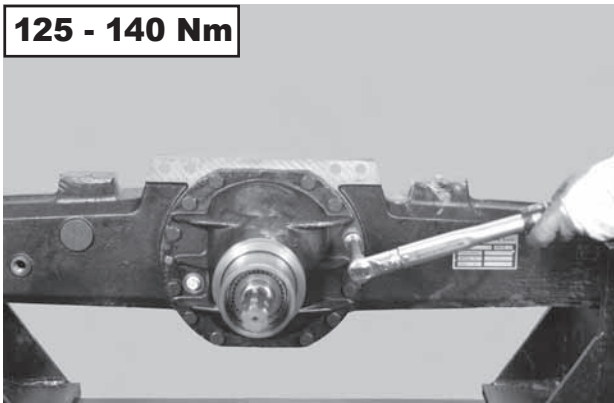
b



c



d



e

- a**
- I** - Shims (14) + Nut (26) = incremento gioco corona - pignone
 - GB** - Shims (14) + Nut (26) = increase clearance crown and pinion

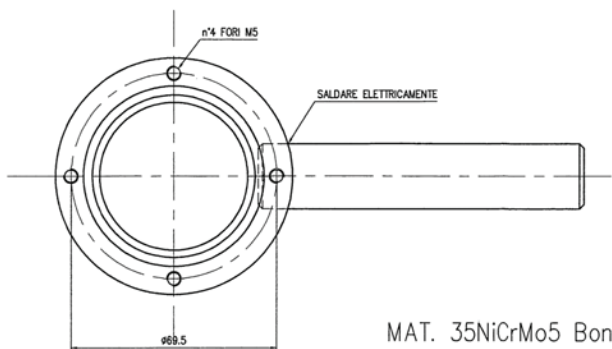
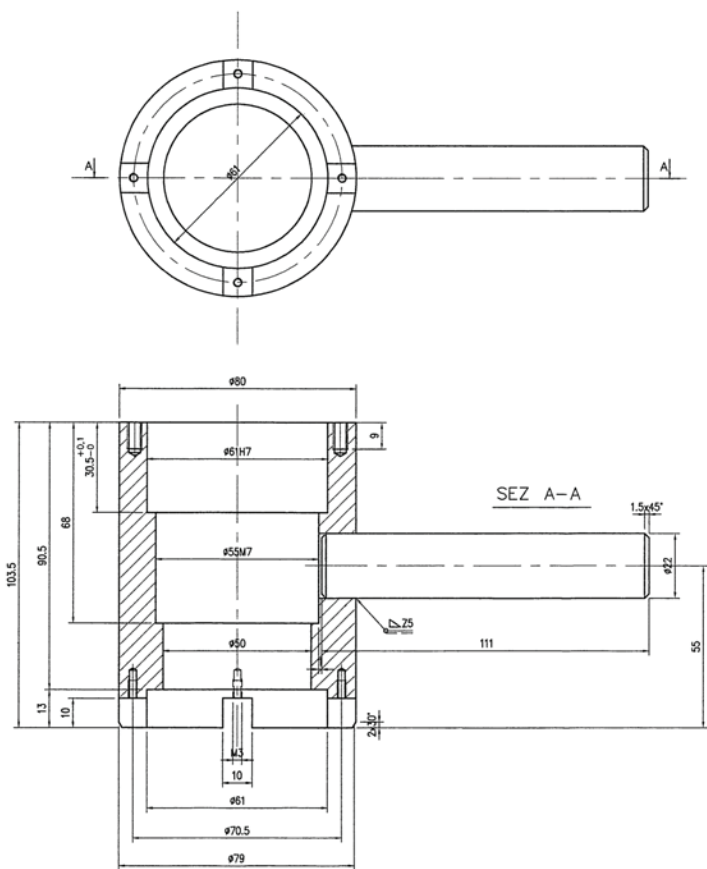
- b**
- I** Applicare sul pignone (10) il codolo T5A e con un torsiometro, controllare la coppia di rotazione del pignone. Coppia di rotazione: 4 - 5 Nm
 - GB** Apply onto the pinion (9) the bar-hold T5A and with the help of a torque metre, check the torque of the pinion (10). Torque: 4 - 5 Nm

- c**
- I** Spalmare le viti (17)(20) con Loctite 242 ed avvitarle in uno dei due fori predisposti.
 - GB** Apply Loctite 242 to the screws (17)(20), fit them into one of the two holes and tighten.

