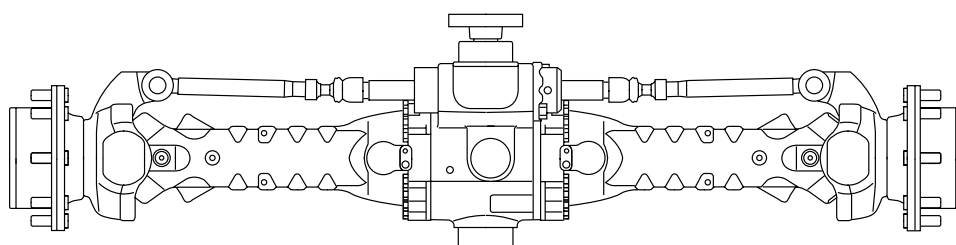


Maintenance and Repair Manual
212
Axle
MO212S20



SPICER OFF-HIGHWAY PRODUCTS



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GB

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.

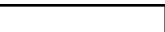
IMPORTANT: In order to facilitate work and protect both working surfaces and operators, it is advisable to use proper equipment such as: trestles or supporting benches, plastic or copper hammers, appropriate levers, pullers and specific spanners or wrenches.

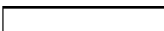
Before going on to disassemble the parts and drain the oil, it is best to thoroughly clean the unit, removing any encrusted or accumulated grease.

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 SPICER CLARK-HURTH.

ITA

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, incrinature, 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 SPICER CLARK-HURTH.

D

Die Leistung und Lebensdauer der mechanischen Teile hängt nicht nur von einer ständigen und richtig durchgeführten Wartung sondern auch von einem sofortigen Eingriff im Störfall ab. Um dieses Handbuch zu erstellen sind wir von einer allgemeinen Überprüfung der Einheit ausgegangen, doch entscheidet der Mechaniker ob die einzelnen Teile bei Reparaturen montiert werden müssen oder nicht. Das Handbuch ist schnell und einfach nachzuschlagen und ermöglicht es anhand der Abbildungen und der Zeichnungen, die die verschiedenen Vorgänge darstellen, gezielt einzugreifen. Nachstehend sind alle Informationen und Hinweise aufgeführt, die zur Zerlegung, Prüfung und Montage der Einzelteile nötig sind. Um die Differentialachse des Fahrzeugs abzumontieren, lesen Sie bitte die Anweisungen in den Handbüchern des Fahrzeugherstellers. Die nachstehenden Beschreibungen gehen davon aus, daß die Fahrzeugachse schon abmontiert worden ist.

WICHTIG: Um die Arbeit zu erleichtern und gleichzeitig die verarbeiteten Flächen zu schützen und die Sicherheit der Arbeiter zu gewährleisten, empfehlen wir geeignete Werkzeuge wie Böcke, Tisch, Gummi- oder Kupferhammer, geeignete Abzieher und Schlüssel zu verwenden. Bevor mit der Zerlegung der Teile begonnen und das Öl abgelassen wird, muß die Achse sorgfältig gereinigt und Verkrustungen und Fettablagen abgetragen werden.

VORAUSSETZUNG: Alle abmontierten mechanischen Teile müssen sorgfältig mit geeigneten Reinigungsmitteln gereinigt oder, wenn beschädigt, verschleißt, gerissen, festgefressen usw. ausgetauscht werden. Insbesondere muß der einwandfreie Zustand aller beweglichen Teile (Lager, Zahnräder, Kegelradpaare, Wellen) und der Dichtungen (O-Ringe, Ölabdichtungen), die am meisten beansprucht werden und verschleifen, kontrolliert werden. Wir empfehlen auf jeden Fall die Abdichtungselemente immer auszuwechseln, wenn eine Überholung oder eine Reparatur der Teile vorgenommen wird. Bei

der Montage müssen die Ränder der Dichtringe geschmiert werden. Wenn beim Kegelradpaar ein Zahnrad ausgewechselt werden muß, muß auch das andere Zahnrad ausgewechselt werden. Bei der Montage müssen die vorgeschriebenen Spiele, Vorspannungen und Drehmomente strengstens eingehalten werden.

GÜLTIGKEIT: Das Handbuch gibt an zu welchen Kennnummern die Einheiten gehören. Der Einfachheit halber sind die Angehörigkeiten folgendermaßen aufgeführt:

→ → [] = bis Kennnummer

[] → → = ab Kennnummer

Wenn keine Angehörigkeit angegeben ist, verstehen sich die Arbeiten zur Zerlegung und Montage für alle Ausführungen gültig.

SPEZIFISCHE WERKZEUGE UND ERSATZTEILE: die Zeichnungen der für Wartungsarbeiten erforderlichen spezifischen Werkzeuge, sind am Ende des Handbuchs aufgeführt; Ersatzteile können beim Fahrzeughersteller oder direkt bei der Kundendienststelle oder bei einem zugelassenen Händler der SPICER CLARK-HURTH bezogen werden.

ESP

El rendimiento y la duración de los órganos mecánicos depende, además que del constante y correcto mantenimiento, también de la intervención inmediata en caso de averías o anomalías.

Al proponer este manual, ha sido considerada la suposición de una revisión general del grupo, pero es el mecánico quien tiene que valorar la necesidad de montar cada uno de los componentes en caso de reparación. El manual es una guía rápida y segura que permite intervenciones precisas por medio de fotografías y de planos que muestran las distintas fases de las operaciones. A continuación figuran todas las informaciones y advertencias necesarias para ejecutar un montaje correcto, para las comprobaciones y el montaje de cada uno de los componentes. Para remover el puente diferencial del vehículo hay que consultar los manuales de los fabricantes del vehículo. En la descripción de las operaciones siguientes se supone que el puente ya ha sido sacado del vehículo.

IMPORTANTE: Para facilitar el trabajo salvaguardando al mismo tiempo las superficies mecanizadas y la seguridad de los operadores, se aconseja que se usen equipos y herramientas adecuados como caballetes y bancos de soporte, martillos de plástico o de cobre, palancas adecuadas, extractores y llaves específicas.

Antes de desmontar las partes y descargar el aceite, es conveniente que se haga una limpieza minuciosa del puente sacando las incrustaciones y acumulaciones de grasa.

INTRODUCCION: Todos los órganos mecánicos desmontados tienen que ser limpiados minuciosamente con productos adecuados y restaurados o sustituidos en el caso de que presenten daños, desgaste, rajaduras, agrietamientos, etc. En particular, comprobar la integridad de todas las partes en movimiento (cojinetes, engranajes, par cónico, ejes) y de estanqueidad (anillos OR, detenedor de aceite) sujetas a mayores sollicitaciones y desgaste.

Se aconseja, de todas formas, que se sustituyan los órganos de estanqueidad cada vez que se ejecute la revisión o reparación de los componentes.

Al volver a montar, los segmentos de compresión tienen que estar lubricados en los bordes de estanqueidad. En el caso del par cónico, la sustitución de uno de sus engranajes comporta también la sustitución del otro. Al montar hay que tener en cuenta escrupulosamente los juegos, las precargas y los pares descriptos.

VALIDEZ: El manual suministra la validez de los grupos en forma de matrícula. Para poder tener una interpretación correcta, la validez está indicada:

→ → [] = hasta la matrícula

[] → → = desde la matrícula en adelante

Si no ha sido indicada validez, las operación de desmontaje y montaje son comunes a todas las versiones.

HERRAMIENTAS ESPECIFICAS Y RECAMBIOS: Los planos de las herramientas específicas necesarias para la ejecución de las intervenciones de mantenimiento figuran al final del manual; los recambios se pueden pedir al fabricante de la máquina o directamente al Service Center o a Distribuidores autorizados de SPICER CLARK-HURTH.

F

Le rendement et la continuité des organes mécaniques dépendent, non seulement d'une maintenance correcte et constante, mais également de la rapidité d'intervention en cas de pannes ou d'anomalies. En vous proposant ce manuel, on envisage l'hypothèse d'une révision générale du groupe, mais c'est au mécanicien d'évaluer la nécessité de monter ou non chacun des composants en cas de réparation. Le manuel est un guide rapide et sûr consentant des interventions précises, au travers de photographies et de dessins prospectifs qui illustrent les différentes phases des opérations. Ensuite, sont reportées toutes les informations et précautions nécessaires pour un démontage correct et les vérifications et assemblage de chaque composant. En ce qui concerne le déplacement du pont d'étai du véhicule, il est nécessaire consulter les manuels fournis par le constructeur du véhicule. En décrivant les opérations suivantes, on présume que le pont ait déjà été enlevé du véhicule.

IMPORTANT: Pour faciliter le travail en sauvegardant en même temps les surfaces usinées et la sécurité des opérateurs, il est préconisé d'utiliser des installations appropriées telles que des étais ou banc de support, maillets en plastique ou cuivre, leviers appropriés, extracteurs et clés spécifiques. Avant de procéder au démontage des parties et vidanger l'huile, il vaut mieux nettoyer soigneusement le pont, en enlevant incrustations et blocs de gras.

PRELIMINAIRE: Tous les organes mécaniques démontés doivent être soigneusement nettoyés à l'aide de produits appropriés et réparés ou remplacés dans le cas où ils seraient abîmés, usés, fêlés, grippés, etc. Vérifier, l'intégrité, en particulier, de toutes les parties en mouvement (paliers, engrenages, couple conique, arbres) et l'étanchéité des bagues (bagues OR, parahuile), qui sont sujettes à plus de sollicitations et à l'usure. Il est préconisé, de toute façon, de substituer les organes d'étanchéité, chaque fois que l'on effectue une révision ou une réparation des composants. Au moment du montage, les bagues d'étanchéité doivent être lubrifiées sur les bords étanches. Dans le cas du couple conique, la substitution de l'un de ses engrenages comporte également la substitution de l'autre. En phase de montage, il faut respecter scrupuleusement les jeux, les précharges et les couples prescrits.

VALIDITE: Le manuel fournit la validité des groupes sous forme de matricule. Pour une meilleure interprétation, les validités sont indiquées comme:

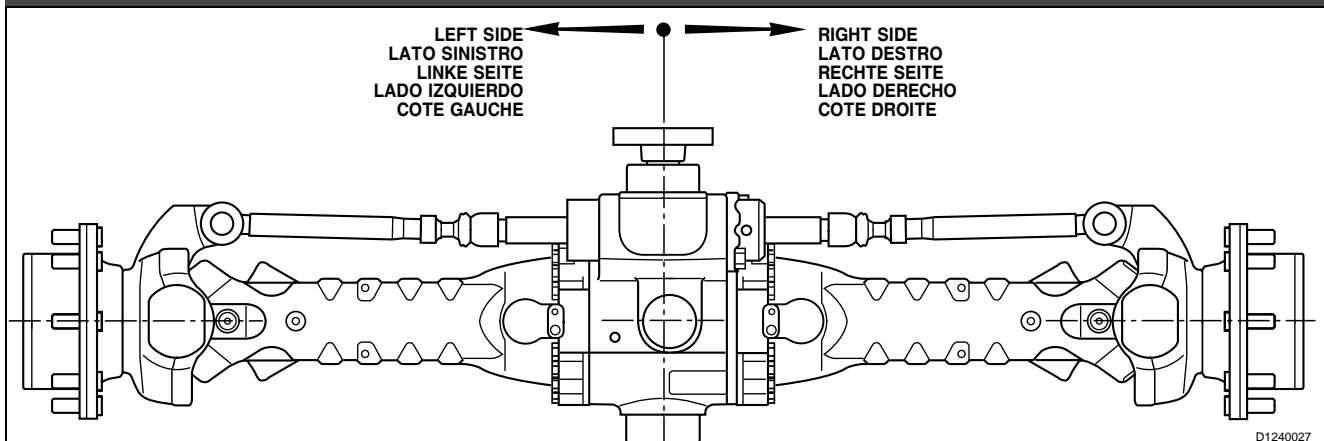
→ → [] = jusqu'à l'immatriculation

[] → → = à partir de l'immatriculation et après

Si les validités ne sont pas indiquées, les opérations de démontage et d'assemblage sont pareilles dans toutes les versions.

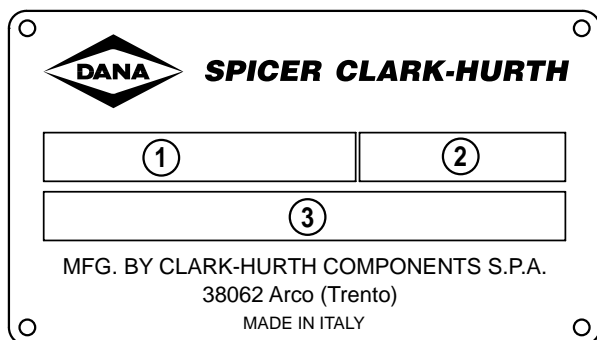
INSTALLATIONS SPECIFIQUES ET PIECES DETACHEES: Les dessins des installations spécifiques nécessaires pour effectuer des interventions d'entretien sont reportées à la fin du manuel, les pièces détachées peuvent être commandées au constructeur de la machine ou directement aux Centres de Services, ou Distributeurs agréés de la Société SPICER CLARK-HURTH.

DEFINITION OF VIEWPOINTS - DEFINIZIONE VISTE - DEFINITION DER ANSICHTEN - DEFINICION VISTAS - DÉFINITION VUES



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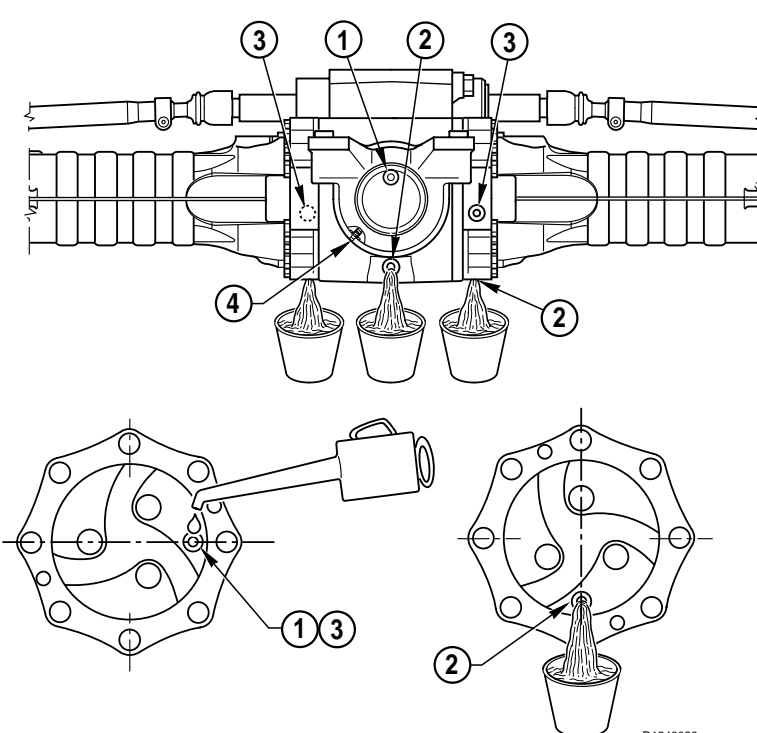
DATA PLATE - TARGA MATRICOLA - KENNUMMERNSCHILD - MATRICULA - PLAQUE D'IMMATRICULATION



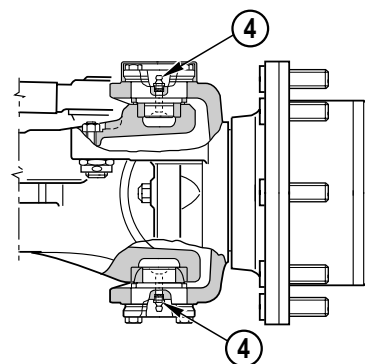
D1240011

- 1** Type and model unit - modification index
Tipo e modello gruppo - indice di modifica
Typ und Modelleles Antriebes - Änderungsverzeichnis
Tipo y modelo grupo - indice de modificación
Type et modèle de ensemble - tableau des modifications
- 2** Serial number
Numero di serie
Seriennummer
Número de serie
Numero de serie
- 3** Lubricant
Lubrificante
Schmieröl
Lubricante
Lubrifiant

MAINTENANCE POINTS - PUNTI DI MANUTENZIONE - WARTUNGSSTELLEN - PUNTOS DE MANUTENCION - POINTS D'ENTRETIEN



D1240028



- 1** Oil filling plug - Tappo di carico
Einfüllstopfen - Tapon de carga
Bouchon de ravitaillement
- 2** Oil draining plug - Tappo di scarico
Ablassstopfen - Tapon de descarga
Bouchon de vidange
- 3** Check level plug - Tappo controllo livello
Stopfen zur Ölpegelkontrolle -
Tapon de contrl de nivel - Jauge de niveau
- 4** Grease nipples - Ingrassatori
Schmierer - Engrasadores
Graisseurs

MAINTENANCE INTERVALS - INTERVALLI DI MANUTENZIONE - WARTUNGSINTERVALLE - INTERVALOS DE MANUTENCIÓN - INTERVALLE DE SERVICE

OPERATION - OPERAZIONE - ARBEITSVORGANG - OPERACION - OPERATION		FREQUENCY - PERIODICITÀ - ZEITABSTAND - FRECUENCIA - PERIODICITE	LUBRICANTS - LUBRIFICANTI - SCHMIERSTOFFE - LUBRICANTES - LUBRIFIANTS
<ul style="list-style-type: none"> Check levels: Controllo livelli: Ölstandkontrolle: Control niveles: Contrôle niveaux: 	Differential Differenziale Im differential Diferencial Differential	monthly mensile monatlich cada mes mensuel	<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 Mit Zusatzmittel für Bremsen in Ölbad Con aditivos para frenos de baño de aceite Avec adjuvants pour freins en bain d'huile 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 Bei Ausführungen mit Kegel- und Telleradpaar und/oder Selbstsperrdifferential, mit Zusatzmitteln für Bremsen in Ölbad Para ejecuciones con par cónico hipoide y/o con diferencial autobloqueante con aditivos para frenos de baño de aceite. Pour exécutions avec couple conique hypoïde et/ou différentiel autobloquant, avec adjuvants pour freins en bain d'huile
	Planetary reduction Riduzione epicicloidale Planetengetrieb Reducción epicicloidial Reduction epicycloïdale	every 200 hours ogni 200 ore alle 200 Std. cada 200 horas toutes les 200 heures	
<ul style="list-style-type: none"> Oil change: Cambio olio: Ölwechsel: Cambio aceite: Vidange huile: 	Differential Differenziale Im differential Diferencial Differential	every 800 hours * ogni 800 ore alle 800 Std. cada 800 horas toutes les 800 heures	
	Planetary reduction Riduzione epicicloidale Planetengetrieb Reducción epicicloidial Reduction epicycloïdale	every 1000 hours * ogni 1000 ore alle 1000 Std. cada 1000 horas toutes les 1000 heures	
	Self-locking differential gear Differenziale autobloccante Selbstsperrdifferential Diferencial autobloqueante Différentiel autobloquant	every 700 hours * <input type="checkbox"/> ogni 700 ore alle 700 Std. cada 700 horas toutes les 700 heures	

* Initially after 100 working hours - Inizialmente dopo 100 ore di lavoro - Erstmals nach 100 Betriebsstunden - Al principio, después de 100 horas de trabajo - Initialement après 100 heures de travail
☐ When it starts sounding noisy - Anche ai primi cenni di rumorosità - Auch falls ungewöhnliche Geräusche zu bemerken sind - También al primer indicio de ruido - Même aux premiers signaux de bruit

OPERATION - OPERAZIONE - ARBEITSVORGANG - OPERACION - OPERATION	MEMBER - ORGANO - ELEMENT - ORGANO - ORGANE	CONDITIONS - CONDIZIONI - BEDINGUNG - CONDICIONES - CONDITIONS	FREQUENCY - PERIODICITÀ - ZEITABSTAND - FRECUENCIA - PERIODICITE	LUBRICANTS - LUBRIFICANTI - SCHMIERSTOFFE - LUBRICANTES - LUBRIFIANTS
Greasing Ingrassaggio Schmieren Engrase Graissage	Articulations Snodi Gelenk Rótula Articulations	Normal work Lavori normali Normale Arbeit Trabajos normales Tâches ordinaires	monthly mensile monatlich cada mes mensuel	MOLIKOTE
		Awkward work Lavori gravosi Schwere Arbeit Trabajos pesados Tâches extraordinaires	Weekly Settimanale Wöchentlich Semanal Hebdomadaire	

ADJUSTMENT AND CHECKS - REGISTRAZIONE E CONTROLLI - EINSTELLUNGEN UND KONTROLLEN - AJUSTE Y CONTROLES - REGLAGES ET CONTROLES

UNIT - GRUPPO - AGGREGAT - GRUPO - GROUPE	OPERATION - OPERAZIONE - ARBEITSVORGANG - OPERACION - OPERATION	FREQUENCY - PERIODICITÀ - ZEITABSTAND - FRECUENCIA - PERIODICITE	SERVICE BRAKE CIRCUIT - CIRCUITO COMANDO FRENI - BREMSKREISLAUF - CIRCUITO MANDOS FRENOS - CIRCUIT DE COMMANDE DES FREINS
Negative brake Freno negativo Federspeicherbremse Freno negativo Frein négatif	Adjustment Registrazione Einstellen Ajuste Réglage	every 1000 hours * ogni 1000 ore alle 1000 Std. cada 1000 horas toutes les 1000 heures	Only for mineral oil use e.g. ATF Dexron II. Make sure that master cylinder seals are suitable for mineral oil. Usare esclusivamente olio minerale ATF Dexron II. Accertarsi che le guarnizioni del cilindro master siano adatte a questo olio. Nur mineralisches Öl verwenden, z.B.: ATF Dexron II. Achtung: Dichtringe des Hauptbremszylinders müssen für dieses Öl geeignet sein. Usar exclusivamente aceite mineral ATF Dexron II. Asegurarse de que las juntas del cilindro principal son adecuadas para este aceite. Utiliser exclusivement huile minérale ATF Dexron II. Vérifier que les joints du maître-cylindre, soient compatibles avec cette huile.
Service brake Freni di servizio Hilfsbremse Frenos de ejercicio Freins de service	Adjustment Registrazione Einstellen Ajuste Réglage	every 500 hours ogni 500 ore alle 500 Std. cada 500 horas toutes les 500 heures	
Wheel nuts Dadi ruota Radmuttern Tuercas rueda Ecrous de roue	Tightening Serraggio - Festziehen Apriete Serrage	every 200 hours ogni 200 ore alle 200 Std. cada 200 horas toutes les 200 heures	

* Initially after 100 working hours - Inizialmente dopo 100 ore di lavoro - Erstmals nach 100 Betriebsstunden - Al principio, después de 100 horas de trabajo - Initialement après 100 heures de travail

**CONVERSION TABLES - TABELLE DI CONVERSIONE - UMRECHNUNGSTABELLEN
TABLAS DE CONVERSION - TABLEAUX DE CONVERSION**

Units of pressure - Unità di pressione - Druckeinheiten
Unidad de presión - Unités de pression:

$$1 \text{ Atm} \cong 1 \text{ bar} \cong 10^5 \text{ Pa} \cong 14.4 \text{ Psi}$$

Units of weight - Unità di peso - Gewichtseinheiten
Unidad de peso - Unités de poids

Units of torque - Unità di coppia - Drehmomenteinheiten
Unidad de par - Unités de couple

	N	daN	kN	kg	lbs
1N	1	0,1	0,001	0,102	0,225
1daN	10	1	0,01	1,02	2,25
1kN	1000	100	1	102	225
1kg	9,81	0,981	0,00981	1	2,205

	Nm	daNm	kNm	kgm	lb-in
1Nm	1	0,1	0,001	0,102	8,854
1daNm	10	1	0,01	1,02	88,54
1kNm	1000	100	1	102	8854
1kgm	9,81	0,981	0,00981	1	86,8
1lb-in	0,1129	0,01129	0,0001129	0,01152	1

**TIGHTENING TORQUES - COPPIE DI SERRAGGIO - ANZIEHDREHMOMENTE
PARES DE TORSION - COUPLES DE SERRAGE**

Unit - Unità di misura - Maßeinheiten - Unidad de medida - Unités de mesure: Nm

SIZE OF BOLT MISURA VITE SCHRAUBENMASS TAMAÑO TORNILLO MESURE VIS		TYPE OF BOLT - TIPO VITE - GEWINDE - TIPO DE TORNILLO - TYPE DE VIS					
		8.8		10.9		12.9	
		Normali + Loctite 242	Loctite 270	Normali + Loctite 242	Loctite 270	Normali + Loctite 242	Loctite 270
COARSE PITCH - PASSO GROSSO - GROßER SCHRITT - PASO GRUESO - GROS PAS	M6 x 1	9,5-10,5	10,5-11,5	14,3-15,7	15,2-16,8	16,2-17,8	18,1-20,0
	M8 x 1,25	23,8-26,2	25,6-28,4	34,2-37,8	36,7-40,5	39,0-43,0	43,7-48,3
	M10 x 1,5	48-53	52-58	68-75	73-81	80-88	88-97
	M12 x 1,75	82-91	90-100	116-128	126-139	139-153	152-168
	M14 x 2	129-143	143-158	182-202	200-221	221-244	238-263
	M16 x 2	200-221	219-242	283-312	309-341	337-373	371-410
	M18 x 2,5	276-305	299-331	390-431	428-473	466-515	509-562
	M20 x 2,5	390-431	428-473	553-611	603-667	660-730	722-798
	M22 x 2,5	523-578	575-635	746-824	817-903	893-987	974-1076
	M24 x 3	675-746	732-809	950-1050	1040-1150	1140-1260	1240-1370
	M27 x 3	998-1103	1088-1202	1411-1559	1539-1701	1710-1890	1838-2032
	M30 x 3,5	1378-1523	1473-1628	1914-2115	2085-2305	2280-2520	2494-2757
FINE PITCH - PASSO FINE - KLEINER SCHRITT PASO FINO - PAS FIN	M8 x 1	25,7-28,3	27,5-30,5	36,2-39,8	40,0-44,0	42,8-47,2	47,5-52,5
	M10 x 1,25	49,4-54,6	55,2-61,0	71,5-78,5	78,0-86,0	86,0-94,0	93,0-103,0
	M12 x 1,25	90-100	98-109	128-142	139-154	152-168	166-184
	M12 x 1,5	86-95	94-104	120-132	133-147	143-158	159-175
	M14 x 1,5	143-158	157-173	200-222	219-242	238-263	261-289
	M16 x 1,5	214-236	233-257	302-334	333-368	361-399	394-436
	M18 x 1,5	312-345	342-378	442-489	485-536	527-583	580-641
	M20 x 1,5	437-483	475-525	613-677	674-745	736-814	808-893
	M22 x 1,5	581-642	637-704	822-908	903-998	998-1103	1078-1191
	M24 x 2	741-819	808-893	1045-1155	1140-1260	1235-1365	1363-1507
	M27 x 2	1083-1197	1178-1302	1520-1680	1672-1848	1834-2027	2000-2210
	M30 x 2	1511-1670	1648-1822	2138-2363	2332-2577	2565-2835	2788-3082

SCREW-LOCKING, SEALING AND LUBRICATING MATERIALS - MATERIALI PER BLOCCAGGIO VITI, TENUTA E LUBRIFICAZIONE - MATERIAL ZUR BLOCKIERUNG VON SCHRAUBEN UND FÜR DICHTUNGEN UND SCHMIERMITTEL - MATERIALES PARA EL BLOQUEO, ESTANQUEIDAD Y LUBRICACION - MATERIAUX POUR LE BLOCAGE VIS, ÉTANCHEITÉ ET LUBRIFICATION

- !** 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.
 Die Materialien zur Blockierung von Schrauben, für Dichtungen und Schmiermittel, die im Handbuch aufgeführt sind, sind dieselben die auch vom Hersteller verwendet werden.
Los materiales para el bloqueo, estanqueidad y lubricación específica indicados en el manual, son los que se usan en la fábrica
 Les matériaux de blocage, d'étanchéité et de lubrification spécifiés indiqués dans ce manuel sont ceux employés à l'usine.
- 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.
 Von diesen Materialien werden die typischen Anwendungen genannt, um sie mit ähnlichen Materialien zu ersetzen, die unter anderen Namen und Kennzeichnungen im Handel erhältlich sind.
De estos materiales damos las aplicaciones típicas que los distinguen, de manera que se puedan sustituir con productos similares comercializados por otras marcas y por tanto con otras siglas.
 De ces matériaux ne sont reportées que les applications typiques qui les distinguent de telle sorte qu'ils puissent être substitués par des produits semblables se trouvant dans le commerce sous d'autres marques et par conséquent sous d'autres sigles.

DENOMINATION DENOMINAZIONE BEZEICHNUNG DENOMINACION DENOMINATION	APPLICATION - APPLICAZIONE - ANWENDUNG - APLICACION - APPLICATION
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. <i>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.</i> Anaerobes Produkt, um das Lockern von Schrauben, Muttern und Stopfen zu verhindern. Für mittlere Widerstandskräfte geeignet. Darf erst aufgetragen werden, wenn die Flächen von Schmiermittel richtig sauber sind. Dazu das entsprechende Produkt verwenden. <i>Producto anaeróbico apto para prevenir el aflojamiento de tornillos, tuerca y tapones. Usado para el frenado de media resistencia. Tiene que ser usado sólo después de haber quitado todo residuo de lubricante con el activador específico.</i> Produit anaérobic servant à prévenir le relâchement des vis, écrous et bouchons. Utilisé pour le freinage demi résistant. Il doit être utilisé après avoir enlevé toute trace de lubrifiant à l'aide d'un activateur spécial.
Loctite 243	<ul style="list-style-type: none"> The oleocompatible alternative to 242. Does not require the activation of lubricated surfaces. <i>Prodotto alternativo al 242 che, essendo oleocompatibile, non richiede l'attivazione di superfici lubrificate.</i> Alternatives Produkt zu Loctite 242. Da es ölkompatibel ist müssen die geschmierten Flächen nicht aktiviert werden. <i>Producto alternativo al 242 que, siendo oleocompatible, no requiere la activación de superficies lubricadas.</i> Produit en alternance avec le 242 lequel étant oléocompatible ne requiert aucune activation des surfaces lubrifiées.
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. <i>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.</i> <i>La rimozione delle parti, può richiedere un riscaldamento a circa 80°C.</i> Anaerobes Produkt für hohe Widerstandskräfte für Schrauben und Muttern geeignet. Zuerst die Fläche sorgfältig aktivieren. Um die Flächen zu säubern, diese auf ca. 80°C erwärmen. <i>Producto anaeróbico apto para el frenado de alta resistencia de tornillos y tuercas. tiene que ser usado después de haber quitado todo residuo de lubricante con el activador específico.</i> <i>La remoción de las partes, puede requerir un calentamiento a unos 80°C.</i> Produit anaérobic apte au freinage à très haute résistance des vis et des écrous. Il doit être utilisé après avoir enlevé toute trace de lubrifiant à l'aide d'un activateur spécial.
Loctite 275	<ul style="list-style-type: none"> Anaerobic product suitable for high-strength locking and sealing of large threaded parts, bolts and stud bolts, for pipe sealing and for protecting parts against tampering; suitable for sealing coupling surfaces with a max. diametrical clearance of 0.25 mm. <i>Prodotto anaerobico adatto per la frenatura e sigillatura ad alta resistenza di parti filettate, bulloni e prigionieri di grandi dimensioni, protezione antimanomissione e sigillatura di tubazioni; può sigillare accoppiamenti con gioco diametrale massimo di 0,25 mm.</i> Anaerobes Produkt zum Bremsen und Siegeln von großen Gewinden, Muttern und Stiftschrauben, sehr widerstandsfähig, verschleißungsbeständig, und zum Siegeln von Rohrleitungen geeignet; kann Kupplungen mit einer maximalen Lagerluft von 0,25 mm siegeln. <i>Producto anaeróbico apto para el frenado y selladura a alta resistencia de tornillos, tuercas y prisioneros de grandes dimensiones, protección anti manomisión y selladura de tubaciones; puede sellar encolcados con juego diametral.</i> Produit anaérobic adapté au freinage et au scellage à haute résistance des parties filetées, boulons et prisonniers de grandes dimensions, protection anti-altération et scellage de tuyauteries; il peut sceller des accouplements ayant un jeu diamétral maximal de 0,25 mm.

SCREW-LOCKING, SEALING AND LUBRICATING MATERIALS - MATERIALI PER BLOCCAGGIO VITI, TENUTA E LUBRIFICAZIONE - MATERIAL ZUR BLOCKIERUNG VON SCHRAUBEN UND FÜR DICHTUNGEN UND SCHMIERMITTEL - MATERIALES PARA EL BLOQUEO, ESTANQUEIDAD Y LUBRICACION - MATÉRIEAUX POUR LE BLOCAGE VIS, ÉTANCHEITÉ ET LUBRIFICATION

DENOMINATION DENOMINAZIONE BEZEICHNUNG DENOMINATION DENOMINATION	APPLICATION - APPLICAZIONE - ANWENDUNG - APLICACION - APPLICATION
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. <i>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.</i> Anaerobes Produkt zur Abdichtung von Flüssigkeiten an Flanschen und Schrauben mit Löcher, die mit Flüssigkeiten in Kontakt stehen. Kann ein Spiel zwischen Flanschen bis 0,2 mm abdichten. <i>Producto anaeróbico apto para le estanqueidad de fluidos entre grupos bridados y de tornillos de orificio comunicante con los fluidos. Puede sellar juegos entre las bridas hasta 0,2 mm.</i> Produit anaérobie apte à la tenue étanche des fluides entre les pièces à brides et des vis à trou en contact avec les fluides. Il peut sceller un jeu parmi les flasques jusqu'à 0,2 mm.
Loctite 577	<ul style="list-style-type: none"> Quick anaerobic sealant for sealing threaded portions of conical or cylindrical unions up to M80. Before using it, remove any lubricant with the specific activator. After polymerisation, disassembly may result rather difficult, so heating may be necessary for larger diameters. <i>Prodotto anaerobico sigillante rapido per la tenuta di filettature di raccordi conici o cilindrici fino a M80. Deve essere usato dopo aver asportato ogni traccia di lubrificante con l'attivatore specifico. Dopo la polimerizzazione presenta una moderata difficoltà di smontaggio per cui può richiedere, per i diametri maggiori, un riscaldamento.</i> Anaerobes Produkt zum schnellen Siegeln und Abdichten von Kegel- oder Zylinderkupplungen bis M80. Darf erst aufgetragen werden, nachdem mit einem spezifischen Wirkstoff jede Spur von Schmiermittel abgetragen worden ist. Nach der Polymerisation könnte das Abmontieren etwas schwierig sein weshalb größere Durchmesser zuerst erhitzt werden müssen. <i>Producto anaeróbico sellante rapido para el estanqueido de tornillos de empalme conico o cilindrico hasta M80. Debe de ser utilizado despues de haber quitado cada mancha de lubricante con activador especifico. Despues de la polimeracion presenta una moderada dificultad de desmontaje por lo tanto puede necesitar, para los diametros mayores, un calentamiento.</i> Produit anaérobie collage rapide assurant l'étanchéité des filetages des raccords coniques ou cylindriques jusqu'à M80. Il doit être utilisé après qu'on ait enlevé toute trace de lubrifiant à l'aide d'un activateur spécial. Une certaine difficulté de démontage se présente après la polymérisation, on peut donc avoir la nécessité de devoir chauffer préalablement pour de plus amples diamètres.
Loctite 638	<ul style="list-style-type: none"> Anaerobic adhesive for fast and high-strength gluing of cylindrical metal joints (hub on shaft). Can glue together parts with clearance ranging between 0.1 and 0.25 mm. <i>Adesivo anaerobico per l'incollaggio rapido ad alta resistenza di giunti cilindrici in metallo (mozzo su albero). Può incollare particolari con gioco tra 0,1 e 0,25 mm.</i> Anaerobes Klebstoff für große Widerstandskräfte für Zylinderkupplungen aus Metall geeignet (Wellennaben). Kann Einzelteil mit einem Radialspiel zwischen 0,1 mm und 0,25 mm zusammenkleben. <i>Adhesivo anaeróbico para el encolado rápido de alta resistencia de juntas cilíndricas de metal (cubo en el eje). Puede encolar piezas con juego entre 0,1 mm y 0,25 mm.</i> Adhésif anaérobie servant à un collage rapide et hautement résistant des joints cylindriques en métal (moyeu sur l'arbre). Il peut servir à coller des pièces avec un jeu allant de 0,1 à 0,25 mm.
Loctite 648	<ul style="list-style-type: none"> Anaerobic adhesive for fast and medium-strength gluing of cylindrical metal joints (hub on shaft). Can glue together parts with radial clearance below 0.1 mm. <i>Adesivo anaerobico per l'incollaggio rapido a media resistenza di giunti cilindrici in metallo (mozzo su albero). Può incollare particolari con gioco radiale inferiore a 0,1 mm.</i> Anaerobes Klebstoff für mittlere Widerstandskräfte für Zylinderkupplungen aus Metall geeignet (Wellennaben). Kann Einzelteil mit einem Radialspiel von weniger als 0,1 mm zusammenkleben. <i>Adhesivo anaeróbico para encolado rápido de media resistencia juntas cilíndricas de metal (cubo en el eje). Puede encolar piezas con juego radial inferior a 0,1 mm.</i> Adhésif anaérobie servant à un collage rapide moyennement résistant des joints cylindriques en métal (moyeu sur l'arbre). Il peut servir à coller des pièces avec un jeu radial inférieur à 0,1 mm.
(AREXONS) Repositionable jointing compound for seals <i>Mastice per guarnizioni riposizionabile</i> Klebstoff für verstellbare Dichtungen <i>Pasta para juntas reposicionable</i> Mastic pour garnitures à remettre en place	<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. <i>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.</i> Klebstoff für Gummidichtung auf Lösemittelbasis, trocknet durch Verdampfung. Wird am äußeren Durchmesser von Dichtungsringe bei rotierenden Wellen mit Metallmantel verwendet. <i>Pasta para juntas de sellado para juntas elásticas a base de disolvente, deshidratante por evaporación. Se utiliza para la estanqueidad en el diámetro externo de segmentos de compresión, para ejes giratorios con armadura metálica exterior.</i> Mastic adhésif à base de solvants pour garnitures élastiques, séchant par évaporation. Il sert garder étanche le diamètre extérieur des bagues d'étanchéité des arbres rotatifs ayant une armature métallique externe.

SCREW-LOCKING, SEALING AND LUBRICATING MATERIALS - MATERIALI PER BLOCCAGGIO VITI, TENUTA E LUBRIFICAZIONE - MATERIAL ZUR BLOCKIERUNG VON SCHRAUBEN UND FÜR DICHTUNGEN UND SCHMIERMITTEL - MATERIALES PARA EL BLOQUEO, ESTANQUEIDAD Y LUBRICACION - MATERIAUX POUR LE BLOCAGE VIS, ÉTANCHEITÉ ET LUBRIFICATION

DENOMINATION DENOMINAZIONE BEZEICHNUNG DENOMINACION DENOMINATION	APPLICATION - APPLICAZIONE - ANWENDUNG - APLICACION - APPLICATION
Silicone Silicone Silikon Silicona Silicone	<ul style="list-style-type: none"> • Semi-fluid adhesive material used for sealing and filling and to protect components from environmental and physical elements. Polymerises with non-corrosive dampness. • <i>Materiale adesivo semifluido usato per sigillatura, riempimenti e per la protezione di componenti dagli elementi ambientali e fisici. Polimerizza con umidità non corrosiva.</i> • Halbflüssiger Klebstoff zum Befestigen, Füllen und zum Schutz von Bestandteilen vor äußeren Einwirkungen. Polymerisiert durch nicht korrosive Feuchtigkeit • <i>Material adhesivo semifluido usado para el sellado, llenado y para la protección de componentes de elementos ambientales y físicos. Polimeriza con humedad no corrosiva.</i> • Produit adhésif semi-fluide utilisé pour le scellage, remplissage et protection des éléments ambiants et physiques. Polymérise à une humidité non corrosive.
(TECNO LUPE/101) Silicone-based grease Grasso al silicone Silikonfett Grasa a la silicona Graisse au silicone	<ul style="list-style-type: none"> • Highly adhesive synthetic grease, with silicone compounds added. Applied to adjustment screws with hole communicating with oil-type fluids. Used when frequent adjusting is required. • <i>Grasso sintetico con elevato grado di adesività, additivato con composti siliconici. Applicato su viti di registrazione a foro comunicante con fluidi di tipo oleoso. Usato quando si richiedono frequenti interventi di registrazione.</i> • Synthetisches Fett mit hoher Haftfestigkeit, mit silikonhaltigen Stoffen legiert. Wird auf Stellschrauben mit Loch, die mit ölhaltigen Flüssigkeiten in Kontakt stehen, angebracht. Wird verwendet, wenn die Schraub öfters eingestellt werden muß. • <i>Grasa sintética con elevado grado de adhesión, aditivada con componentes silicónicos. Aplicada en tornillos de ajuste de orificio comunicante con fluidos de tipo oleoso. Se usa cuando se requieren frecuentes intervenciones de ajuste.</i> • Graisse synthétique ayant un degré d'adhésivité élevé, adjuvée de composés au silicone. Appliqué sur les vis de réglage à trou communiquant avec des fluides du type huileux. Utilisé quand il y a besoin de réglages fréquents.
Molikote (DOW CORNING)	<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. • <i>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.</i> • Schmierstoff mit Molybdändisulfid; wird zum Schmieren von Gelenkstiften und gegen Ankleben und Oxidation von nicht dauergeschmierten Einzelteilen verwendet. • <i>Compuesto lubricante que contiene bisulfuro de molibdeno, usado para la lubricación de rótulas y para prevenir encoladuras y oxidaciones de piezas no lubricadas de manera continua.</i> • Composé lubrifiant contenant du bisulfure de molybdène, utilisé pour lubrifier les axes d'articulation et prévenir collages et oxydations des pièces qui ne sont pas continuellement lubrifiées.
(Lithium-based) Grease Grasso (al Litio) (Lithium) Fett Grasa (al Litio) Graisse (au Lithium)	<ul style="list-style-type: none"> • Applied to bearings, sliding parts and used to lubricate seals or parts during assembly • <i>Applicato a cuscinetti, parti scorrevoli e per lubrificare guarnizioni o pezzi in fase di montaggio.</i> • Wird auf Lager, Gleitteilen aufgetragen und zum Schmieren von Dichtungen oder von Teilen bei der Montage verwendet. • <i>Aplicada a cojinetes, partes deslizables o para lubricar juntas o piezas en fase de montaje.</i> • Appliqué sur les paliers, parties coulissantes et pour lubrifier les garnitures ou pièces pendant la phase de montage.

NOTES ON SAFETY PRECAUTIONS - NOTE RIGUARDANTI LA SICUREZZA - BEMERKUNGEN ZUR SICHERHEIT - NORMAS CONCERNIENTES A LA SEGURIDAD - NOTES EN MATIERE DE SECURITE

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.

ITA

- 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.

D

- 1 - Die beschriebenen Vorgänge werden an der Achse vorgenommen, wenn diese auf einem Bock blockiert ist. Zur Bearbeitung der Einzelteile, werden diese auf die Werkbank gelegt.
- 2 - Wenn eine Achse abgenommen wird, einen Sicherheitsbock unter den zweiten Arm legen.
- 3 - Werden Arbeiten an der Achse vorgenommen, wenn diese noch an der Maschine montiert ist, Böcke zur Halterung unter die Achse stellen und die Maschine der Länge nach blockieren.
- 4 - Es dürfen sich keine fremde Personen in der Nähe der Maschine während der Arbeiten aufhalten; diesen Bereich absperren und mit Schilder kennzeichnen, die auf die laufenden Arbeiten hinweisen. Zündschlüssel von der Maschine abnehmen.
- 5 - Nur saubere Werkzeuge guter Qualität verwenden; alte, beschädigte oder improvisierte Hilfsmittel nicht verwenden. Sicherstellen, daß die Dynamometer geprüft und geeicht worden sind.
- 6 - Bei Reparaturen, stets Handschuhe und rutschfeste Schuhe tragen.
- 7 - Mit Öl beschmutzte Stellen, sofort reinigen.
- 8 - Gebrauchte Schmiermittel, Dichtungen, Reinigungslappen und

Lösemittel müssen als Sondermüll und auf jeden Fall laut den örtlich geltenden Vorschriften entsorgt werden.

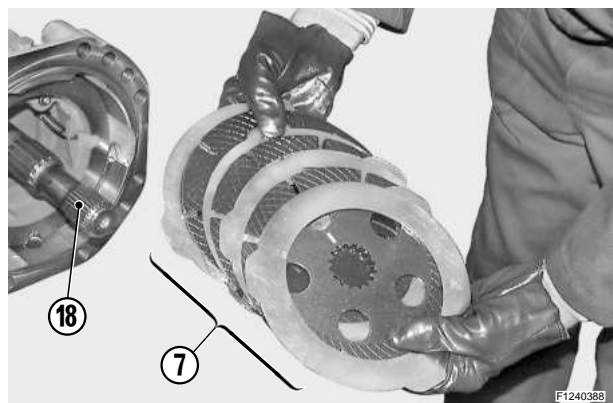
- 9 - Zur Reinigung ausschließlich schwache Lösemittel wie Petroleum, Terpentin oder wasserhaltige Lösemittel verwenden. Auf keinen Fall Trichloräthylen, tuolol- oder xylolhaltige Lösemittel usw. verwenden.
- 10 - Um die Arbeitsvorgänge verständlich abzubilden, werden in einigen Fotos die Aggregate ohne Einzelteile gezeigt, die sonst bei der Arbeit nicht abmontiert werden müssen. Nur die beschriebenen Teile abmontieren.
- 11 - Unter RECHTS und LINKS versteht man in diesem Handbuch die Seite einer Person, die zur Achse schaut und zwar dem Antrieb entgegengesetzt.
- 12 - Nach beendeten Arbeiten und um Rostbildungen zu vermeiden, die Teile an denen der Lack ggf. beschädigt worden ist, anstreichen.

ESP

- 1 - Las operaciones descritas se refieren al eje bloqueado en un caballete y a algunas partes apoyadas en el banco de trabajo.
- 2 - Cuando se saca un brazo del eje, colocar debajo del otro un caballete de seguridad antivuelco.
- 3 - Si se trabaja con un eje montado en la máquina, asegurarse de haber colocado caballetes soporte y de haber inmovilizado longitudinalmente la máquina.
- 4 - No permitir que personas extrañas entren en la zona de trabajo; delimitar esta zona, colgar carteles de aviso de hombres trabajando y sacar las llaves de arranque de la máquina.
- 5 - Usar sólo y exclusivamente herramientas limpias y de buena cualidad; descartar llaves o herramientas gastadas o dañadas, de calidad mediocre o improvisadas. Asegurarse de que las llaves dinamométricas han sido controladas y calibradas.
- 6 - Durante las operaciones de reparación, llevar siempre guantes y calzado antideslizamiento.
- 7 - Limpiar inmediatamente las zonas que pudieran estar sucias de aceite.
- 8 - Los lubricantes, las juntas, los trapos para la limpieza y los disolventes usados hay que eliminarlos como desechos especiales y, de todas formas, de acuerdo con las normativas vigentes en el país en el que se revisan los ejes.
- 9 - Para limpiar, utilizar sólo disolventes débiles excluyendo en absoluto tricloroetileno, diluyentes y disolventes a base de toluol, silol, etc.; usar sólo disolventes ligeros como queroseno, aguarrás minerales o disolventes ecológicos a base de agua.
- 10 - Para que resulte clara la exposición y la ilustración, en las figuras de algunos grupos faltan algunas piezas que por lo general se pueden dejar montadas. Sacar sólo las partes descritas.
- 11 - Las palabras DERECHA E IZQUIERDA usadas en el manual se refieren a la persona que mira el eje del lado opuesto a la toma de movimiento.
- 12 - Al final de las reparaciones, para evitar oxidaciones, retocar cuidadosamente las partes pintadas que estuvieran dañadas.

F

- 1 - Les opérations décrites se rapportent à l'essieu bloqué sur chevalet et de quelques pièces posées sur un établi de travail.
- 2 - Quand on enlève un essieu monté sur la machine, ajuster sous l'autre bras un chevalet de sécurité contre tout basculement.
- 3 - Si on oeuvre sur un essieu monté sur la machine, s'assurer d'avoir aménagé des chevalets de soutien et d'avoir bloqué la machine en longueur.
- 4 - Ne jamais permettre à des étrangers de pénétrer dans la zone de travail; délimiter cette zone, mettre des pancartes de signalisation de travaux en cours et enlever les clés de contact de la machine.
- 5 - N'utiliser que des outils propres et de bonne qualité; éliminer clé ou autres outils usés, abîmés, de mauvaise qualité ou improvisés. Veiller à ce que les clés dynamométriques aient été contrôlées et calibrées.
- 6 - Pendant les opérations de réparation, endosser toujours gants et chaussures antidérapantes.
- 7 - Nettoyer tout de suite les éventuelles zones souillées d'huile.
- 8 - Les lubrifiants, les garnitures, les éventuels chiffons servant au nettoyage et les solvants utilisés devront être récoltés et traités comme rebut spécial conformément aux lois en vigueur dans le pays où les essieux sont en révision.
- 9 - Pour le nettoyage, n'utiliser que des solvants à base de toluol, xylol, etc.; n'utiliser que des solvants légers tels que kérosène, essences minérales, ou solvants écologiques à base d'eau.
- 10 - En ce qui concerne la clarté en matière d'illustration et exposition, sur les figures de certains groupes, il y a des pièces manquantes qui normalement peuvent rester montées. Enlever uniquement les pièces décrites.
- 11 - Les termes DROITE et GAUCHE utilisés dans ce manuel se rapportent à la personne regardant l'essieu du côté opposé à celui de la prise de mouvement.
- 12 - A la fin des opérations, afin d'éviter un risque d'oxydation nuisible, retoucher soigneusement les parties vernies éventuellement abîmées.