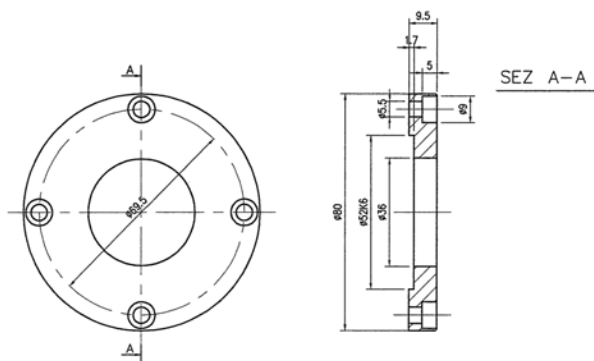
- d**
- I** Spalmare viti e filetti con **LOCTITE 242**. Spalmare la superficie del corpo centrale con **Loctite 510** ed installare il coperchio completo di pignone.
 - GB** Apply **Loctite 242** to the thread and screw. Coat the surface of the main body with **Loctite 510** and install the reduction gear complete with pinion.
- NOTE. Assicurarsi che il sigillante crei un velo continuo attorno ai fori di fissaggio.
- NOTE. Make sure that a continuous layer of sealant runs around the locking holes.

- e**
- I** Serrare le viti (9) con il metodo incrociato ad una coppia di serraggio di 125 - 140 Nm.
 - GB** Using the criss-cross method and a tightening torque of 125 - 140 Nm.

T5B
7379

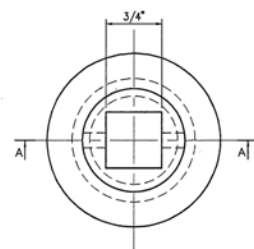
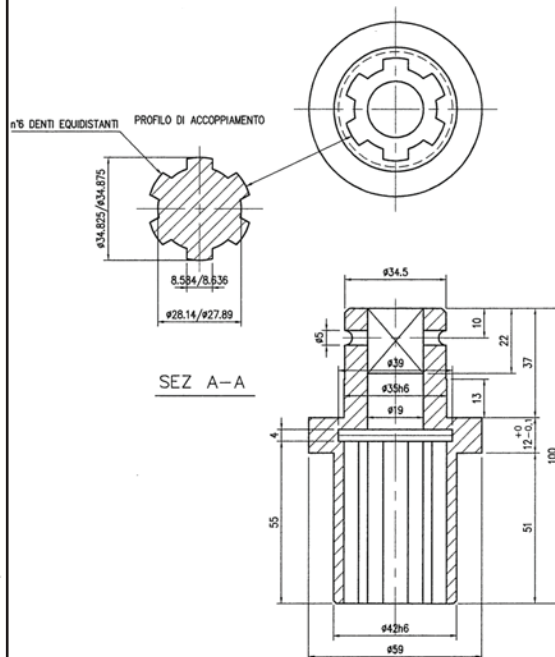


MAT. 35NiCrMo5 Bon.

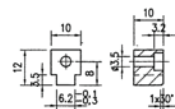


MAT. C40 Bon.

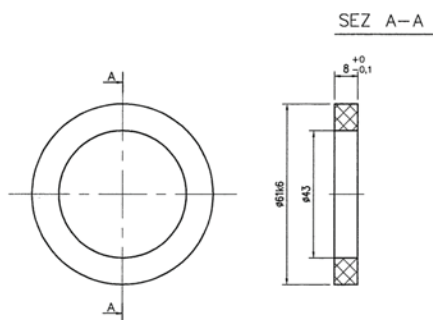
T5A
7379



MAT. 35NiCrMo5 Bon.