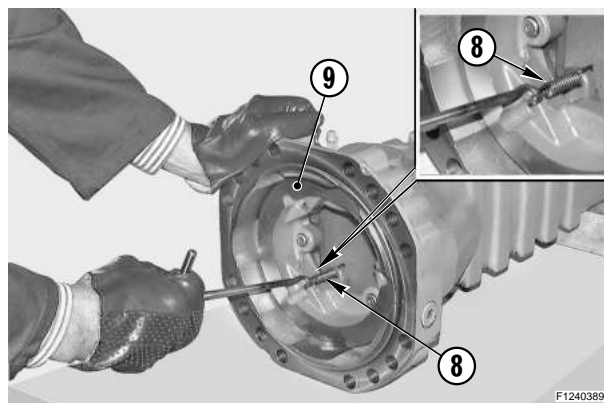
GB

a

Remove the braking disks (7) and note down their order of assembly.

NOTE. 1 - If the disks do not need replacing, avoid switching their position.

2 - Extract the u-joint (18).

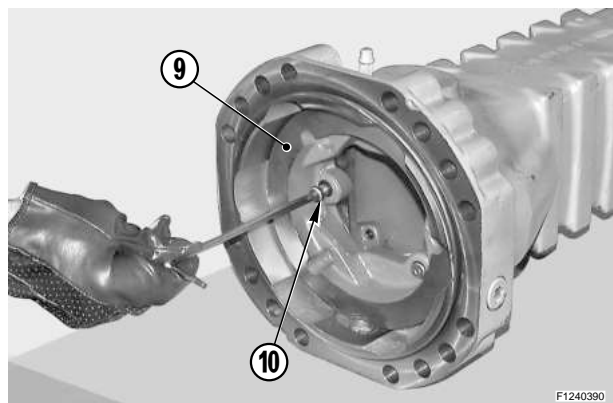


GB

b

Remove the reversal springs (8) from the piston (9).

NOTE. If the springs (8) are weak or deformed they must be replaced.



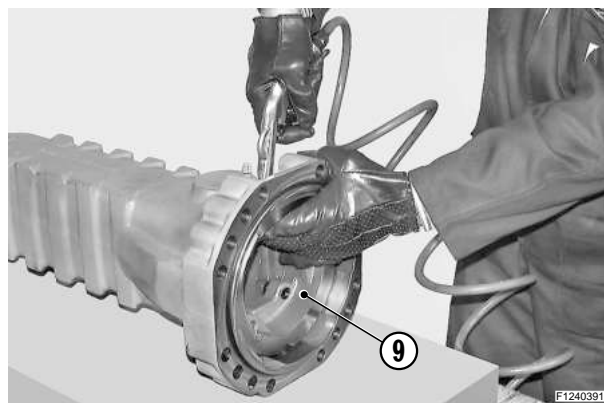
GB

c

Remove the pin screws (10) guiding the piston (9).

CAUTION! If the screws are to be replaced, note down the different colours for the different brake gap.

(See «HOW TO ASSEMBLE THE BRAKING UNITS»)

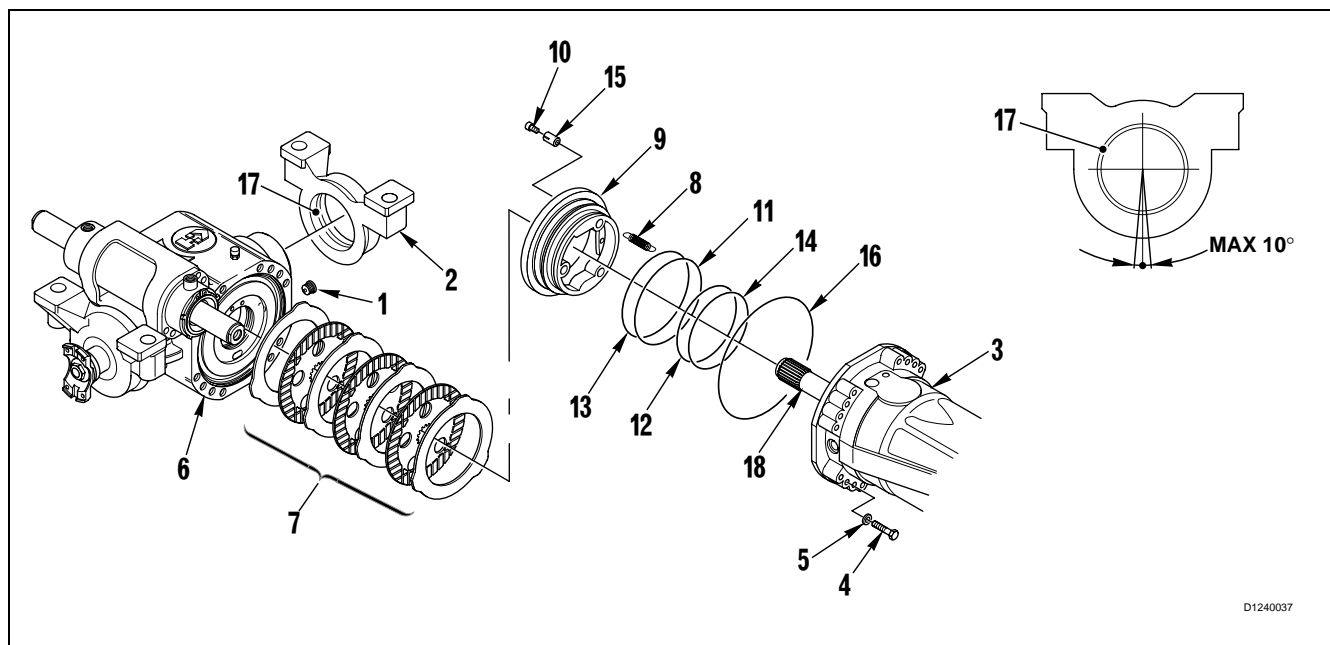


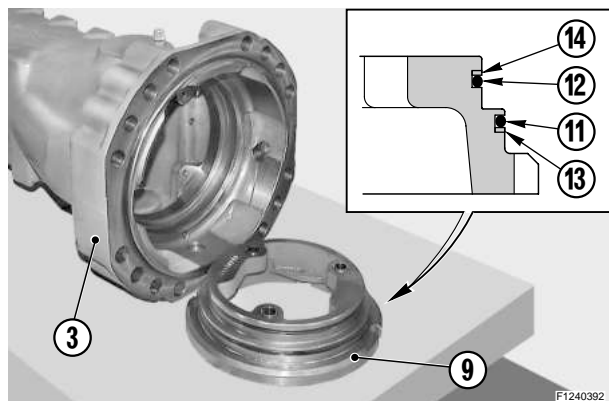
GB

d

Slowly introduce compressed air through the connection of the braking circuit in order to extract the entire piston.

CAUTION! Hold on to the piston as it may be suddenly ejected and damaged.

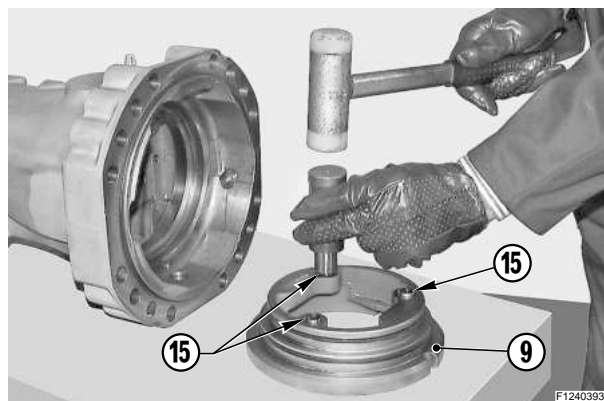




GB

a

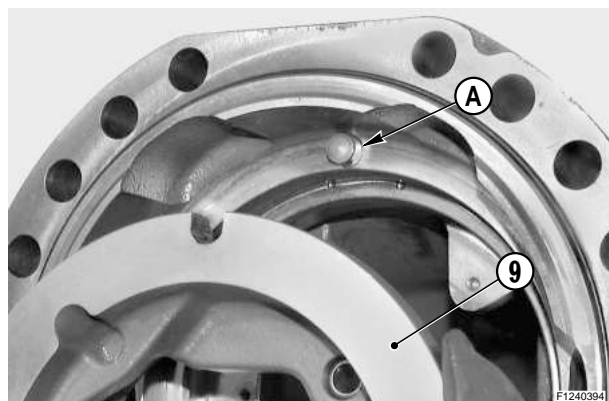
Accurately clean the piston (9) and the seats of slide and seal. Replace the O-rings (11) and (12) and the anti-extrusion rings (13) and (14); make sure that the assembly side is correct.
CAUTION! Accurately check the positioning of the anti-extrusion rings (13) and (14).



GB

b

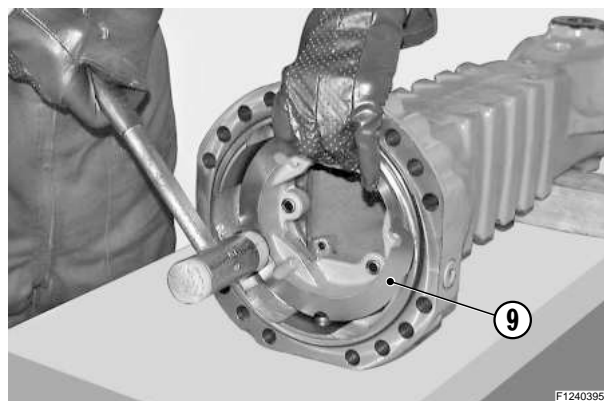
Insert the stroke automatic regulation springs (15); place them in line with the piston (9).



GB

c

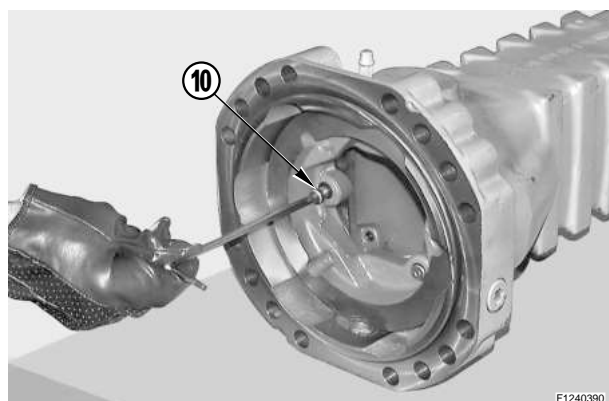
Lubricate the seals (11) and (12) and fit the piston (9) into the arm (3).
CAUTION! Make sure that the piston seat fits into the stop pin (A) inside the arm.



GB

d

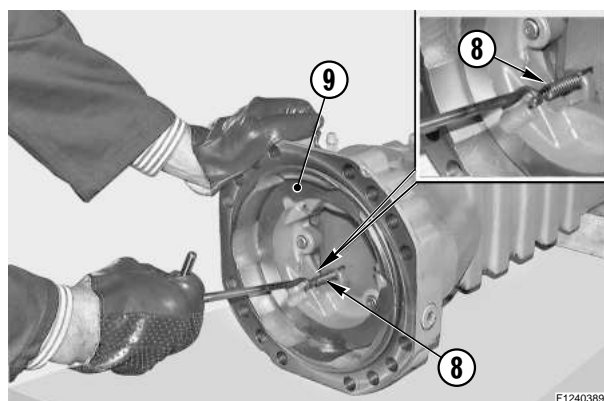
Assist the insertion of the piston (9) by lightly hammering around the edge with a plastic hammer.



GB

e

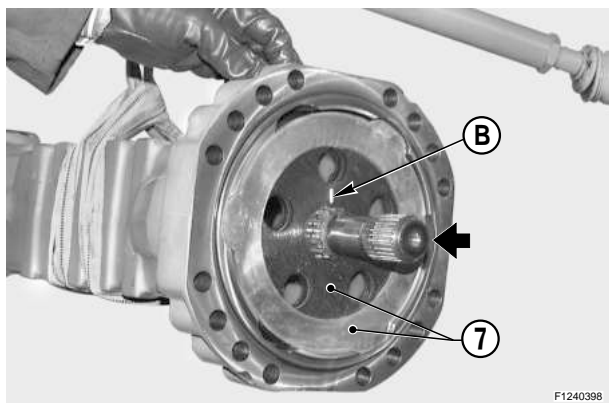
Fit the pin screws (10) making sure that they are all of the same colour. White: 1 mm gap
Yellow: 0.75 mm gap
Blue: 0.5 mm gap
Apply Loctite 270 to the thread.
Torque wrench setting: 5-7 Nm.



GB

f

Fit the reversal springs (8) on the piston (9).
CAUTION! Pay due attention not to deform the connections of the springs.

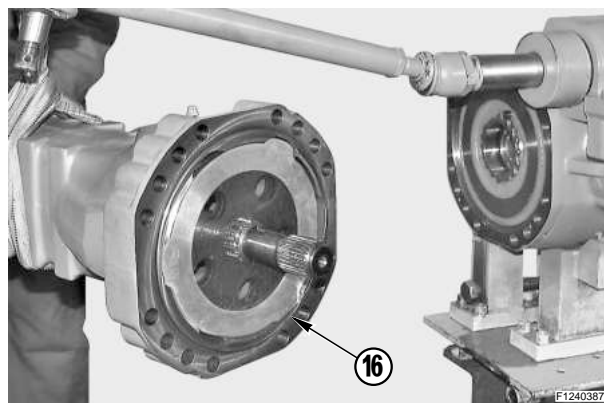


GB

a

Slightly lubricate the braking disks (7) and fit them in the arm following the correct sequence; orient them so that the oil circulation holes and the marks "B" are perfectly lined up.

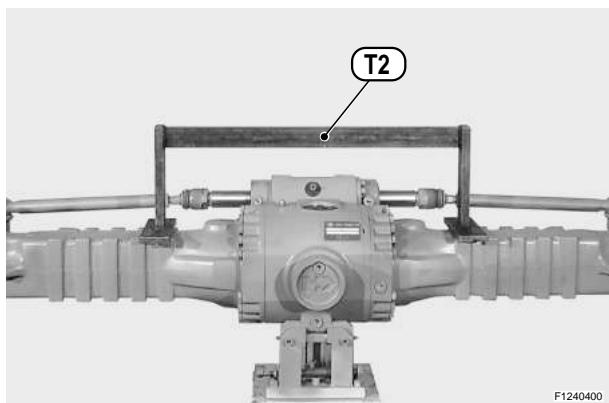
NOTE. When installing the steel discs, the slot corresponding to the oil level cap should always be kept free.



GB

b

Check that the positioning of the sealing ring (16) on the arm is intact; install the complete arm. Lock it into position using two facing screws (4) and washers (5).

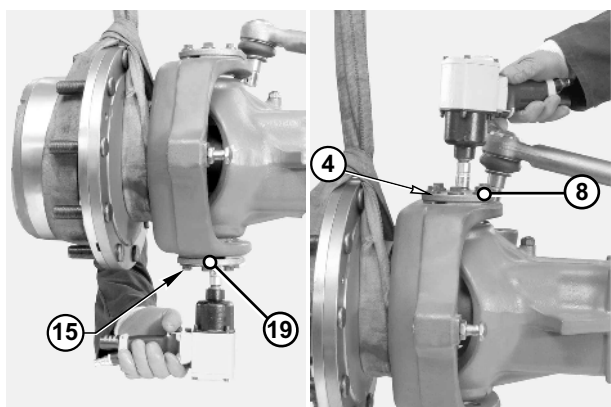
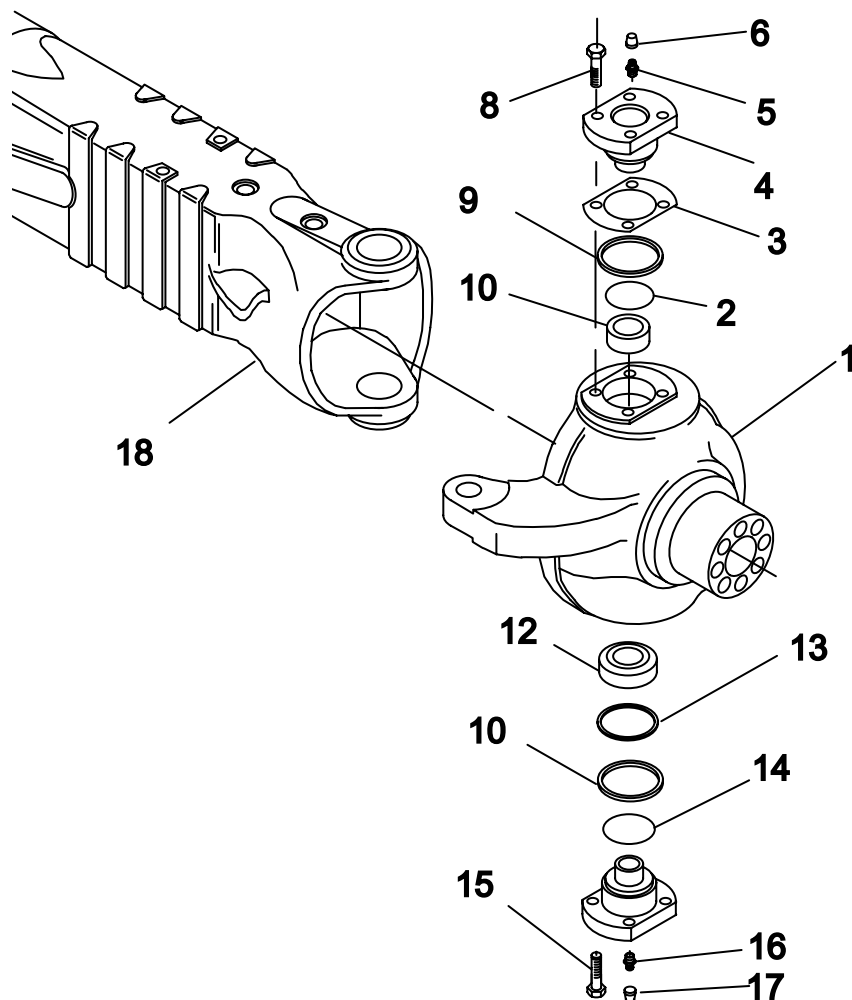


GB

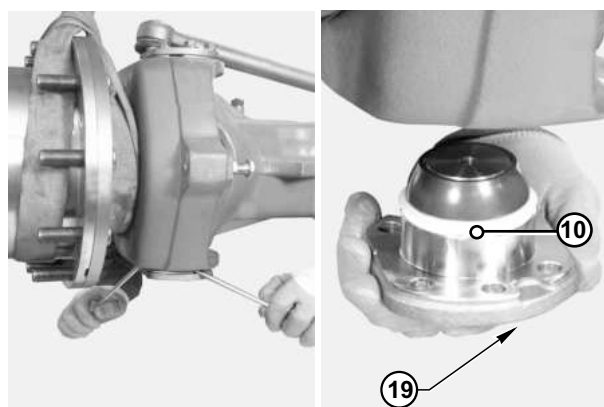
c

Check the flatness of the arms using tool T2 and finally lock the arms with the screws (4) and the washer (5) using the cross-tightening method.

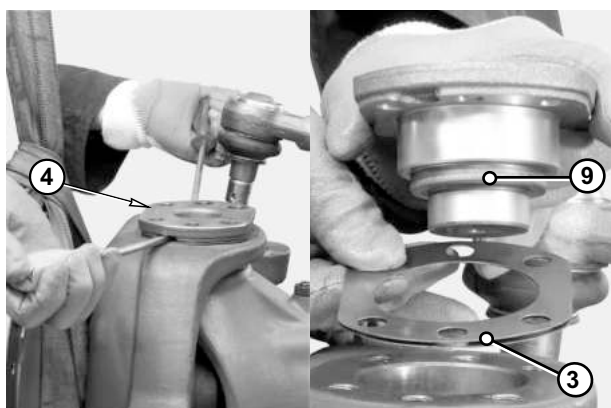
Torque wrench setting: 298 Nm



Unloose and remove the fittin screws (15)(8) from the articulation pin (19)(4).



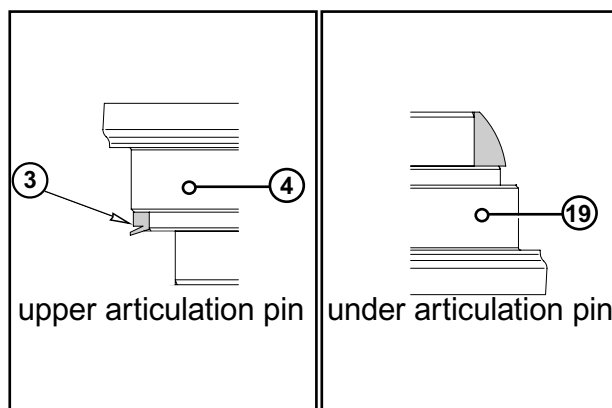
Remove the bottom articulation (19) pin complete with front sealing ring (10).



GB

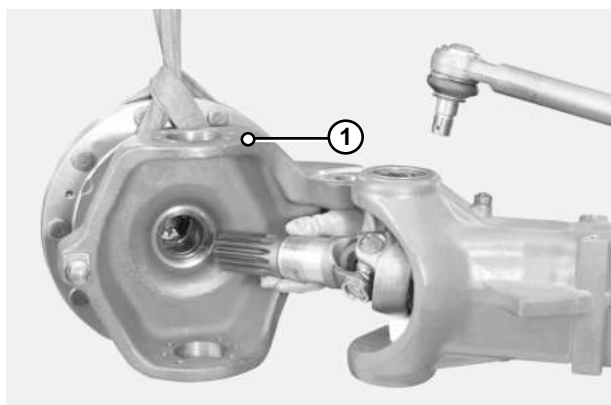
a

Using two levers, remove the top articulation pin (4) complete with front seal (9) and shims (3) .
Pay attention not to damage the surfaces.



GB

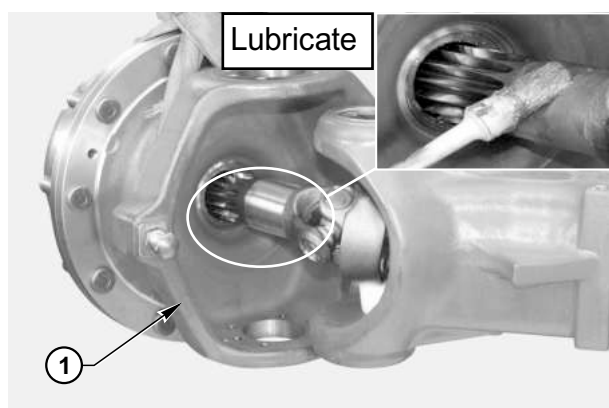
b



GB

c

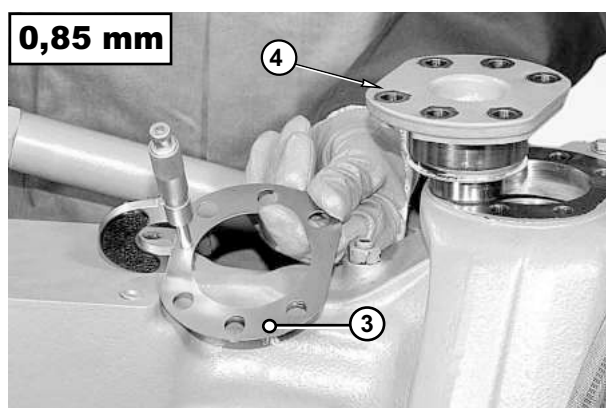
Remove the complete steering case (1).



GB

a

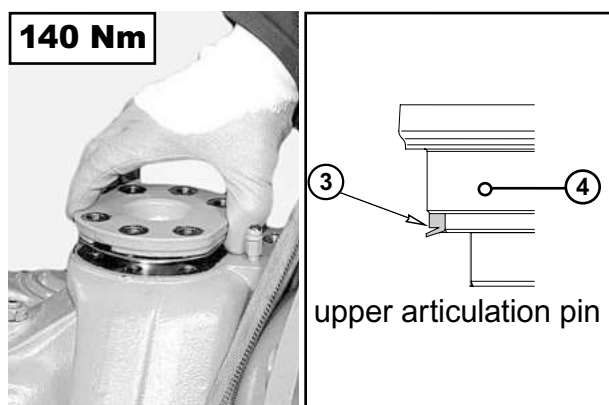
Lubricate the terminal of the u-joint and install the steering case (1).
Pay due attention not to damage the dust cover rings and the sealing rings.



GB

b

Prepare a series of shims (3) of 0,85 mm. To be assembled under the upper pin (4).



GB

c

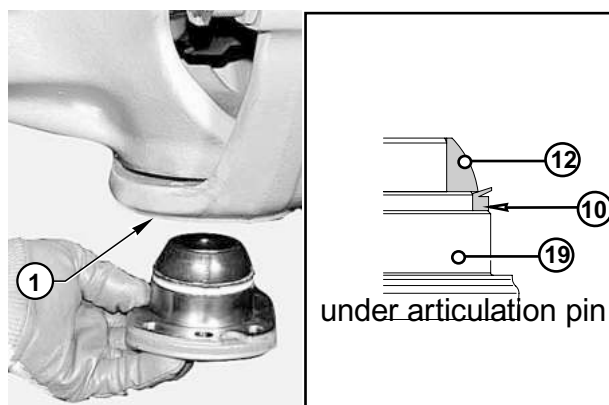
Fit a new seal (3) onto the top articulation pin (4). Lubricate and install the unit in the steering case. Position the screws (8) and tight wrench 140Nm.
Check the correct assembly side of the seal (3).



GB

d

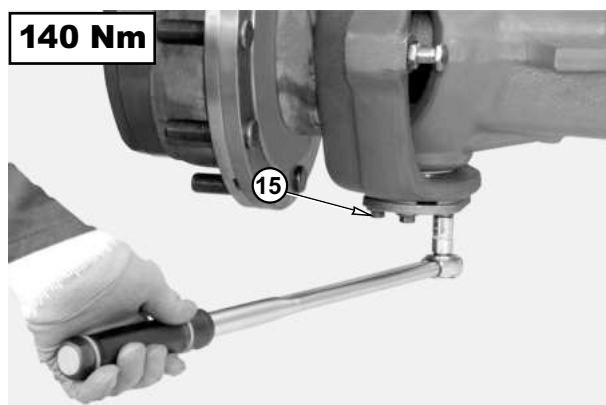
Lubricate and the unit in the steering case.



GB

e

Fit the unit (19) in the steering case (1). Position the screws (15) and tightly tighten.
Check for the correct assembly side of the seal (10).



GB

f

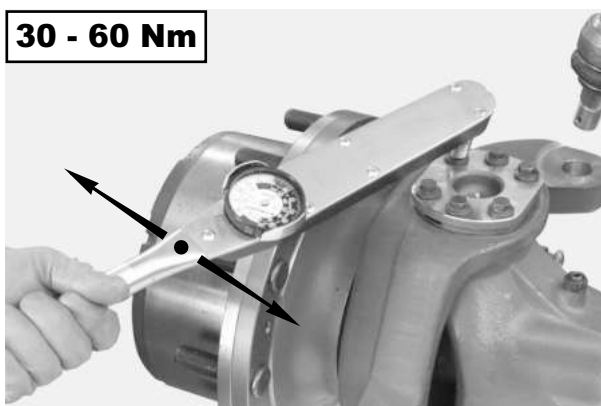
Tighten the new fittin screws (15) of top and bottom articulation pins in sequence using the cross tightening method.
Torque wrench setting: 140 Nm



GB

a

Check by means of a lever that there is no vertical gap.
In case there is any gap, determine the width and reduce it by removing shims.



30 - 60 Nm



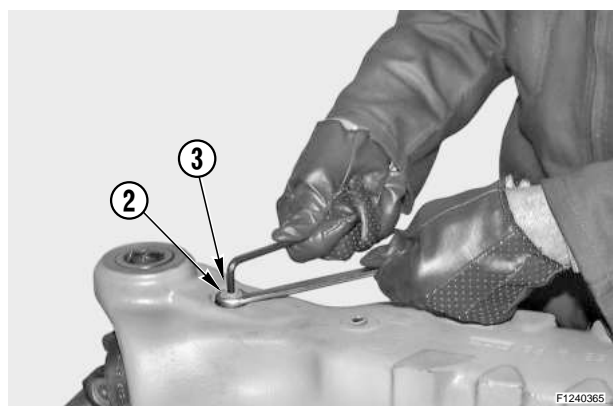
GB

b

Check the torque of the pins, which has to be between 30 and 60 Nm. If the preliminary measured value is too high, the shims have to be increased.



HOW TO REMOVE THE U-JOINT - RIMOZIONE DOPPIO GIUNTO CARDANICO - DOPPELGELENKWELLE ABMONTIEREN -
REMOCION SEMIEJES - DEPOSE DE JOINT DE CARDAN DOUBLE

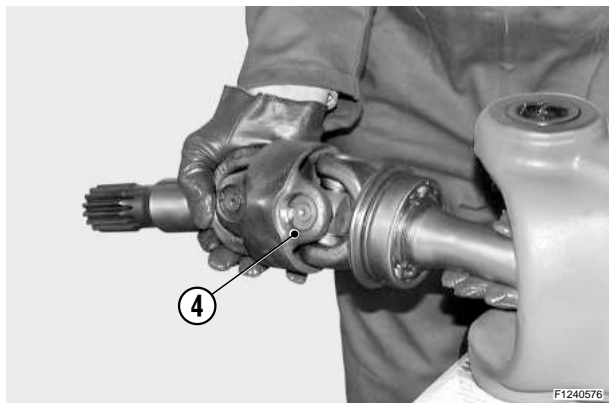


Unloose and remove the top and bottom check nuts (2) from the dowels (3).



Remove top and bottom check dowels (3) from the flange (5) or bush (13).

FLANGED VERSION - VERSIONE A FLANGIA - AUSFÜHRUNG MIT FLANSCH - VERSION A BRIDA - VERSION A FLASQUE

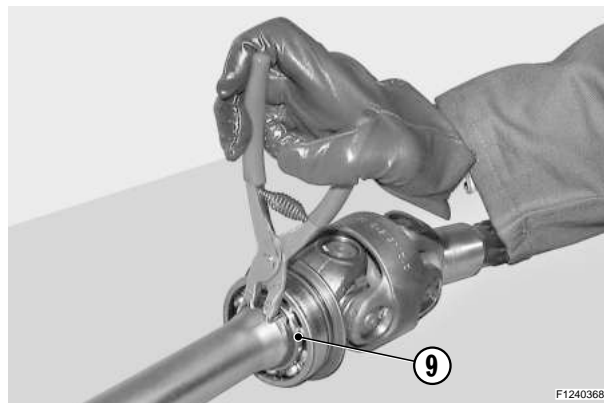


GB

a

Remove the u-joint (4).

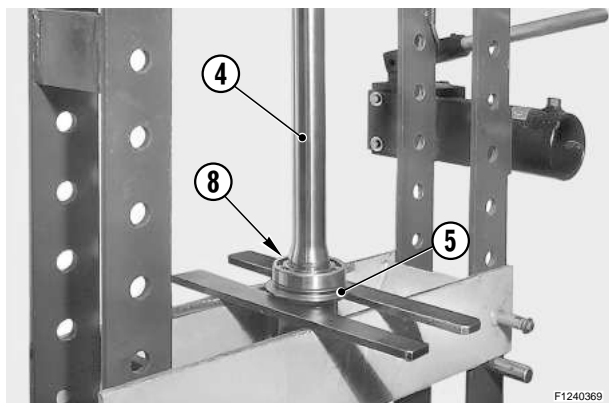
NOTE. To remove the u-joint use, if necessary, a plastic hammer or a lever.



GB

b

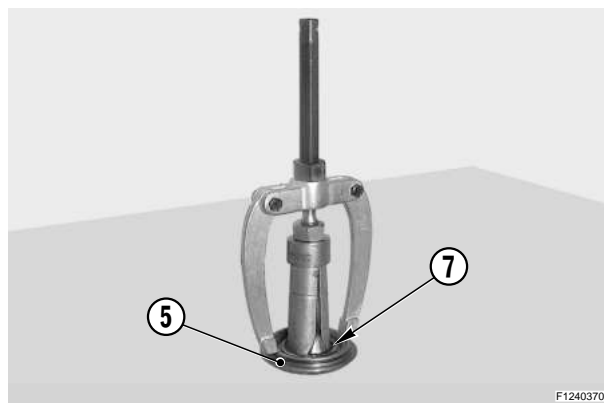
Remove the snap ring (9) from the bearing as well as the packing ring (5).



GB

c

Position the entire u-joint (4) under a press and remove the bearing (8) and the ring (5) simultaneously.

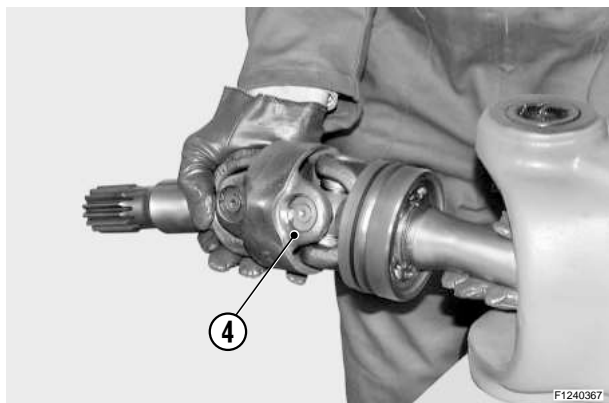


GB

d

Extract the sealing ring of the shaft from the flange (5).
NOTE. Note down the assembly side of the ring.

COUPLING VERSION - VERSIONE A MANICOTTO - AUSFÜHRUNG MIT MUFFE - VERSION A MANGUITO - VERSION A MANCHON

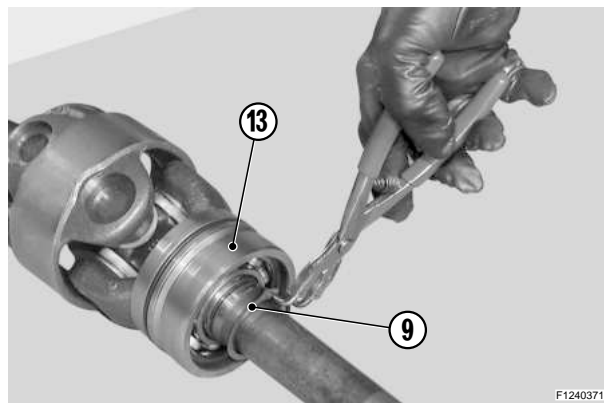


GB

e

Remove the entire u-joint (4).

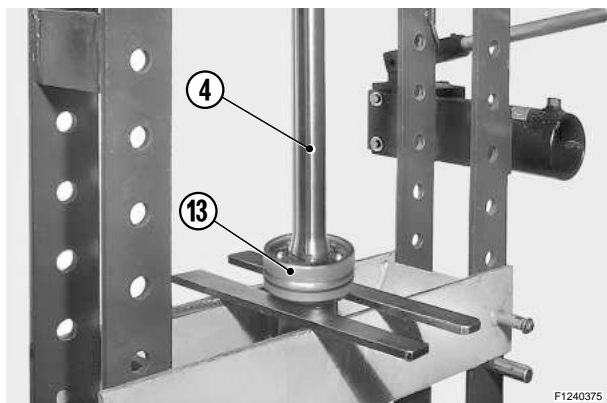
NOTE. To remove the u-joint use, if necessary, a plastic hammer or a lever.



GB

f

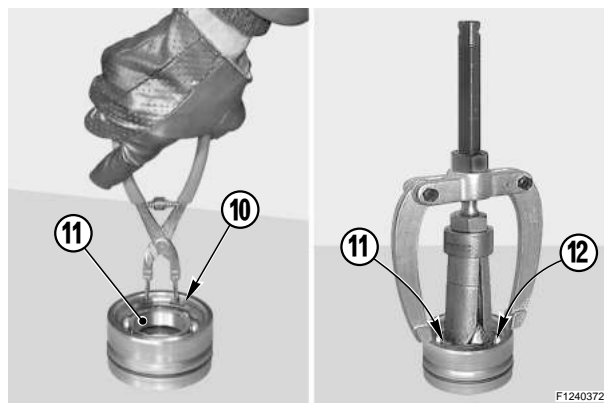
Remove the snap ring (9) from the bushing unit (13).



GB

a

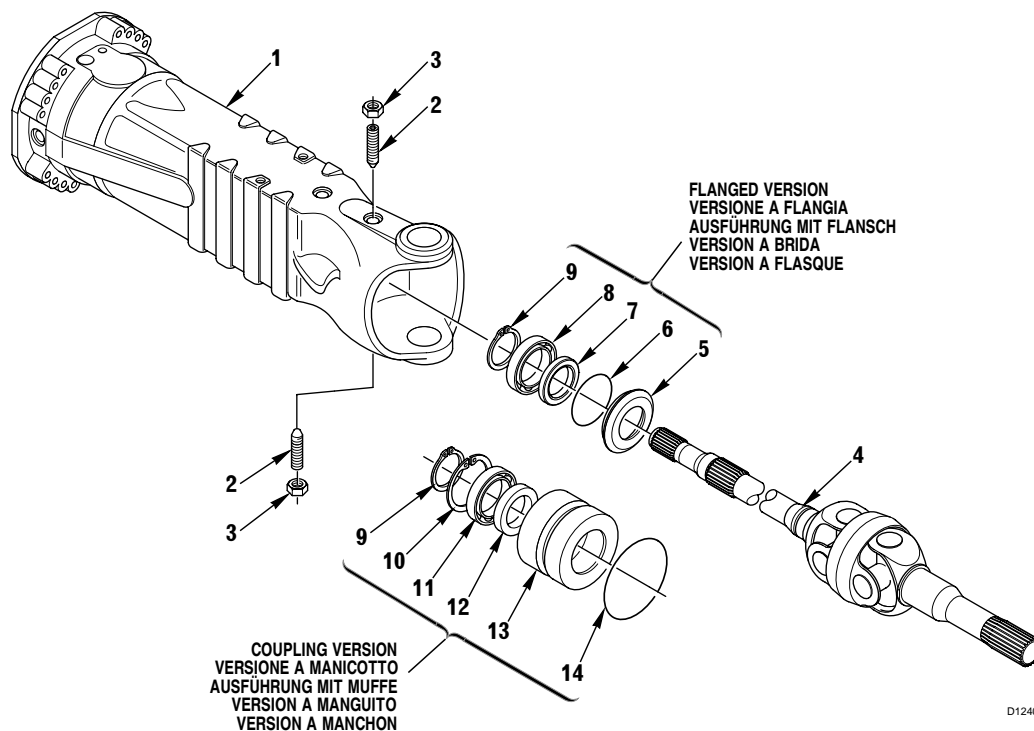
Position the entire u-joint (4) under a press and remove the complete bush (13).



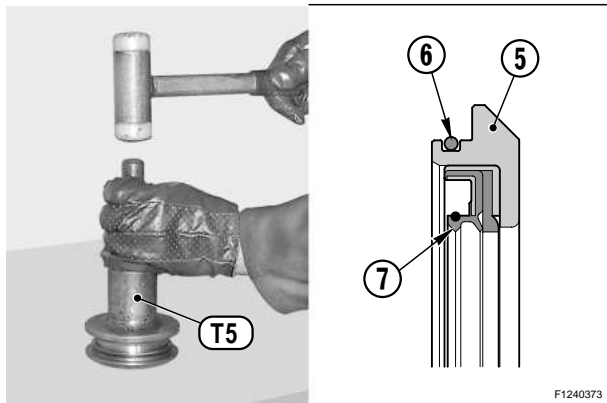
GB

b

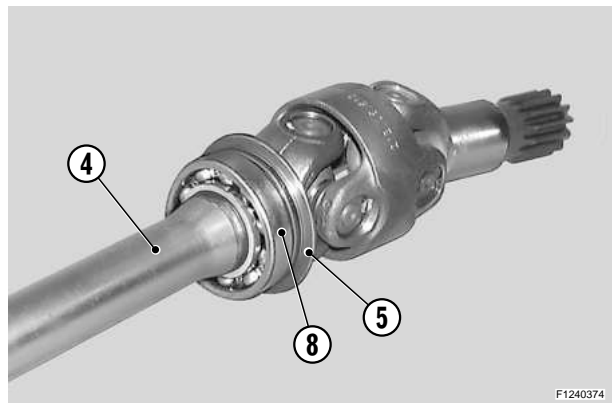
Remove the snap ring (10) from the bearing (11). Use a puller to remove the bearing (11), the sealing ring (12) and the O-ring (14).
NOTE. Note down the assembly side of the ring (12).



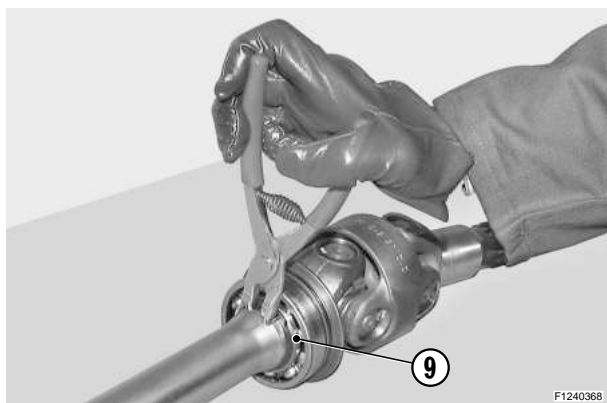
FLANGED VERSION - VERSIONE A FLANGIA - AUSFÜHRUNG MIT FLANSCH - VERSION A BRIDA - VERSION A FLASQUE



Insert the sealing ring (7) of the shaft in the flange (5), using tool **T5**.
NOTE. Carefully check the assembly side. Also replace the outer O-ring (6).

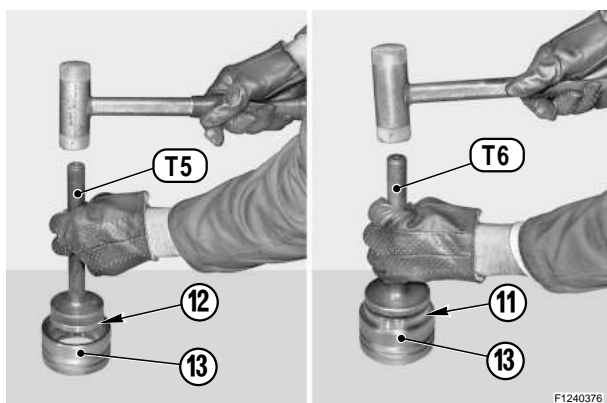


Fit the flange (5) onto the u-joint (4).
Heat the bearing (8) at an approx. temperature of 100° C, fit it on the u-joint and fasten.

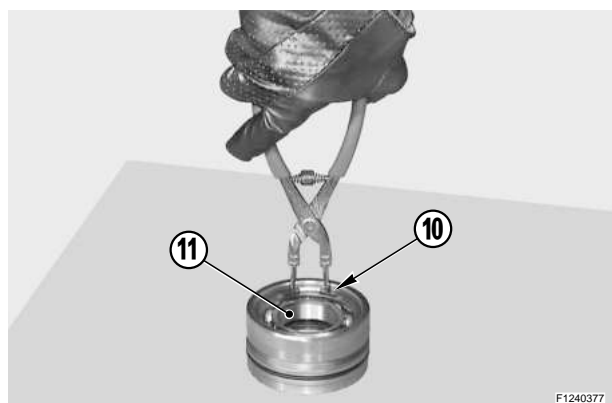


Fit the snap ring (9) on the bearing (8).

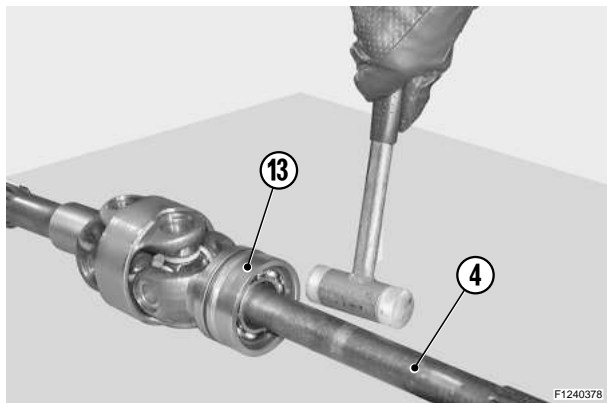
COUPLING VERSION - VERSIONE A MANICOTTO - AUSFÜHRUNG MIT MUFFE - VERSION A MANGUITO - VERSION A MANCHON



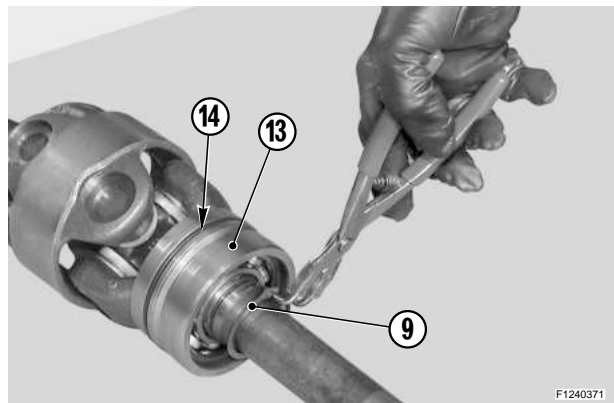
Using tools **T5** and **T6**, insert the sealing ring (12) and the bearing (11) in the bush (13).
NOTE. Carefully check the assembly side of the seal (12).



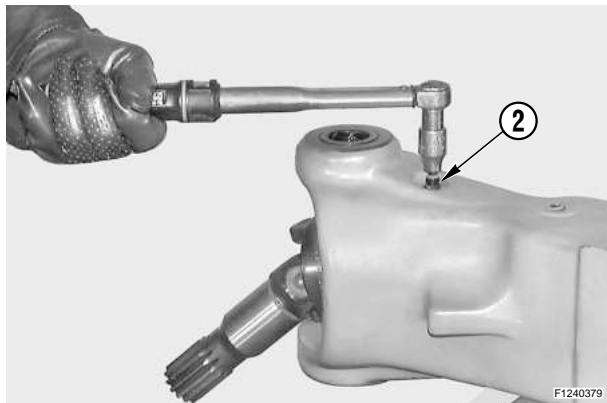
Fit the snap ring (10) on the bearing (11).



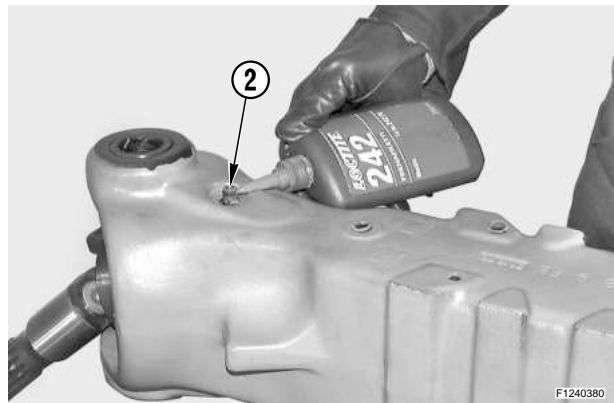
Heat the bearing in oil at an approx. temperature of 100°C and fit the entire bush (13) on the u-joint (4).



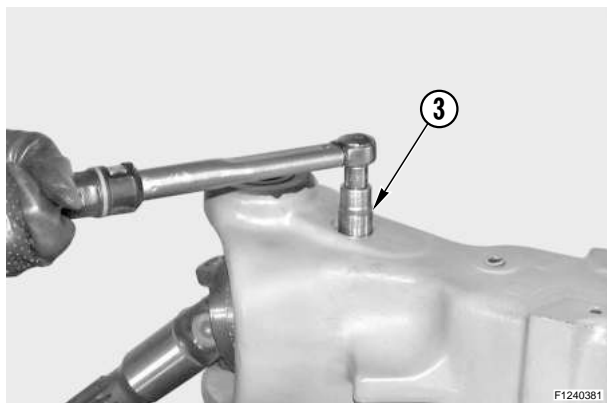
Fit the check ring (9) on the bushing unit (13); also put the O-ring (14) into position.



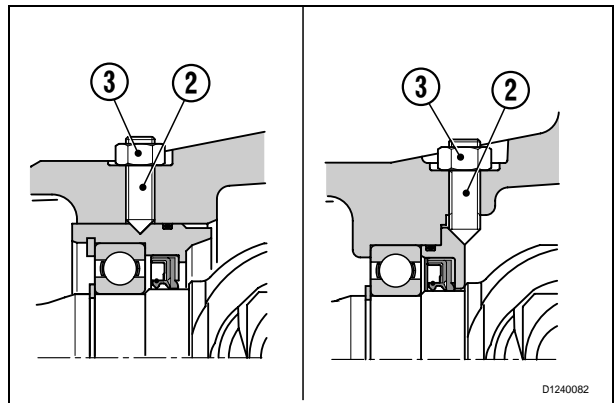
Insert the u-joint and tighten the top and bottom dowels (2).
Torque wrench setting: Max. 15 Nm.
NOTE. For u-joint coming with a bush, centre the point of the check dowels in the slot.

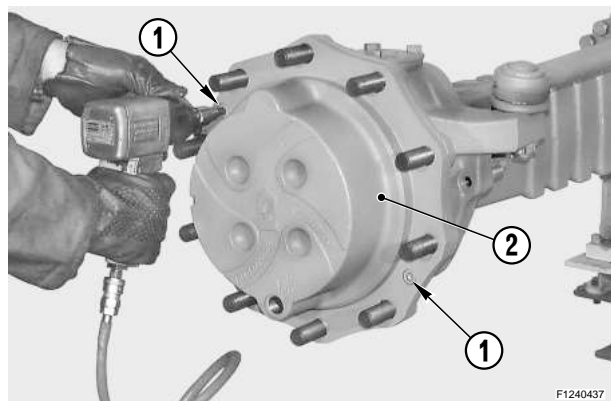


Apply Loctite 242 to the jutting parts of the dowels (2).



Screw the check nuts (3) of the dowels (2) and lock them using a dynamometric wrench.
Torque wrench setting: 122 Nm





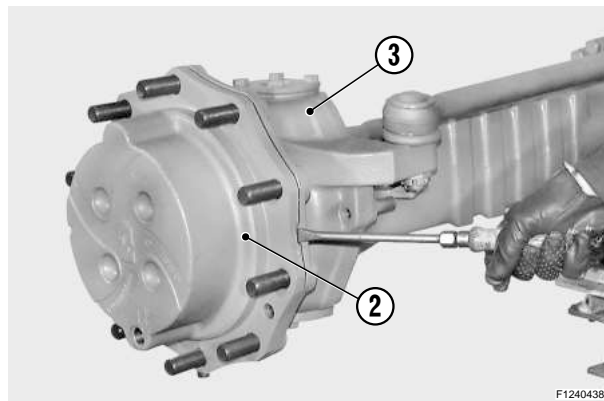
F1240437



GB

a

Disconnect the steering bars from the steering case (3).
For details, see «HOW TO REMOVE THE COMPLETE STEERING CASE».
Remove the securing screws (1) from the planetary carrier cover (2).



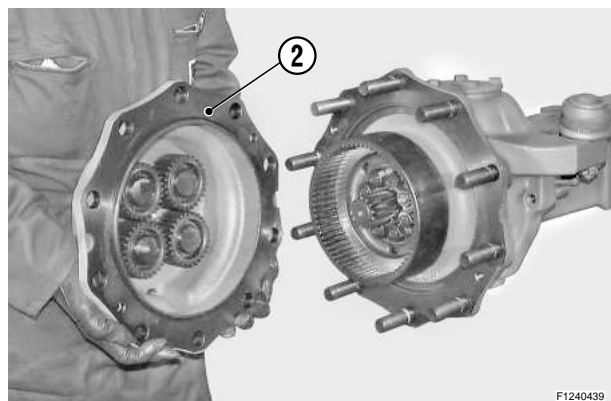
F1240438



GB

b

Disjoin the planetary carrier cover (2) from the steering case (3) by alternatively forcing a screwdriver into the appropriate slots.



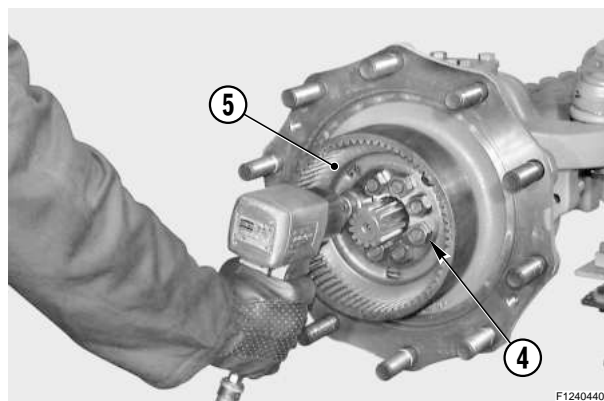
F1240439



GB

c

Remove the complete planetary carrier cover (2).



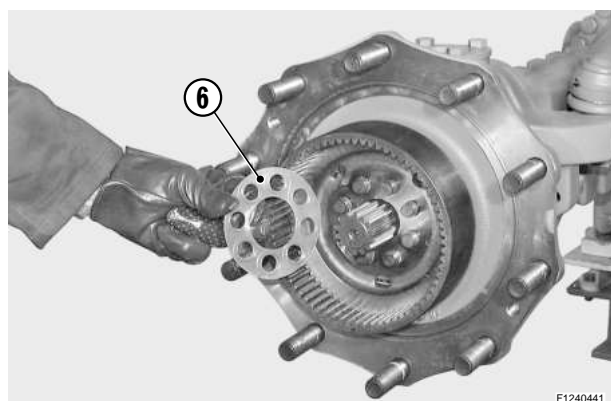
F1240440



GB

d

Unloose and remove the tightening nuts (4) from the crown flange (5).



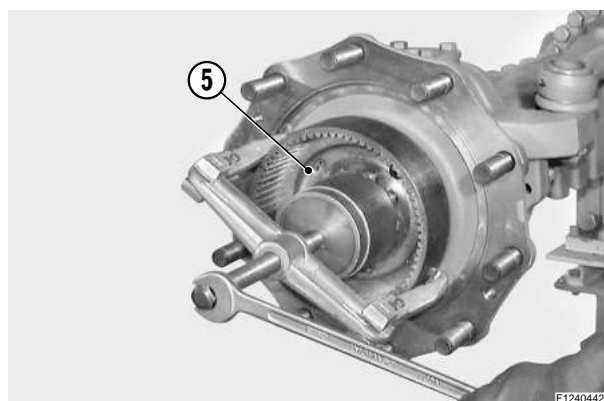
F1240441



GB

e

Remove the safety flange (6).



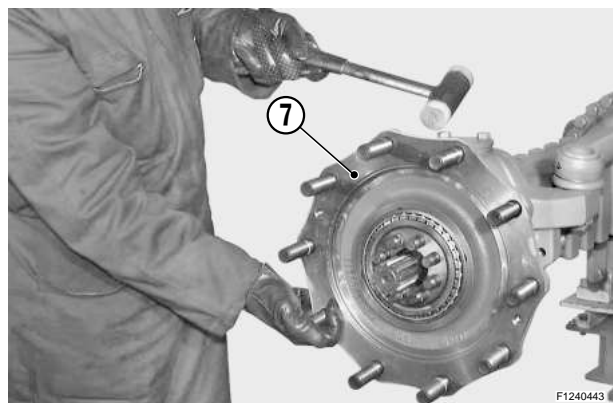
F1240442



GB

f

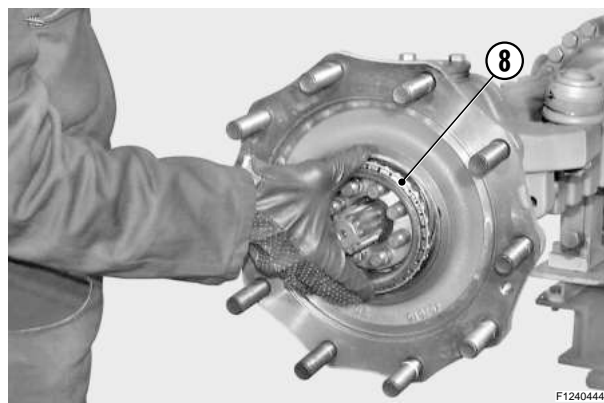
Using a puller, remove the complete crown flange (5) by acting on the stud bolts.



GB

a

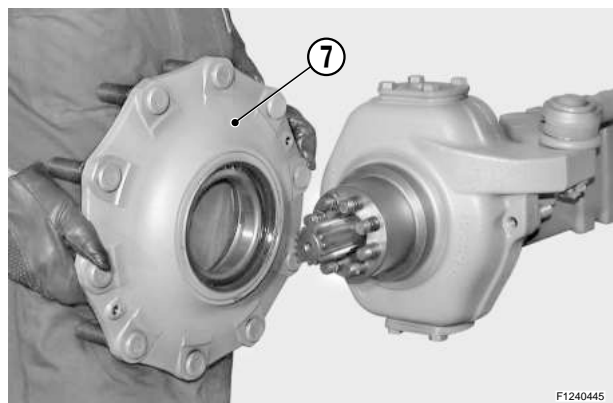
Partially extract the hub (7) using a plastic hammer.
NOTE. Alternately hammer on several equidistant points.



GB

b

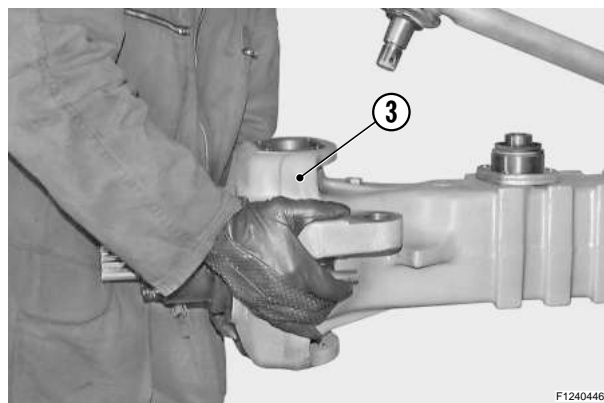
Remove the external bearing (8).



GB

c

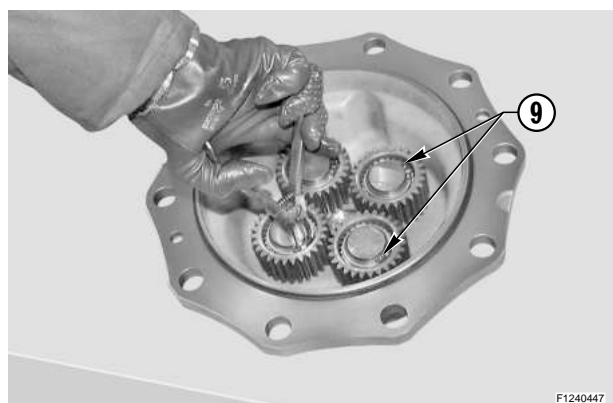
By hand remove the complete hub (7).



GB

d

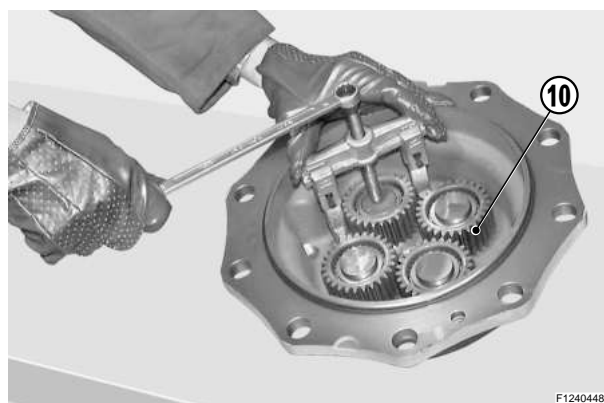
Remove the pins and remove the steering case (3).
For details, see «HOW TO REMOVE THE COMPLETE STEERING CASE»



GB

e

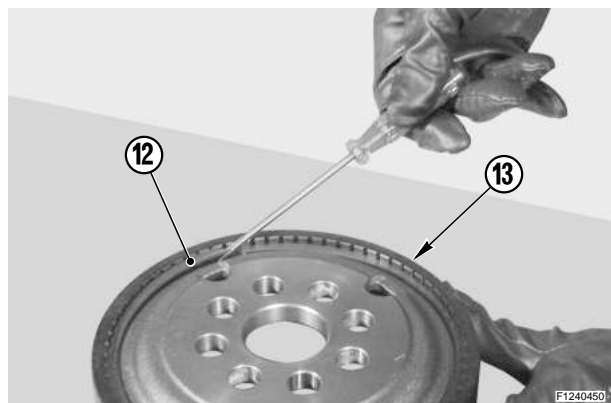
Remove the snap rings (9).



GB

f

With the help of a puller, remove the planet wheel gears (10).
NOTE. Note down the assembly side of planet wheels.



Remove the snap ring (12) from the crown (13).



Remove the crown flange (5).



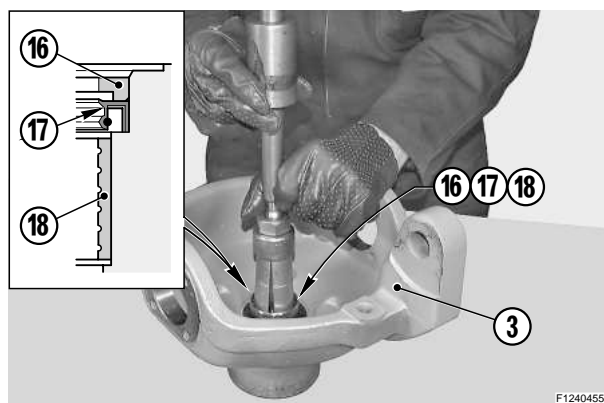
Remove the sealing ring from the hub (14).



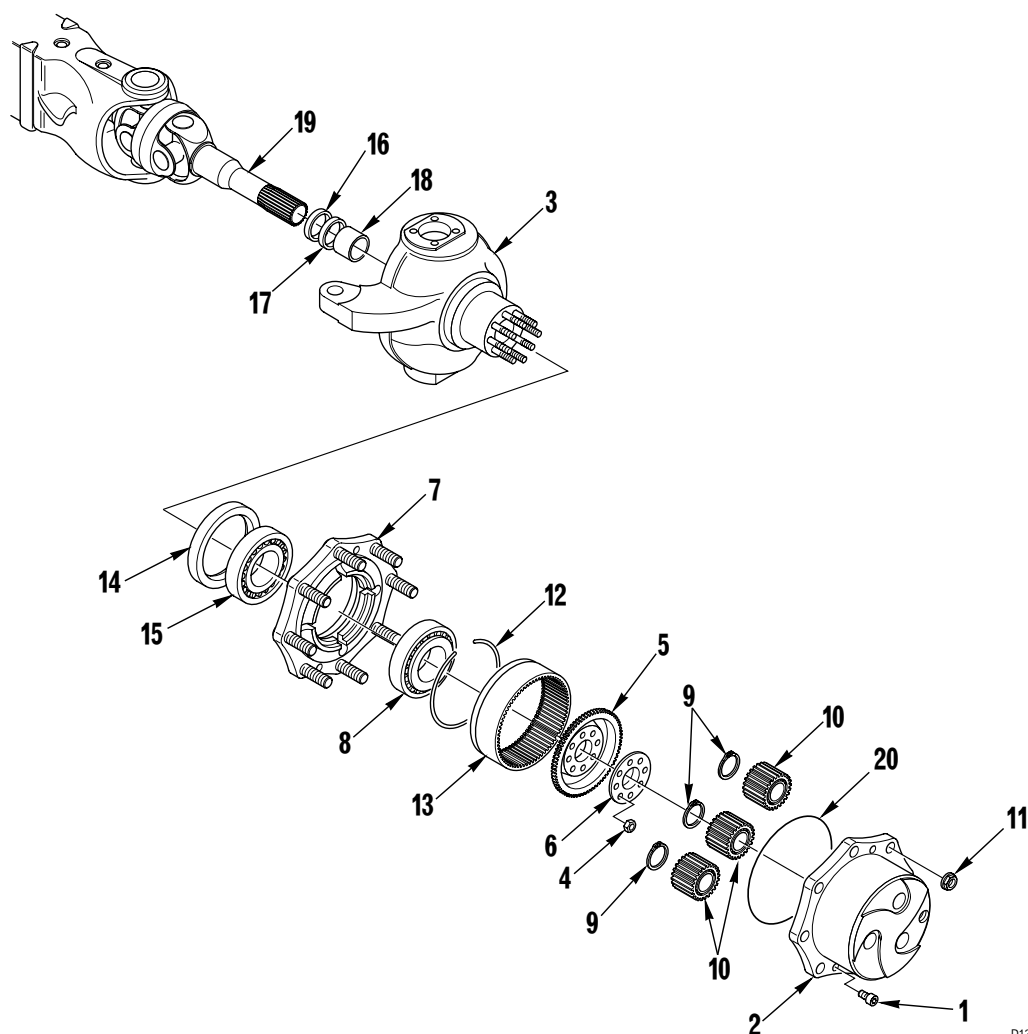
Remove the internal bearing (15).



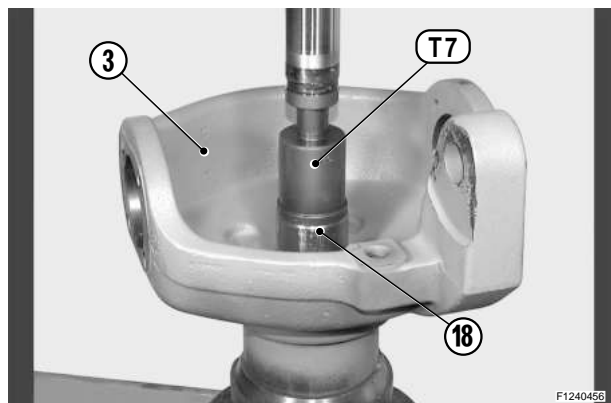
Remove the external thrust blocks from the bearings (8) and (15) forcing a pin-driver into the appropriate slots on the hub (7).
NOTE. Hammer in an alternate way so as to avoid crawling or deformation of the thrust blocks.



Use a puller to remove the centring ring (16), the sealing ring (17) and the bearing (18) from the steering case (3).
NOTE. Note down the orientation of both centring ring (16) and sealing ring (17).



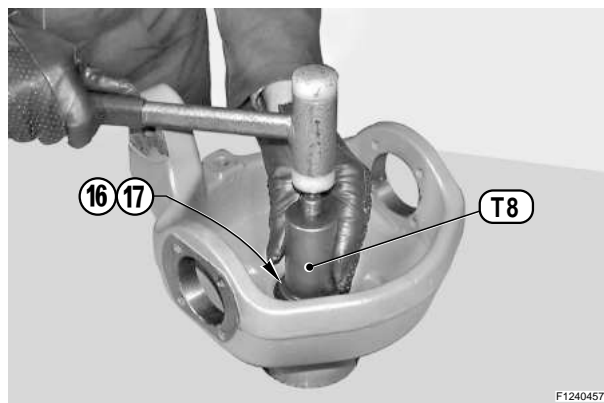
D1240040



GB

a

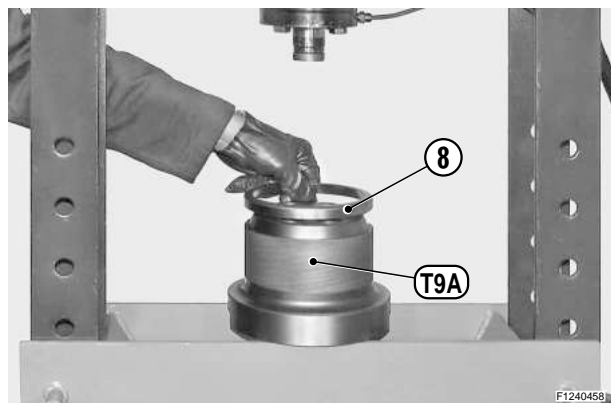
Lubricate the bushing (18) and the seat of the steering case (3).
Install the bushing (18), using tool T7.



GB

b

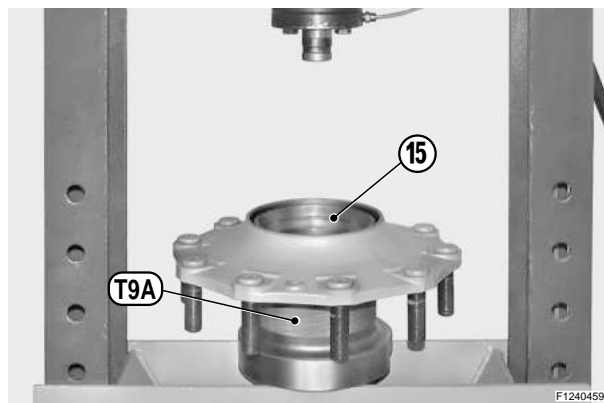
Lubricate the outer surface of the sealing ring (17) and centring ring (16); fit them into their seat using tool T8.



GB

c

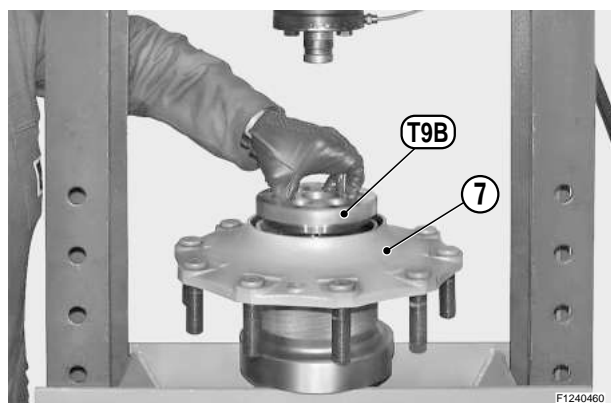
Position the lower part of tool T9A and the thrust block of the external bearing (8) under the press.



GB

d

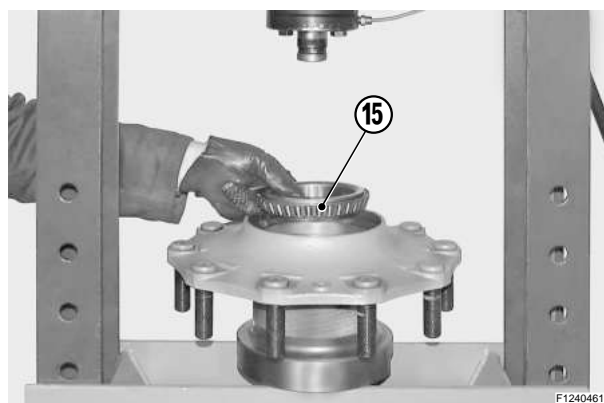
Lubricate the seats of the bearings and position the hub (7) on tool T9A; position the thrust block of the internal bearing (15).
NOTE. Check that the thrust block is correctly oriented.



GB

e

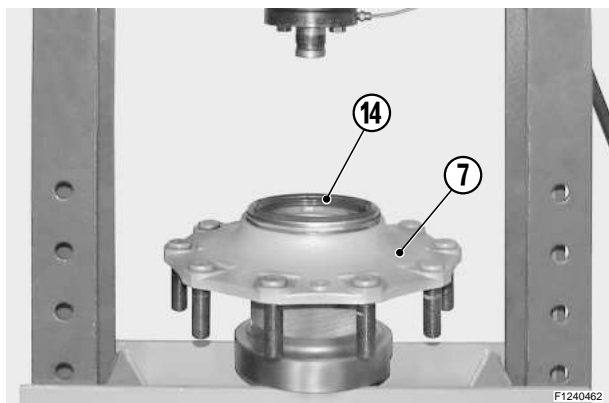
Position the upper part of tool T9B and press the thrust blocks into the hub (7) all the way down.



GB

f

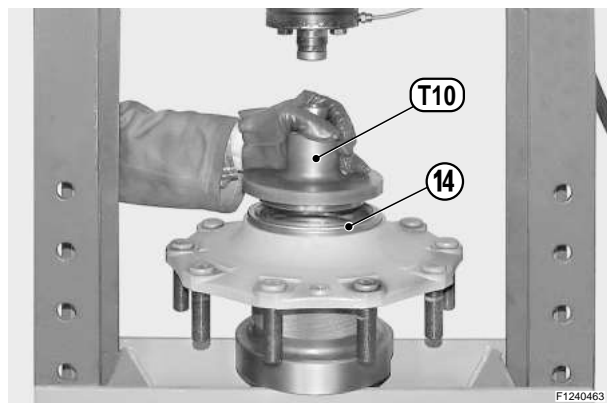
Fit the bearing (15) into the internal thrust block.



GB

a

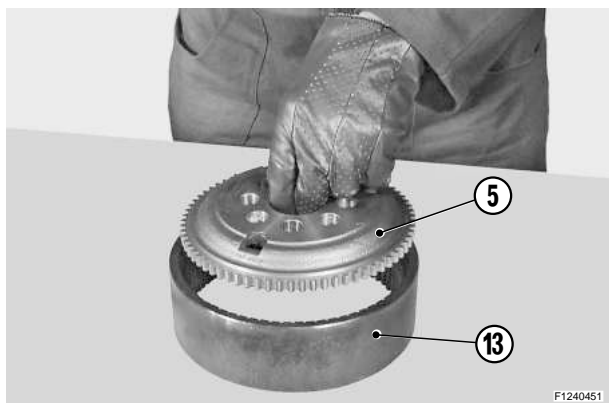
Apply a repositionable jointing compound for seals to the outer surface of the sealing ring (14). Position the sealing ring (14) in the hub (7).
NOTE. Check that the ring (14) is correctly oriented.



GB

b

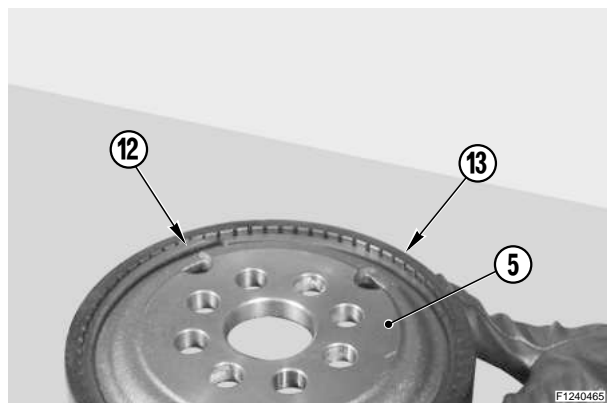
Position tool **T10** and press the sealing ring (14) into its seat.



GB

c

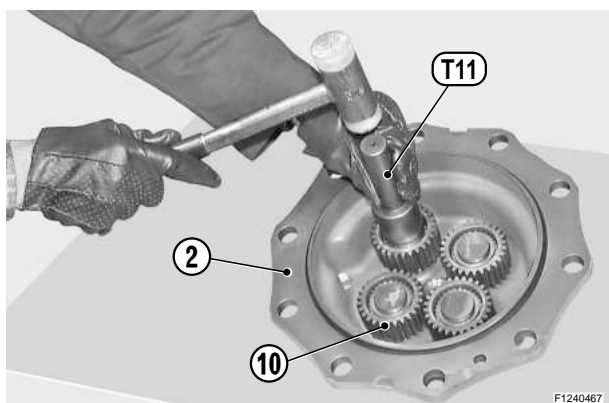
Insert the flange (5) in the crown (13).



GB

d

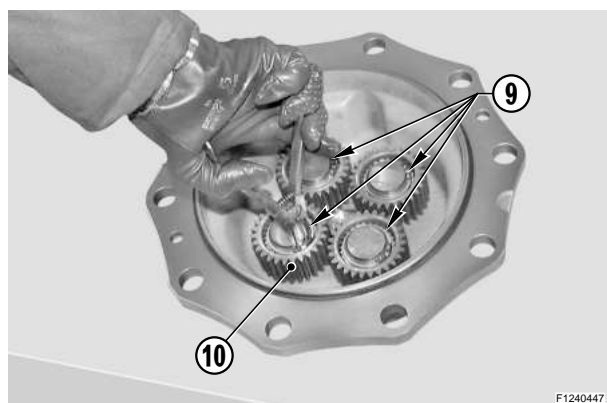
Insert the snap ring (12) in order to fix the flange (5) in the crown (13).
NOTE. Carefully check that ring (12) is properly inserted in the slot of the crown (13)



GB

e

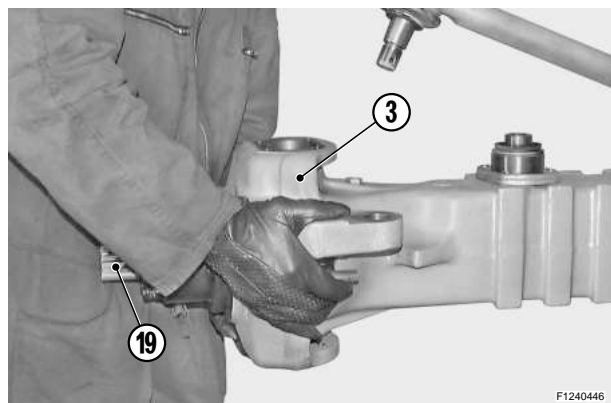
With the help of tool **T11**, insert the planet wheel gears (10) into the cover (2).
Accurately check the orientation.



GB

f

Lock the gears (10) into position by fitting the snap rings (9).



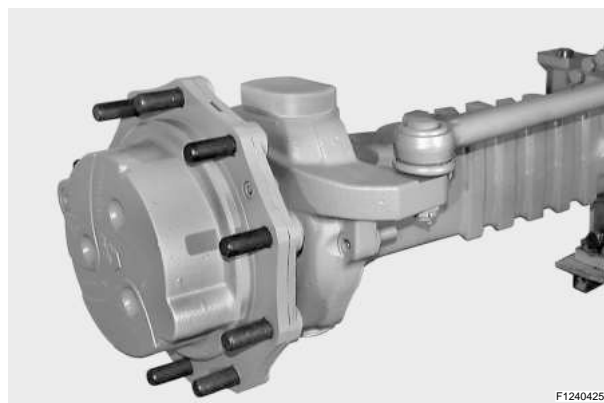
F1240446



GB

a

Fit the steering case (3) onto the U-joint (19) and install the articulation pins. For pin assembly details, see «HOW TO ASSEMBLE THE COMPLETE STEERING CASE».



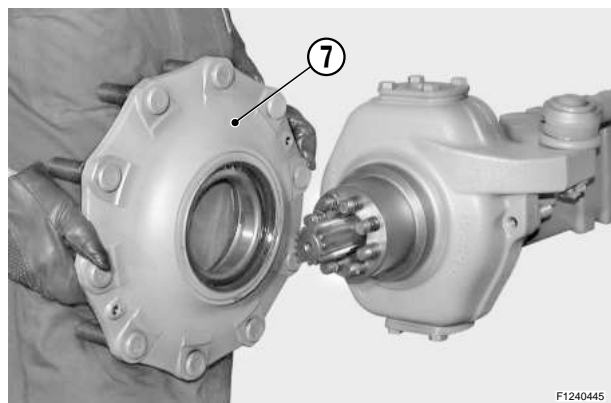
F1240425



GB

b

Connect the steering bars.
For details, see «HOW TO INSTALL THE COMPLETE STEERING CASE».



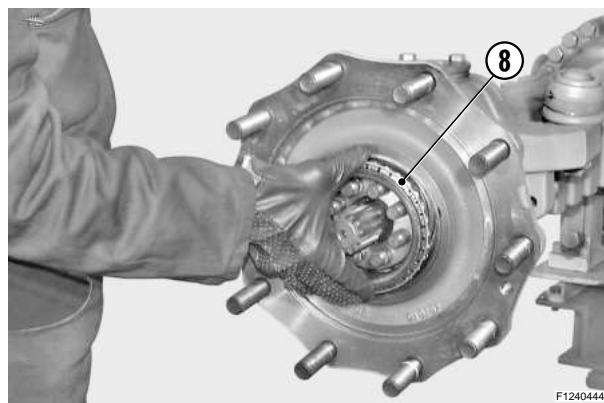
F1240445



GB

c

Install the hub (7).



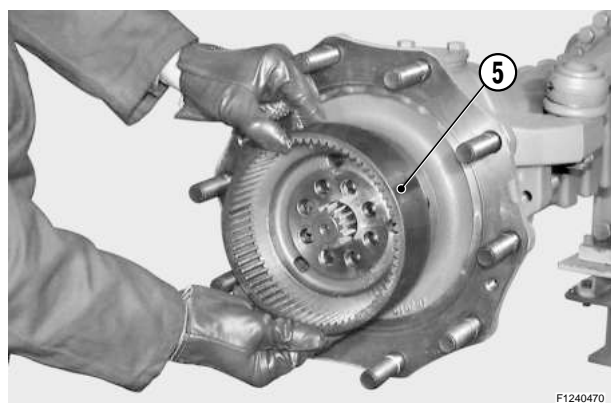
F1240444



GB

d

Install the external bearing (8).
NOTE. Using a plastic hammer, drive the bearing to the limit stop by lightly hammering around the edge.



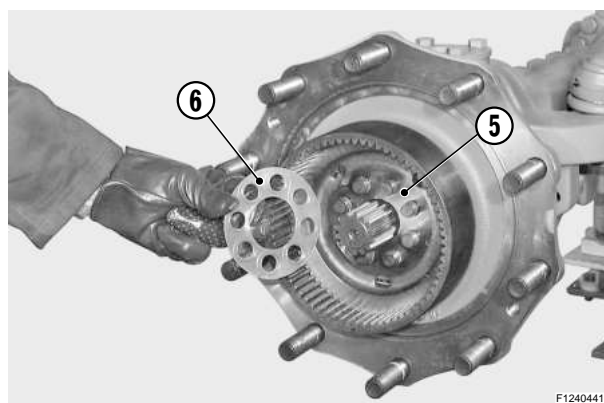
F1240470



GB

e

Fit the complete crown flange (5).
NOTE. In order to fasten the flange (5), use a plastic hammer and alternately hammer on several equidistant points.



F1240441



GB

f

Apply Tecnolube Seal 101 grease to the surface of the safety flange (6) which touches the crown flange (5).
Fit the safety flange (6).



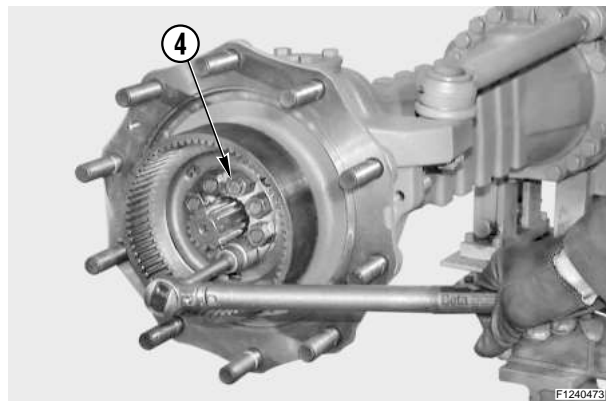
F1240472



GB

a

Apply Loctite 242 to the studs and fit in the nuts (4).



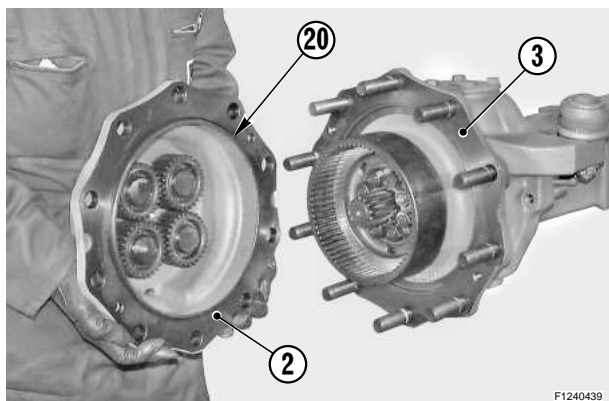
F1240473



GB

b

Cross tighten the nuts (4) in two stages.
Initial torque wrench setting: 120 Nm
Final torque wrench setting: 255-285 Nm



F1240439

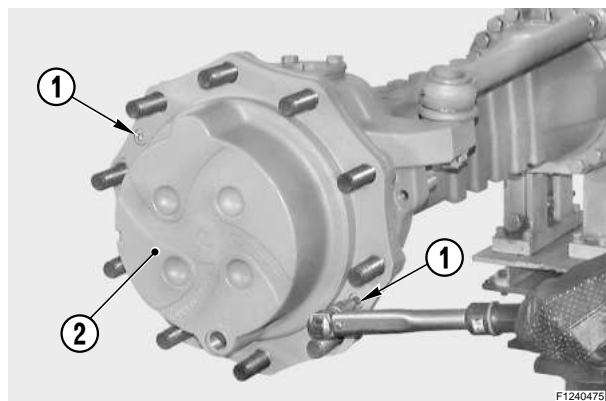


GB

c

Fit the planetary carrier cover (2) onto the hub (3).

CAUTION! Check that the O-ring (20) is in good condition and in position.



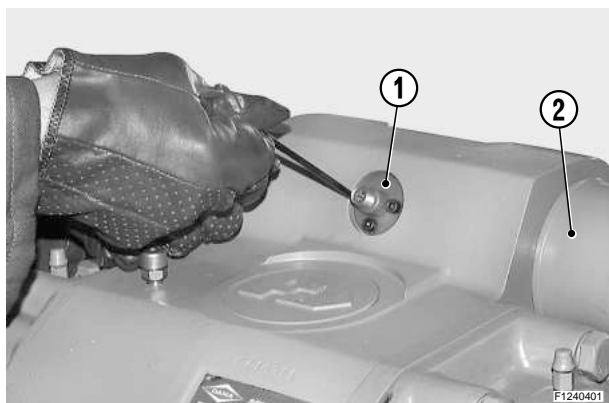
F1240475



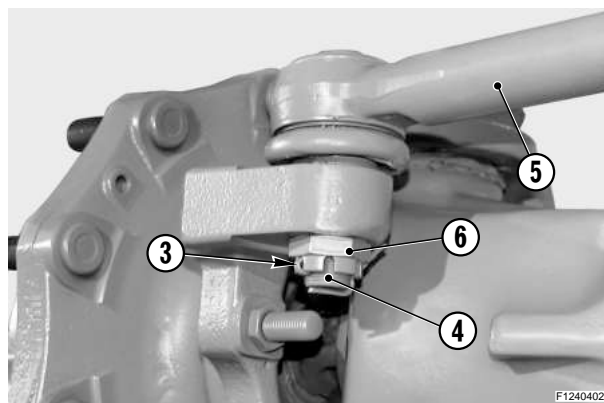
GB

d

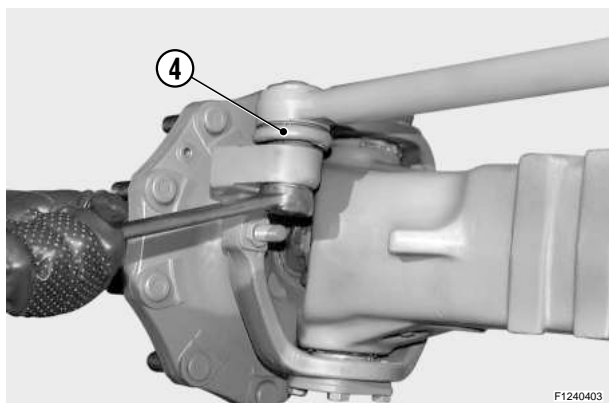
Lock the planetary carrier cover (2) by tightening the screws (1).
Torque wrench setting for screws: 40-50 Nm



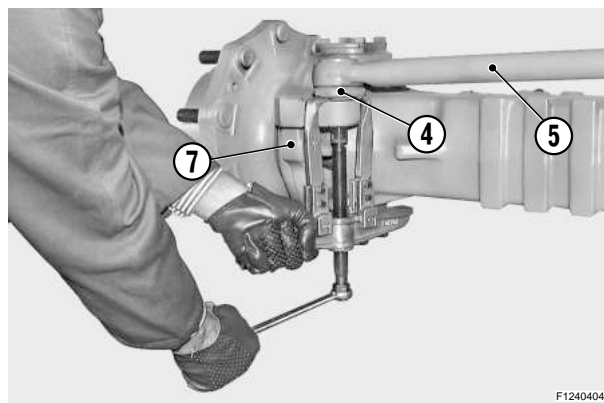
a Remove the centring sensor (1) of the steering piston (2), if supplied.



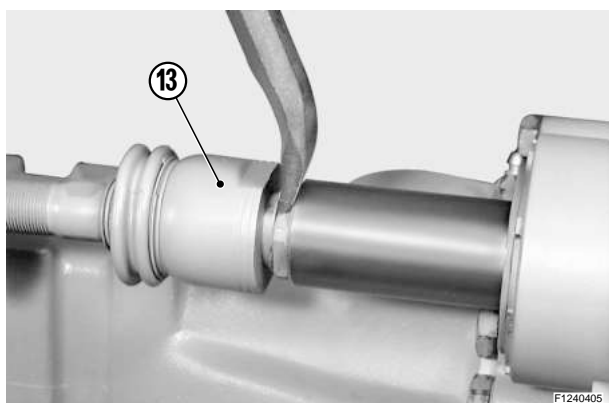
b Remove the safety cotter pins (3) from the articulation pins (4) of the steering bars (5).
CAUTION! Dispose of used cotter pins.



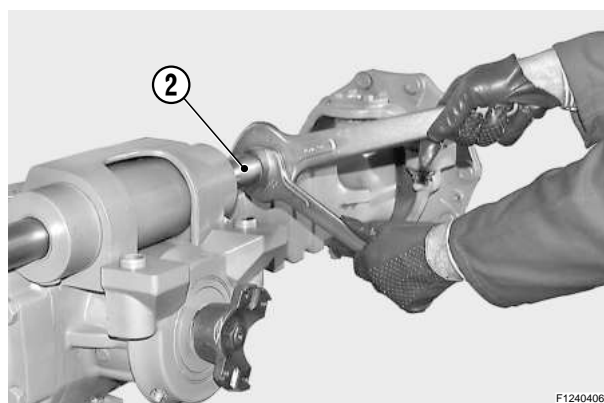
c Remove the castellated nuts (6) that lock the articulation pins (4).



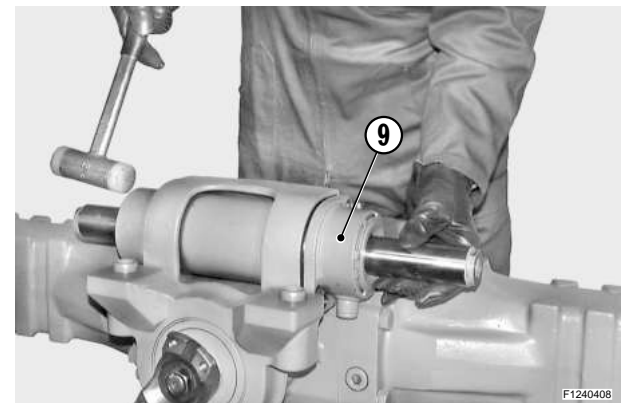
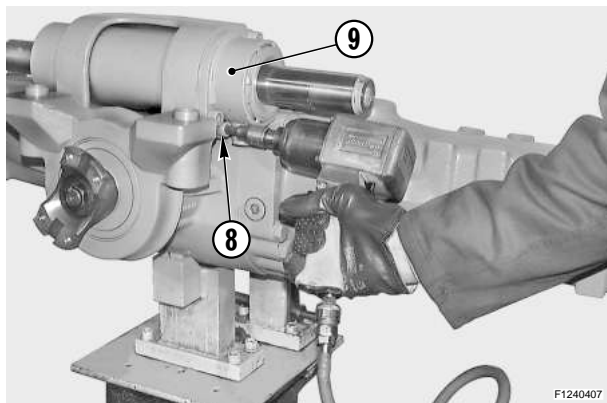
d Disconnect the tapered pins of the articulation (4) from the steering case (7) by means of a puller.



e If the connection of the steering bars includes a safety collar (13), raise the border.



f Disconnect left and right steering bars (5) from the piston (2).



GB

a

Remove the securing screws (8) from the steering cylinder (9).

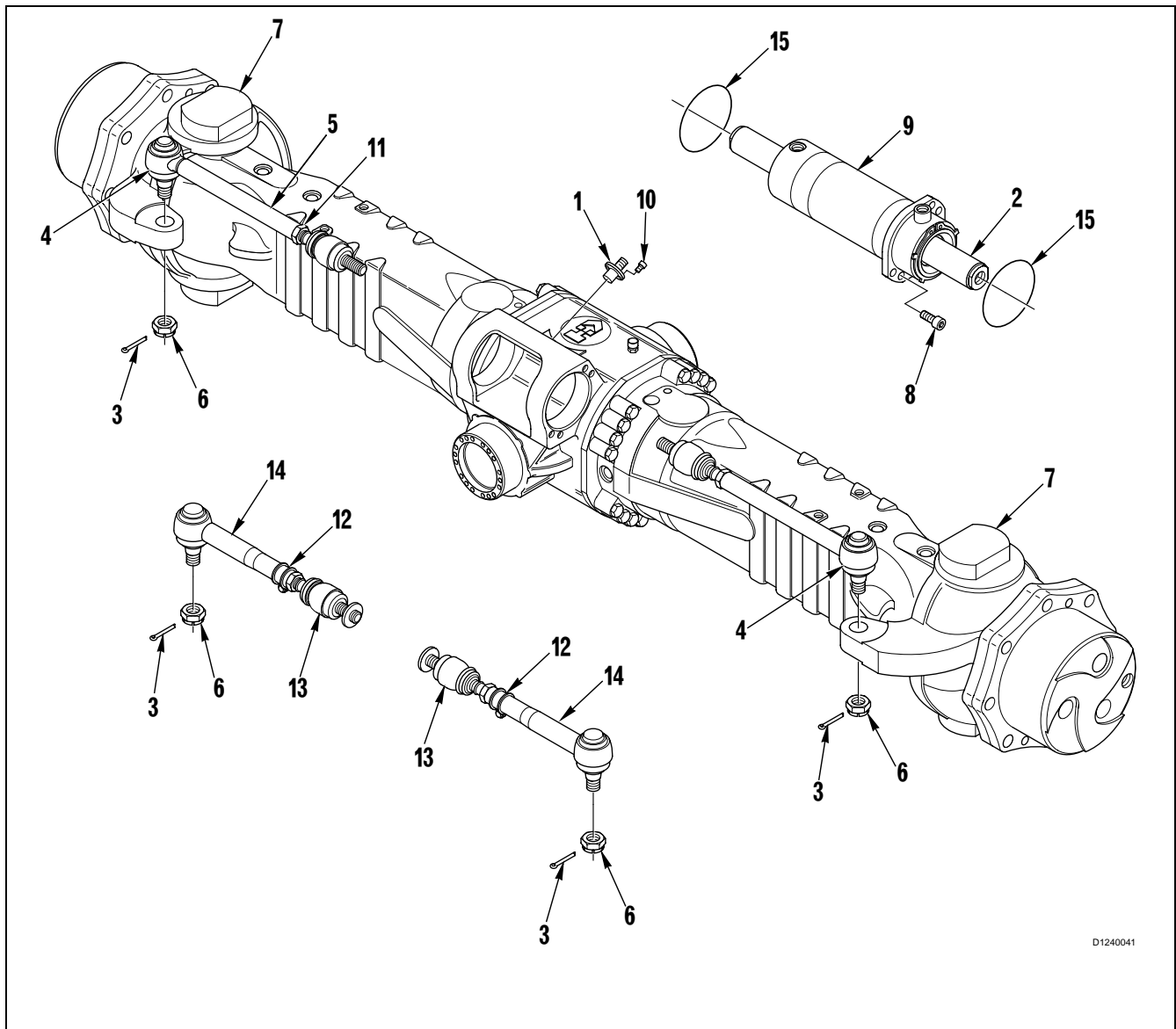


GB

b

Extract the cylinder (9) using a plastic hammer.

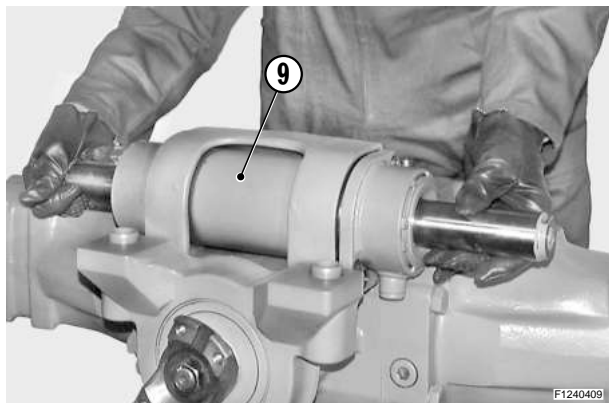
NOTE. For cylinder disassembly, refer to «HOW TO DISASSEMBLE THE STEERING CYLINDER».



D1240041



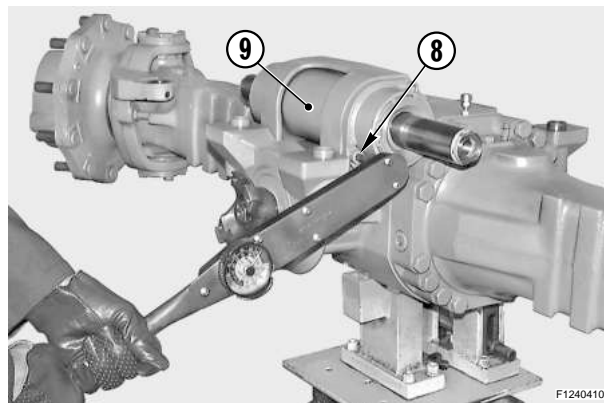
HOW TO INSTALL THE STEERING CYLINDER - INSTALLAZIONE CILINDRO DI STERZATURA - LENKZYLINDER INSTALLIEREN -
INSTALACION CILINDRO DE DIRECCION - INSTALLATION DU CYLINDRE DE BRAQUAGE



GB

a

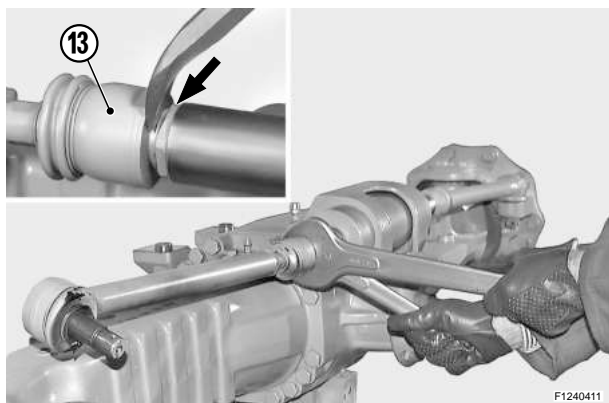
Check that the O-rings (15) of the axle unit are in good condition; lubricate the seats of the seals (15) and fit the steering cylinder (9) into its seat.



GB

b

Lock the cylinder by cross-tightening the screws (8).
Torque wrench setting: 116–128 Nm

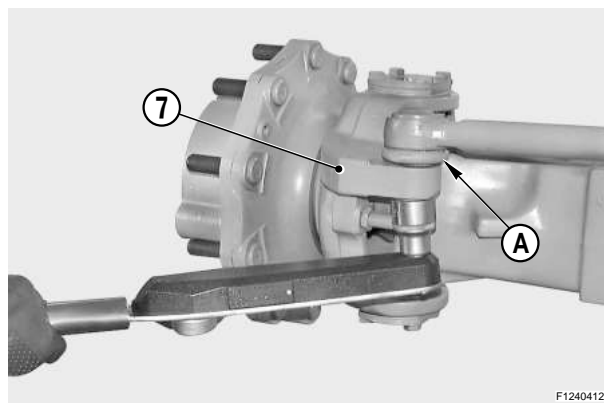


GB

c

Apply Loctite 242 to the thread and connect the steering bars by screwing the terminals onto the piston stem.
Torque wrench setting: 240–270 Nm

NOTE. Versions with coupling require that the rim of the articulation (13) is riveted onto the surfaces of the piston stem.

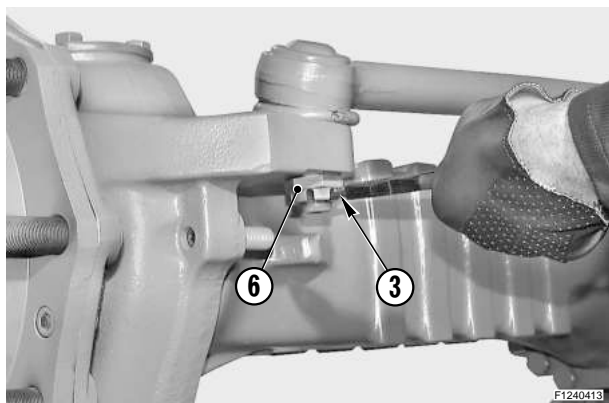


GB

d

Insert the pins (4) in the steering case (7) and lock into position using a torque wrench setting of 260–290 Nm.
Find the position of the notching in relation to the hole of the cotter pins and tighten the nut (6) further.