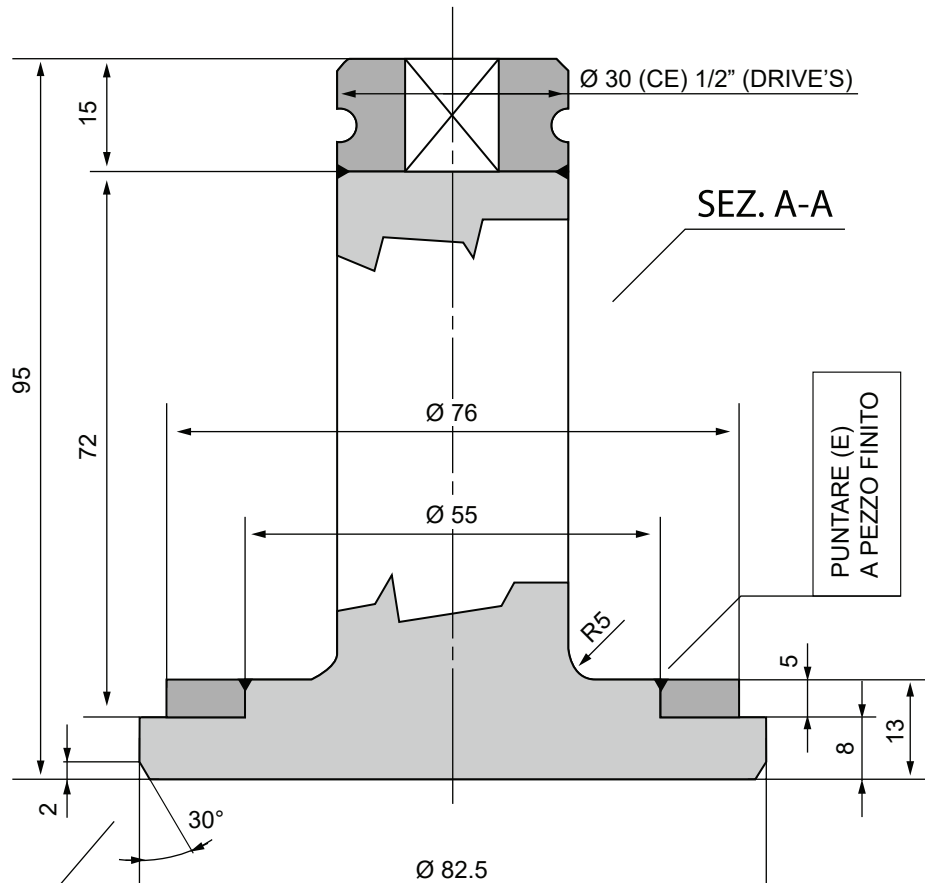


MAT. X155CrVMo121KU (SOR1)