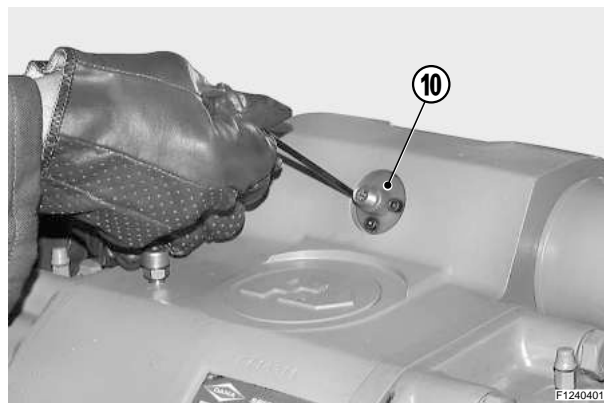
CAUTION! Check that rubber guards (A) are intact.



GB

e

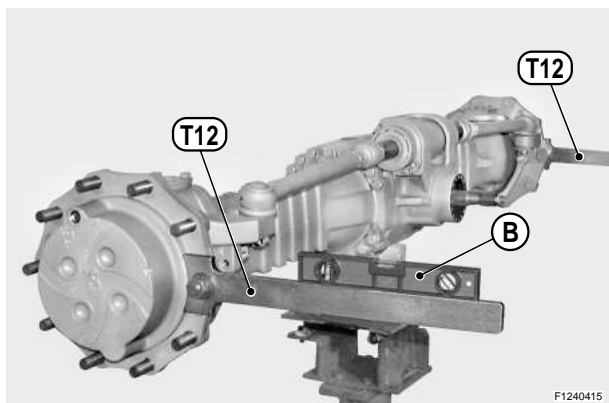
Insert the cotter pins (3) and bend the safety stems.
CAUTION! Use new cotter pins.



GB

f

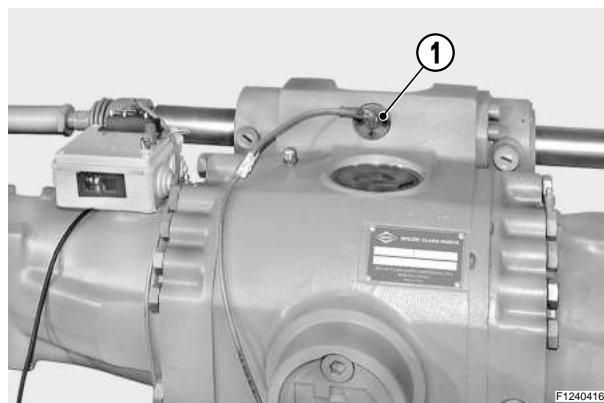
Install the proximity (1) for checking piston centring - if applicable - and tighten the screws (10).
Torque wrench setting: 5–6 Nm



GB

a

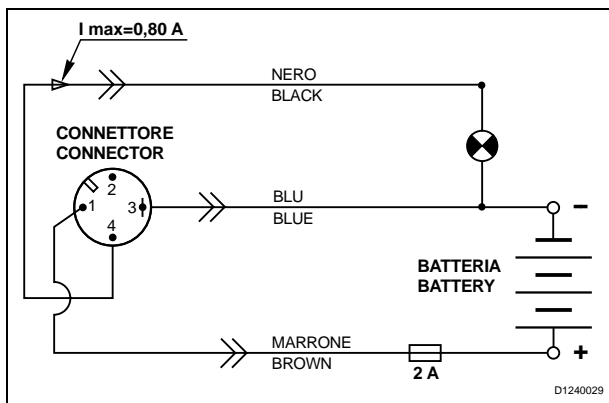
CAUTION. Eliminate the action of the negative brake, if fitted.
Apply tools **T12** to the hubs and lock them.
Using a level **"B"**, check that tools are perfectly flat and parallel to each other.



GB

b

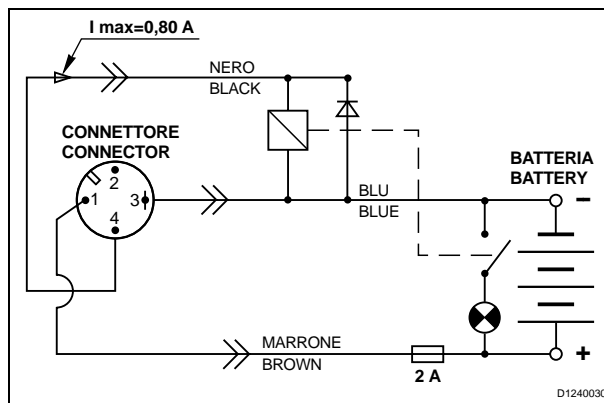
Connect the sensor (1) to the inspection device according to either diagram.



GB

c

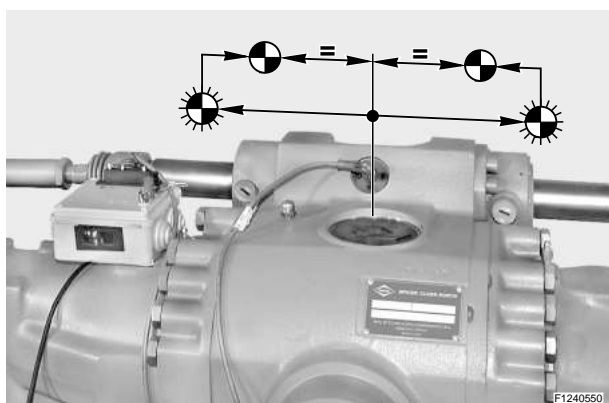
Sensor connection card, STANDARD version.



GB

d

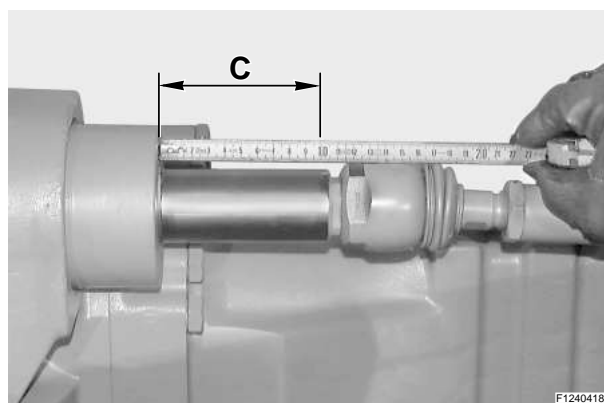
Sensor connection card, OPTIONAL version.



GB

e

Centre the piston by slowly moving it first in one direction then in the other and position it half way on the stroke, which is determined by the switching on and off of the signal lamp of the inspection device in the reversal stage.

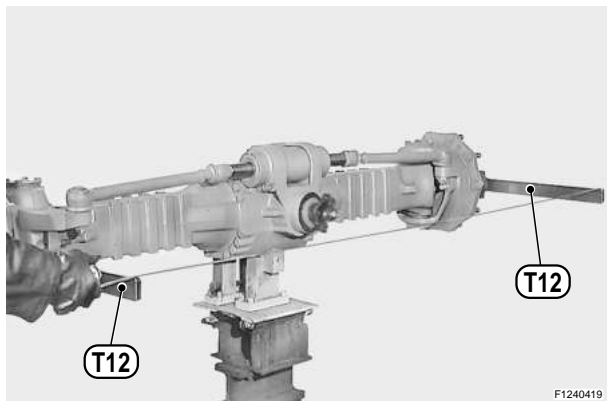


GB

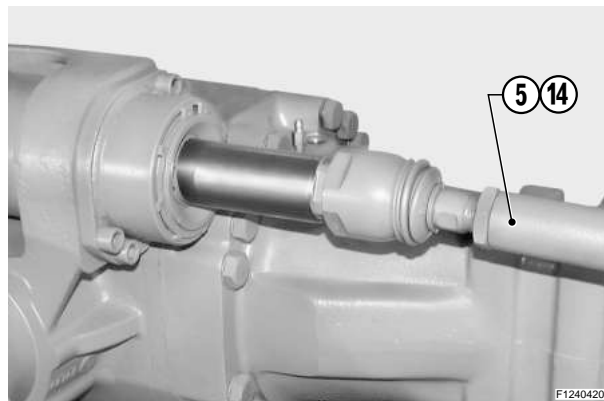
f

Inspect jut **"C"** on one side of the piston and note down the size for checking later adjustments.

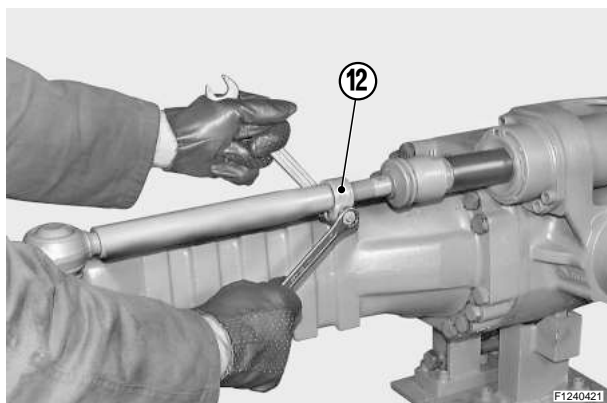
NOTE. If cylinders come without a sensor, the centring of the piston must be carried out on the basis of the maximum stroke.



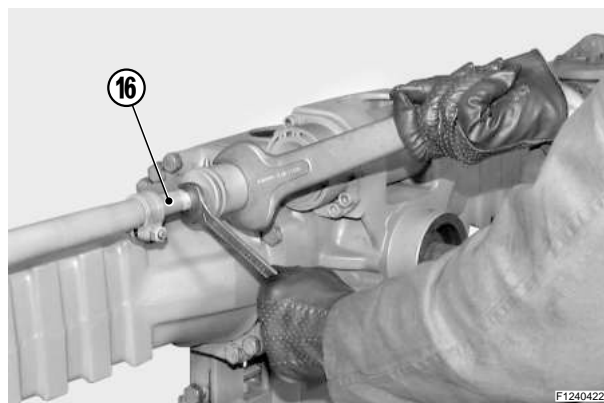
Without moving the piston, check front and rear size at the edge of tools **T12**.
Max. difference: 0.6–0.7 mm
NOTE. In order to check the rear size, rotate the bevel pinion and check that tools **T12** are flat.



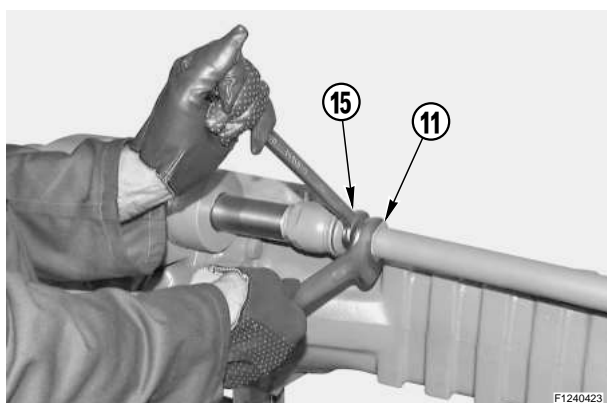
If necessary, adjust convergence without moving the centring of the piston and adjust the length of the steering bars (5) or (14).
NOTE. With a half turn of screw, the front size is reduced by about 3 mm, whereas the rear one is increased by about 3 mm.



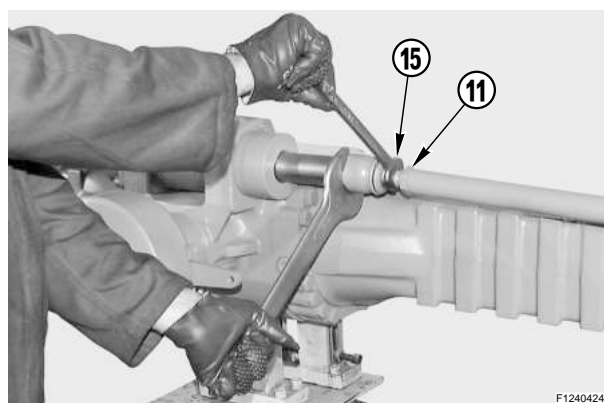
CONVERGENCY ADJUSTMENT ON UNITS WITH COLLAR
Unloose the nuts on the collars (12).



Rotate the ball-and-socket joints (16) until convergence has been obtained.
Check that articulations move easily and lock the collars (12).
Torque wrench setting for nuts: 42–52 Nm



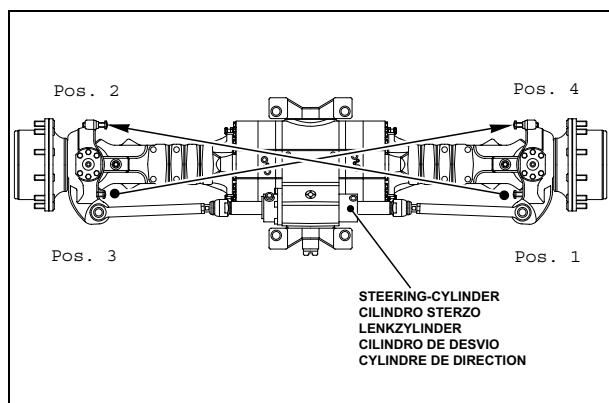
CONVERGENCY ADJUSTMENT ON ALTERNATIVE VERSIONS
Unloose the nuts (11) and screw them onto the ball-and-socket joints (15).



Hold the articulations still and rotate the ball-and-socket joints (15).
Once the convergence has been adjusted, lock the nuts (11).
Torque wrench setting for nuts: 298–328 Nm



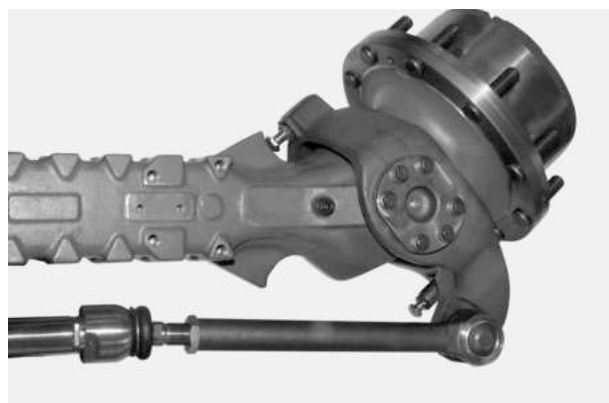
HOW TO INSTALL THE STEERING CYLINDER - INSTALLAZIONE CILINDRO DI STERZATURA - LENKZYLINDER INSTALLIEREN - INSTALACION CILINDRO DE DIRECCIÓN - INSTALLATION DU CYLINDRE DE BRAQUAGE



GB

a

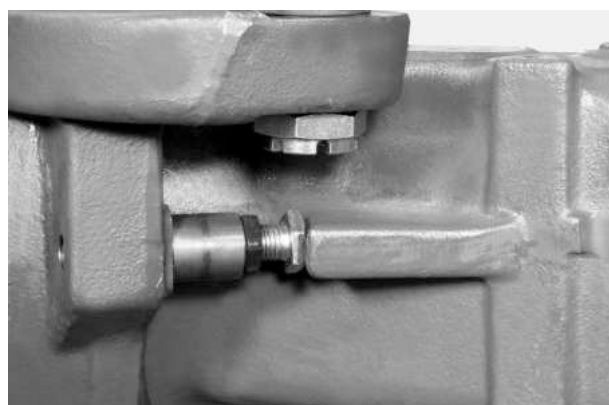
ADJUSTING THE STEERING ANGLE
NOTE. Perform the same operations on both sides (see diagram).
Loosen the nut of one of the adjusting screws on cylinder side.



GB

c

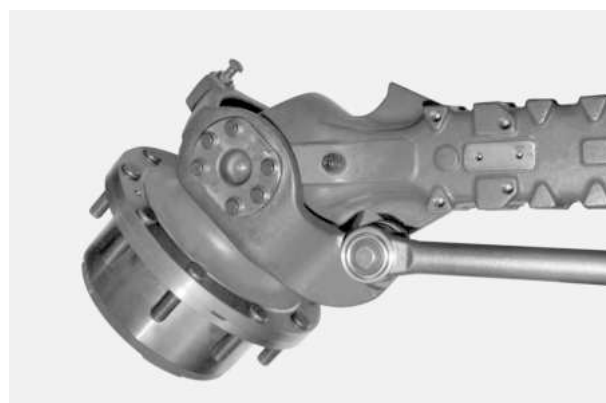
Perform one full steering operation until the adjusted screw leans against the arm stop.



GB

e

IMPORTANT! The screws must lean against the respective arm stops all at the same time.



GB

b

Perform one full steering operation until the adjusted screw leans against the arm stop.

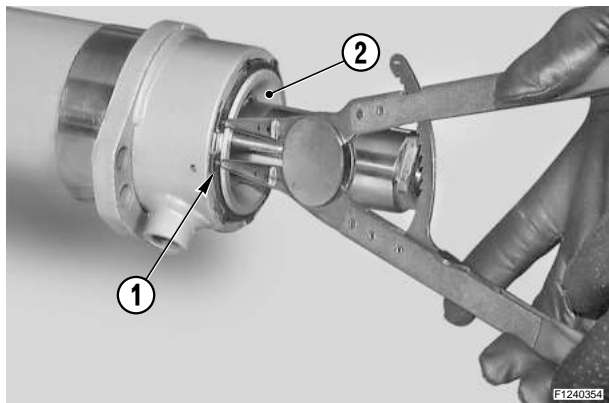


GB

d

As you hold the adjusted screw in position against the arm stop, adjust the screw opposite, on non-cylinder side, until it leans against the arm stop.

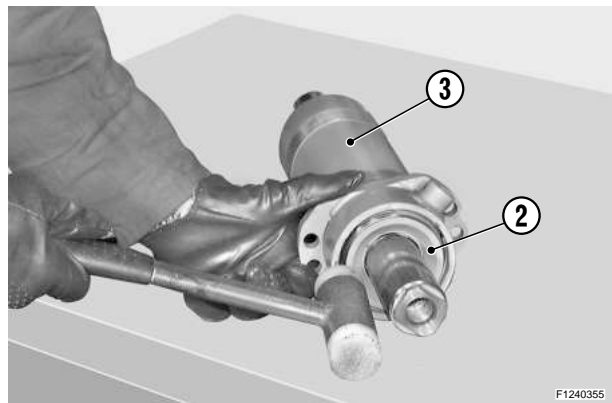
STEERING ANGLE ANGOLO DI STERZATURA EINSLAGWINKEL ANGULACION DE DESVIO- ANGLE DE BRAQUAGE		40°	37°	36°	35°	30°	29°
DISTANCE DISTANZA ABSTAND DISTANCIA DISTANCE	'B' mm	30	37	39,4	41,8	53,3	38,2



GB

a

Remove the snap ring (1) from the cylinder head (2).

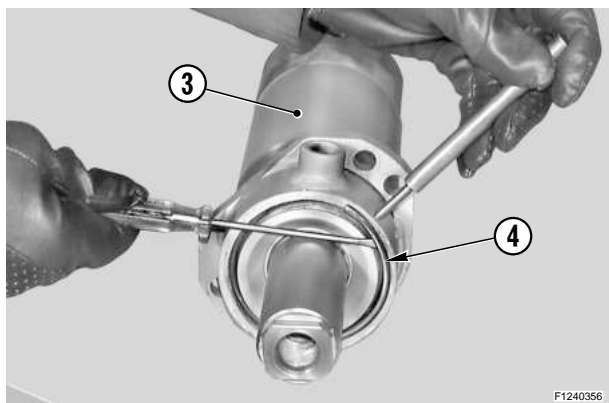


GB

b

With the help of a plastic hammer, push the head (2) inside the cylinder (3).

NOTE. The head should line up with the edge of the cylinder.



GB

c

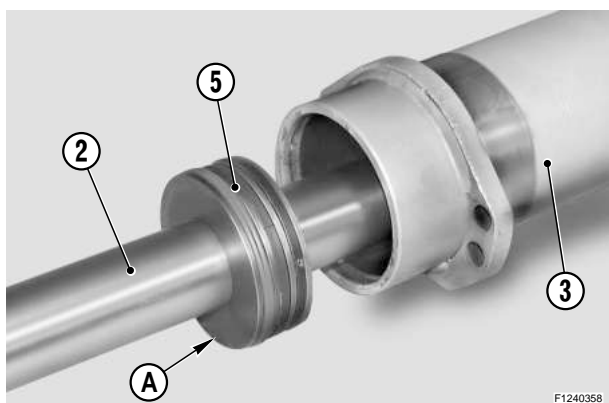
With the help of a drift, apply pressure to the stop ring (4) that is placed inside the cylinder (3) and extract the ring using a screwdriver.



GB

d

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).



GB

e

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

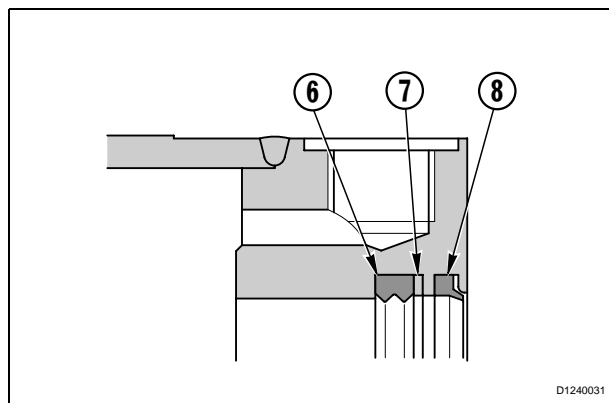
CAUTION! Note down the assembly side of the piston (5). The bevelled part "A" of the piston is oriented towards the head (2).

GB

f

Remove all seals, anti-extrusion rings and scraper rings from head (2), cylinder (3) and piston (5).

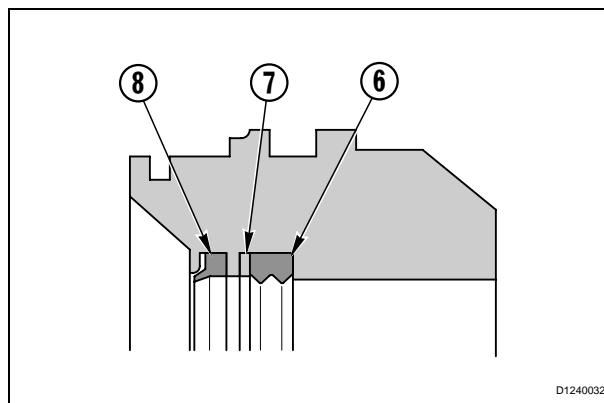
NOTE. 1 - All seals must be replaced every time the unit is disassembled. 2 - Particular attention must be paid not to damage the seats of both seals and piston slide.



GB

a

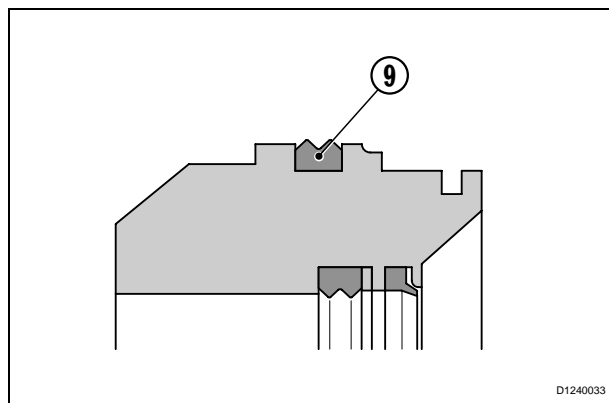
After applying grease, install the sealing ring (6) of the shaft, the anti-extrusion ring (7) and the scraper ring (8) inside the cylinder (3).
CAUTION! Thoroughly check that positioning of the anti-extrusion ring (7) is correct.



GB

b

After applying grease, install the sealing ring (6) of the shaft, the anti-extrusion ring (7) and the scraper ring (8) in the head (2).
CAUTION! Thoroughly check that positioning of the anti-extrusion ring (7) is correct.



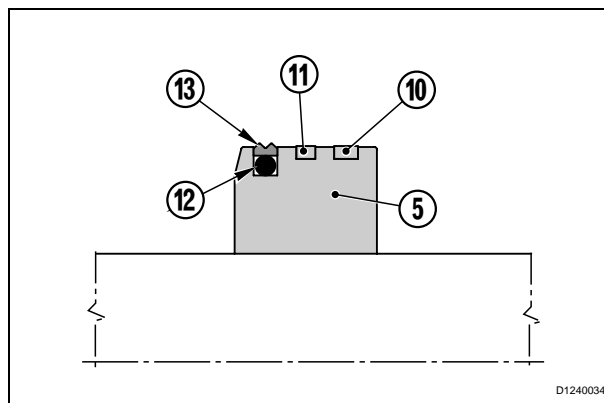
GB

c

Fit the seal (9) onto the outside of the head (2).

CAUTION!

- 1 - In order to facilitate assembly, apply grease to the outer surface of the piston.
- 2 - Do not roll the seal (9) up.



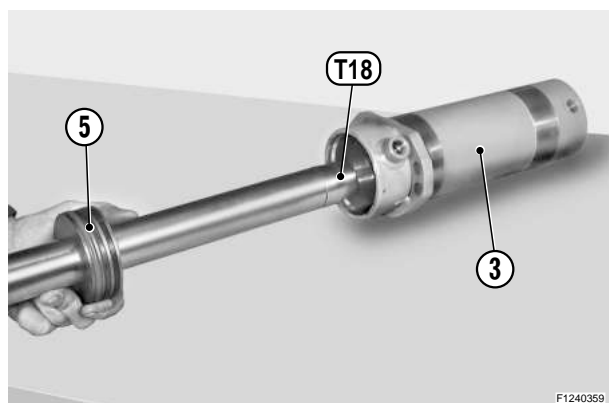
GB

d

Prepare the piston (5) by fitting it with the guide ring (10), the magnetic ring (11), the O-ring (12) and the seal (13).

CAUTION!

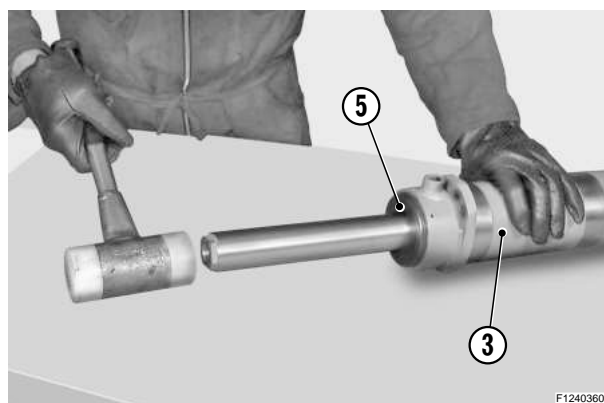
- 1 - In order to facilitate assembly, apply grease.
- 2 - If a centring sensor is not fitted, then the magnetic ring (11) should be replaced by another guide ring (10).



GB

e

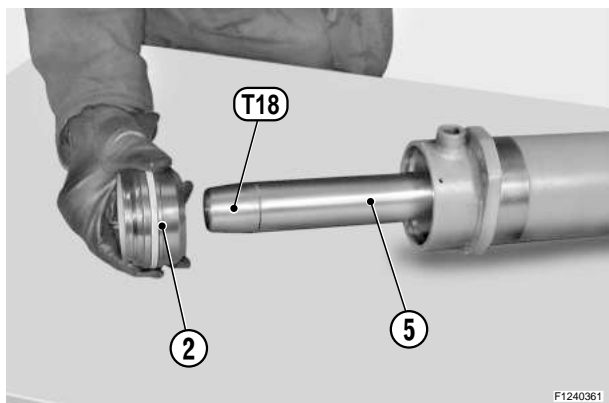
Apply tool **T18** to the shaft on the opposite side of the head (2) and centre it on the cylinder (3) so that it fits into the piston (5).
NOTE. Apply a little grease to seals and cylinder.



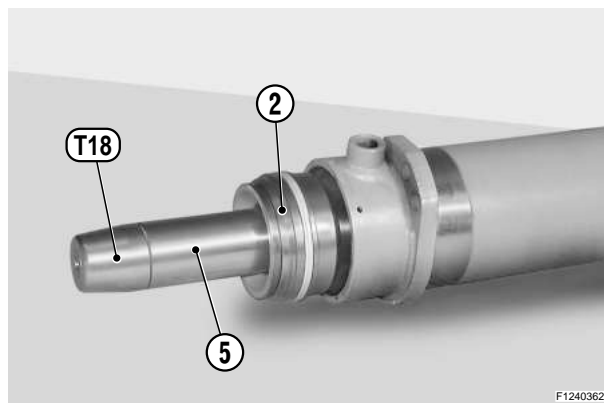
GB

f

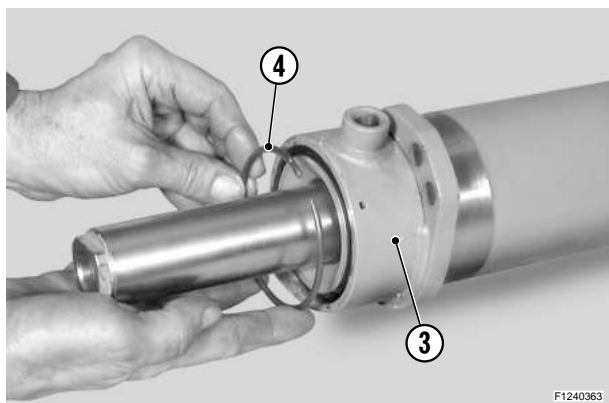
Push the piston (5) into the cylinder for 100 mm using a plastic hammer.



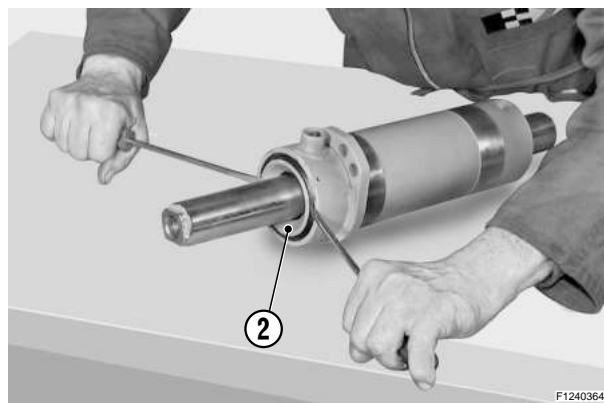
Remove tool **T18** and apply it to the opposite side of the piston (5).



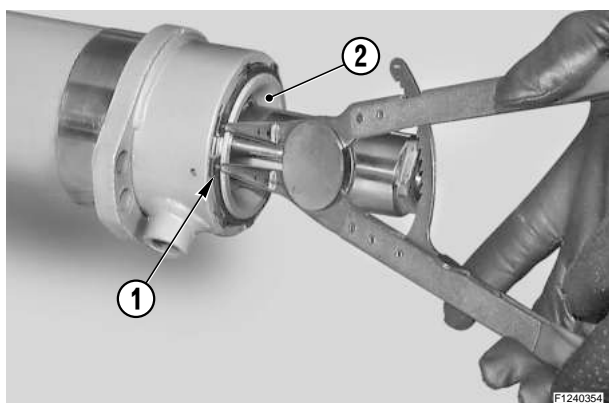
Apply grease to head (2) seals, fit the head onto the piston and push it into the cylinder (3) using a plastic hammer.
NOTE. Insert the head as to line it up with the edge of the cylinder.



Insert the stop ring (4) ensuring that it fits into the seat of the cylinder (3).



Apply pressure to the head using two screwdrivers or levers until the head is fastened onto the stop ring (4).

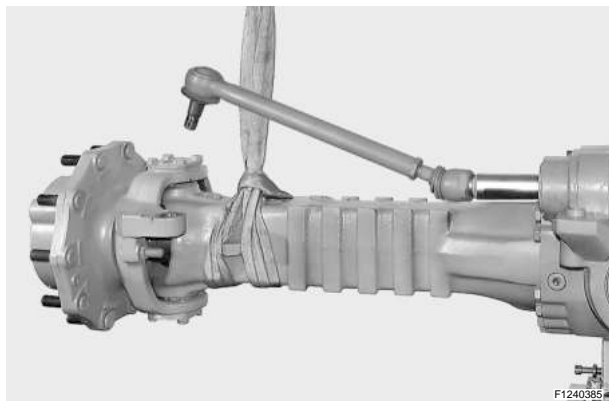


Fit the snap ring (1) on the head (2).
CAUTION! Make sure that the snap ring (1) is securely fastened in its seat.
If necessary, force it into its seat using a drift and a hammer.



HOW TO REMOVE AND DISASSEMBLE THE DIFFERENTIAL UNIT - RIMOZIONE E SMONTAGGIO GRUPPO DIFFERENZIALE - DIFFERENTIAL
ABMONTIEREN UND ZERLEGEN - REMOCION Y DESMONTAJE GRUPO DIFERENCIAL - DEPOSE ET DEMONTAGE DU GROUPE DIFFERENTIEL

REMOVING - RIMOZIONE - ABMONTIEREN - REMOCION - DEPOSE



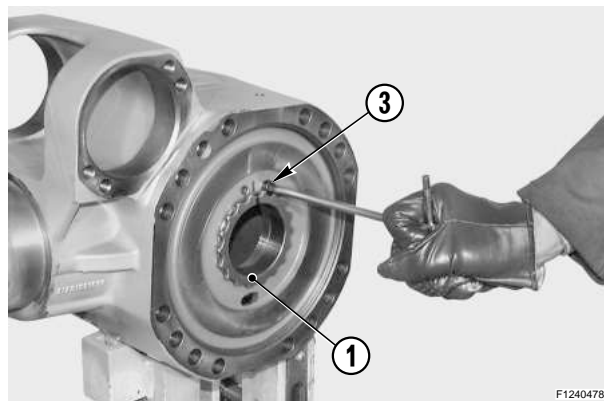
F1240385



GB

a

Remove the complete arms.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISKS».



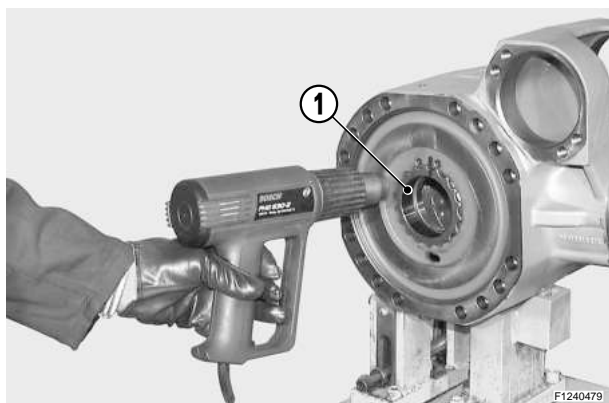
F1240478



GB

b

Mark the position of the ring nuts (1). Remove the fitting screws (3) from the ring nuts (1).



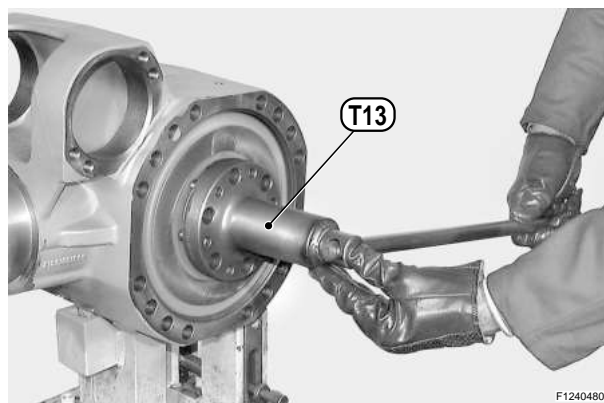
F1240479



GB

c

Uniformly heat the ring nuts (1) up to a temperature of 80° C.



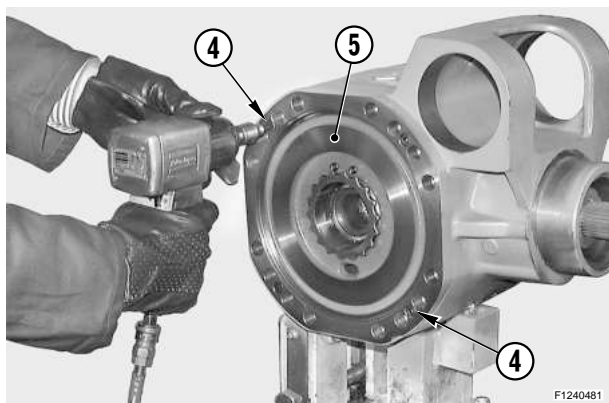
F1240480



GB

d

Apply tool T13 and remove the ring nuts.
NOTE. Accurately clean the threaded portions on ring nuts of body and cover.



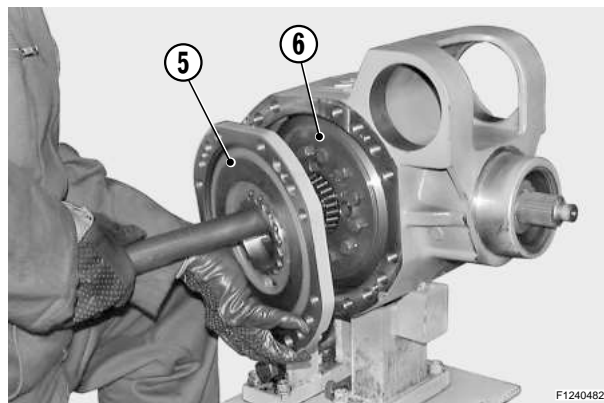
F1240481



GB

e

Remove the fitting screws (4) from the middle cover (5).



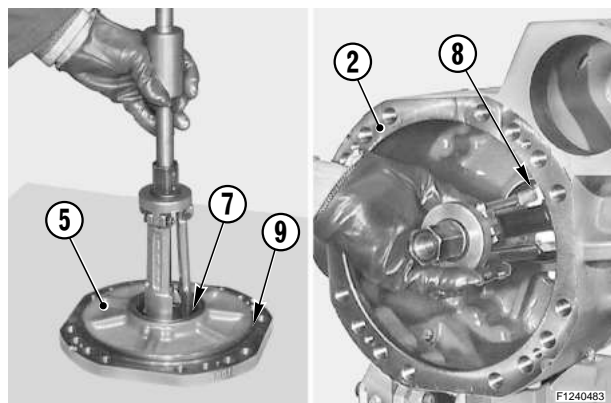
F1240482



GB

f

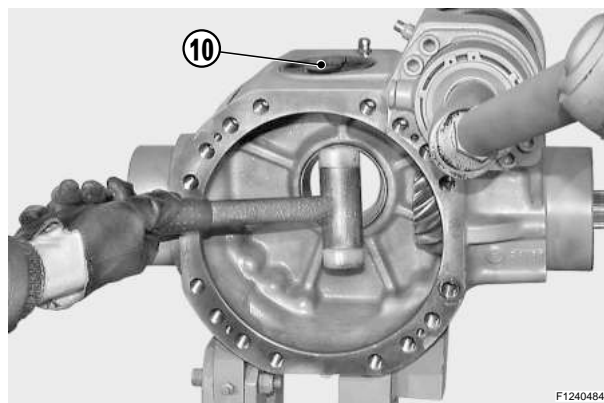
Insert a screw-driver in the opposing slots then force and remove the middle cover (5) and the complete differential unit (6).
NOTE. Support the pieces using a rod.



GB

a

If the bearings need replacing, extract the external thrust blocks of the bearings (7) and (8) from middle cover (5) and central body (2).
NOTE. Accurately check the O-ring (9).

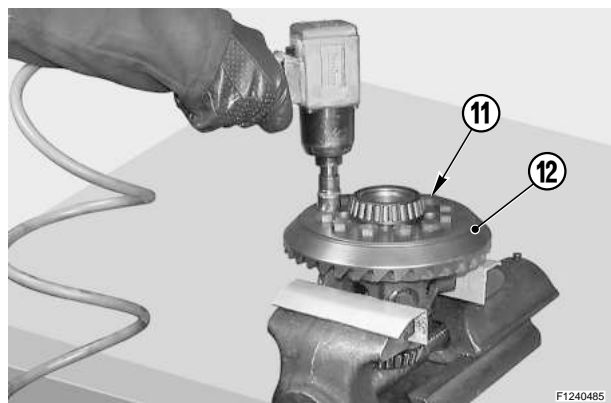


GB

b

Remove the top plug (10).

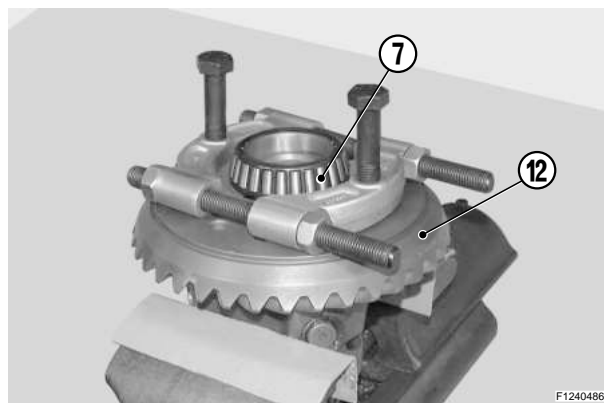
DISASSEMBLING - SMONTAGGIO - ZERLEGEN - DESMONTAJE - DESASSEMBLAGE



GB

c

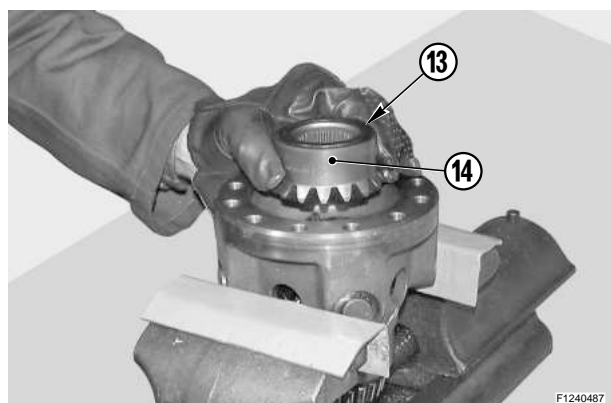
Remove the fitting screws (11) from the crown (12).



GB

d

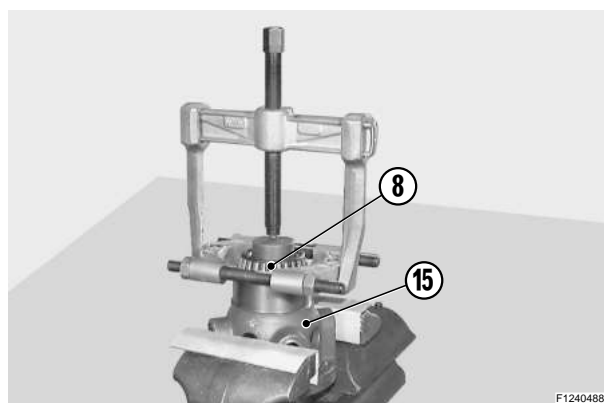
If the bearing need replacing, extract the bearing (7) and remove the crown (12).



GB

e

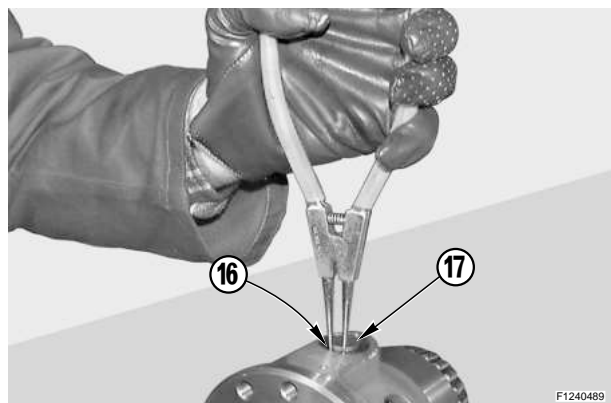
Remove the shim washer (13) and the planetary gear (14).



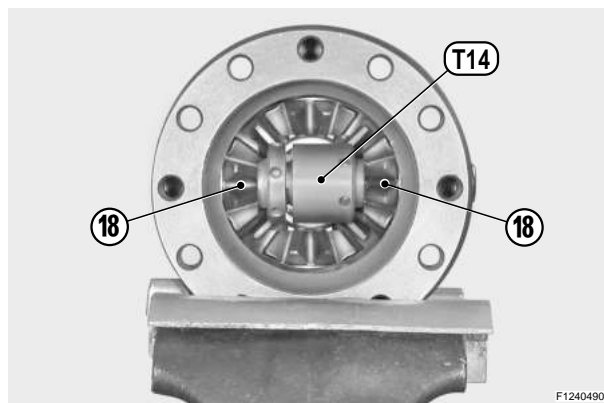
GB

f

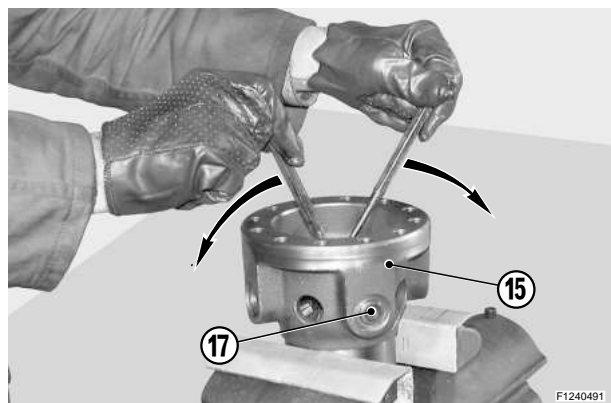
If the bearing need replacing, extract the bearing (8) from the differential carrier (15).



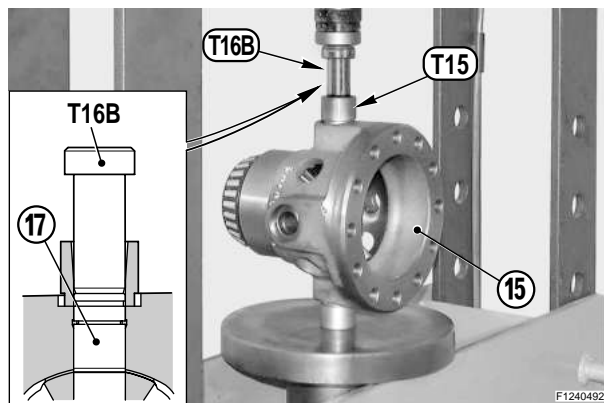
Remove the snap rings (16) from the two pins (17) of the planet wheel gears (18).



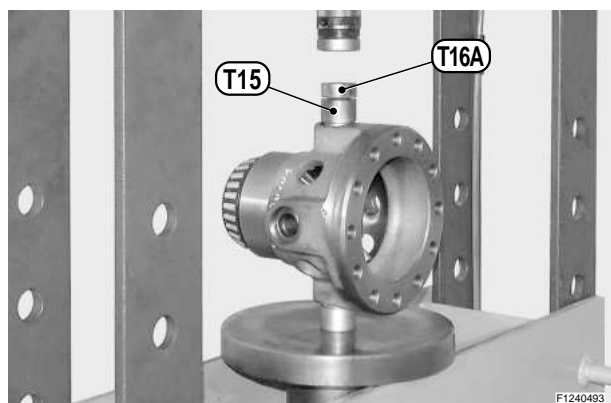
Insert tool T14 between the planet wheel gears (18).



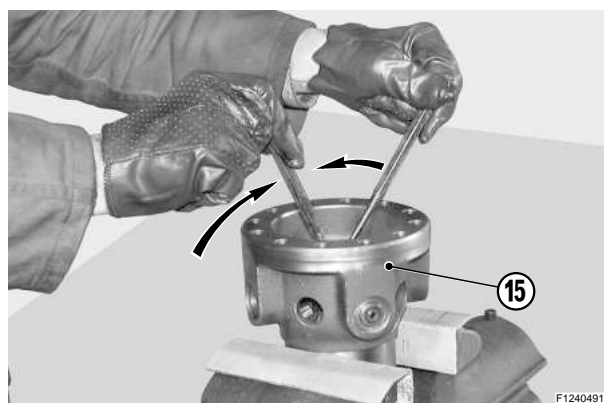
Force tool T14 in-between the planet wheel gears (18) using two pin-drivers.
CAUTION! Make sure that tool T14 is perfectly lined up with the pins (17) when locked.



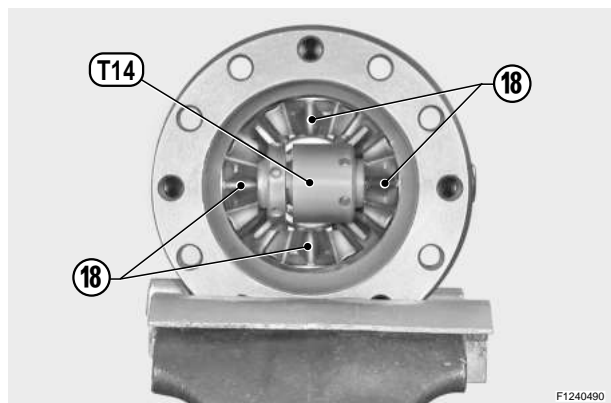
Place the differential carrier (15) under a press, position bush T15 and insert gudgeon T16A. Press T16A pin to limit position.



Remove gudgeon T16A and bush T15.
NOTE. In this condition the tool T14 contains pin (17).



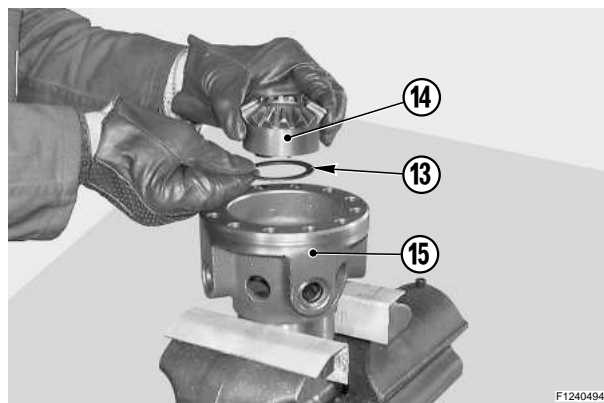
Remove tool T14 together with the pin (17) of the planet wheel.



GB

a

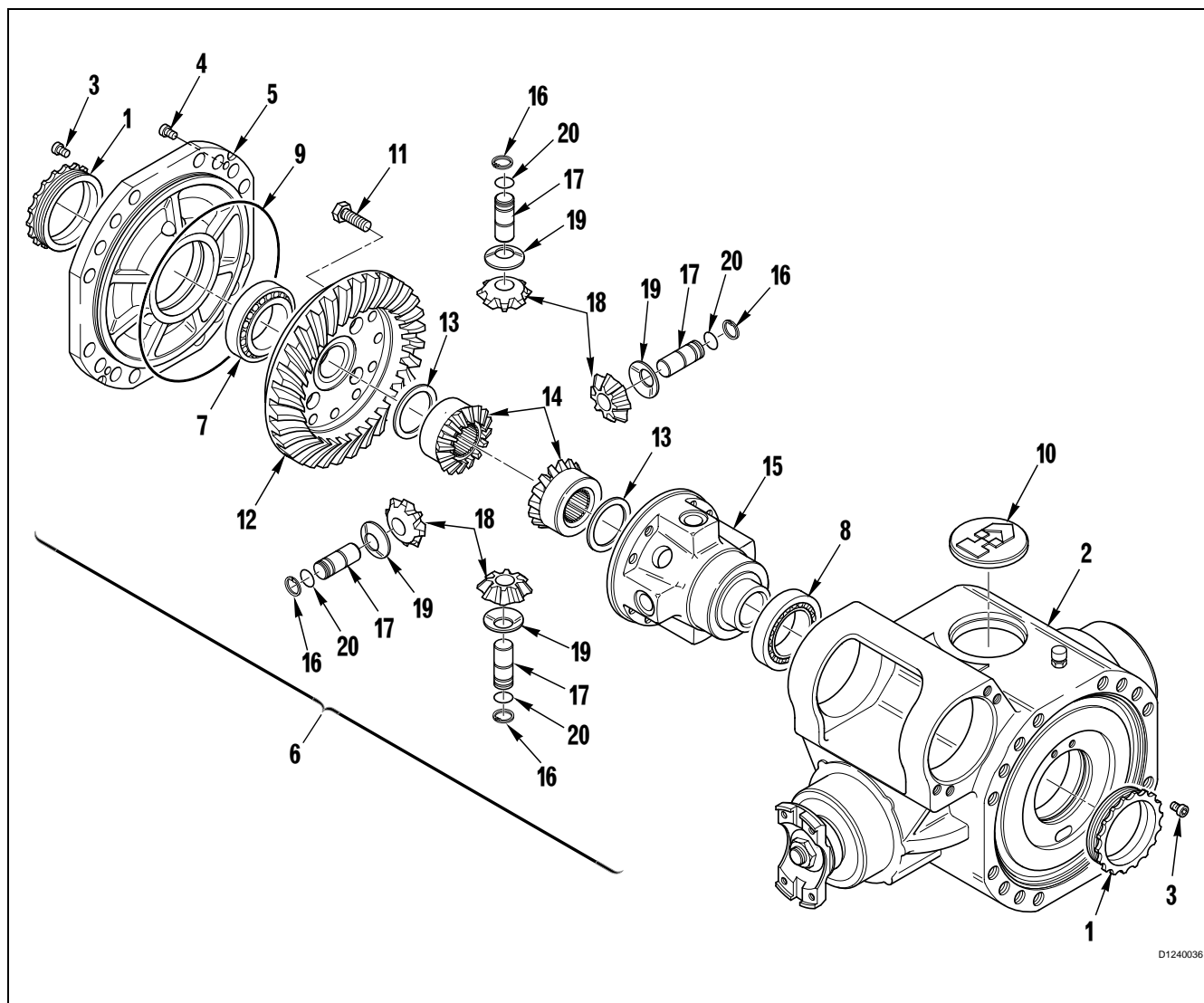
Leave the released planetary gear in position and again lock tool T14.
Repeat the operations for the extraction of the pin of the 2nd planet wheel (17).
Repeat the operations for all other pins.



GB

b

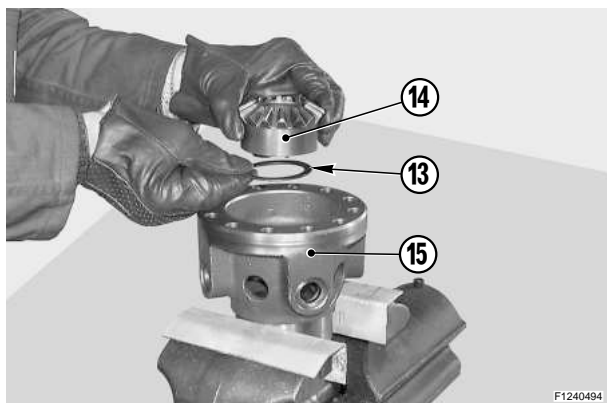
Remove tool T14 and remove the last two planet wheel gears (18), the 2nd differential unit gear (14) and the relative shim washer (13) from the differential carrier.





HOW TO ASSEMBLE AND INSTALL THE DIFFERENTIAL UNIT - ASSEMBLAGGIO ED INSTALLAZIONE GRUPPO DIFFERENZIALE -
DIFFERENTIALAGGREGAT MONTIEREN UND INSTALLIEREN - MONTAJE E INSTALACION DEL GRUPO DIFERENCIAL -
ASSEMBLAGE ET INSTALLATION DU GROUPE DIFFERENTIEL

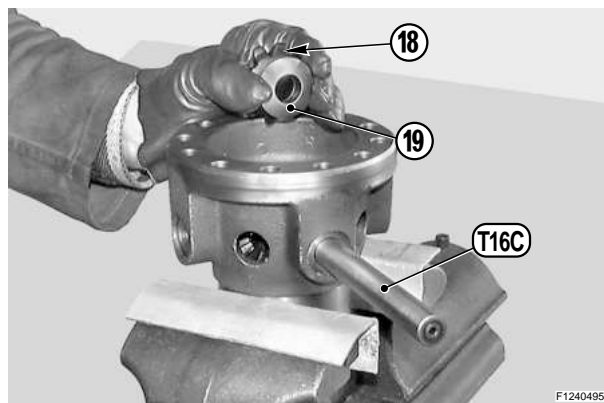
ASSEMBLING - ASSEMBLAGGIO - MONTIEREN - MONTAJE - MONTAGE



GB

a

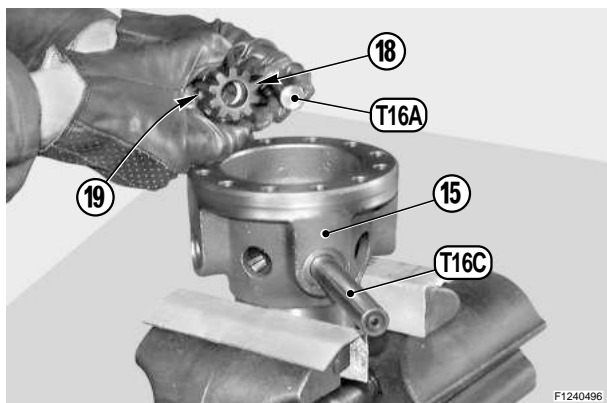
Insert the shim washer (13) and the planetary gear (14) in the differential carrier (15).



GB

b

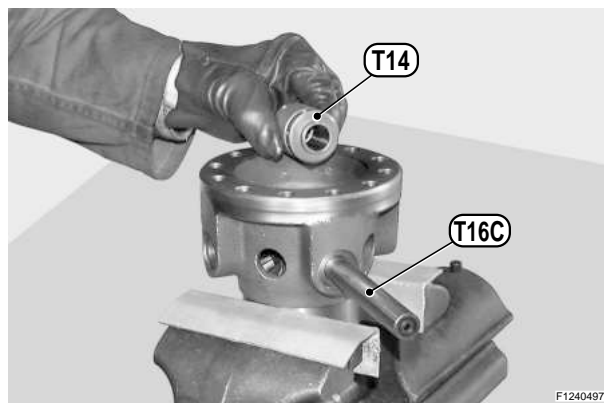
Position the shim washer (19) and the first planet wheel gear (18). Hold them in position using bar T16C.



GB

c

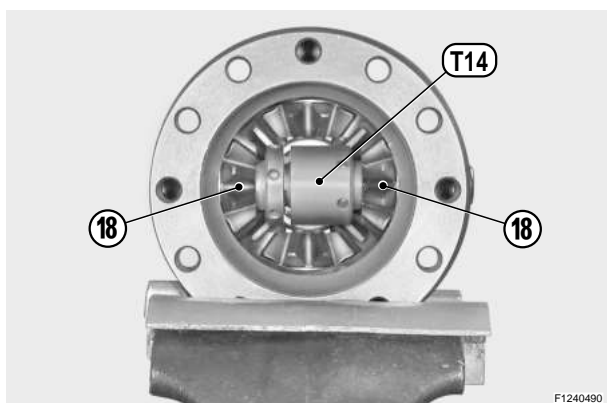
With the help of gudgeon T16A, position the second planet wheel gear (18) and the relative shim washer (19).



GB

d

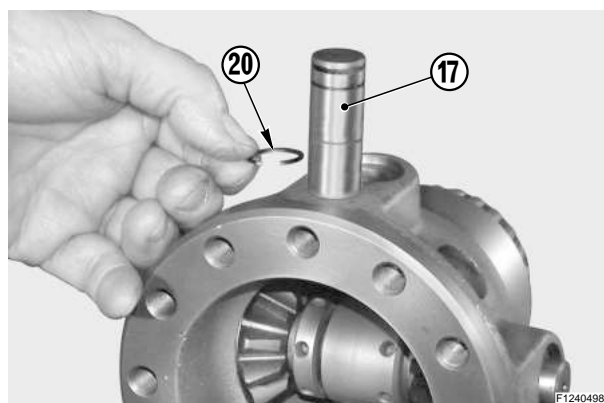
Insert tool T14 between the two planetary gears (18). Line up the entire unit by pushing bar T16C all the way down until gudgeon T16A is ejected.



GB

e

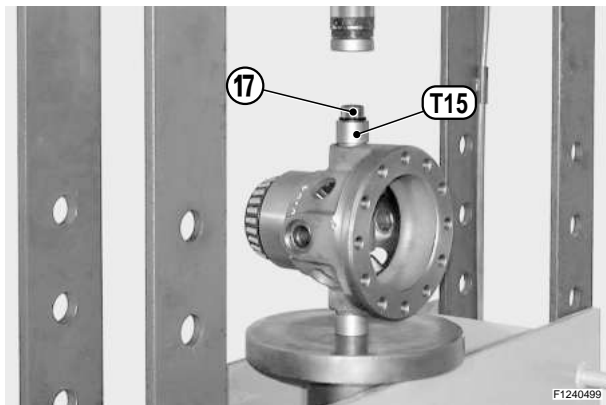
Lock tool T14 behind the planet wheel gears (18). After locking, remove bar T16C.



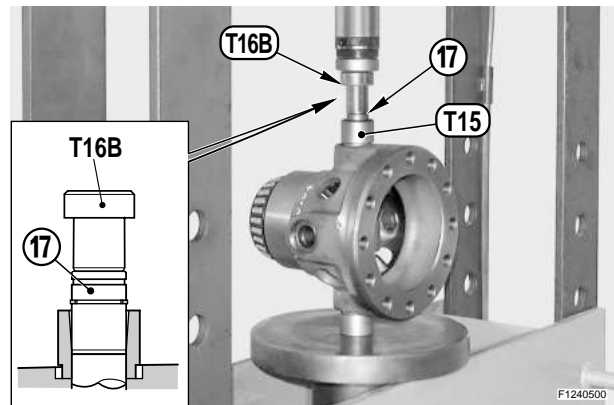
GB

f

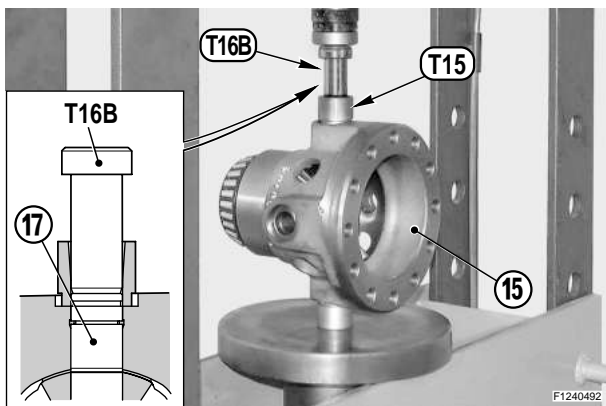
Fit the snap rings (20) onto the pins (17).



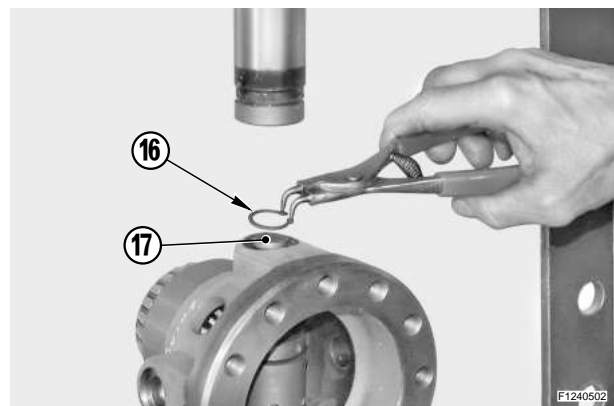
Place the differential carrier (15) under the press, position bush T15 and insert the planet wheel pin (17).



Put gudgeon T16B on top of the planet wheel pin (17).

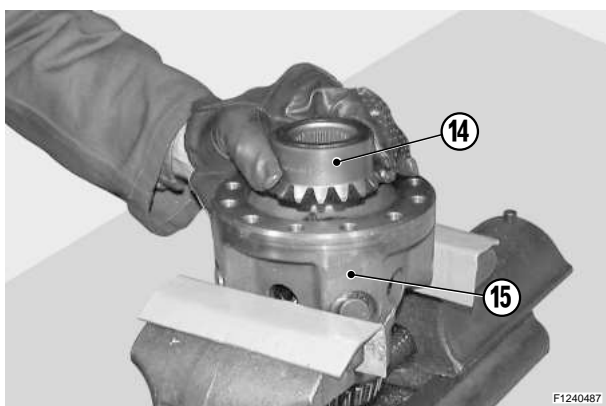


Press T16B pin all the way down.

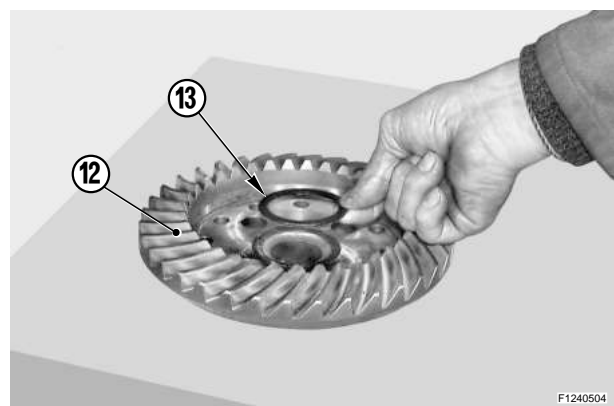


Remove gudgeon T16B, bush T15 and fit the snap ring (16) on the pin (17).

CAUTION! Make sure that the snap ring centres the seat and that it rests on the surface of the differential carrier.
Repeat the operations on the other planet wheel pin or planet wheel axle.

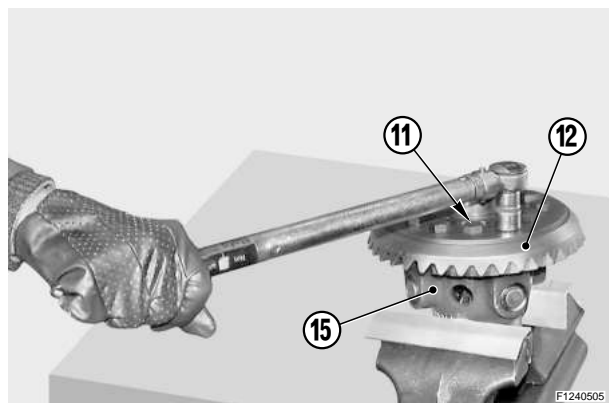


Position the second planetary gear (14) in the differential carrier (15).



Position the shim washer (13) on the crown (12).

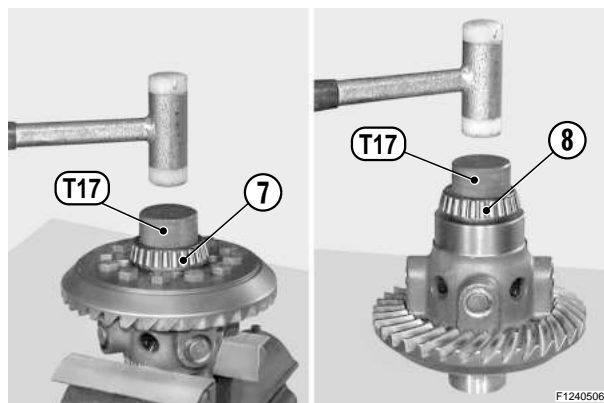
NOTE. In order to hold the shim washer (13) in position, apply grease to it.



GB

a

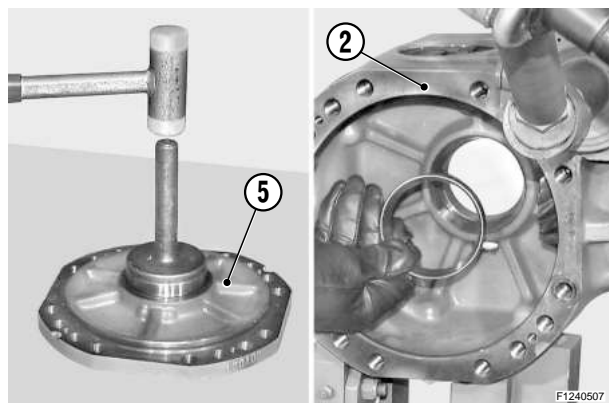
Position the crown (12) on the differential carrier (15) and lock it with screws (11) applied with Loctite 242.
Torque wrench setting for screws: 128–142 Nm
NOTE. Secure the screws using the cross-tightening method.



GB

b

Install the bearings (7) and (8) using tool T17.

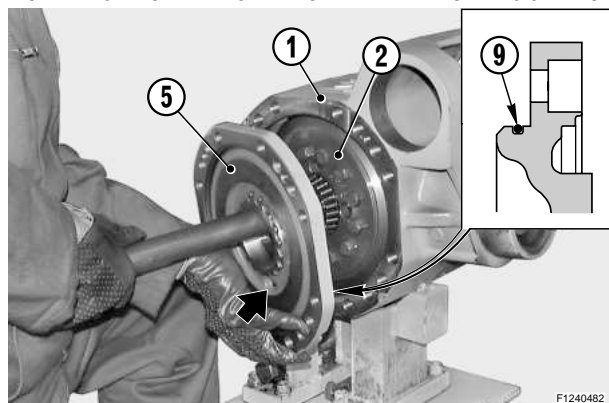


GB

c

If the bearings are replaced, insert the external thrust blocks in the middle cover (5) and in the central body (2).

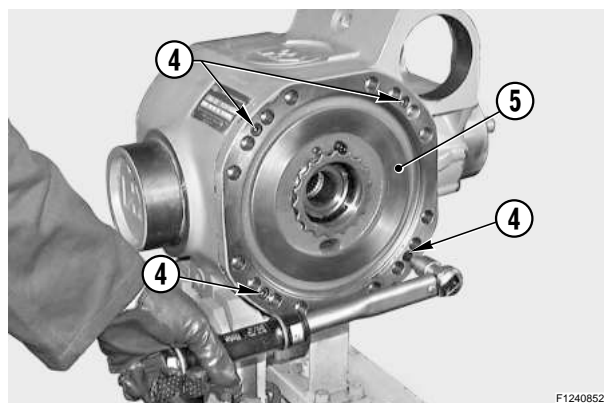
INSTALLING - INSTALLAZIONE - INSTALLIEREN - INSTALACION - INSTALLATION



GB

e

Position the differential unit (6) in the central body (2) with the help of a bar and fit the middle cover (5).
NOTE. Thoroughly check the state of the O-ring (9) and make sure that the cover is fitted with the oil discharge in the lower position.



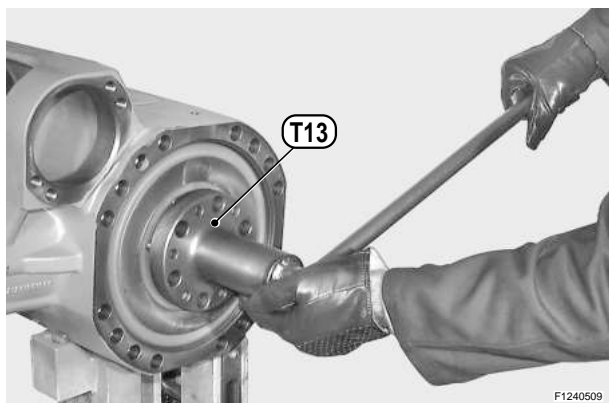
GB

f

Lock the middle cover (5) with screws (4).
Torque wrench setting for screw: 23.8–26.2 Nm

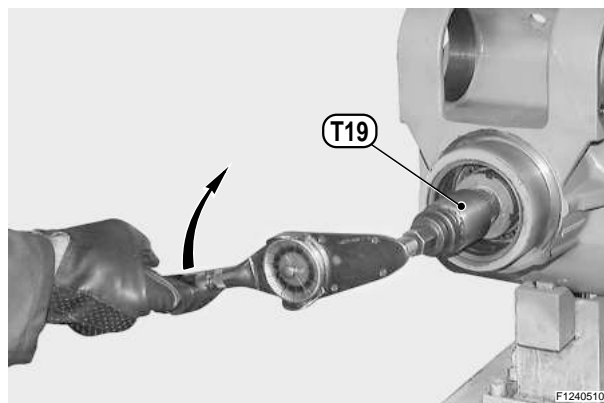


HOW TO ASSEMBLE AND INSTALL THE DIFFERENTIAL UNIT - ASSEMBLAGGIO ED INSTALLAZIONE GRUPPO DIFFERENZIALE -
DIFFERENTIALAGGREGAT MONTIEREN UND INSTALLIEREN - MONTAJE E INSTALACION DEL GRUPO DIFERENCIAL -
ASSEMBLAGE ET INSTALLATION DU GROUPE DIFFERENTIEL



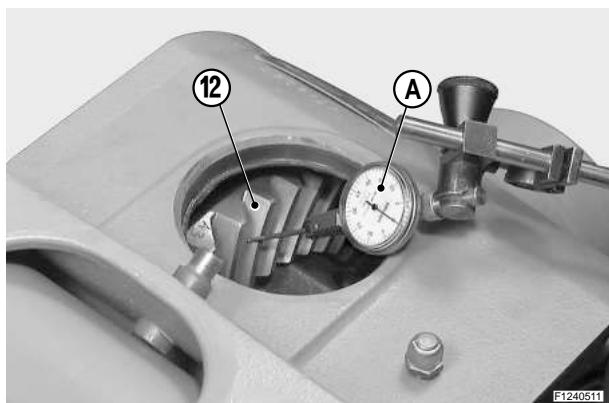
NOTE. If the ring nuts (1) are removed, spread them with Loctite 242.

Tighten ring nuts on the crown side until clearance between pinion and crown is zero, then lock the crown; go back $1/4 \div 1/2$ turn.

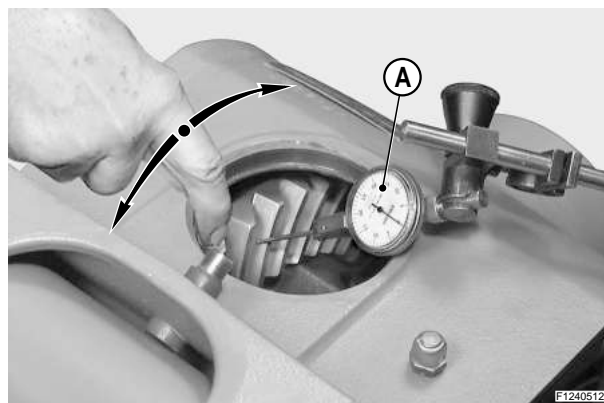


Pre-set the bearings by means of the ring nut situated on the opposite side of the crown, so as to increase pinion torque up to $140 \div 210$ Ncm.

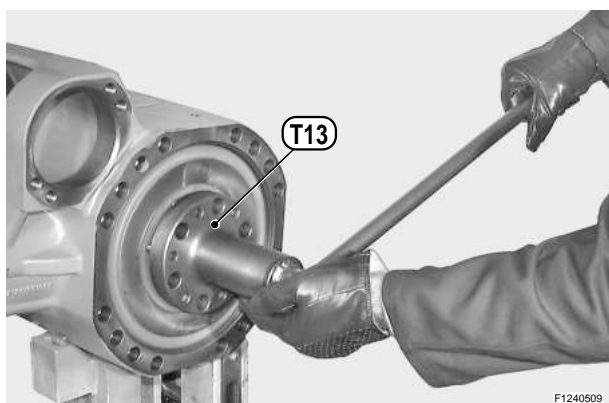
CAUTION! If bearings are not new, check the static torque; if bearings are new, check the continuous torque.



Introduce a comparator with rotary key "A" through the top plug hole (10). Position the comparator on the centre of one of the teeth of the crown (12), pre-set it to 1mm and reset it.



Manually move the crown (12) in both directions in order to check the existing backlash between the pinion and the crown.



Adjust the backlash between the pinion and the crown by unloosening one of the ring nuts (1) and tightening the opposite to compensate.
Normal backlash: see table.

RATIO - RAPPORTO VERHÄLTNIS RAPORTE - RAPPORT	CLEARANCE - GIOCO - SPIEL JUEGO - JEU	
	MIN.	MAX.
9 ÷ 34	0,18	0,23
9 ÷ 35	0,13	0,18
11 ÷ 31	0,20	0,28
11 ÷ 35	0,13	0,18
12 ÷ 35	0,13	0,18
12 ÷ 41	0,15	0,20
14 ÷ 32	0,18	0,23
14 ÷ 36	0,15	0,20
14 ÷ 41	0,15	0,20
15 ÷ 32	0,18	0,23
15 ÷ 47	0,13	0,18

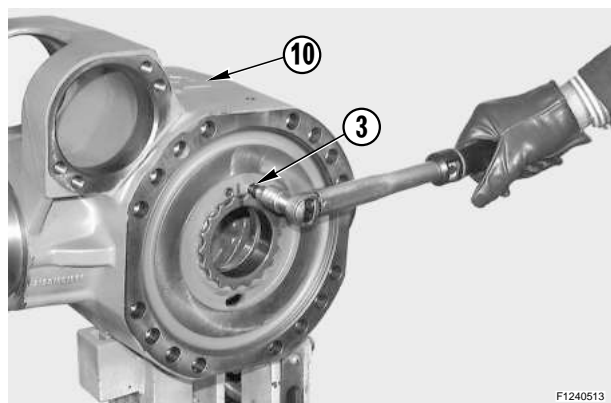
Difference between MIN and MAX clearance for whole circumference should not exceed 0.09 mm.

La differenza tra gioco MIN e MAX rilevata sull'intera circonferenza non deve superare il valore di 0,09 mm.

Der Unterschied zwischen dem MIN e MAX Spiel der gesamten Kreislinie darf den Wert von 0,09 mm nicht überschreiten.

La diferencia entre el juego Min y Max determinada sobre la entera circunferencia no debe de superar el valor de 0,09 mm.

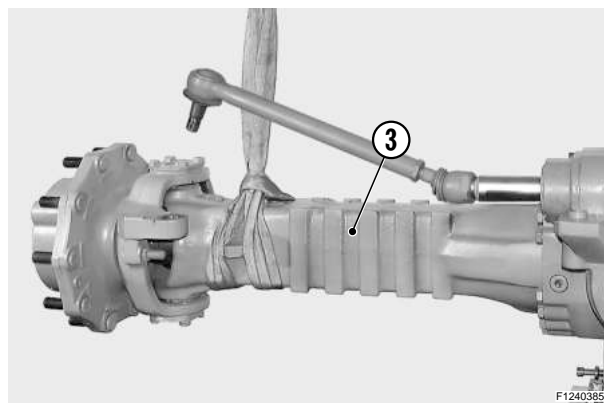
La différence de jeu entre MIN et MAX relevée sur toute la circonférence ne doit pas aller au-delà de la valeur de 0,09 mm.



GB

a

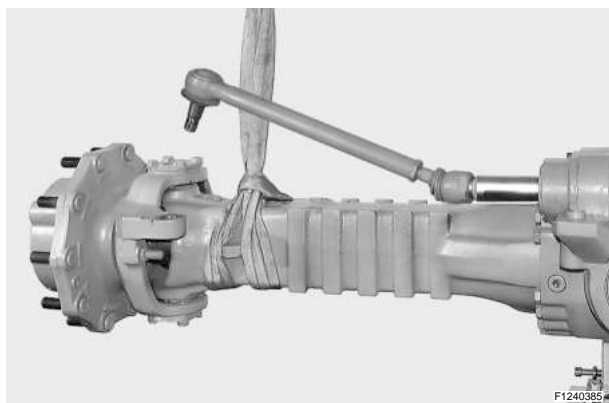
Apply Loctite 242 to the screws (3), fit them into one of the two holes and tighten.
Torque wrench setting: 23.8–26.2 Nm
Fit the top plug (10) after applying repositionable jointing compound for seals to the rims.



GB

b

Re-install the complete arms.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISKS».



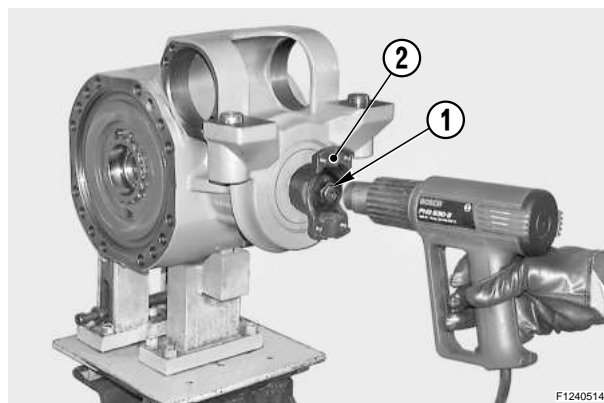
F1240385



GB

a

Remove the complete arms and the differential unit.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISKS» and «REMOVING THE DIFFERENTIAL UNIT».

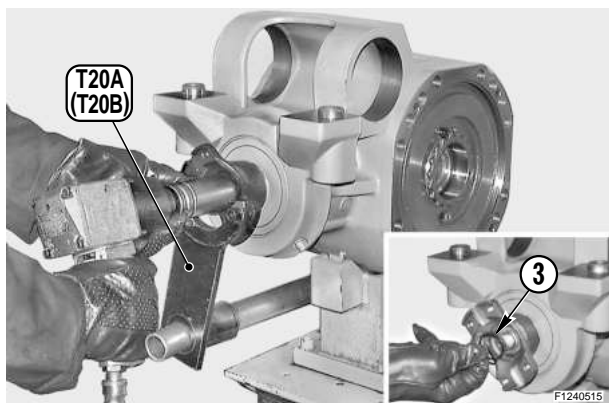


F1240514

GB

b

If disassembly is awkward, heat the check nut (1) of the flange (2) at 80°C.
NOTE. Heating is meant to unloose the setting of Loctite on the nut (1).



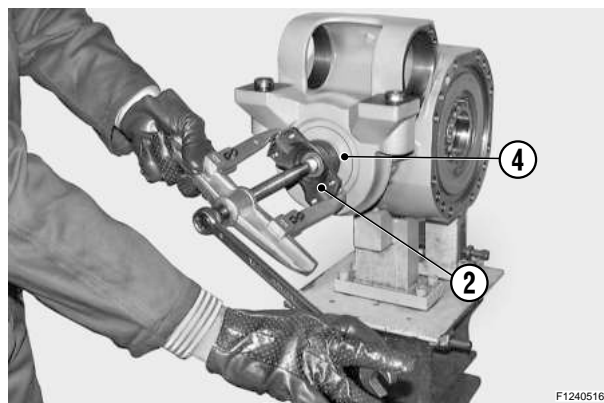
F1240515



GB

c

Position tool **T20A** (or **T20B**), so as to avoid pinion rotation.
Unloose and remove the nut (1); also remove the O-ring (3).



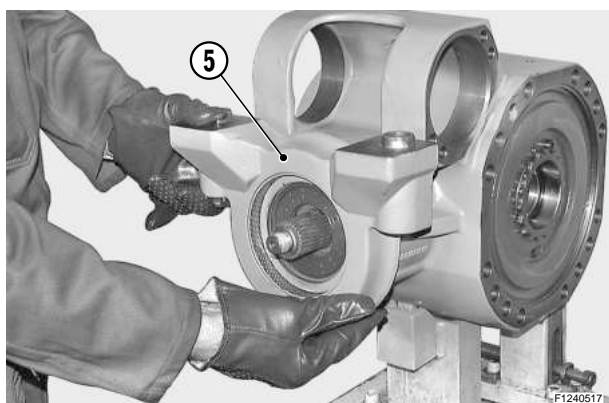
F1240516



GB

d

Remove the flange (2) complete with guard (4) by means of a puller.



F1240517

GB

e

Remove the swinging support (5).



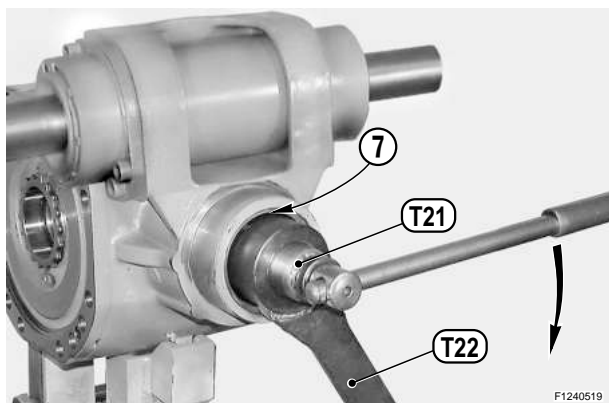
F1240518



GB

f

Remove the sealing ring (6).

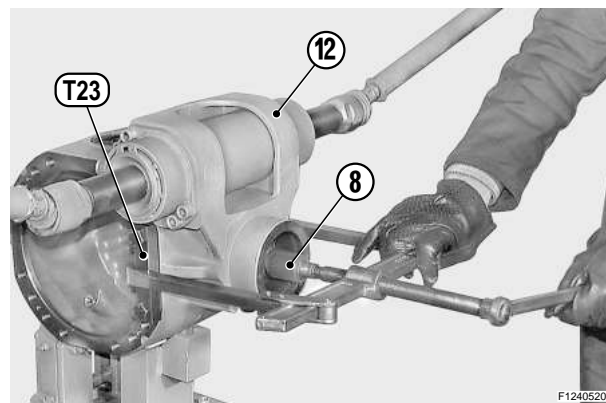


GB

a

Position wrench **T22** onto the ring nut (7) and apply bar hold **T21** to the pinion (8).
Stop wrench **T22** and rotate the pinion so as to release and remove the ring nut (7).

NOTE. If disassembly proves awkward, weld the ring nut at approx. 80°C.

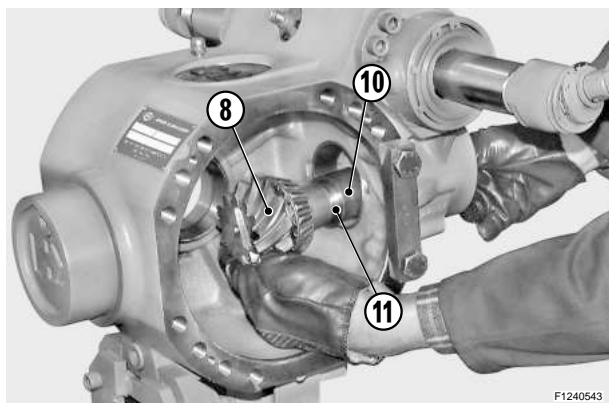


GB

b

Apply blocks **T23** and, with the help of a puller, extract the pinion (8) complete with the internal bearing (9), the distance piece (10) and shims (11).

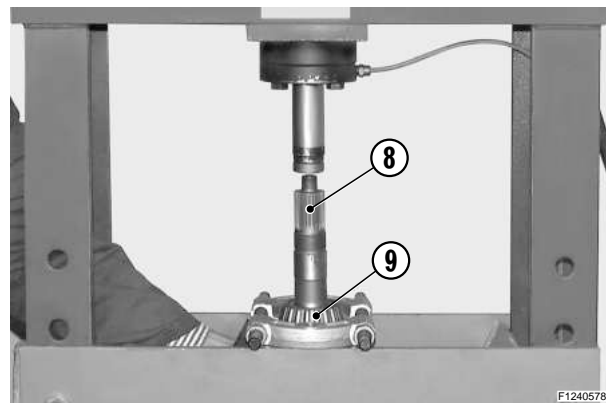
NOTE. The thrust blocks of the bearings remain in the central body (12).



GB

c

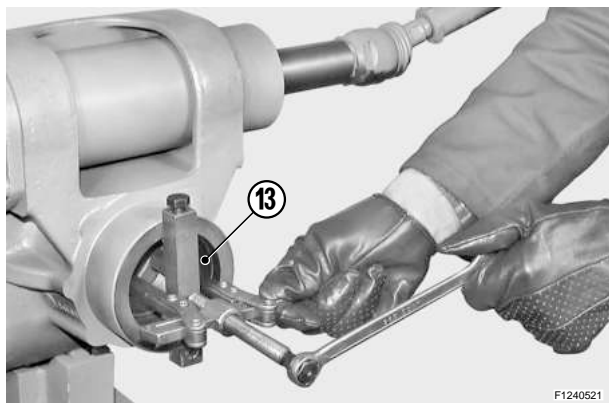
Remove the pinion (8), shims (11) and distance piece (10).



GB

d

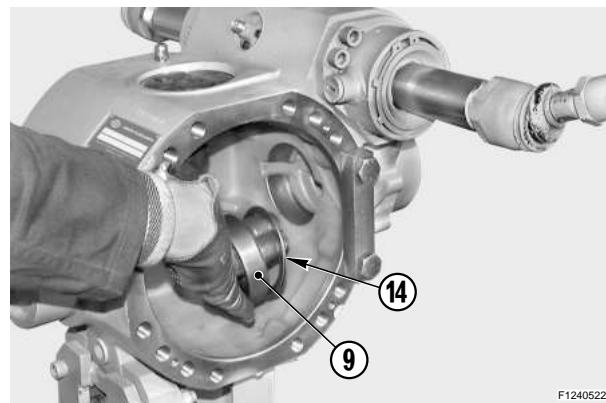
Using a puller and a press, remove the inner bearing (9) from the pinion (8).



GB

e

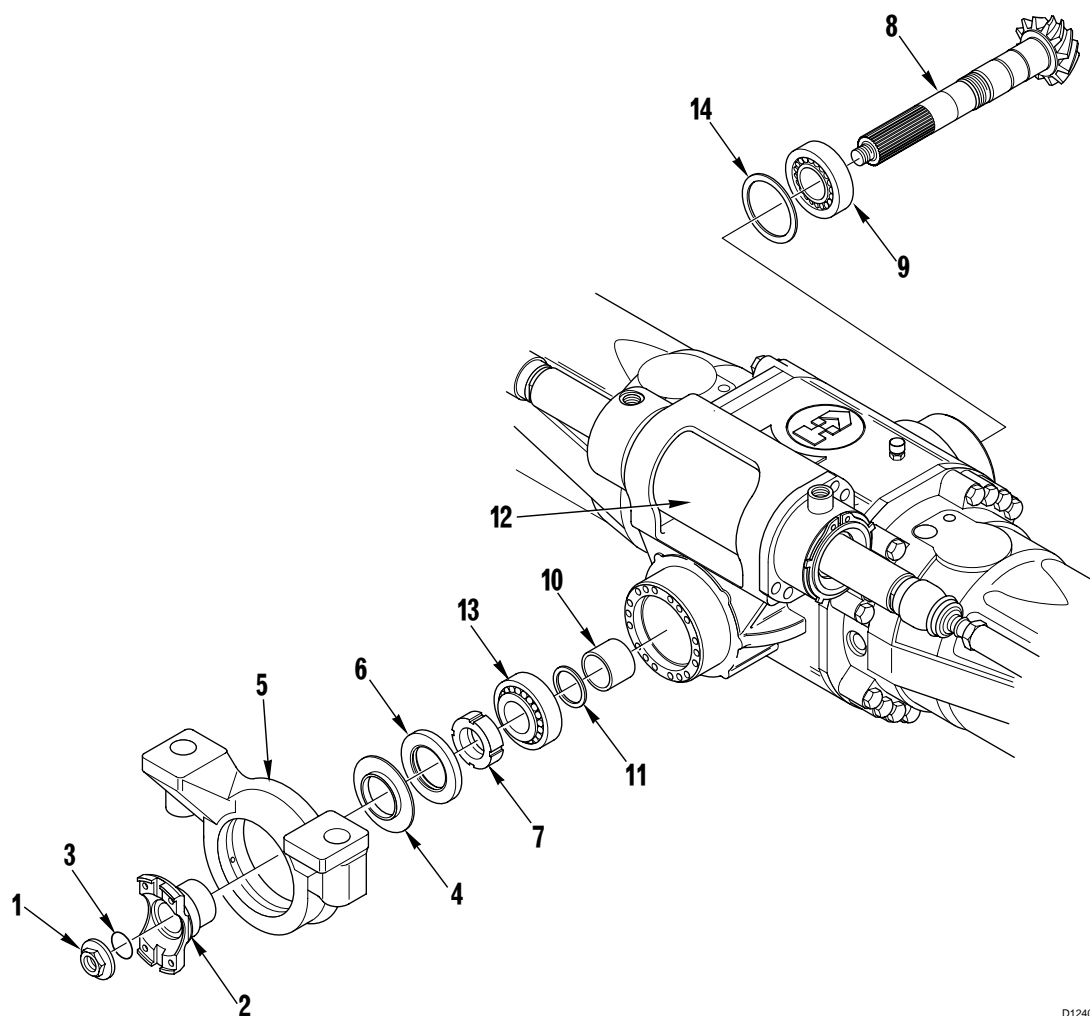
Remove the thrust block of the external bearing (13).



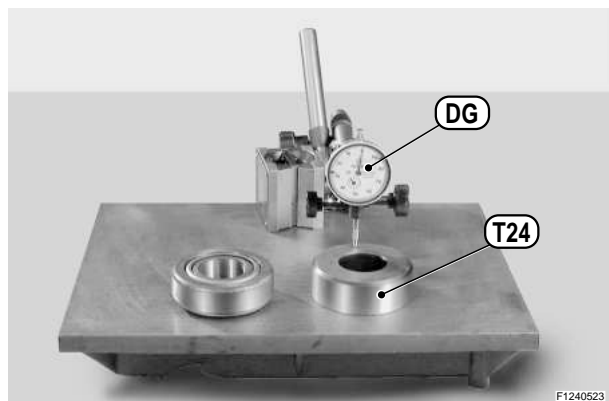
GB

f

Insert a drift in the appropriate holes and remove the thrust block of the internal bearing (9) as well as the shim washers (14).



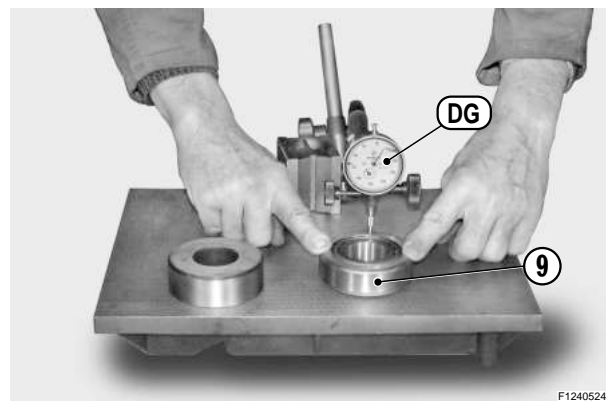
D1240042



GB

a

Using a surface plate, reset a centesimal comparator "DG" and place it on the measurement ring T24 (with a thickness of 30.2 mm). Preset the comparator to approx. 2 mm.

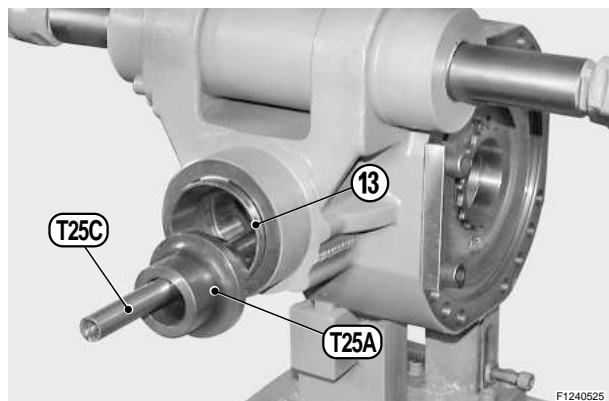


GB

b

Bring the internal bearing (9), complete with its thrust block, under the comparator "DG". Determine overall thickness "D" of the bearing checking the discrepancy between this size and the size of the measurement ring.

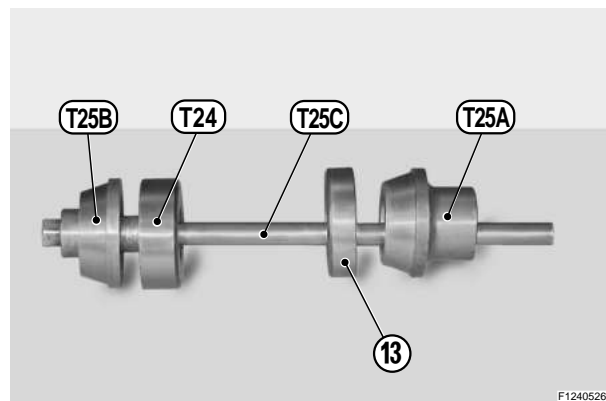
CAUTION! Press the thrust block in the centre and take several measurements while rotating the thrust block.



GB

c

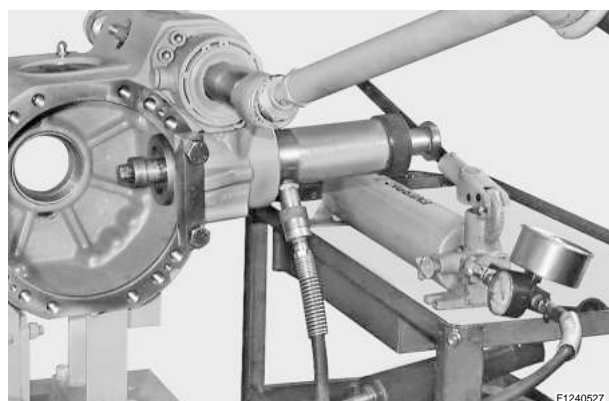
Partially insert the thrust block of the external bearing (13).



GB

d

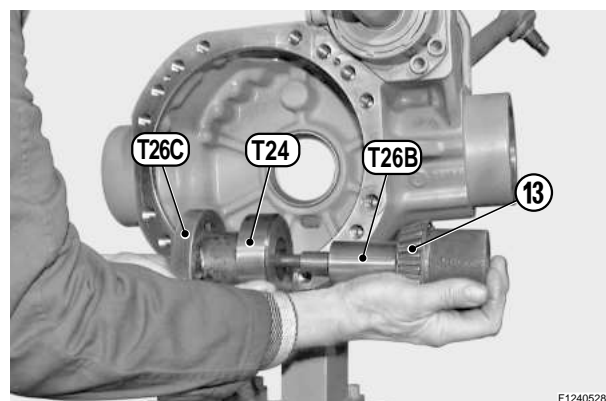
Install tension rod T25C, measurement ring T24 and front guide tool T25A on the thrust block of the external bearing (13).



GB

e

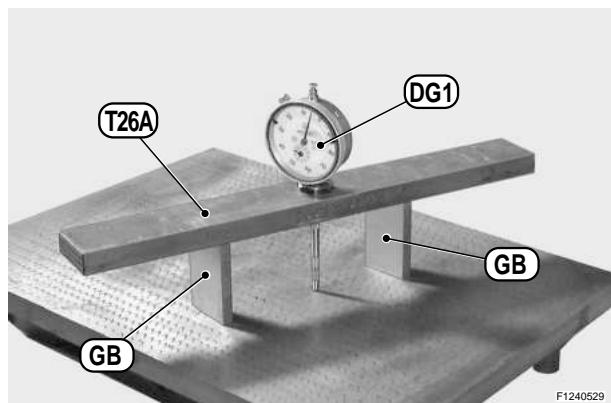
Connect the tension rod to the press and move the thrust block of the external bearing (13) into its seat. Disconnect the press and remove the tension rod.
NOTE. Before starting the next stage, make sure that the thrust block has been completely inserted into its seat.



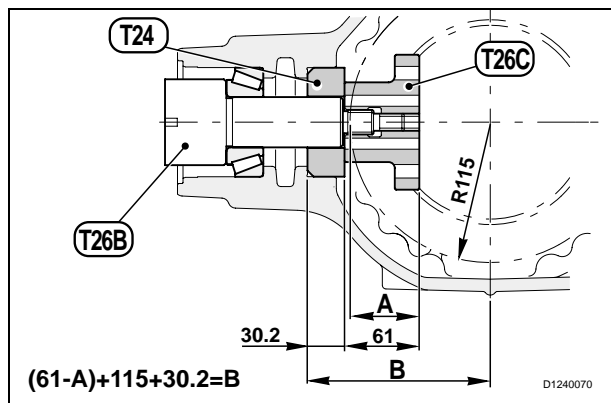
GB

f

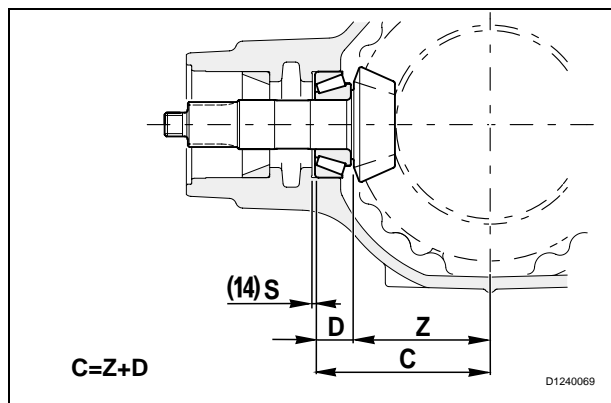
Insert tool T26B complete with external bearing (13), measurement ring T24 and gauged ring nut T26C. Manually tighten.