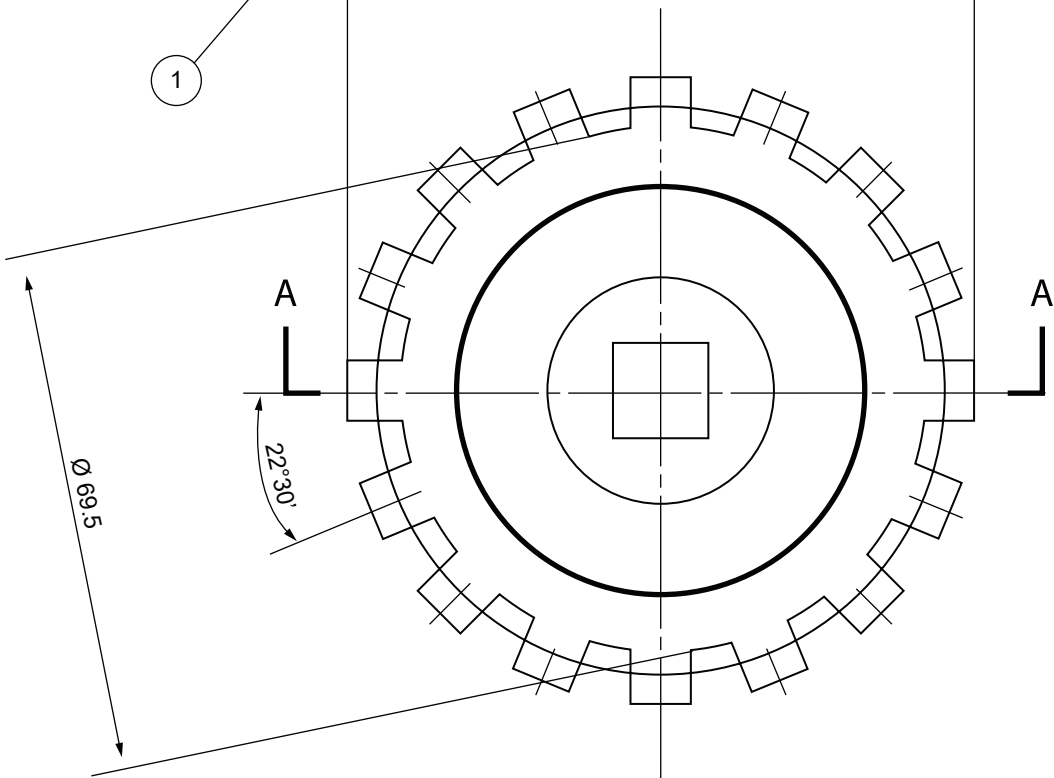


MAT. BRONZO

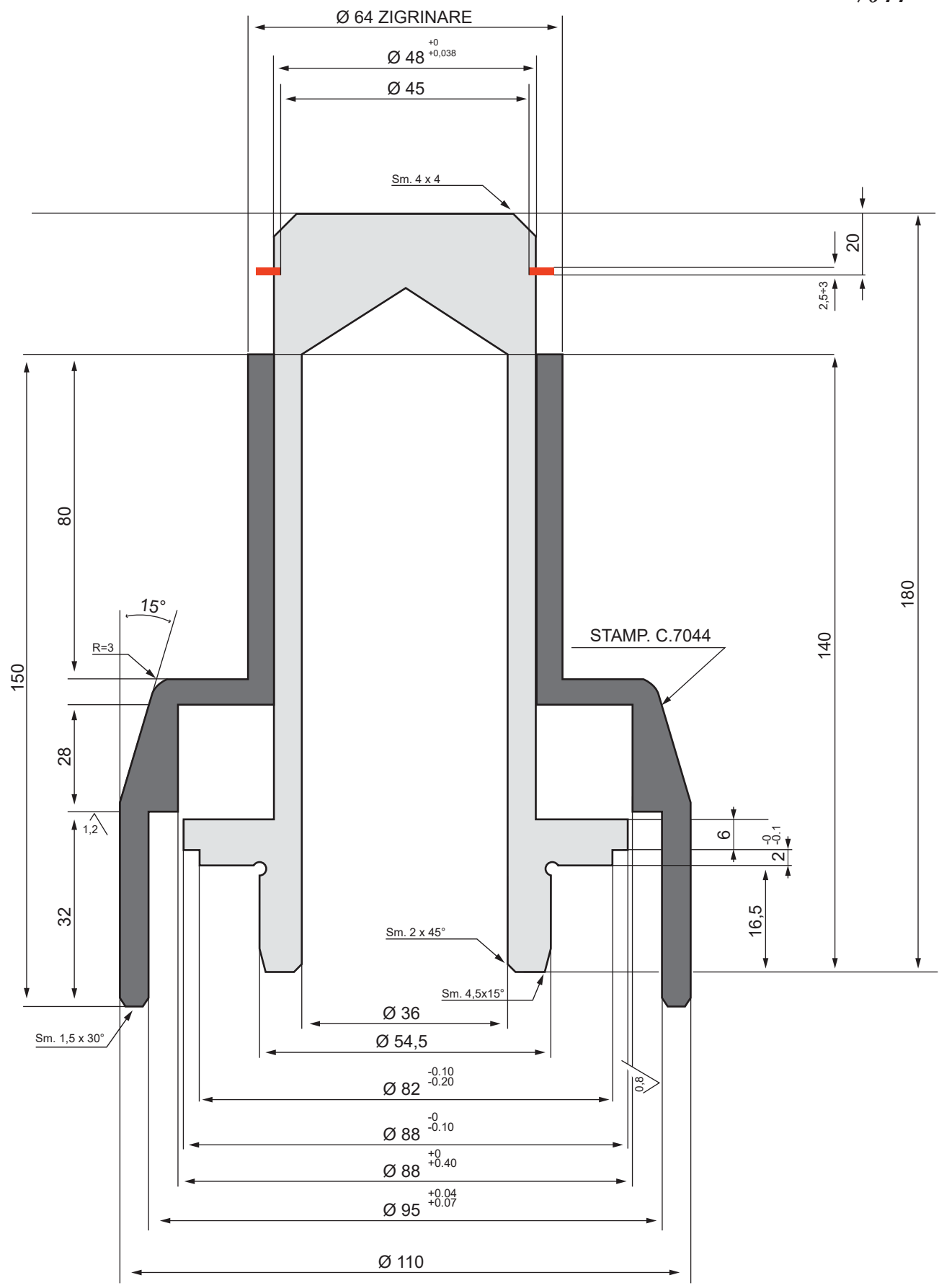
T6
6463



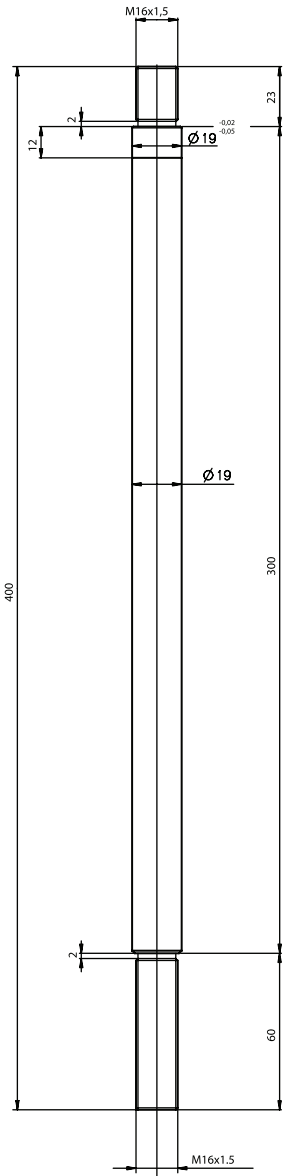
1



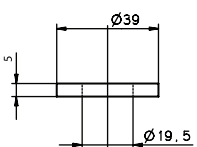
T7
7044



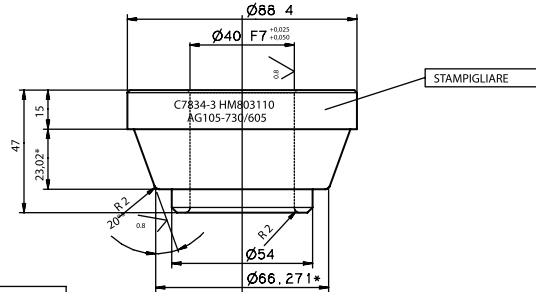
T8 7834



SMUSSI NON QUOTATI 0,5x45°