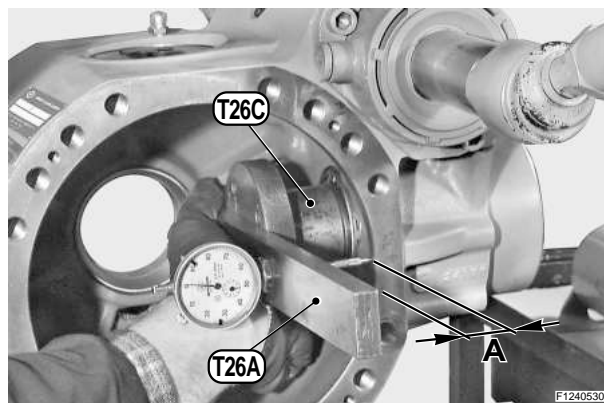
Fit a centesimal comparator "DG1" with long stem into bar T26A; when the bar rests on two size-blocks "GB" of 57 mm, reset the comparator. Preset the comparator to approx. 2 mm and reset.



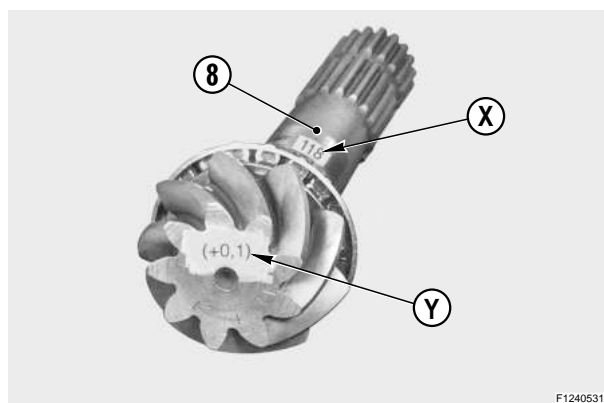
Calculate size "B" which will be the first useful value for calculating the size of the shims (14) that are to be inserted under the thrust block of the internal bearing (9).



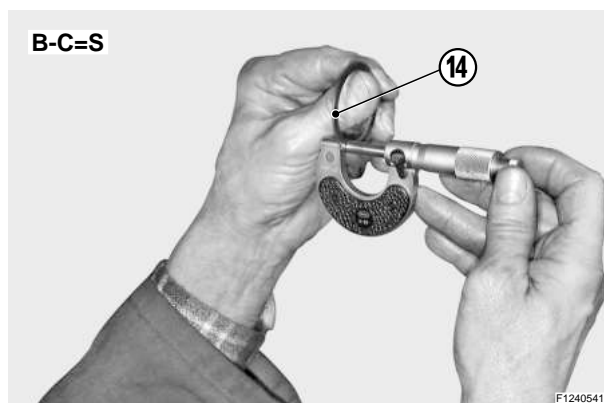
Calculate size "C" which represents the second value for calculating the size of the shims "S" that are to be placed under the thrust block of the internal bearing (9).



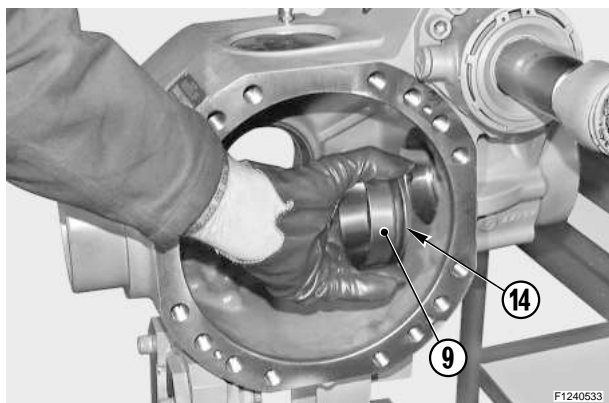
Lay bar T26A on gauged nut T26C and take the size "A" at about 57 mm corresponding to the maximum diameter of arms centring.



Check the nominal size (X) marked on the pinion and add or subtract the indicated variation (Y) so as to obtain size "Z".
e.g.: $Z = 118 + 0.1 = 118.1$
 $Z = 118 - 0.2 = 117.8$

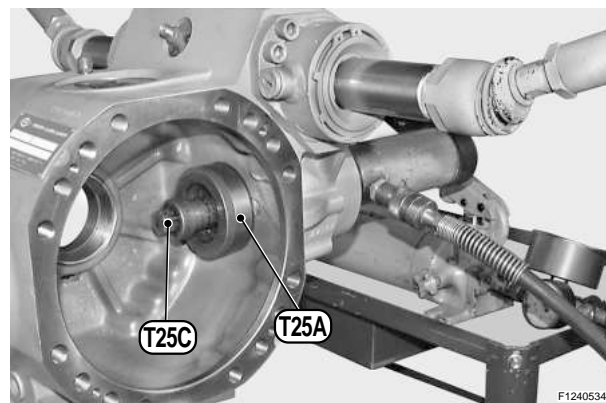


Calculate the difference between sizes "B" and "C" so as to obtain the size "S" of the shim (14) that will go under the thrust block of the internal bearing (9).



Insert shim "S" (14) and the thrust block of the internal bearing (9) in the central body.

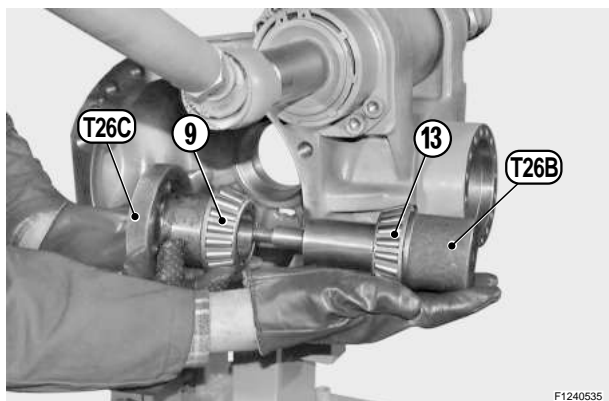
NOTE. To hold shim "S" (14) in position, apply grease.



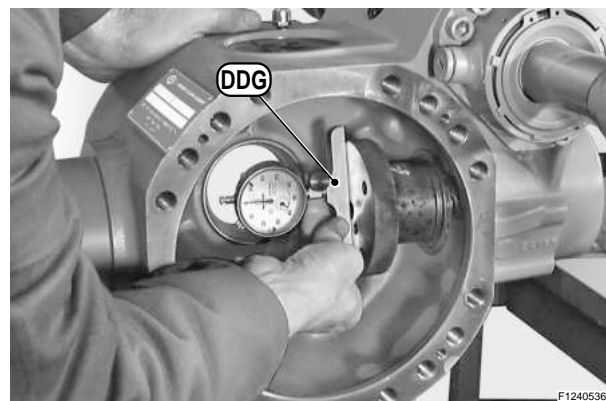
Position tool **T25A** and tension rod **T25C**.

Connect the tension rod to the press, fasten the thrust block and then remove the tools.

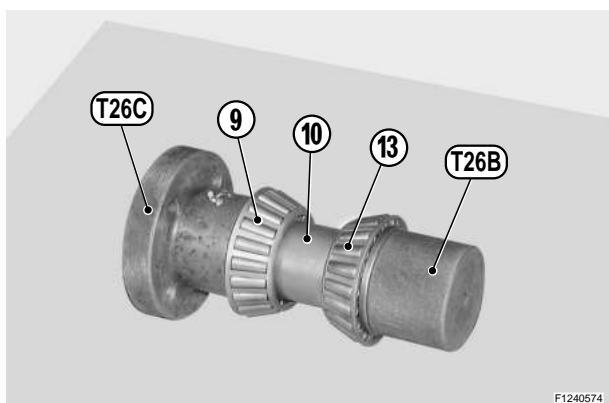
NOTE. Before going on to the next stage, make sure that the thrust block has been completely inserted.



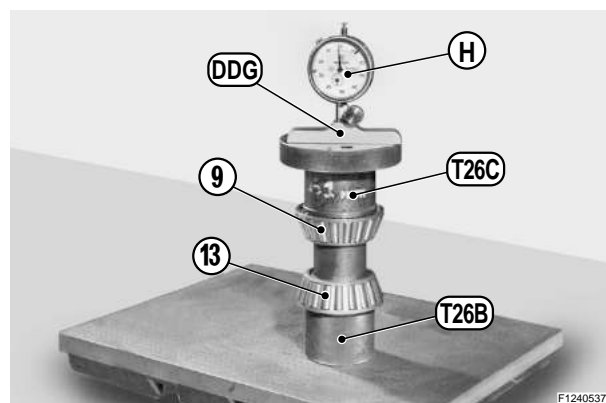
Position tools **T26C** and **T26B** complete with tapered bearings (9) and (13); manually tighten until a rolling torque has been obtained.



Insert the stem of a depth comparator "**DDG**" in either side hole of tool **T26C**; reset the comparator with a presetting of approx. 3 mm.



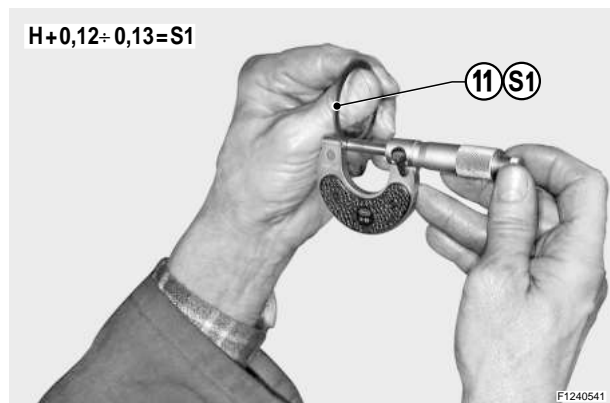
Remove the comparator and release tools and bearings from the central body.
Re-install all and insert the distance piece (10) between bearings (9) and (13); manually tighten the whole pack.



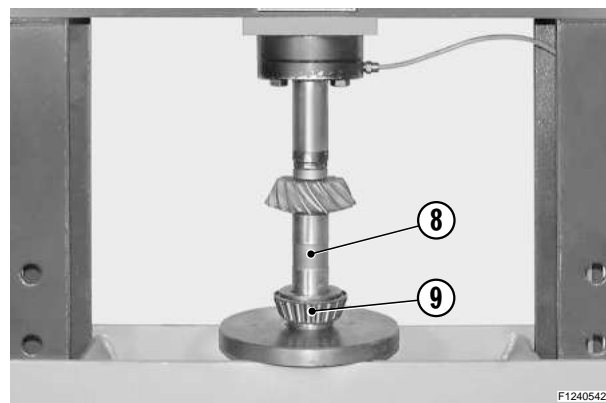
Insert depth comparator "**DDG**" into tool **T26B-T26C** and measure variation "**H**" in relation to the zero setting performed back at point d.



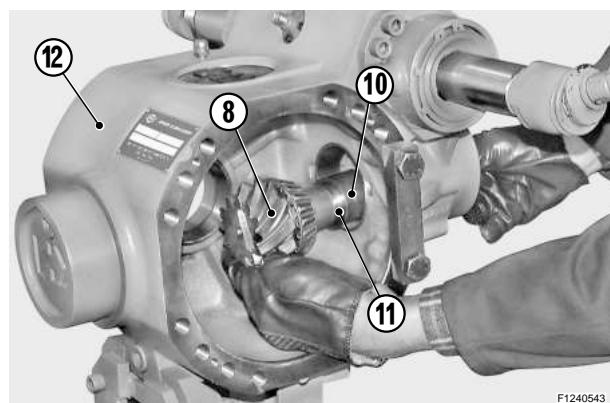
HOW TO INSTALL AND ADJUST THE BEVEL PINION - INSTALLAZIONE E REGISTRAZIONE PIGNONE CONICO - KEGELRAD INSTALLIEREN UND EINSTELLEN - INSTALACION Y AJUSTE DEL PIÑÓN CONICO - INSTALLATION ET REGLAGE DU PIGNON CONIQUE



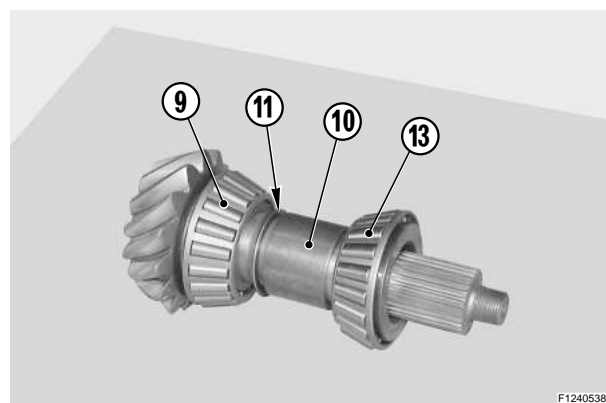
The variation is to be added to a set value of 0.12–0.13 mm., so as to obtain the size of shim "S1" (11) which will be inserted between the external bearing (13) and the distance piece (10) and subsequently, to determine the preload for the bearings.



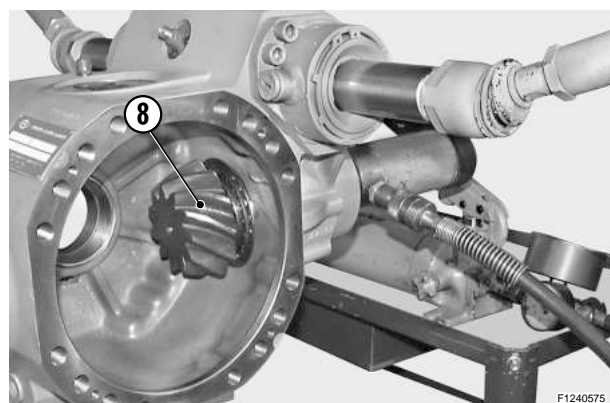
Position the internal bearing (9) and the pinion (8) under a press; force the bearing onto the pinion.



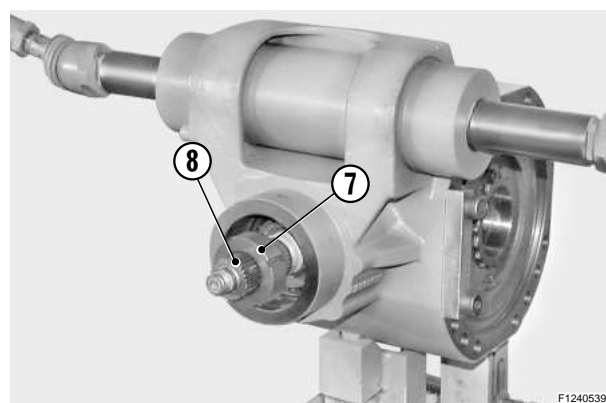
Fit the pinion (8), shim "S1" (11) and distance piece (10) in the main body (12).
NOTE. The finer shims must be placed in- between the thicker ones



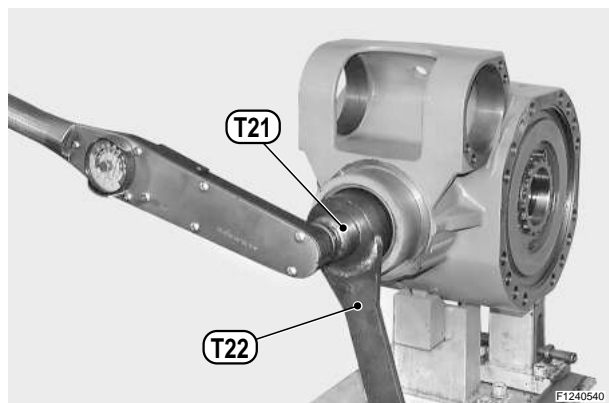
Insert the external bearing (13) in the central body in order to complete the pack arranged as in the figure.



Connect the pinion (8) to the tie rod **T28A** and **T28B**; connect the tie rod **T28C** (see special tools) to the press and block.



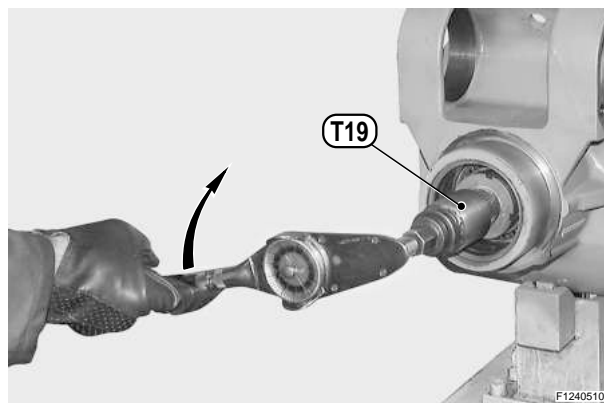
Apply Loctite 242 to the thread of the ring nut (7) and screw the nut onto the pinion (8).



GB

a

Apply special wrench **T22** to the ring nut (7) and bar-hold **T21** to the pinion (8).
Lock the wrench **T22** and rotate the pinion using a dynamometric wrench, up to a minimum required torque setting of 500 Nm.



GB

b

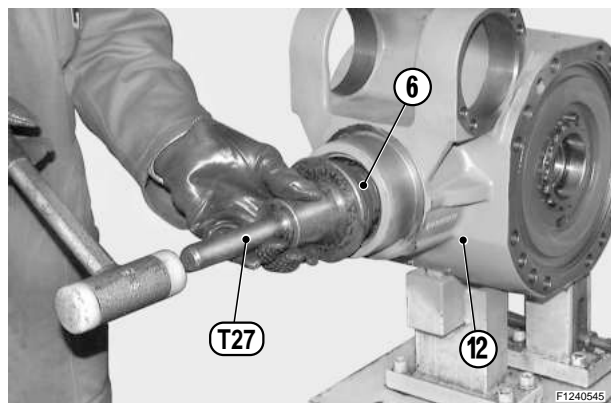
Apply onto the pinion (8) the bar-hold and with the help of a torque metre, check the torque of the pinion (8).
Torque: 120–170 Ncm

CAUTION! If torque exceeds the maximum value, then the size of shim "S1" (11) between the bearing (13) and the distance piece (10) needs to be increased.

If torque does not reach the set value, increase the torque setting of the ring nut (7) in different stages to obtain a maximum value of 570 Nm.

CAUTION! If torque does not reach the minimum value, then the size of shim "S1" (11) needs to be reduced.

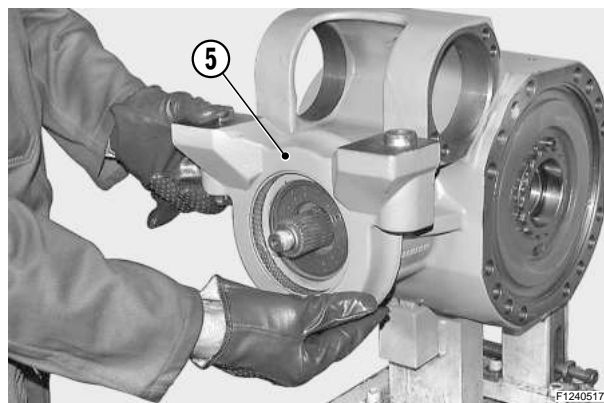
CAUTION! When calculating the increase or decrease in size of shim "S1", bear in mind that a variation of shim (11) of 0.01 mm corresponds to a variation of 60 Ncm in the torque of the pinion (8).



GB

a

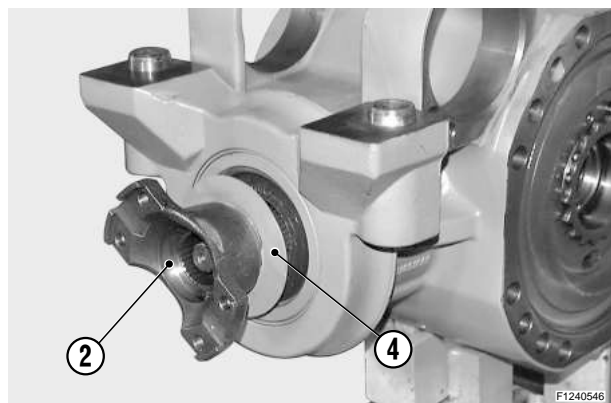
Lubricate the outer surface of the new sealing ring (6) and fit it onto the central body (12) using tool T27.



GB

b

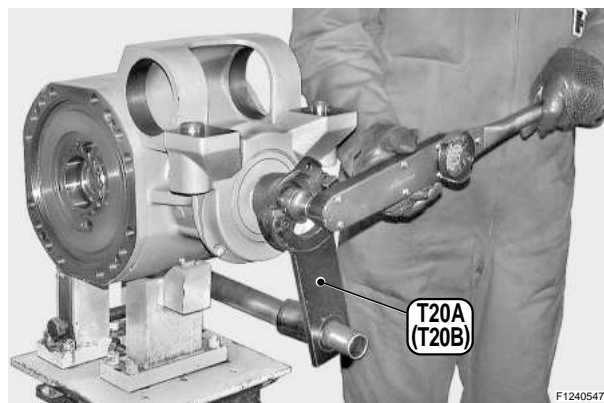
Install the swinging support (5).
NOTE. Check that it is properly oriented.



GB

c

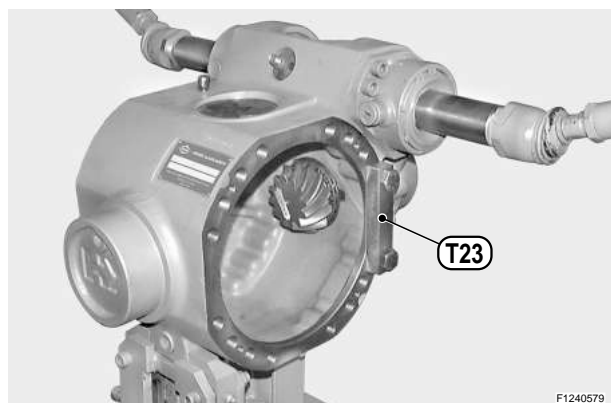
Fit the flange (2) complete with the guard (4) and fasten it. For keying the flange (2), use a plastic hammer if necessary.
NOTE. Make sure that the guard (4) is securely fastened onto the flange and that it is not deformed.



GB

d

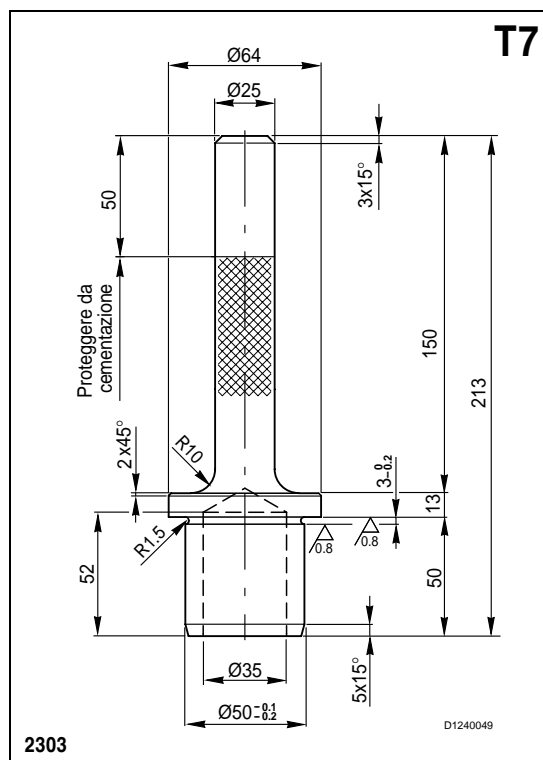
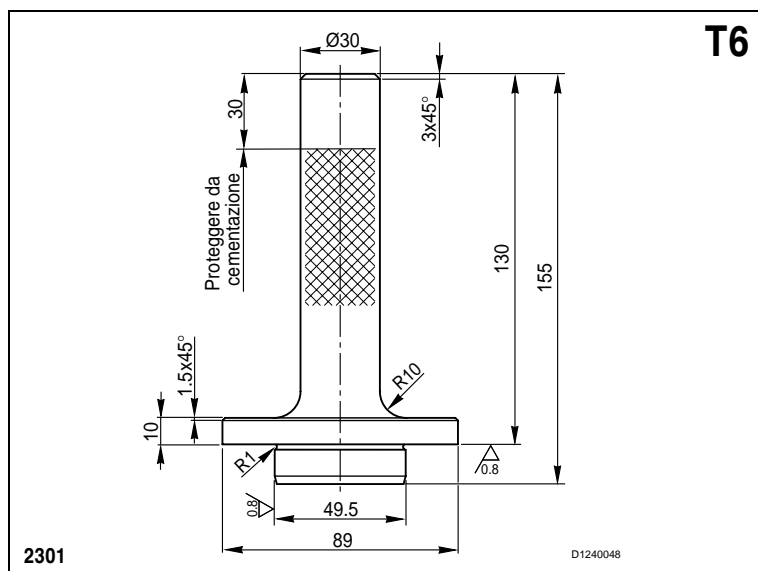
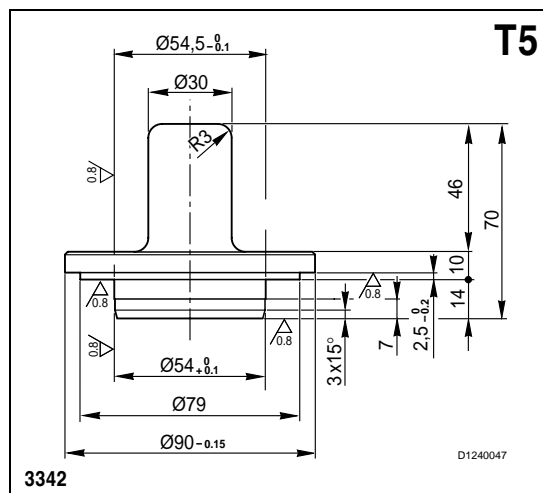
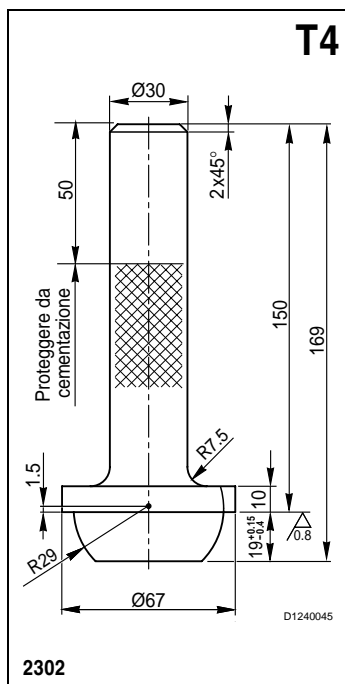
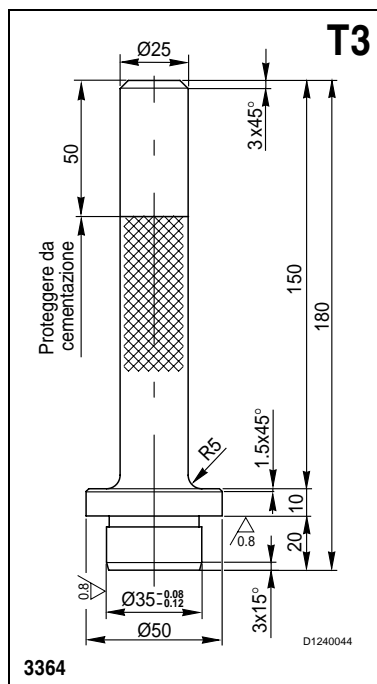
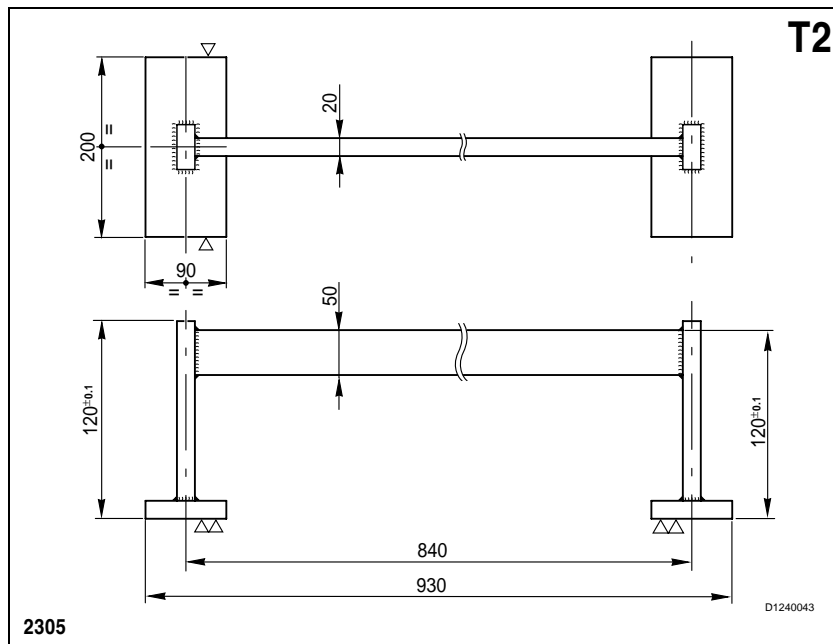
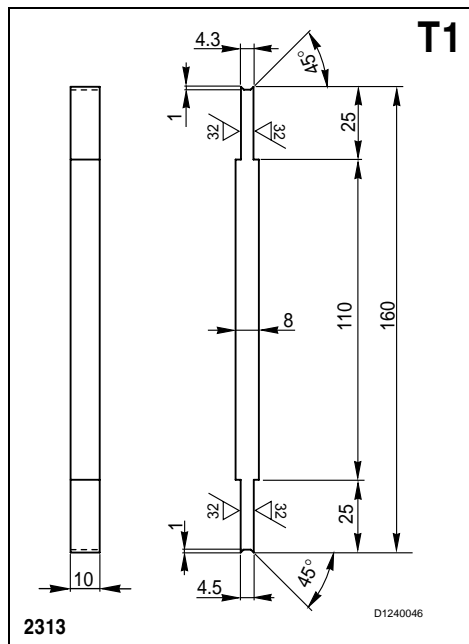
Apply Loctite 242 to the threaded part of the pinion (8). Position tool T20A (or T20B) and fasten it in order to avoid rotation. Insert O-ring (3) the nut (1) and tighten it using a dynamometric wrench.
Torque wrench setting: 280–310 Nm

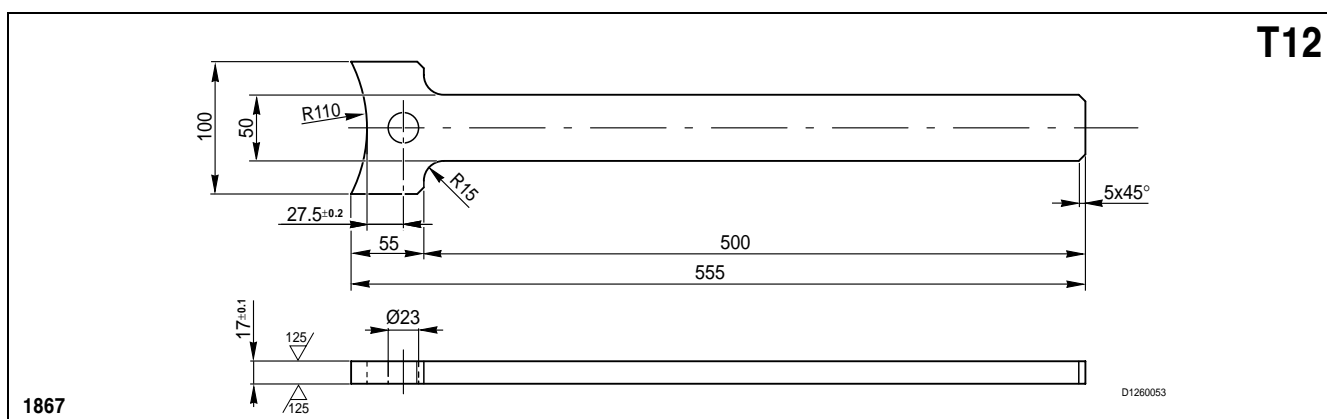
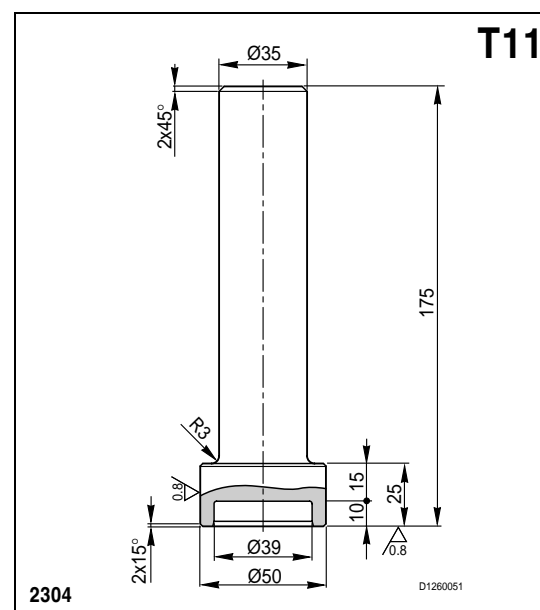
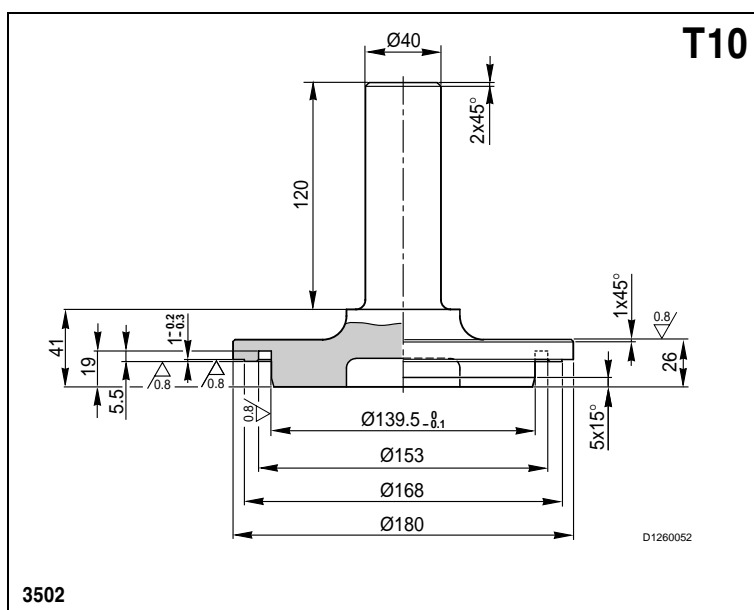
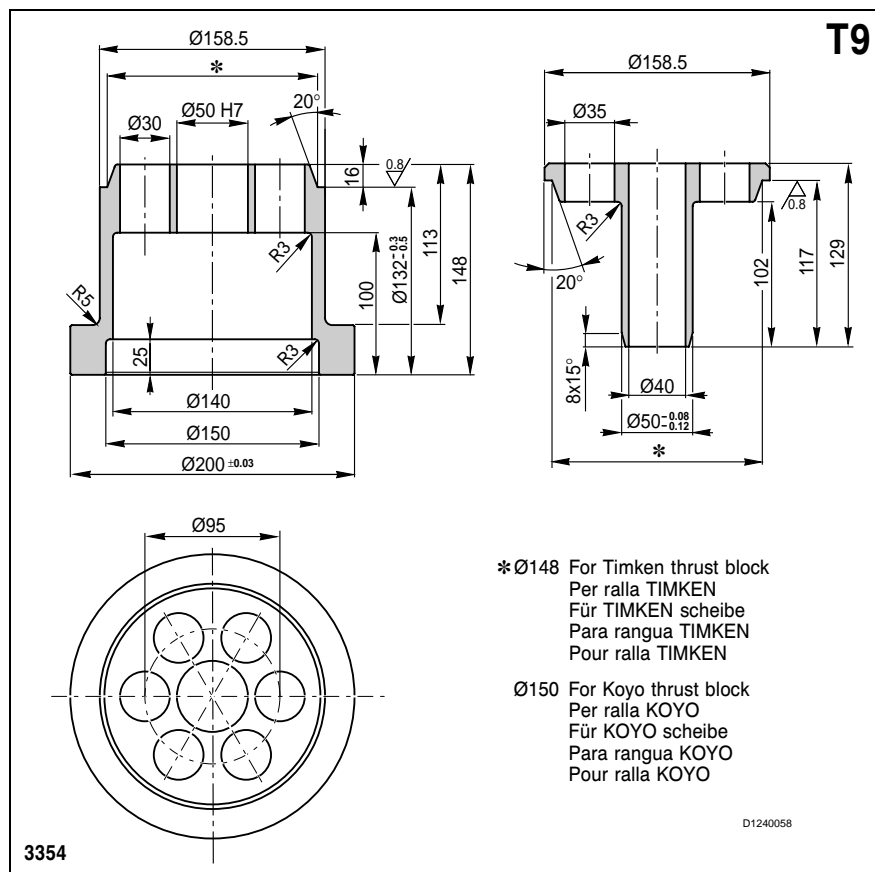
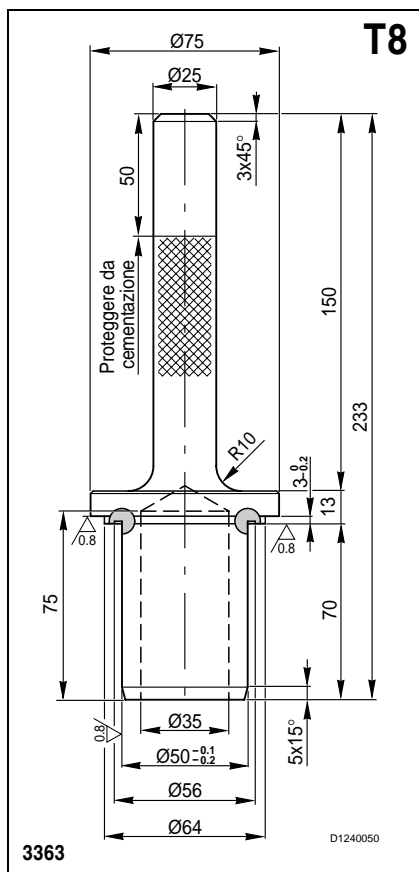


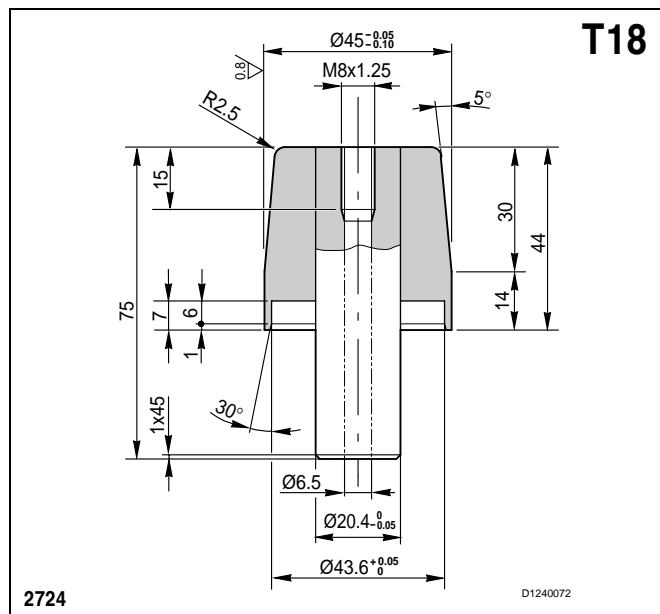
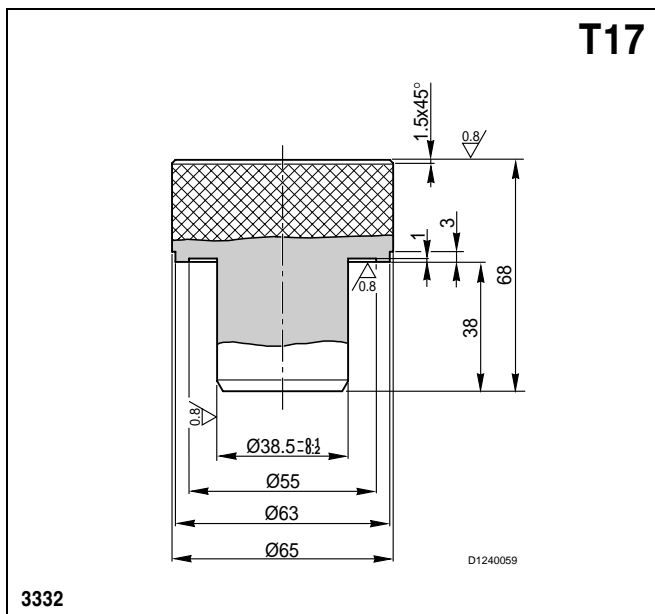
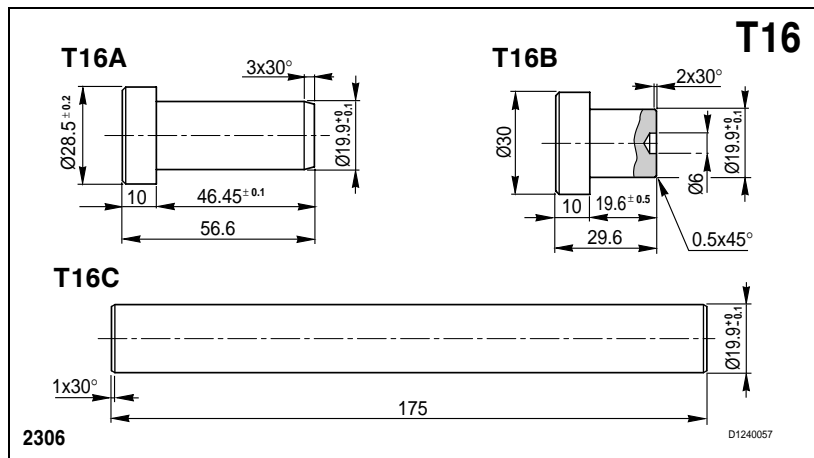
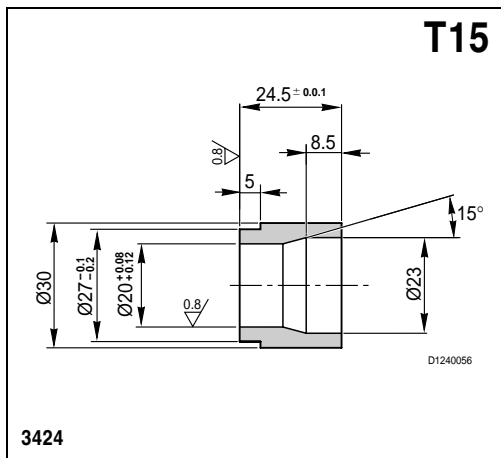
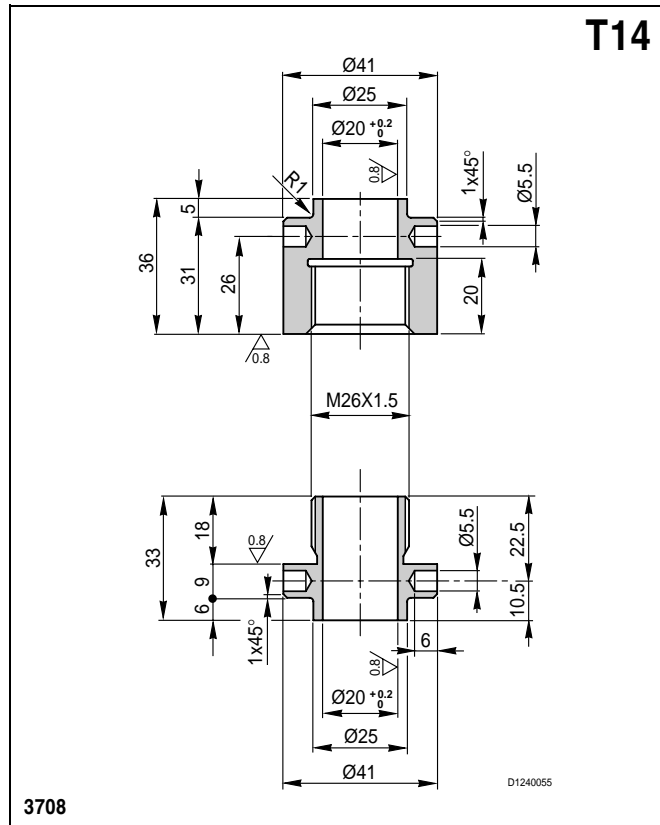
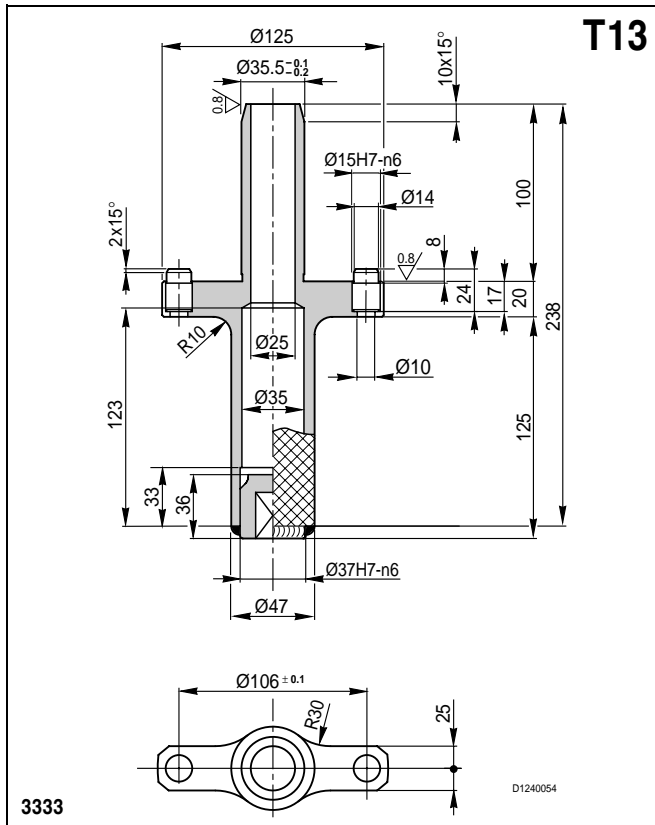
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Remove blocks T23 (used for extracting the pinion) and re-install the arms.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISKS».

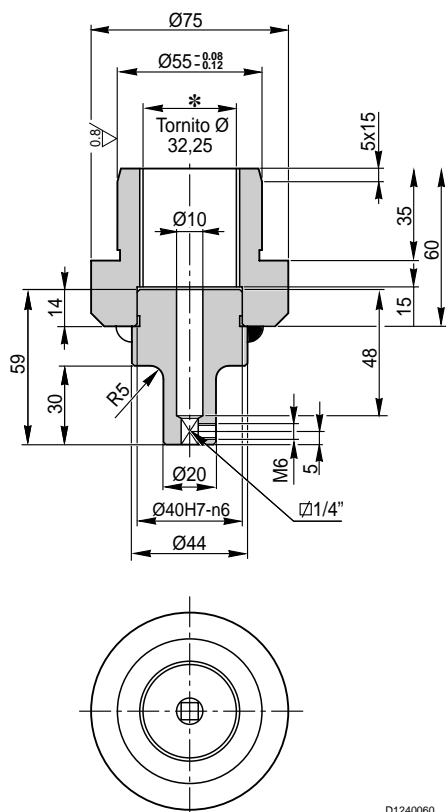






T19

* 38x1.25x29 DIN 5480

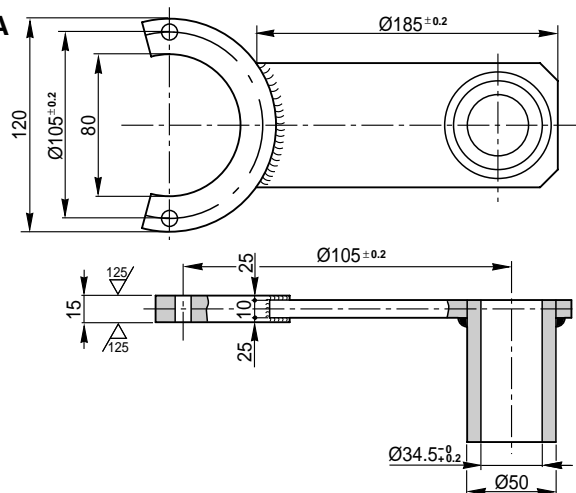


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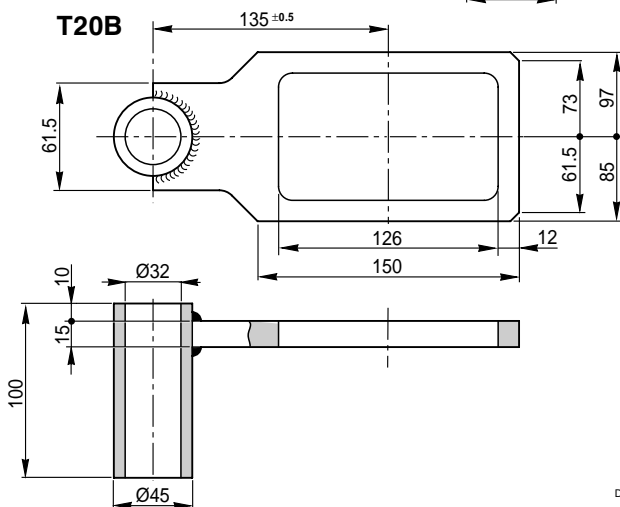
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T20

T20A



T20B

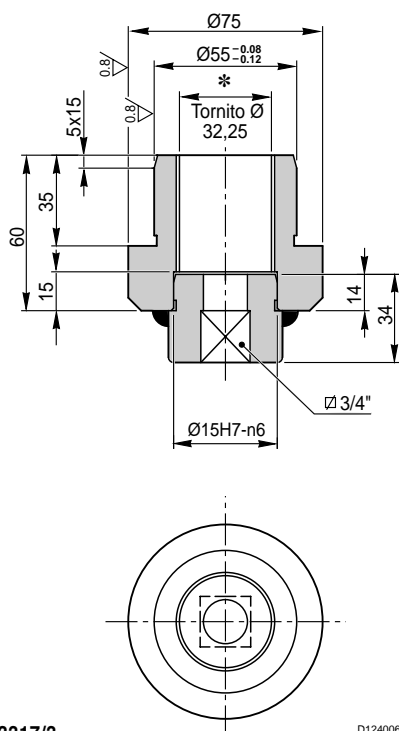


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T21

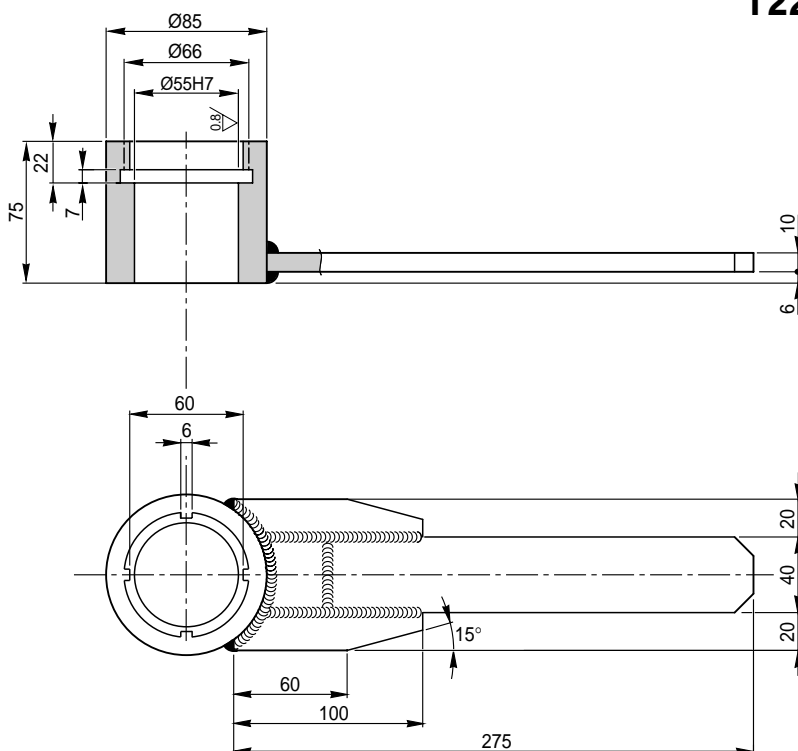
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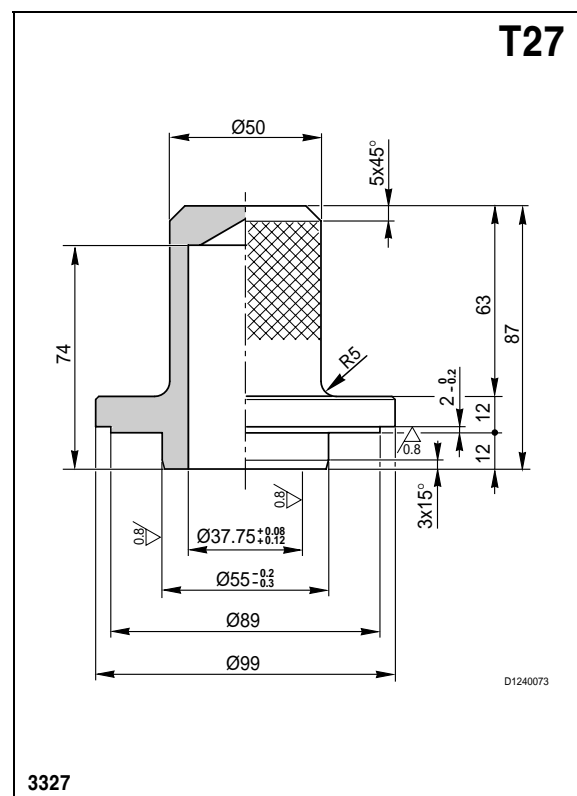
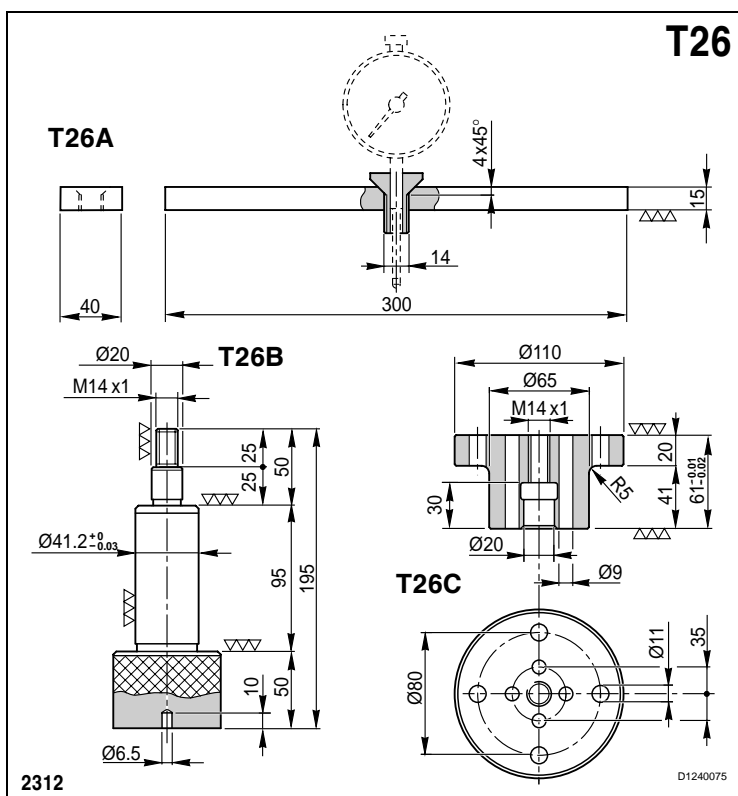
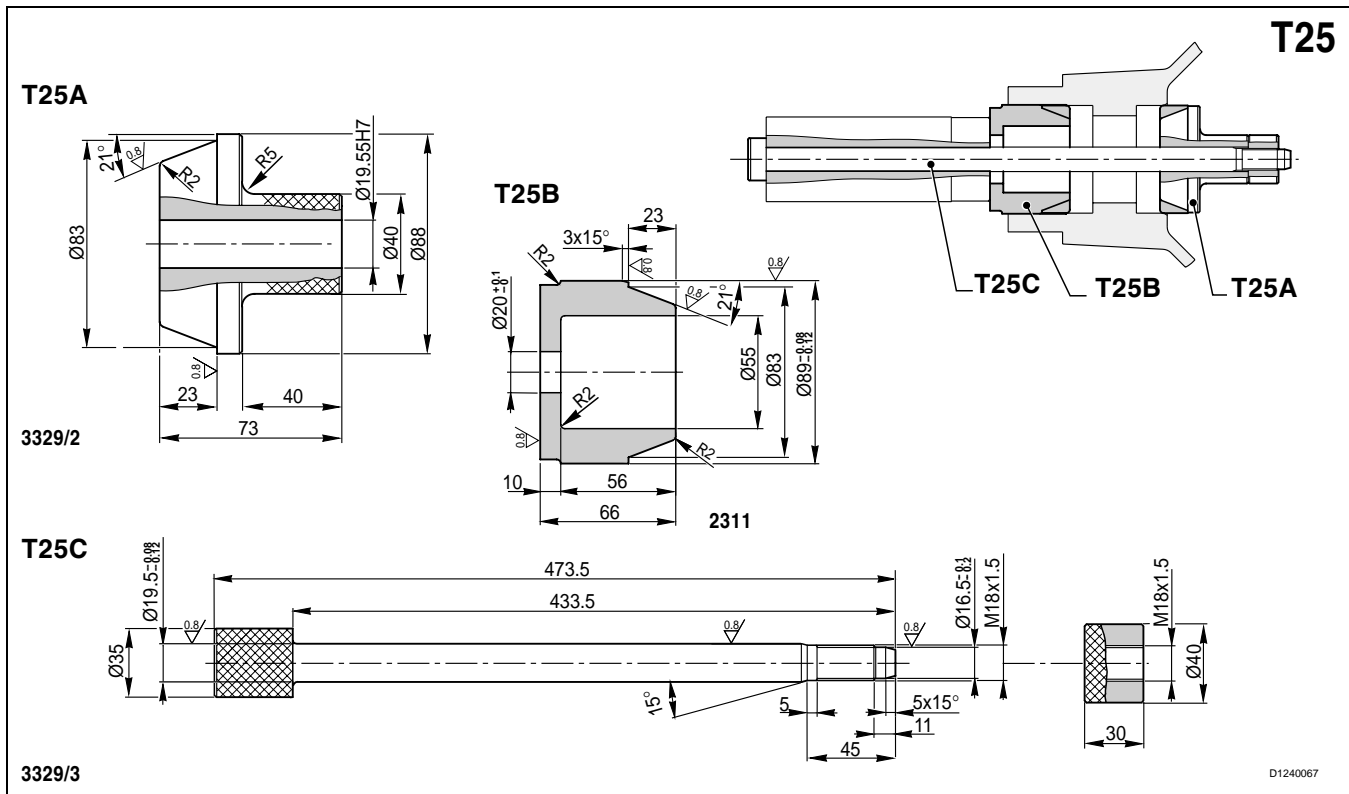
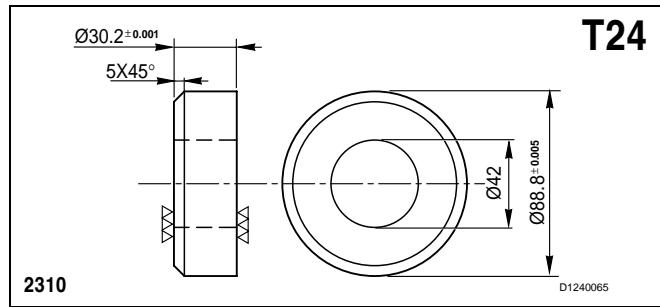
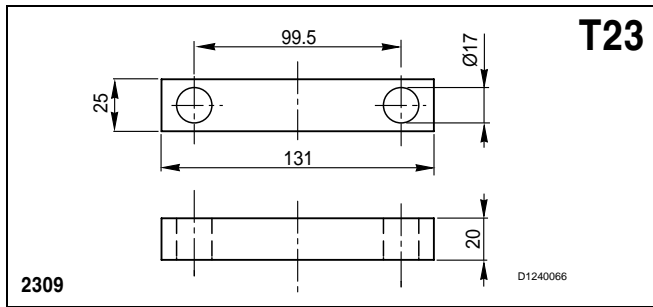
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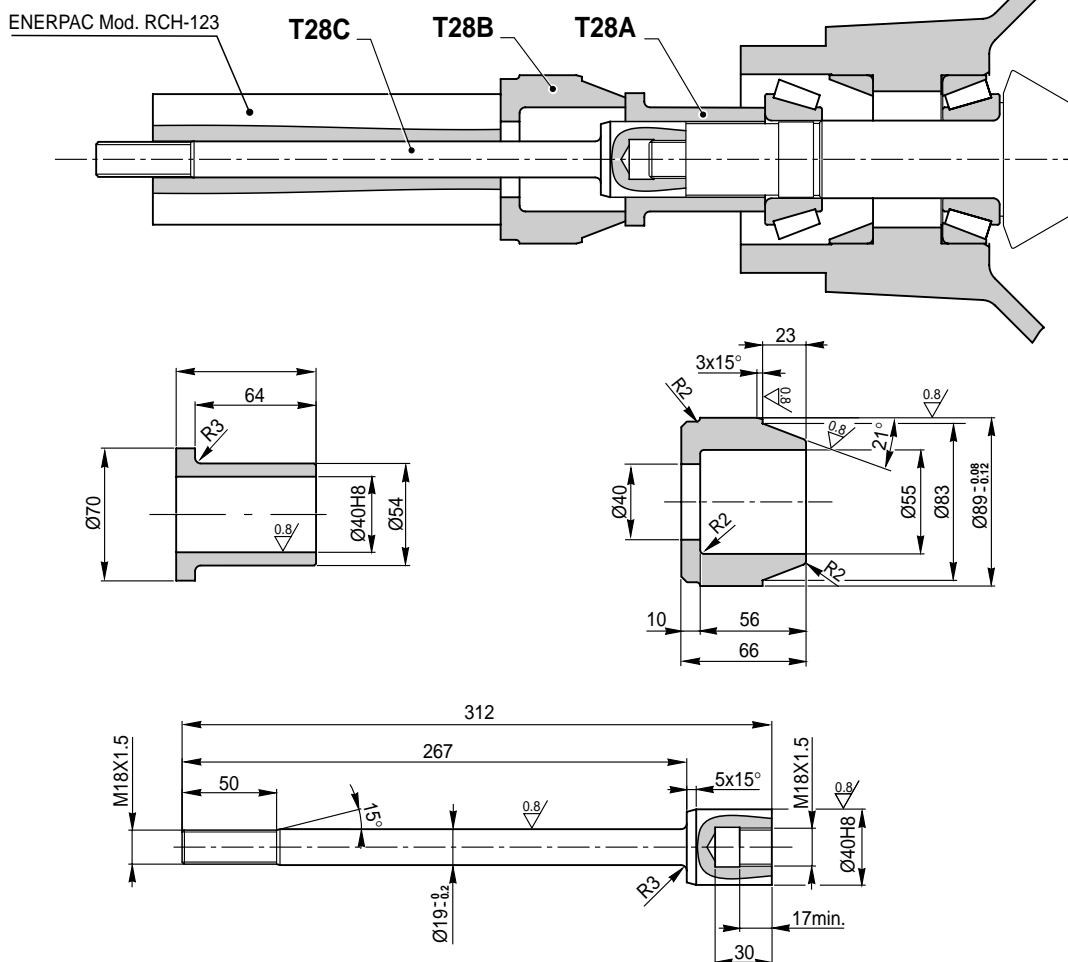


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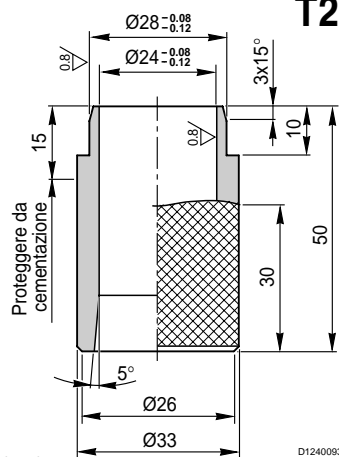
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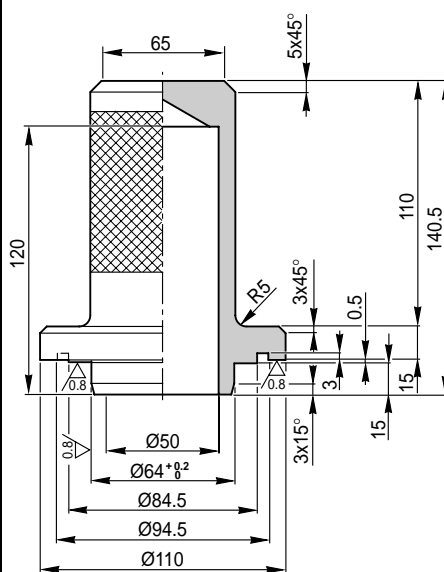
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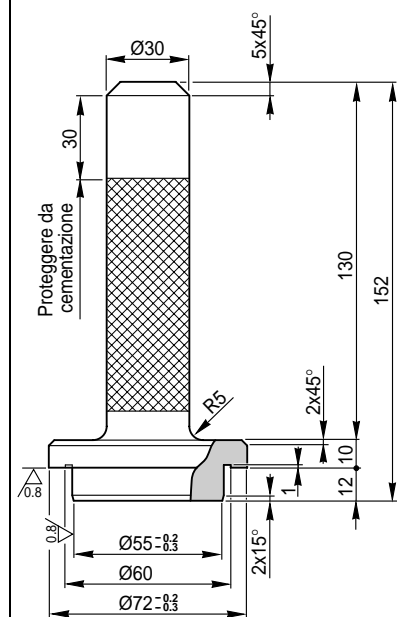
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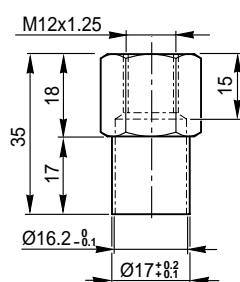
T32



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T30



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PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
<p>Insufficient braking Frenatura insufficiente Ungenügende Bremswirkung Frenado insuficiente Freinage insuffisant</p>	<p>1. Incorrect adjustment</p> <p>1. Incorretta regolazione</p> <p>1. Fehlerhafte Einstellung</p> <p>1. Ajuste incorrecto</p> <p>1. Mauvais réglage</p>	<p>Inspect disc thickness and if discs are usable readjust brakes to the specifications in the vehicle's manual.</p> <p>Controllare lo spessore dei dischi freno e, se i dischi freno possono essere riutilizzati, registrarli come da istruzioni del manuale del veicolo.</p> <p>Bremsscheibenstärke überprüfen, können die Bremscheiben noch verwendet werden, Spiel neu einstellen gemäß Anweisungen im Handbuch des Fahrzeuges.</p> <p>Controlar el espesor de los discos del freno y, si los discos del freno pueden volver a utilizarse, ajustarlos de acuerdo con las instrucciones del manual del vehículo.</p> <p>Inspecter l'épaisseur des disques frein et, si les disques frein sont en bon état, régler selon les instructions du manuel du véhicule.</p>
	<p>2. Brake discs worn out</p> <p>2. Dischi freno usurati</p> <p>2. Bremsscheiben verschlissen</p> <p>2. Discos del freno gastados</p> <p>2. Disques frein usés</p>	<p>Inspect disc thickness and replace if necessary.</p> <p>Controllare lo spessore dei dischi freno e, se necessario, sostituirli.</p> <p>Bremsscheibenstärke überprüfen und falls erforderlich ersetzen.</p> <p>Controlar el espesor de los discos del freno y, si fuera necesario, sustituirlos.</p> <p>Inspecter l'épaisseur des disques frein et si nécessaire remplacer les disques.</p>
	<p>3. Incorrect brake fluid</p> <p>3. Fluido non idoneo nel circuito</p> <p>3. Ungeeignete Flüssigkeit in der Bremsanlage</p> <p>3. Fluido no adecuado para el circuito</p> <p>3. Fluide inadéquat dans le circuit</p>	<p>Replace all seals in axle and master cylinder that have made contact with the incorrect fluid and all brake hoses. If incorrect fluid leaked into axle oil, seals and o-rings in axle must be replaced.</p> <p>Sostituire tutti gli anelli di tenuta del ponte e del cilindro master che sono venuti a contatto con il fluido non idoneo nonché i tubi flessibili. Se il fluido non idoneo è entrato nel ponte e si è mescolato con il lubrificante devono essere sostituiti tutti gli anelli di tenuta ed gli O-rings.</p> <p>Alle Dichtringe und Gummischläuche die mit der falschen Flüssigkeit in Kontakt gekommen sind, in der Achse und im Hauptbremszylinder ersetzen. Sollte diese Flüssigkeit auch in die Achse gelangt sein, sind auch sämtliche O-Ringe und Dichtringe der Achse zu ersetzen.</p> <p>Sustituir todos los segmentos de compresión del puente y del cilindro principal que han estado en contacto con el fluido no adecuado como así también los tubos flexibles. Si el fluido no adecuado ha entrado en el puente y se ha mezclado con el lubricante, hay que sustituir todos los segmentos de compresión y los O-Rings.</p> <p>Substituer tous les joints d'étanchéité du pont et du maître-cylindre qui ont été en contact avec ce fluide mais aussi les tubes flexibles. Si le fluide incorrect est entré dans le pont et s'est mélangé avec le lubrifiant tous les joints d'étanchéité et o-ring doivent être changés.</p>

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Insufficient braking <i>Frenatura insufficiente</i> Ungenügende Bremswirkung <i>Frenado insuficiente</i> Freinage insuffisant	4. Loss of brake fluid 4. <i>Perdita del fluido dal circuito freno</i> 4. Verlust von Bremsflüssigkeit 4. <i>Pérdida del fluido del circuito del freno</i> 4. Fluidé dans le circuit de freinage	Inspect for and repair any leaks in outside circuit or master cylinder. If caused by incorrect brake fluid see correction N. 3. If leak is to the outside replace the o-rings between the center and intermediate housings. If leak is to the inside replace above o-rings and brake piston o-rings. <i>Controllare e riparare tutte le perdite del circuito esterno o del circuito master.</i> <i>Se la causa è dovuta al fluido non idoneo vedere rimedio n. 3.</i> <i>Se la perdita è verso l'esterno del ponte sostituire gli O-ring tra la scatola centrale ed il coperchio intermedio.</i> <i>Se la perdita è verso l'interno del ponte, sostituire gli O-ring sopra menzionati e quelli del pistone freno.</i> Äussere Bremsanlage und Hauptbremszylinder auf Ölverluste prüfen. Sollte der Verlust auf ungeeignete Bremsflüssigkeit zurückzuführen sein, siehe Abhilfe N.3. Sollte der Verlust nach aussen sein, die O-Ringe zwischen dem Achsmittengehäuse und den Zwischengehäuse ersetzen. Sollte der Verlust nach innen sein, oben genannte O-Ringe und jene der Bremskolben ersetzen. <i>Controlar y reparar todas las pérdidas del circuito exterior o del cilindro principal.</i> <i>Si la causa se debe al fluido no idóneo, véase el remedio nº3.</i> <i>Si la pérdida es hacia fuera del puente, sustituir los O-Ring entre la caja central y la tapa intermedia.</i> <i>Si la pérdida es hacia el interior del puente, sustituir los O-Ring mencionados más arriba y los del pistón del freno.</i> Inspecter et réparer toutes les fuites du circuit externe ou du maître-cylindre. Si la cause est due à l'utilisation d'un fluide non indiqué voir remède N. 3. Si la fuite est vers l'extérieur du pont, substituer les o-rings entre le carter central et les carters intermédiaires. Si la fuite est vers l'intérieur du pont substituer les o-rings mentionnés ci-dessus et ceux des pistons frein.
	5. Overheated axle causing brake fluid to vaporize. (Brake return when axle cools) 5. <i>Surriscaldamento del ponte con vaporizzazione del fluido.</i> <i>(I freni ritornano quando il ponte si raffredda)</i> 5. Verdunstung der Bremsflüssigkeit wegen Überhitzung. (Im abgekühlten Zustand ist die Bremswirkung wieder hergestellt) 5. <i>Sobrecalentamiento del puente con vaporización del fluido.</i> <i>(Los frenos vuelven a funcionar cuando se enfría el puente)</i> 5. Surchauffe du pont avec vaporisation du fluide. (Les freins fonctionnent à nouveau quand le fluide se refroidit).	See «overheating» problem. <i>Vedere problema: Surriscaldamento.</i> Siehe Problem: Überhitzung. <i>Véase el problema: Sobrecalentamiento.</i> Voir probleme: Surchauffe.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Soft brake pedal <i>Pedale del freno non risponde</i> Leichtes Bremspedal <i>El pedal del freno no funciona</i> Pedale du frein ne repond pas	6. Air in brake circuit <i>6. Aria nel circuito frenante</i> 6. Luft in der Bremsanlage <i>6. Aire en el circuito frenante</i> 6. Air dans le circuit	Bleed brakes as described in the vehicle's service manual. <i>Spurgare il circuito frenante come da istruzioni di spurgo del manuale del veicolo.</i> Bremsen entlüften gemäß Anweisungen im Handbuch des Fahrzeugs. <i>Purgar el circuito frenante se acuerdo con las instrucciones de purga del manual del vehículo.</i> Purger le circuit de frein selon «instructions de purge» du manuel du véhicule.
Ineffective safety brake <i>Freno negativo inefficiente</i> Federspeicherbremse ohne Funktion. <i>Freno negativo ineficiente</i> Inefficacite du frein negatif	7. Incorrect adjustment <i>7. Registrazione incorretta</i> 7. Fehlerhafte Einstellung des Bremsscheibenspieles <i>7. Ajuste incorrecto</i> 7. Mauvais réglage	See correction N. 1. <i>Vedere rimedio N. 1.</i> Siehe Abhilfe N. 1. <i>Véase remedio N. 1.</i> Voir remède N. 1.
	8. Brake disc worn out <i>8. Dischi freno usurati</i> 8. Bremslamellen verschlissen <i>8. Discos del freno gastados</i> 8. Usure disques frein	See correction N. 2. <i>Vedere rimedio N. 2.</i> Siehe Abhilfe N. 2. <i>Véase remedio N. 2.</i> Voir remède N. 2.
Overheating <i>Surriscaldamento</i> Überhitzung <i>Sobrecalentamiento</i> Surchauffe	9. Oil level wrong <i>9. Livello olio non corretto</i> 9. Niedriger Ölspiegel-Falscher Ölstand <i>9. Nivel de aceite no correcto</i> 9. Niveau d'huile pas incorrect	Drain, flush and refill oil to proper level. <i>Scaricare, eseguire un lavaggio e riempire d'olio fino a livello.</i> Öl ablassen, reinigen und richtigen Ölstand wieder herstellen. <i>Descargar, ejecutar un lavado y llenar con aceite hasta el nivel.</i> Vidanger, rincer et refaire le niveau d'huile.
	10. Too small of a brake gap <i>10. Poco gioco tra i dischi freno</i> 10. Zu wenig Spiel zwischen den Bremslamellen <i>10. Poco juego entre los discos del freno</i> 10. Peu de jeu entre les disques frein	Readjust brakes to the specifications in the vehicle's service manual. <i>Registare il freno come istruzioni da manuale del veicolo.</i> Spiel gemäß Anweisungen im Handbuch des Fahrzeuges herstellen. <i>Ajustar el freno de acuerdo con las instrucciones del manual del vehículo</i> Regler le frein selon les instructions du manuel du véhicule.
	11. Park brake dragging <i>11. Freno di parcheggio in trazione</i> 11. Feststellbremse zieht <i>11. Freno de estacionamiento en tracción</i> 11. Frein de parc mal réglé	Unlock the brake and adjust the correct gap. <i>Sbloccare il freno ripristinando il gioco corretto.</i> Bremsen lösen und richtiges Lamellenspiel einstellen. <i>Desbloquear el freno restableciendo el juego correcto.</i> Débloquer le frein et régler le jeu.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Overheating <i>Surriscaldamento</i> Überhitzung <i>Sobrecalentamiento</i> Surchauffe	12. Incorrect brake fluid in system <i>12. Fluido non idoneo nel circuito</i> 12. Ungeeignete Flüssigkeit in der Bremsanlage <i>12. Fluido no adecuado en el circuito</i> 12. Fluide incorrect dans le circuit	See correction N. 3. <i>Vedere rimedio N. 3.</i> Siehe Abhilfe N. 3. <i>Véase remedio N. 3</i> Voir remède N. 3.
	13. No free-pedal at master cylinder <i>13. Non c'è corsa a vuoto sul cilindro master</i> 13. Kein Leerweg am Bremspedal <i>13. No hay carrera en vacío en el cilindro principal</i> 13. Pas de garde sur la pedale du maître-cylindre	Readjust brake pedal as described in the vehicle's service manual. <i>Registrazione il pedale del freno come istruzioni da manuale del veicolo.</i> Bremspedal gemäß Anweisungen im Handbuch des Fahrzeuges einstellen. <i>Ajustar el pedal del freno de acuerdo con las instrucciones del manual del vehículo.</i> Régler la pedale du frein selon les instructions du manuel du véhicule.
	14. Restriction in brake lines <i>14. Restringimento sul circuito del freno</i> 14. Verengung in der Bremsanlage <i>14. Circuito del freno restringido</i> 14. Reglage sur circuit du frein	Inspect for and replace damage lines. <i>Controllare e riparare i condotti ammaccati o piegati.</i> Anlage überprüfen und verbeulte oder geknickte Leitungen ersetzen. <i>Controlar y reparar los conductos golpeados o plegados.</i> Inspecter et réparer les conduites endommagées.
	15. Restriction in return line of brake Servo system <i>15. Restringimento sul condotto di ritorno del sistema servo</i> 15. Verengung in der Rückflussleitung des Servobremssystems <i>15. Conducto de retorno del sistema servo restringido</i> 15. Etranglement sur la conduite de retour du servo-frein	Inspect for and replace damaged return line. Inspect for and remove any filter, tee'd in line or any other source of back pressure from the return line. <i>Controllare e riparare il condotto ammaccato o piegato. Controllare e sostituire tutti i filtri e raccordi sul circuito o qualsiasi altro ostacolo nel condotto di ritorno.</i> Anlage überprüfen und verbeulte oder geknickte Leitungen ersetzen. Alle Filter und Abzweigungen in der Anlage überprüfen, sämtliche Hindernisse für den freien Durchfluß entfernen. <i>Controlar y reparar el conducto golpeado o plegado. Controlar y sustituir todos los filtros y empalmes en el circuito o cualquier otro obstáculo en el conducto de retorno.</i> Inspecter et réparer la conduite endommagée. Inspecter et changer tous les filtres, raccords en «T» ou autre obstacle sur le circuit de retour.
	16. Incorrect lubricant <i>16. Lubrificante non idoneo</i> 16. Ungeeignetes Schmieröl <i>16. Lubricante no adecuado</i> 16. Lubrifiant incorrect	Change the retaining rings of the brake circuit and brake pump. <i>Sostituire gli anelli di tenuta del circuito freno e della pompa freno.</i> Die Abdichtungsringe des Bremskreislaufs der Bremspumpe ersetzen. <i>Sustituir los segmentos de compresión del circuito del freno y de la bomba del freno.</i> Remplacer les anneaux d'étanchéité du circuit et de la pompe de frein.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Diff-lock inoperative <i>Il blocco differenziale non funziona</i> Differentialsperre ohne Wirkung <i>El bloque del diferencial no funciona</i> Mauvais fonctionnement du blocage du différentiel	17. If manual control, loose or misadjusted linkage <i>17. Se il comando è manuale: comando scollegato o registrato male</i> 17. Bei mechanisch betätigter Sperre, loser oder schlecht eingestellter Hebel <i>17. Si el mando es manual: mando desconectado o mal ajustado</i> 17. Si la commande est manuel: commande déconnectée ou mal réglée	Inspect and correct linkage and readjust as indicated in vehicle's service manual. <i>Controllare, riparare e registrare il comando indicato nel manuale del veicolo.</i> Hebel überprüfen und gemäß Anweisungen im Handbuch des Fahrzeuges einstellen. <i>Controlar, reparar y ajustar el mando indicado en el manual del vehículo.</i> Inspecter, réparer et régler la commande selon le manuel du véhicule.
	18. If hydraulic control, problems in the hydraulic or electrical circuits of the vehicle <i>18. Se il comando è idraulico: problemi nel circuito elettrico del veicolo</i> 18. Bei hydraulisch betätigter Sperre, Probleme in der hydraulischen oder elektrischen Anlage des Fahrzeuges <i>18. Si el mando es hidráulico: problemas en el circuito eléctrico del vehículo</i> 18. Si la commande est hydraulique: problème dans le circuit électrique dans le véhicule	Refer to the service manual for the vehicle. <i>Fare riferimento alle istruzioni nel manuale del veicolo.</i> Siehe Anweisungen im Handbuch des Fahrzeuges. <i>Consultar las instrucciones del manual del vehículo.</i> Voir instructions dans manuel du véhicule.
	19. If hydraulic control: problems in actuating cylinder (noteable through loss of hydraulic oil or increase of the oillevel in axle) <i>19. Se il comando è idraulico: problemi nell'attuatore (caratterizzati da perdite del fluido idraulico o da aumento del livello d'olio nel ponte)</i> 19. Bei hydraulisch betätigter Sperre, Ölverlust im Betätigungszylinder (erkentlich durch Verlust von hydraulisch Flüssigkeit oder Anstieg des Öelniveaus in der Achse) <i>19. Si el mando es hidráulico: problemas en el actuador (caracterizados por pérdidas del fluido hidráulico o por un aumento del nivel del aceite en el puente)</i> 19. Si la commande est hydraulique: problèmes dans le vérin (caractérisés par des fuites de fluide hydraulique ou augmentation du niveau d'huile dans le pont)	Rebuilt cylinder. <i>Controllare e riparare il cilindro.</i> Überprüfen und Zylinder reparieren. <i>Controlar y reparar el cilindro.</i> Inspecter et réparer le cylindre.
	20. If with lim. slip differential, worn discs <i>20. Se il differenziale è del tipo autobloccante, dischi usurati</i> 20. Wenn mit Selbstsperrdifferential, Scheiben verschlissen <i>20. Si el diferencial es del tipo autobloqueante: discos gastados</i> 20. Si avec différentiel à glissement limité, usure sur les disques	Replace discs. <i>Sostituire i dischi.</i> Scheiben ersetzen. <i>Sustituir los discos.</i> Remplacer les disques.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Oil coming out of breather <i>Olio fuoriesce dallo sfiato</i> Ölaustritt aus dem Entlüfter <i>El aceite sale del purgador</i> Huile sort du reniflard	21. Leak in internal brake system 21. <i>Perdita di fluido idraulico dal sistema frenante</i> 21. Verlust von hydraulisch Flüssigkeit der Bremsanlage 21. <i>Pérdida de fluido hidráulico del sistema frenante</i> 21. Fuite de fluide hydraulique du système de freinage	See correction N. 2 and 3. <i>Vedere rimedio N. 2 e 3.</i> Siehe Abhilfe N. 2 und 3. <i>Véanse remedios N. 2 y 3.</i> Voir remède N. 2 et 3.
	22. Leak in diff-lock actuating cylinder 22. <i>Perdita d'olio idraulico dal circuito del blocco differenziale</i> 22. Verlust von Hydraulisch Flüssigkeit der hydraulisch Anlage der Differentialsperre 22. <i>Pérdida de aceite hidráulico del circuito del bloque del diferencial</i> 22. Fuite d'huile hydraulique du circuit de blocage du différentiel	See correction N. 19. <i>Vedere rimedio N. 19.</i> Siehe Abhilfe N. 19. <i>Véase remedio N. 19.</i> Voir remède N. 19.
NoSpin indexing noise when driving straight CAUTION! With NoSpin, fatigue damage can occur on the side with the larger tire. <i>Il NoSpin è rumoroso viaggiando sul rettilineo</i> ATTENZIONE! Con il NoSpin possono verificarsi avarie da fatica sul lato con il pneumatico più grande. NoSpin macht Geräusche bei Geradeausfahrt ACHTUNG! Mit NoSpin können auf der Seite mit dem grösseren Reifenradius Ermüdungsschäden auftreten. <i>El NoSpin hace ruido andando en un rectilíneo</i> CUIDADO! con el No Spin se pueden producir averías por fatiga en un lado en el neumático más grande. Le No-Spin fait du bruit en roulant en ligne droite ATTENTION! Avec le NoSpin, des ruptures de fatigue peuvent se produire du côté des pneumatiques les plus grands.	23. Unequal tire pressure left and right 23. <i>Pressione disuguale nei pneumatici sui due lati</i> 23. Ungleichmässiger Reifendruck links und rechts 23. <i>Presión desigual en los neumáticos a ambos lados</i> 23. Pressions différentes dans les pneumatiques sur les deux cotés du véhicule	Inflate tires to the recommended pressure in the service manual, or until the rolling radius is equal. <i>Gonfiare i pneumatici alla pressione raccomandata nel manuale o comunque fino ad ottenere un raggio statico uguale.</i> Reifen vorschriftsgemäß aufpumpen bis ein gleichgroßer statischer Halbmesser erreicht wird. <i>Hinchar los neumáticos a la presión recomendada en el manual o, de todas formas, hasta obtener un rayo estático igual.</i> Gonfler les pneumatiques selon la pression recommandée dans le manuel ou jusqu'à obtenir le même rayon sous charge.
	24. Different style, size or brand of tires between left and right hand side 24. <i>Pneumatico di disegno, marca o costruttore diversi sui due lati</i> 24. Unterschiedliche Reifen, -größen - marken, links und rechts 24. <i>Neumáticos de diseño, marca o fabricante distintos a los dos lados</i> 24. Pneumatiques de sculptures ou de constructeurs différents sur les deux côtés du véhicule	Change tires to make the rolling radius equal. Vary the tire pressure within the specifications until the rolling radius is equal. <i>Cambiare pneumatici o rendere i raggi statici dei pneumatici eguali.</i> <i>Variare la pressione dei pneumatici nei campi di tolleranza prescritti dai costruttori dei pneumatici stessi, fino ad ottenere un raggio statico uguale.</i> Reifen ersetzen sodaß ein gleich-großer Statischer Halbmesser erreicht wird. Reifendruck im Bereich der Vorschriften ändern bis ein gleichgroßer Halbmesser erreicht wird. <i>Cambiar los neumáticos o hacer que los rayos estáticos de los neumáticos sean iguales.</i> <i>Variar la presión de los neumáticos en los campos de tolerancia prescritos por los fabricantes de dichos neumáticos, hasta obtener un radio estático igual.</i> Changer les pneumatiques ou rendre les rayons sans charge des pneumatiques égaux. Modifier la pression des pneumatiques dans les tolérances prescrites par les constructeurs de ces mêmes pneumatiques, jusqu'à obtenir un rayon sous charge identique.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
Noise during coast and under power the same <i>Rumorosità uguale sia in tiro che in rilascio</i> Geräusch im Zug und im Schub gleich stark <i>Ruido igual tanto en tracción como en inercia</i> Bruit en traction ou en retenue	25. Wheel bearings damaged <i>25. Cuscinetti dei mozzi danneggiati</i> 25. Lager der Radnaben beschädigt <i>25. Cojinetes de los cubos dañados</i> 25. Roulements des moyeux endommagés	Replace and adjust. <i>Sostituire i particolari in avaria.</i> Beschädigte Teile gemäß Anweisungen. <i>Sostituire le piezas averiadas.</i> Remplacer les pièces endommagées.
Noise under power greater than during coast <i>Rumorosità più elevata in tiro piuttosto che in rilascio</i> Geräusch stärker im Zug als im Schub <i>Ruido más elevado en tracción que en inercia</i> Bruit plus élevé en traction qu'en retenue.	26. Low oil level <i>26. Livello olio basso</i> 26. Niedriger Ölstand <i>26. Nivel de aceite bajo</i> 26. Niveau d'huile insuffisant	Refill oil to proper level. <i>Ripristinare il livello olio.</i> Schmieröl nachfüllen bis richtiger Ölstand wieder hergestellt ist. <i>Restablecer el nivel del aceite.</i> Refaire le niveau d'huile.
	27. Incorrect lubricant <i>27. Olio non idoneo</i> 27. Ungeeignetes Schmieröl <i>27. Aceite no adecuado</i> 27. Huile incorrect	See correction N. 16. <i>Vedere rimedio N. 16.</i> Siehe Abhilfe N. 16. <i>Véase remedio N. 16.</i> Voir remède N. 16.
	28. Ring and pinion worn <i>28. Coppia conica usurata</i> 28. Kegel- und Tellerrad verschlissen <i>28. Par cónico gastado</i> 28. Usure du couple conique	Inspect through top cover. Replace and adjust. <i>Controllare attraverso il coperchio superiore.</i> <i>Sostituire la coppia conica.</i> Durch die obere Bohrung überprüfen. Kegel- und Tellerrad ersetzen. <i>Controlar a través de la tapa superior.</i> <i>Sustituir el par cónico.</i> Inspectionner au travers du couvercle supérieur. Remplacer le couple conique.
	29. Worn ring and pinion bearings <i>29. Cuscinetti della coppia conica usurati</i> 29. Kegelrollenlager des Kegel- und Tellerradpaares verschlissen <i>29. Cojinetes del par cónico gastados</i> 29. Usure des roulements du couple conique	Replace and adjust. <i>Sostituire i particolari in avaria.</i> Beschädigte Teile ersetzen. <i>Sostituire le piezas averiadas.</i> Remplacer les pièces endommagées.
	30. Worn planetary gears or bearings <i>30. Planetari o cuscinetti dell'epicicloidale usurati</i> 30. Planetenräder oder Lager der Planetenabtriebe verschlissen <i>30. Planetarios y cojinetes del epicicloidale gastados</i> 30. Usure des planétaires ou roulement de l'épicycloïdale	Replace. <i>Sostituire i particolari in avaria.</i> Beschädigte Teile ersetzen. <i>Sostituire le piezas averiadas.</i> Remplacer les pièces endommagées.

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
<p>Noise during coast greater than under power</p> <p><i>Rumorosità più elevata in rilascio piuttosto che in tiro</i></p> <p>Geräusch stärker im Schub als im Zug</p> <p><i>Ruido más elevado en inercia que en tracción</i></p> <p>Bruit plus élevé en retenue qu'en traction</p>	<p>31. Loose pinion nut</p> <p><i>31. Ghiera pignone allentata</i></p> <p>31. Wellenmutter des Kegelritzels lose</p> <p><i>31. Virola del piñón floja</i></p> <p>31. Ecrou du pinion dévissé</p>	<p>Inspect ring, pinion and pinion bearings. If undamaged, retighten nut.</p> <p><i>Controllare la coppia conica ed i rispettivi cuscinetti, se non fossero danneggiati serrare la ghiera.</i></p> <p>Kegel- und Tellerrad und Lager überprüfen. Sollten diese nicht beschädigt sein, Wellenmutter anziehen.</p> <p><i>Controlar el par cónico y los cojinetes correspondientes.</i></p> <p>Inspecter le couple conique et les roulements et si rien n'est endommagé, resserrer l'ecrou.</p>
	<p>32. Only pinion bearing damaged</p> <p><i>32. Solo un cuscinetto del pignone è danneggiato</i></p> <p>32. Nur eines der Lager des Kegelritzels ist beschädigt</p> <p><i>32. Sólo un cojinete del piñón está dañado</i></p> <p>32. Seulement un roulement du pignon est endommagé</p>	<p>See correction N. 29.</p> <p><i>Vedere rimedio N. 29.</i></p> <p>Siehe Abhilfe N. 29.</p> <p><i>Véase remedio N. 29.</i></p> <p>Voir remède N. 29.</p>
<p>Noise during turn (without NoSpin)</p> <p><i>Rumore sotto sterzo (senza NoSpin)</i></p> <p>Geräusch während der Kurvenfahrt (ohne NoSpin)</p> <p><i>Ruido en la dirección (sin NoSpin)</i></p> <p>Bruit en braquage (sans NoSpin)</p>	<p>33. Worn spider and/or side gears</p> <p><i>33. Satelliti e/o planetari del differenziale danneggiati</i></p> <p>33. Ausgleich kegelräder und/oder welleräder verschlissen</p> <p><i>33. Satélites y/o planetarios del diferencial dañados</i></p> <p>33. Satellites et/ou planétaires du différentiel endommagés</p>	<p>Replace.</p> <p><i>Sostituire i particolari danneggiati.</i></p> <p>Beschädigte Teile ersetzen.</p> <p><i>Sustituir las piezas dañadas.</i></p> <p>Remplacer les pièces endommagées.</p>
<p>A «Stick slip» noise when going from forward to reverse</p> <p><i>Un rumore tipo «Stick slip» si manifesta durante l'inversione di marcia</i></p> <p>«Stick slip» -Geräusch bei Änderung der Fahrtrichtung</p> <p><i>Un ruido tipo «Stick slip» se manifiesta al invertir la marcha</i></p> <p>Un bruit type «Stick slip» se manifeste pendant l'inversion</p>	<p>34. Worn or damaged cardanshaft</p> <p><i>34. Giunto cardanico danneggiato</i></p> <p>34. Kardanwelle beschädigt</p> <p><i>34. Junta cardánica dañada</i></p> <p>34. Joint cardan endommagé</p>	<p>Inspect and replace as described in vehicle's service manual.</p> <p><i>Controllare e sostituire il giunto come indicato nel manuale del veicolo.</i></p> <p>Überprüfen und Kardanwelle gemäß. Anweisungen im Handbuch des Fahrzeuges ersetzen.</p> <p><i>Controlar y sustituir la junta como se indica en el manual del vehículo.</i></p> <p>Inspecter et remplacer le joint cardan selon les indications du manuel du véhicule.</p>
	<p>35. Loose wheel</p> <p><i>35. Ruota allentata</i></p> <p>35. Rad lose</p> <p><i>35. Rueda floja</i></p> <p>35. Roue dévissée</p>	<p>Inspect for wheel and wheel stud damage. Replace if needed and retorque lugnuts.</p> <p><i>Ispezionare eventuali danni al disco ed alle colonnette del mozzo ruota, se necessario sostituire i particolari danneggiati e serrare i dadi alla coppia prescritta.</i></p> <p>Eventuelle Schäden an der Felge und an den Radbolzen überprüfen. Falls erforderlich beschädigte Teile ersetzen und Radmuttern gemäß vorgeschriebenem Drehmoment anziehen.</p> <p><i>Inspeccionar los posibles daños al disco y a las columnas del cubo de la rueda; si fuera necesario, sustituir las piezas dañadas y apretar las tuercas al par prescrito.</i></p> <p>Inspecter les éventuels dommages au disque et aux goujons du moyeu de rue. Si nécessaire remplace les pièces endommagées et serrer les écrous au couple prescrit.</p>

PROBLEM - PROBLEMA - PROBLEM - PROBLEMA - PROBLEME	CAUSE - CAUSE - URSACHE - CAUSAS - CAUSE	CORRECTION - RIMEDI - ABHILFE - REMEDIOS - REMEDE
<p>A «Stick slip» noise when going from forward to reverse</p> <p><i>Un rumore tipo «Stick slip» si manifesta durante l'inversione di marcia</i></p> <p>«Stick slip» -Geräusch bei Änderung der Fahrtrichtung</p> <p><i>Un ruido tipo «Stick slip» se manifiesta al invertir la marcha</i></p> <p>Un bruit type «Stick slip» se manifeste pendant l'inversion</p>	<p>36. Articulation box joint and achsel shaft damaged</p> <p><i>36. Giunti della scatola snodo, semiassi o snodi di sterzata danneggiati</i></p> <p>36. Kupplung des Gelenkgehäuseg, Halbachse beschädigt</p> <p><i>36. Juntas de la caja de la rótula, semi-eje o perno de dirección dañados</i></p> <p>36. Joint boîtier d'articulation, demi-essieu endommagé</p>	<p>Inspect and replace.</p> <p><i>Ispezionare e sostituire i particolari danneggiati.</i></p> <p>Überprüfen und beschädigte Teile ersetzen.</p> <p><i>Inspeccionar y sustituir las piezas dañadas.</i></p> <p>Inspecter et remplacer les pièces endommagées.</p>
	<p>37. Spider pins loose in diff-carrier</p> <p><i>37. Satelliti liberi nella scatola differenziale</i></p> <p>37. Ausgleich kegelräder im Differential lose</p> <p><i>37. Satélites libres en la caja del diferencial</i></p> <p>37. Satellites libres dans le carter central</p>	<p>Inspect through top cover. Replace.</p> <p><i>Controllare attraverso il coperchio superiore, sostituire i particolari danneggiati.</i></p> <p>Durch die obere Bohrung überprüfen. Beschädigte Teile ersetzen.</p> <p><i>Inspectioner au travers du couvercle supérieur.</i></p> <p>Remplacer les pièces endommagées.</p>
	<p>38. Damaged or missing spider and/or side gear washers</p> <p><i>38. Rondelle di rasamento del differenziale usurate</i></p> <p>38. Anlaufscheiben im Differential verschlissen</p> <p><i>38. Arandelas de espesor del diferencial gastadas</i></p> <p>38. Usure des rondelles du différentiel</p>	<p>See correction N. 33.</p> <p><i>Vedere rimedio N. 33.</i></p> <p>Siehe Abhilfe N. 33.</p> <p><i>Véase remedio N. 33.</i></p> <p>Voir remède N. 33.</p>

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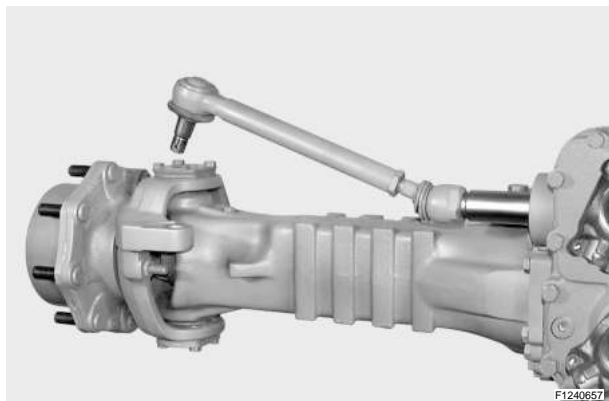
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HOW TO DISASSEMBLE THE MECHANIC PARKING BRAKE UNIT - SMONTAGGIO GRUPPO FRENO DI STAZIONAMENTO A COMANDO MECCANICO - MECHANISQUE HANDBREMSE ABMONTIEREN - DESMONTAJE GRUPO FRENO ESTACIONAMIENTO MECANICO - DEMONTAGE DU FREIN DE STATIONNEMENT MECANIQUE



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a

NOTE. The same disassembly procedure applies to both arms and may only be carried out when levers (3) are released. Disconnect the tension bar from the steering case. For details, see «HOW TO REMOVE THE STEERING CYLINDER».

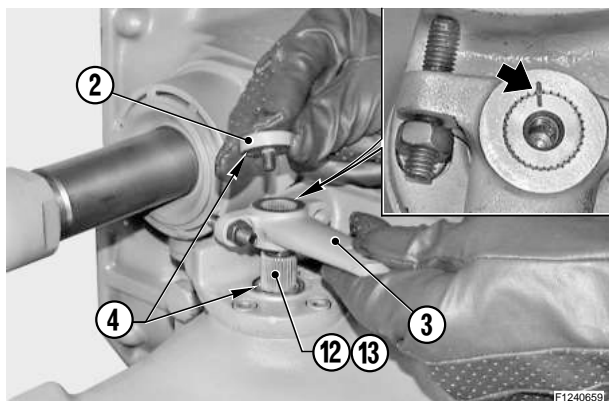


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b

Draw out the screw (1) locking the washer (2) that stops the lever (3).