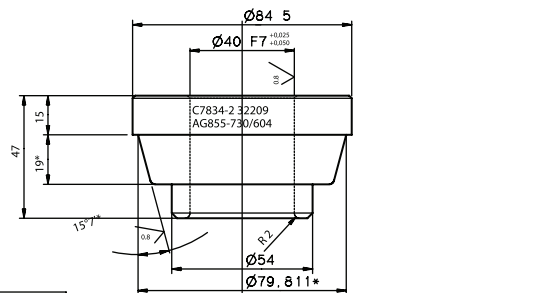


* = ESEGUIRE IN OPERA CON CUSCINETTO HM803110

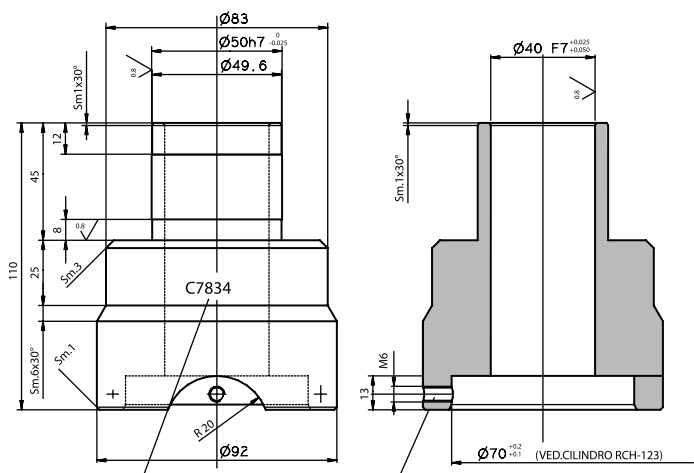


PROF.DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°

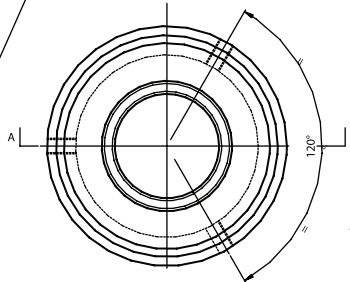
* = ESEGUIRE IN OPERA CON CUSCINETTO 32209

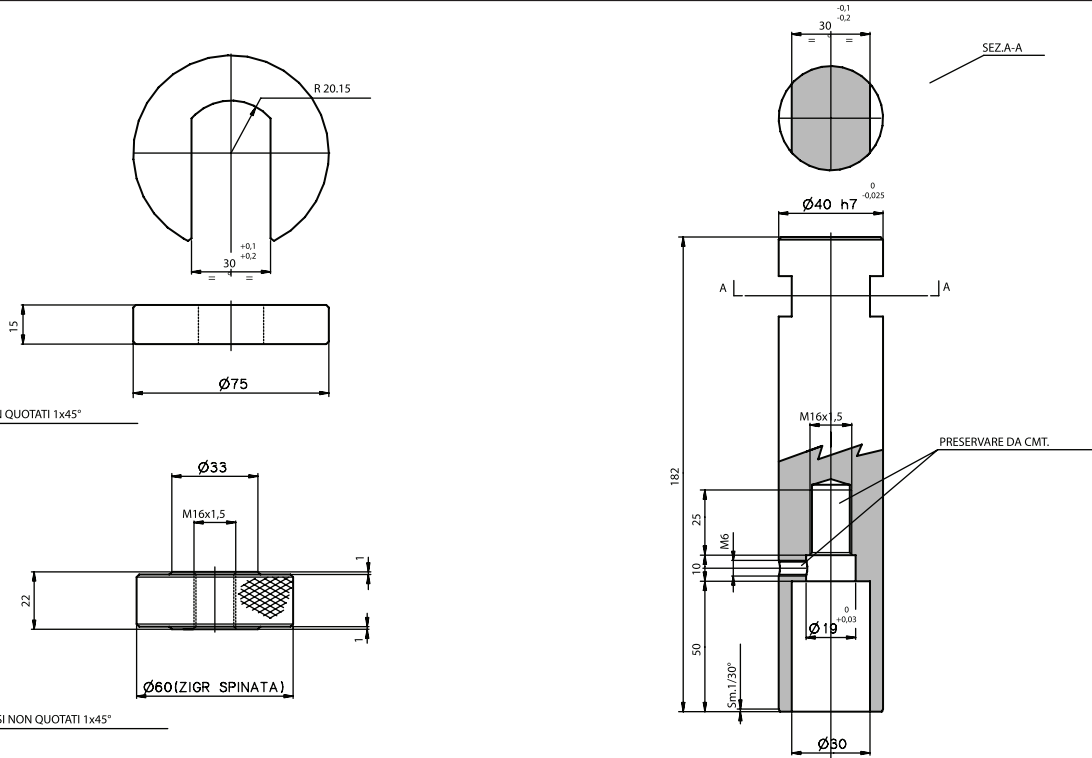


PROF.DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°



PROF.DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°



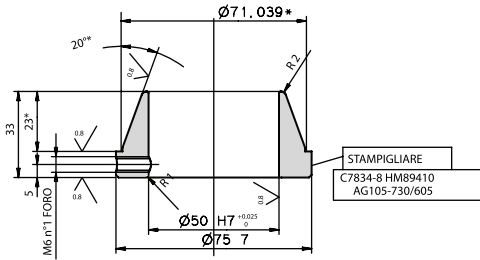


SMUSSI NON QUOTATI 1x45°

SMUSSI NON QUOTATI 1x45°

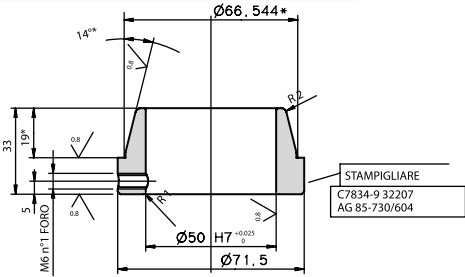
PROF. DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°

* = ESEGUIRE IN OPERA CON CUSCINETTO HM 89410-N



PROF. DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°

* = ESEGUIRE IN OPERA CON CUSCINETTO 32207



PROF. DI CMT. 0,7-0,9
HRC. 58-60
SMUSSI NON QUOTATI 1x45°