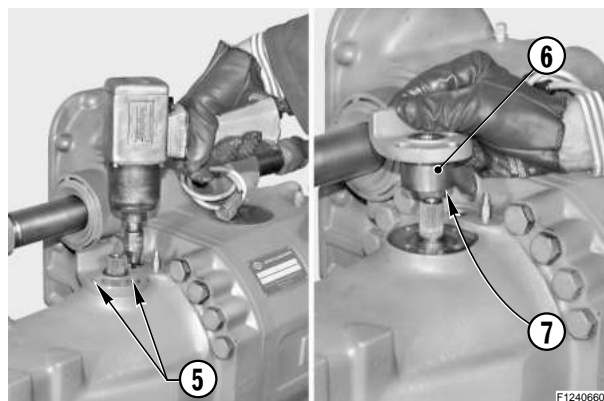
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GB

c

Remove washer (2), lever (3) and O-rings (4). Mark the positions of levers (3) in relation to the thrust levers (12) and (13).

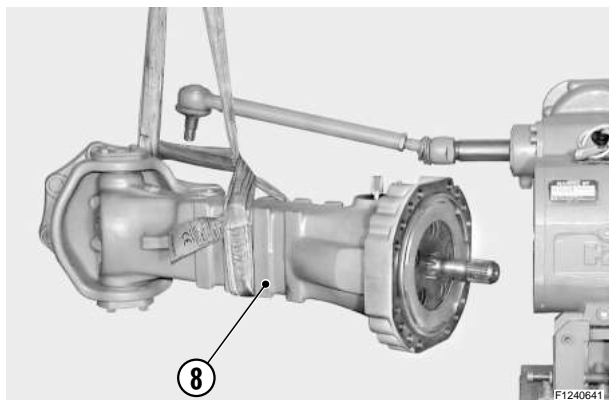


F1240660

GB

d

Draw out the screws (5) and remove bush (6) along with O-ring (7).



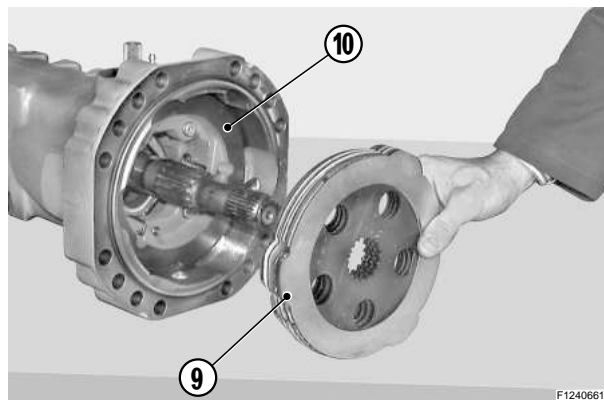
F1240641



GB

e

Connect the whole arm (8) to the hoist and put the rod under light tension. Remove the whole arm; for details, see «CHECKING AND REPLACING THE BRAKING DISKS».



F1240661

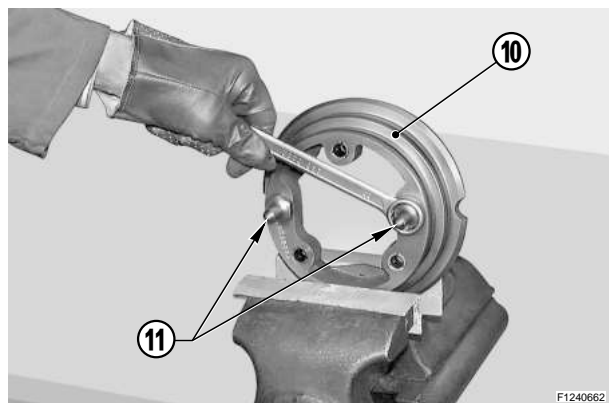
GB

f

Remove the braking disks (9) and the whole piston (10). For details, see «CHECKING AND REPLACING THE BRAKING DISKS».



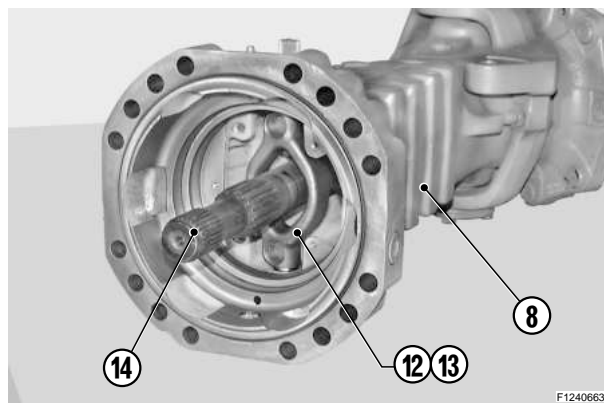
HOW TO DISASSEMBLE THE MECHANIC PARKING BRAKE UNIT - SMONTAGGIO GRUPPO FRENO DI STAZIONAMENTO A COMANDO MECCANICO - MECHANISQUE HANDBREMSE ABMONTIEREN - DESMONTAJE GRUPO FRENO ESTACIONAMIENTO MECANICO - DEMONTAGE DU FREIN DE STATIONNEMENT MECANIQUE



GB

a

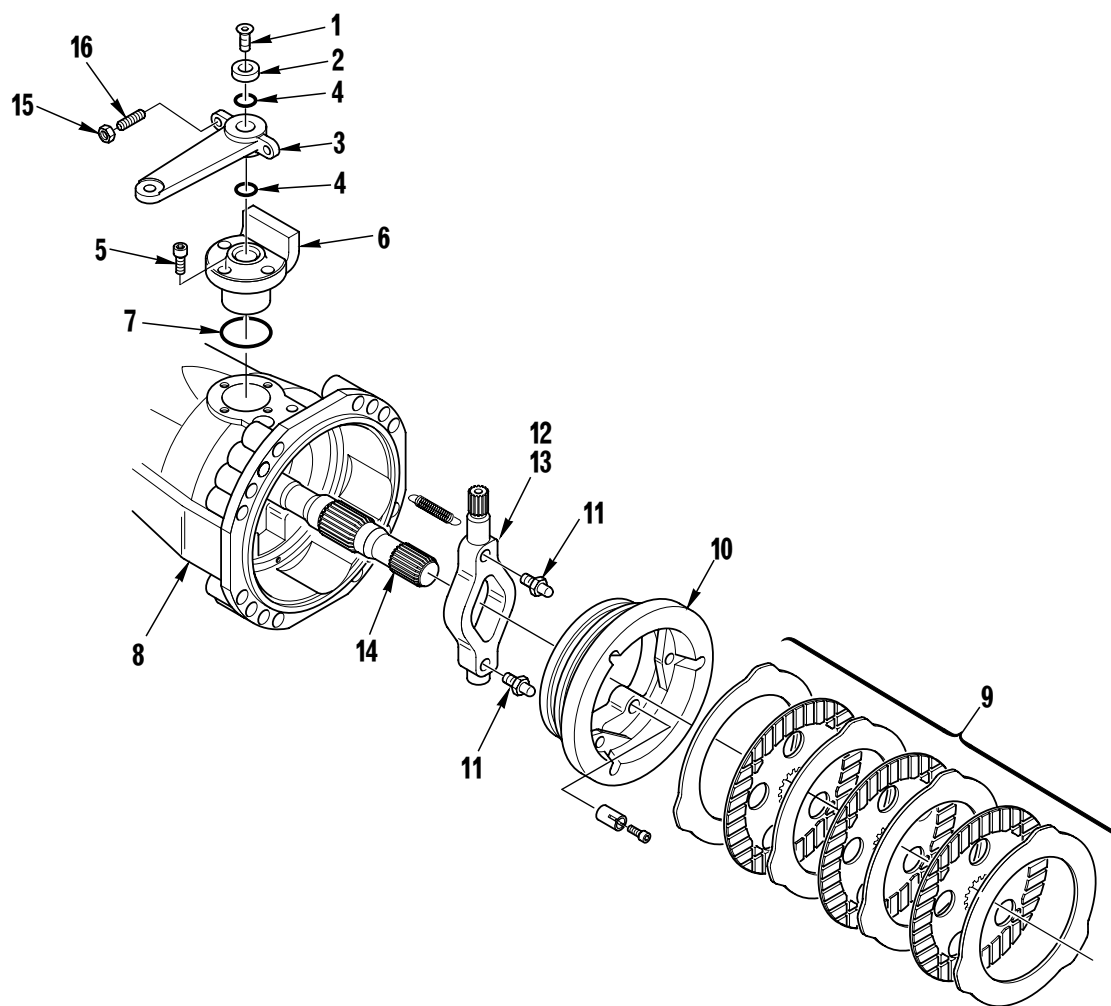
If pins (11) need replacing, block the piston (10) into a vice whose jaws are covered in smooth material and remove the pins.



GB

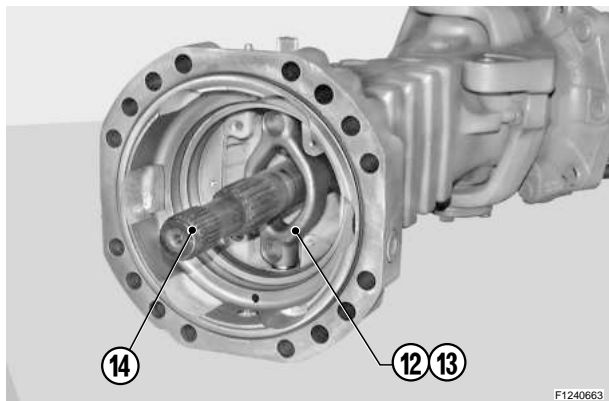
b

If thrust levers (12) and (13) need replacing, remove the U-joint (14) before removing the arms (8).
For details, see «HOW TO REMOVE THE U-JOINT».





HOW TO ASSEMBLE THE MECHANIC PARKING BRAKE UNIT - ASSEMBLAGGIO GRUPPO FRENO DI STAZIONAMENTO A COMANDO MECCANICO - MECHANISQUE HANDBREMSE MONTIEREN - ASEMBLAJE GRUPO FRENO ESTACIONAMIENTO MECANICO - ASSEMBLAGE DU FREIN DE STATIONNEMENT MECANIQUE



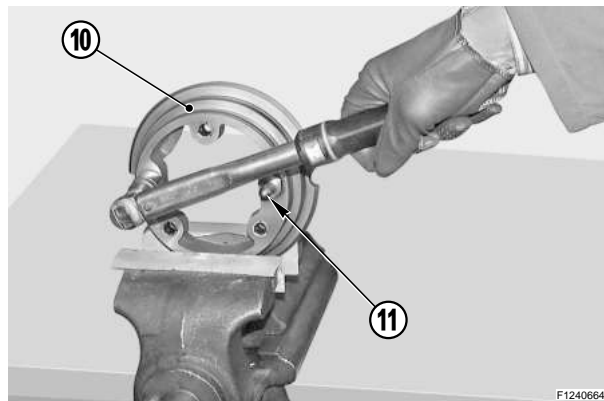
F1240663



GB

a

Install thrust levers (12) and (13), then install the U-joint (14). For details, see «HOW TO INSTALL THE U-JOINT».



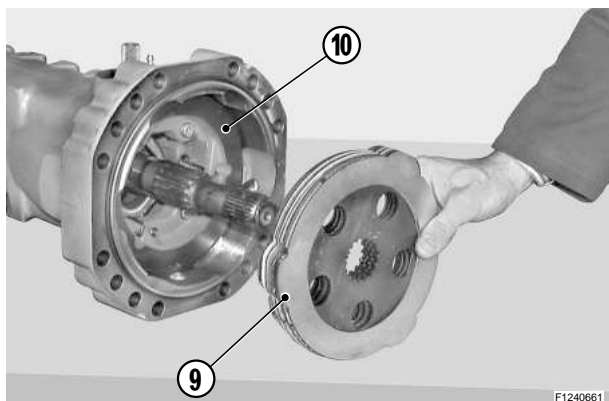
F1240664



GB

b

Apply Loctite 270 to the threaded portion of the pins (11) and fit them onto the piston (10). Block them: torque wrench setting 30–35 Nm.



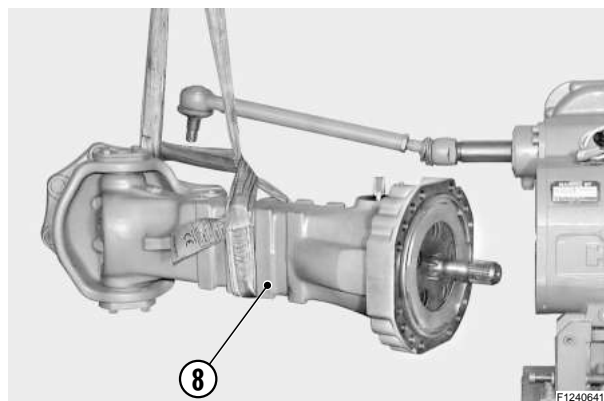
F1240661



GB

c

Re-install the piston (10) and the braking disks (9). For details, see «HOW TO ASSEMBLE THE BRAKING UNITS».



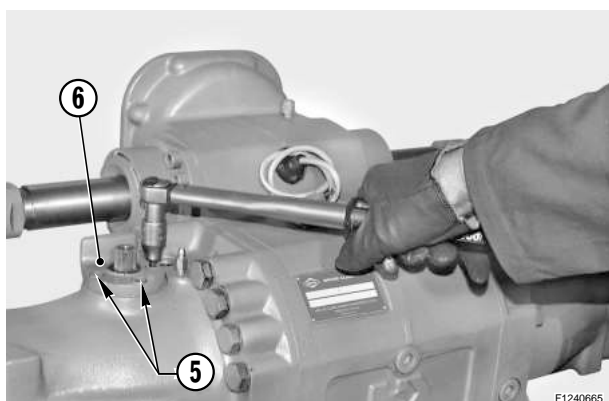
F1240641



GB

d

Install the arms (8) into the main body; check flatness and block arms following the appropriate procedures illustrated in section «HOW TO ASSEMBLE THE BRAKING UNITS».



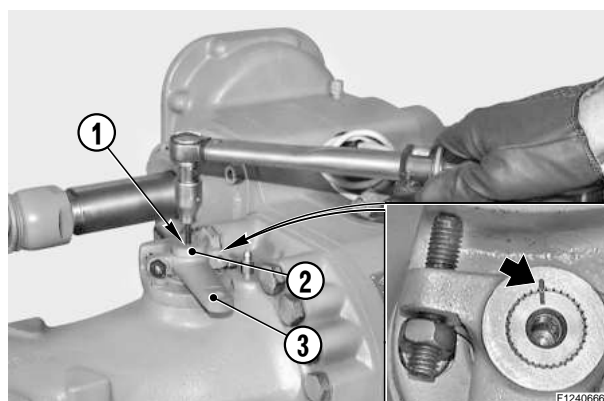
F1240665



GB

e

Install the bush (6) complete with O-ring (7) and block it with screws (5). Tighten screws with a torque wrench setting of 23.8–26.2 Nm.



F1240666



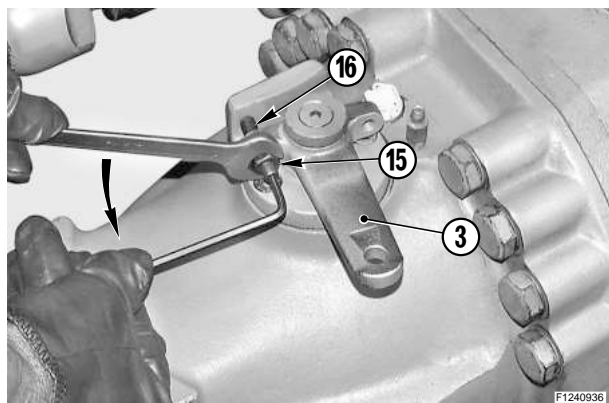
GB

f

Install in sequence the lower O-ring (4), the lever (3) and the washer (2) with the relative O-ring (4). Block with screw (1) and tighten using a torque wrench setting of 23.8–26.2 Nm.
CAUTION! Refer and keep to the positions marked during disassembly.



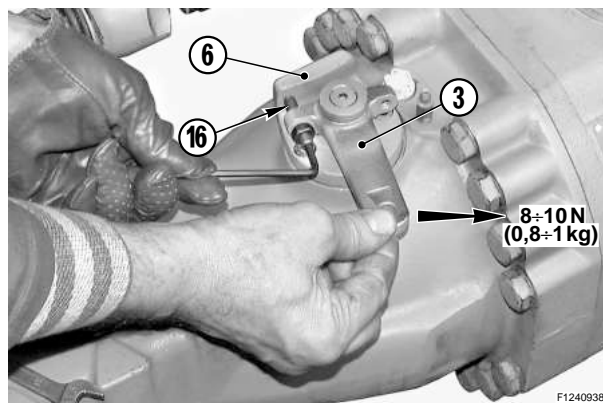
HOW TO ASSEMBLE THE MECHANIC PARKING BRAKE UNIT - ASSEMBLAGGIO GRUPPO FRENO DI STAZIONAMENTO A COMANDO MECCANICO - MECHANISQUE HANDBREMSE MONTIEREN - ASEMBLAJE GRUPO FRENO ESTACIONAMIENTO MECANICO - ASSEMBLAGE DU FREIN DE STATIONNEMENT MECANIQUE



GB

a

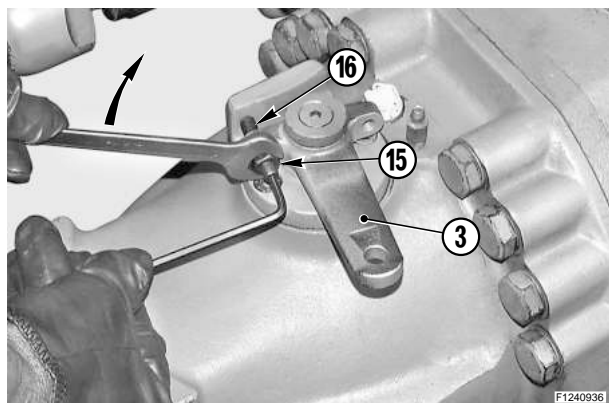
Connect the braking circuit and apply maximum working pressure to set the disks.
Release the pressure, loosen nut (15) and unscrew dowel (16) by a few turns.



GB

b

Apply a force of 8–10 N (0.8–1 kg) to lever (3). Direct the force towards the braking direction in order to eliminate the idle stroke. While the force is being applied, tighten dowel (16) until it is caused to rest onto bush (6).



GB

c

Lock dowel (16) in this position with nut (15).
Torque wrench setting: 20–25 Nm.

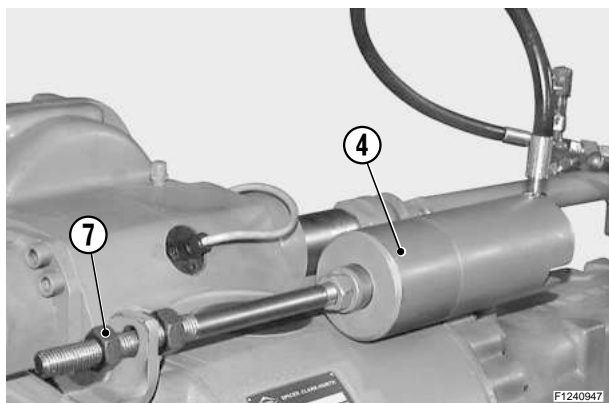
CAUTION! The idle stroke should be eliminated without preloading thrust levers (12) and (13).



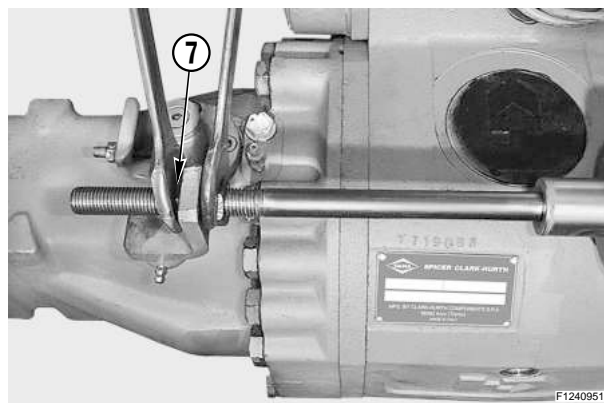
GB

d

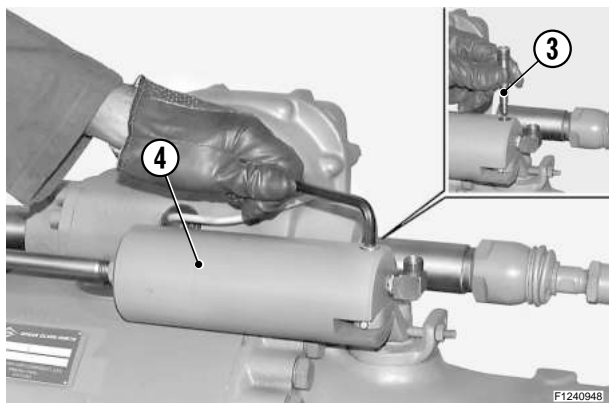
CAUTION! After connecting the control cable, check that when brakes are released both dowels (16) do lean against bush (6).



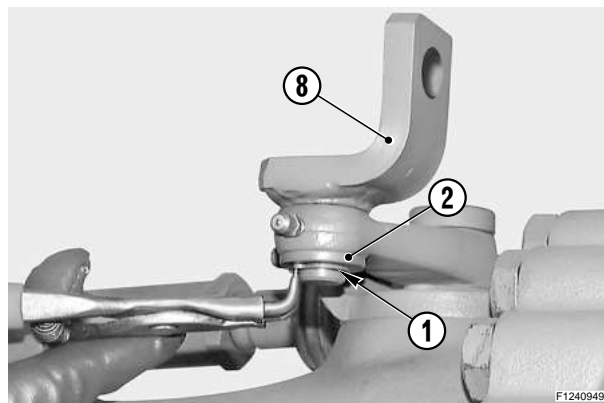
Insert pressure into cylinder (4) in order to release the brakes.
NOTE. If the machine hydraulic system cannot be used, use an external manual pump.



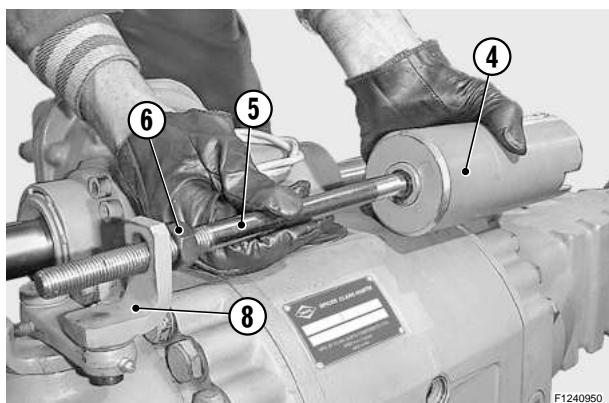
Loosen and remove the external nut (7).



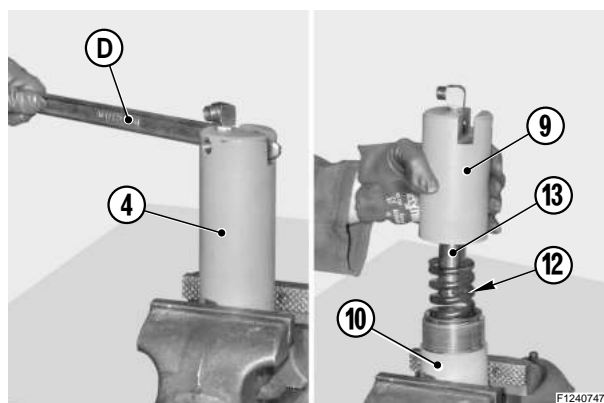
Release the pressure in the cylinder and disconnect the pressure delivery tube.
Remove the fulcrum pin (3) from the cylinder (4).



Remove the snap ring (1) that checks the support (8) and remove the distance piece (2).



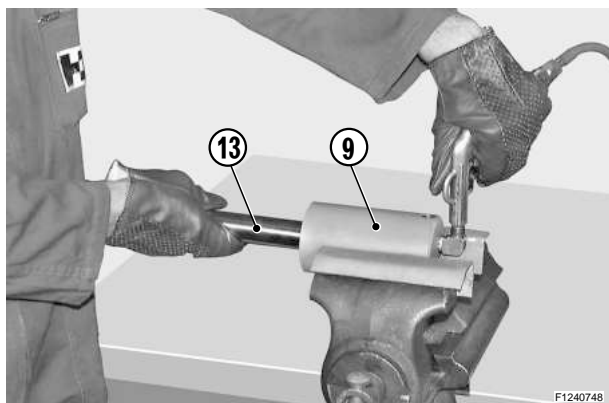
Remove the cylinder assembly (4) complete with rod (5), internal nut (6) and support (8).



Place cylinder (4) into a vice with the spring seat side (10) engaged in it and, using a bar "D", loosen and remove the cylinder unit (9) complete with piston (13) and spring (12).



HOW TO REMOVE AND DISASSEMBLE THE EXTERNAL HYDRAULIC NEGATIVE BRAKE - RIMOZIONE E SMONTAGGIO FRENO NEGATIVO IDRAULICO ESTERNO - ÄußERE HYDRAULISCHE NEGATIVBREMSE ABMONTIEREN - REMOCION Y DESMONTAJE FRENO NEGATIVO IDRAULICO EXTERIOR - ENLEVER ET DEMONTER DU FREIN NEGATIF HYDRAULIQUE EXTERNE

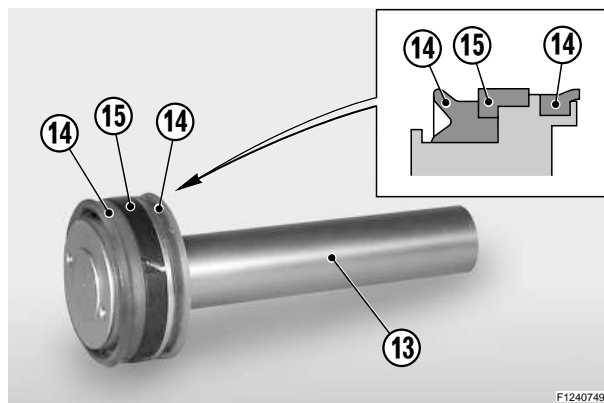


GB

a

Gently introduce the union piece of the cylinder unit (9) so as to eject the piston (13).

CAUTION! Hold the piston as it may be forced out rapidly and be damaged.

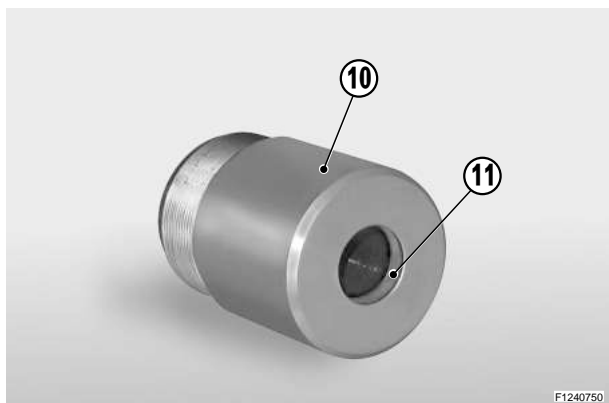


GB

b

Remove seals (14) and guide ring (15) from the piston (13).

NOTE. Note down seals direction of assembly.



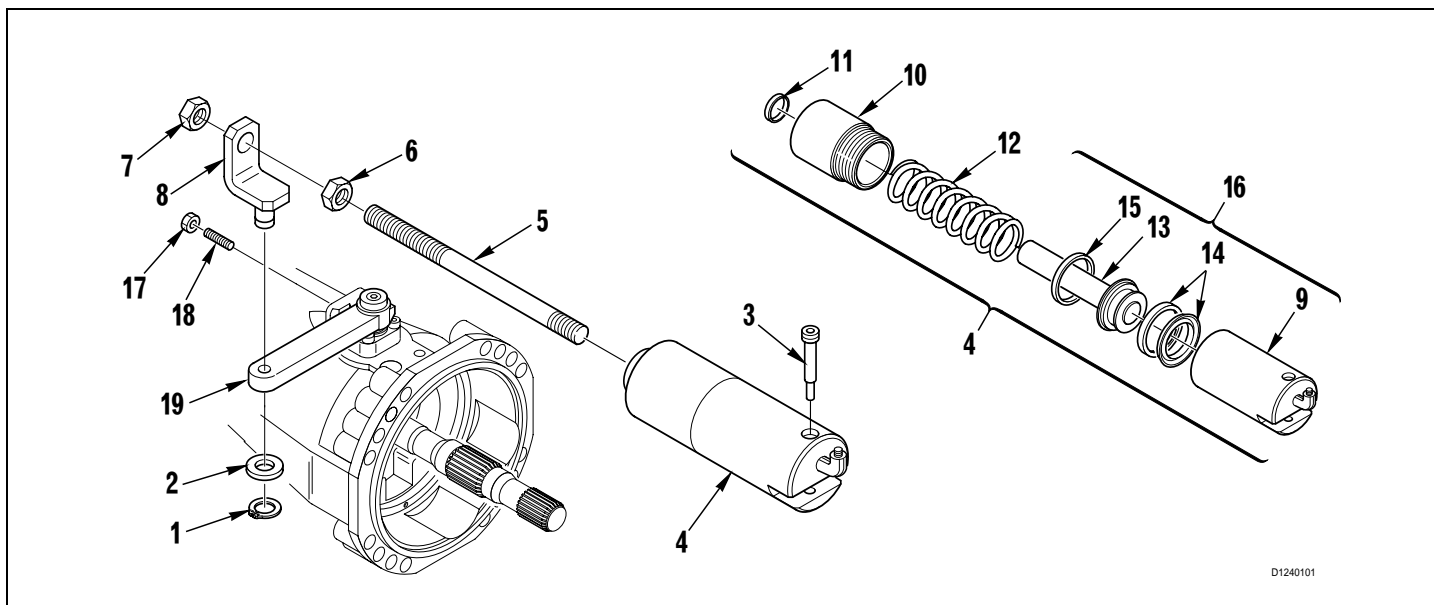
GB

c

ONLY IF NECESSARY

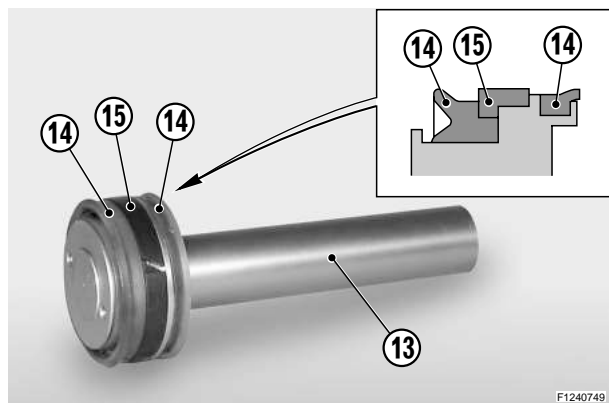
Remove the guide ring (11) from the spring seat (10).

CAUTION! If the guide ring (11) is removed, it must be replaced.





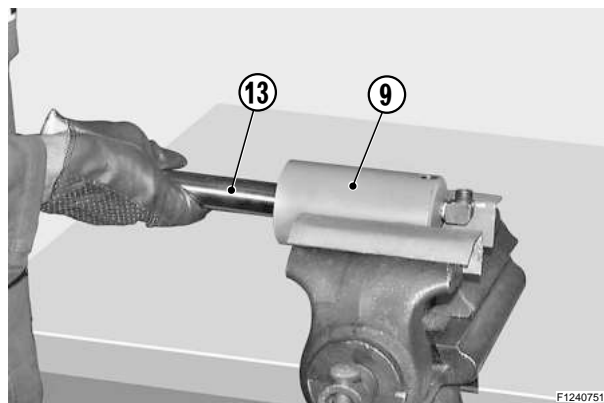
HOW TO ASSEMBLE AND INSTALL THE EXTERNAL HYDRAULIC NEGATIVE BRAKE - ASSEMBLAGGIO ED INSTALLAZIONE FRENO NEGATIVO IDRAULICO ESTERNO - ÄußERE HYDRAULISCHE NEGATIVBREMSE MONTIEREN - ASEMBLAJE Y INSTALACION FRENO NEGATIVO IDRAULICO EXTERIOR - ASSEMBLAGE ET INSTALLATION DU FREIN NEGATIF HYDRAULIQUE EXTERNE



GB

a

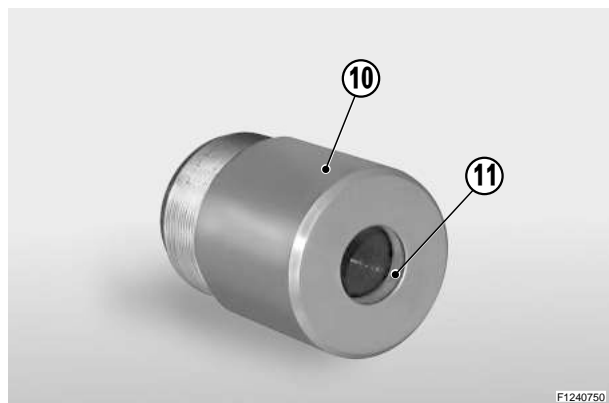
Install guide ring (15) and seals (14) onto the piston (13).
CAUTION! Carefully check seals assembly direction.



GB

b

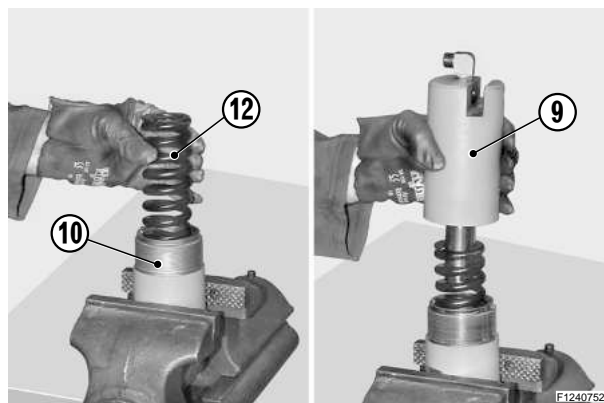
Lubricate the seals (14) and the inside of the cylinder (9); introduce the whole piston and move it to end of stroke.



GB

c

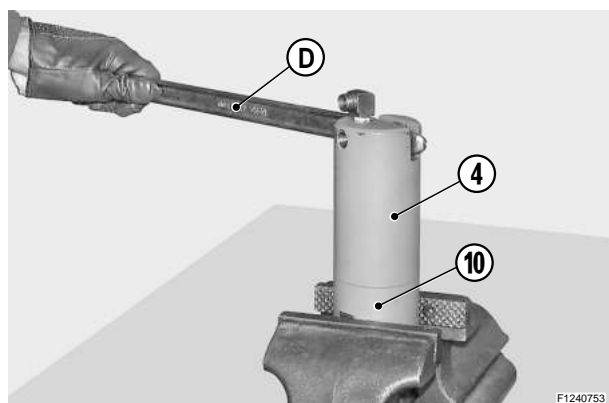
If guide ring has been removed, insert a new one (11) into the seat of the spring.
Lubricate the guide ring.



GB

d

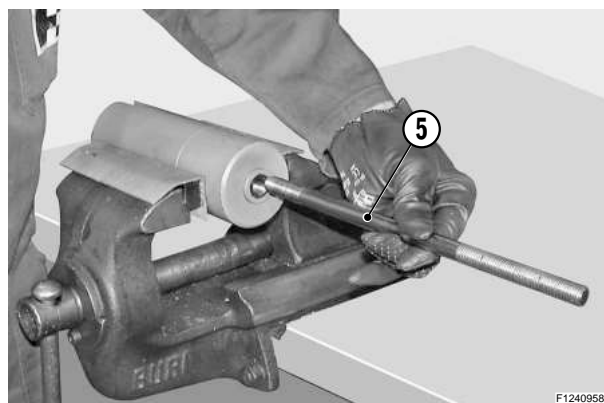
Position the spring seat (10) in a vice and insert spring (12).
Lubricate the thread. Assemble the whole cylinder (9).



GB

e

Screw the cylinder (9) into the spring seat (10) and lock it using a bar "D".



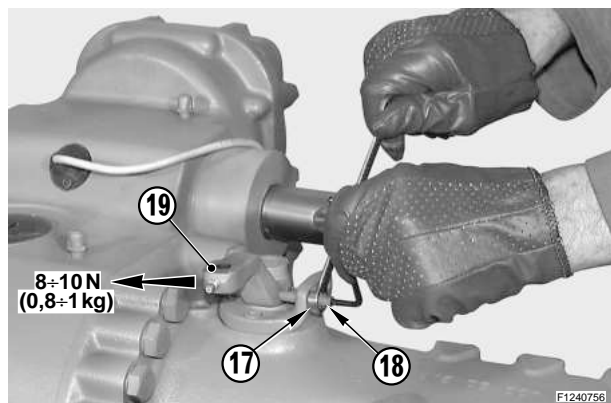
GB

f

Apply Loctite 270 to the rod (5) and screw it in the piston (13) as far as it will go.



HOW TO ASSEMBLE AND INSTALL THE EXTERNAL HYDRAULIC NEGATIVE BRAKE - ASSEMBLAGGIO ED INSTALLAZIONE FRENO NEGATIVO IDRAULICO ESTERNO - ÄUßERE HYDRAULISCHE NEGATIVBREMSE MONTIEREN - ASEMBLAJE Y INSTALACION FRENO NEGATIVO IDRAULICO EXTERIOR - ASSEMBLAGE ET INSTALLATION DU FREIN NEGATIF HYDRAULIQUE EXTERNE

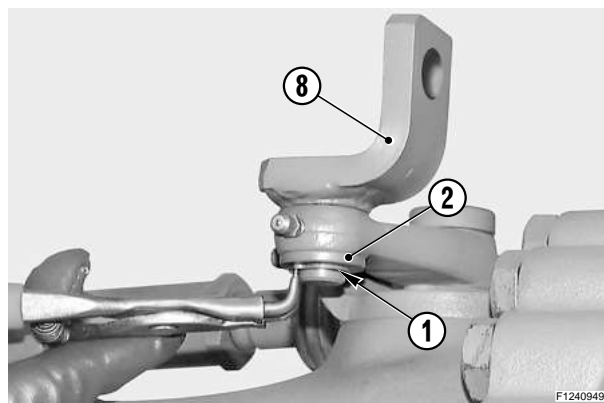


GB

a

Loosen nuts (17) and set braking levers (19) clearances to zero by turning dowels (18); lock nuts (17) with a torque wrench setting of 20 – 25 Nm.

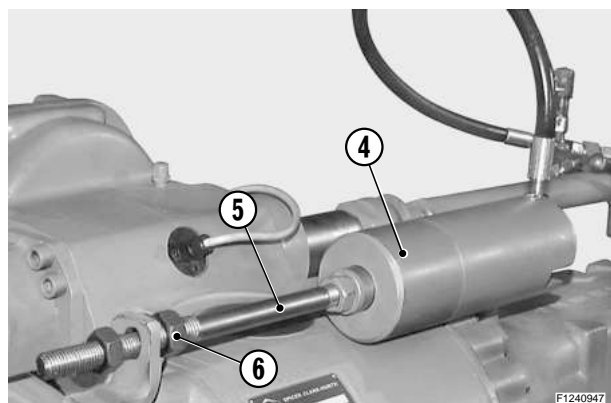
CAUTION! Clearances should be set to zero without causing any preloading.



GB

b

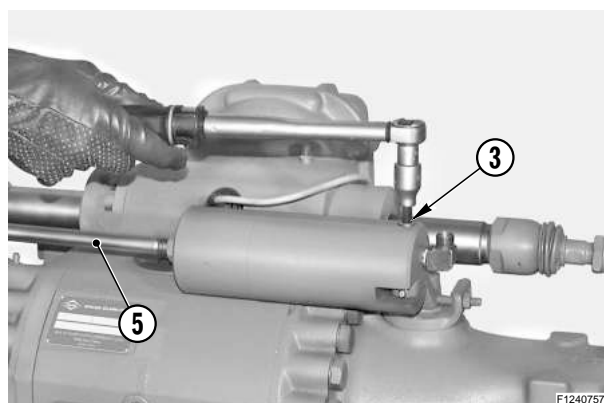
Install distance piece (2) and insert the pin of support (10) into the right-hand braking lever. Fit the second distance piece (2) and snap ring (1).



GB

c

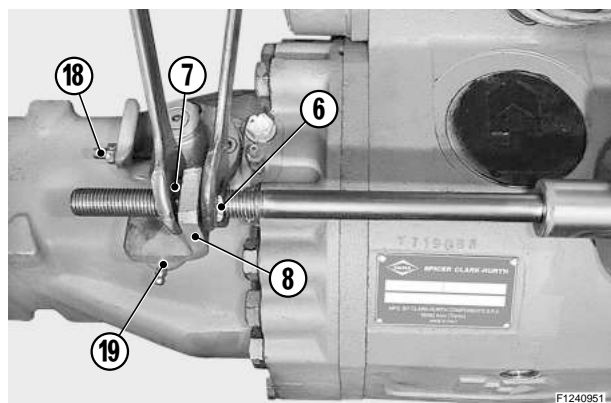
Install cylinder (4) complete with rod (5) and internal nut (6).



GB

d

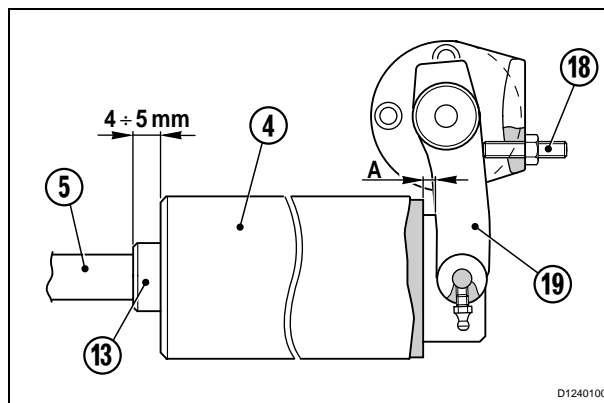
Centre the hole of fulcrum pin (3). Apply Loctite 242 to the pin thread, screw and tighten pin with a dynamometric wrench set at 25 – 30 Nm.



GB

e

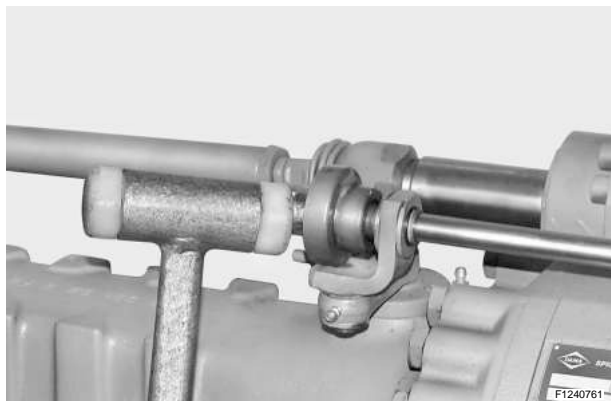
Introduce pressure into the cylinder (4) and whilst holding both levers (19) back against the adjusting screws (18), move nuts (6) and (7) so that they are made to rest against support (8); lock the nuts with a torque wrench setting of 50 – 60 Nm.



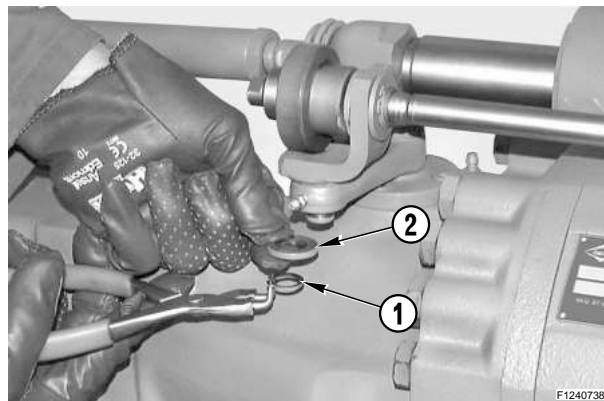
GB

f

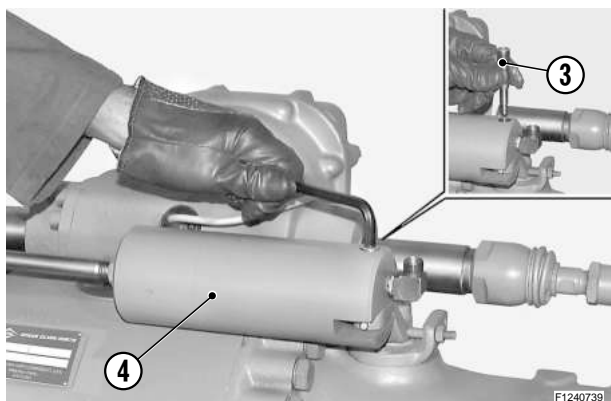
Check that, when the brakes are released (pressure inserted), levers (19) do lean against the screws (18) without prestressing them and make sure that a clearance "A" is left between cylinder (4) and lever (19). Also check that when pressure is released, piston (13) projects out by 4 – 5 mm.



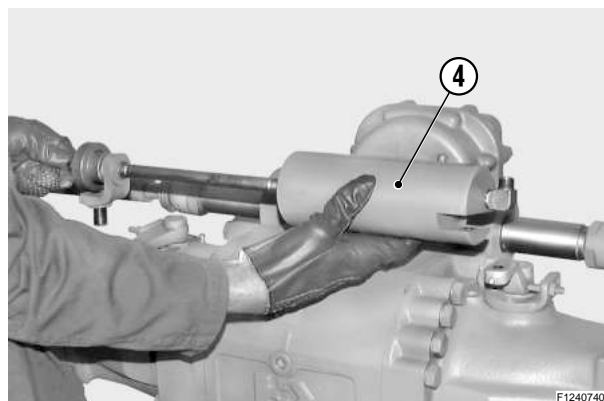
CAUTION! Before starting any operation on the assembly, disable the cylinder by giving a light hammer blow to the external ring of the check unit.



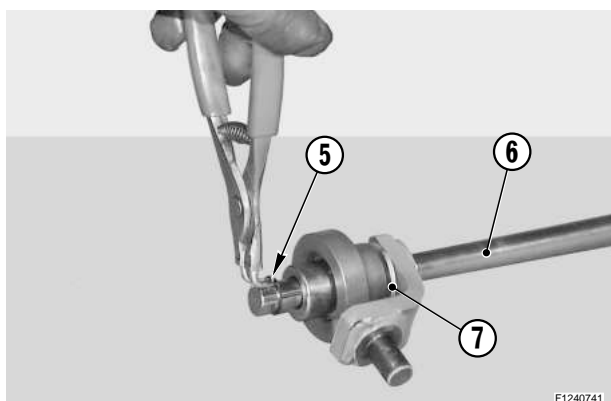
Remove snap ring (1) and extract distance piece (2).



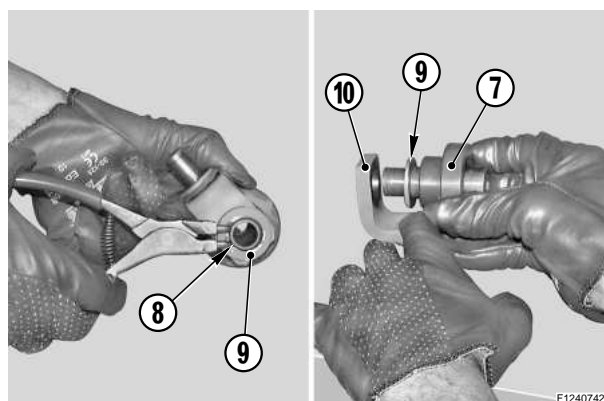
Remove the fulcrum pin (3) from the cylinder (4).



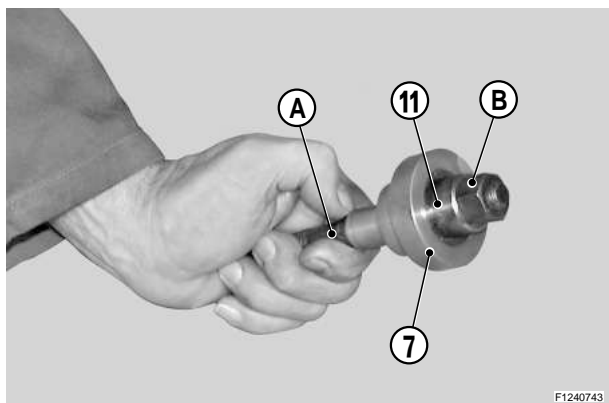
Remove the complete cylinder set (4).



Remove snap ring (5) from stem (6) and extract the check unit (7).



Remove snap ring (8) and washer (9) and separate support (10) and second washer (9) from the check unit (7).



F1240743

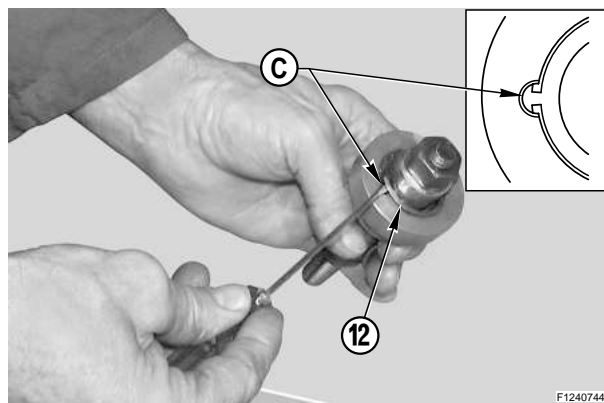


GB

a

Introduce an M14x100 screw "A" into the hole of the check unit (7) and screw a nut "B" until the spring seat (11) is moved to the end of stroke.

NOTE. Use a T.C.E.I. screw.



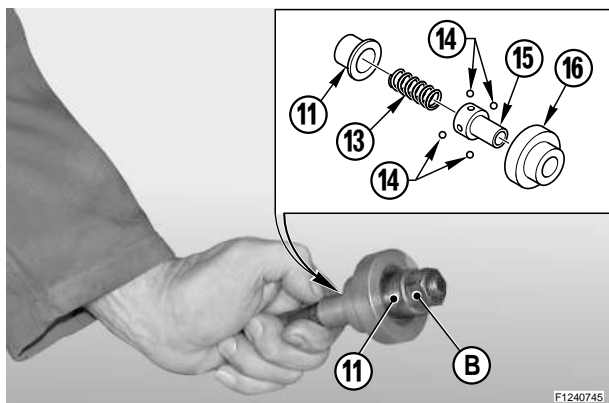
F1240744



GB

b

Rotate snap ring (12) until ring ends match slot "C".
Remove snap ring (12).



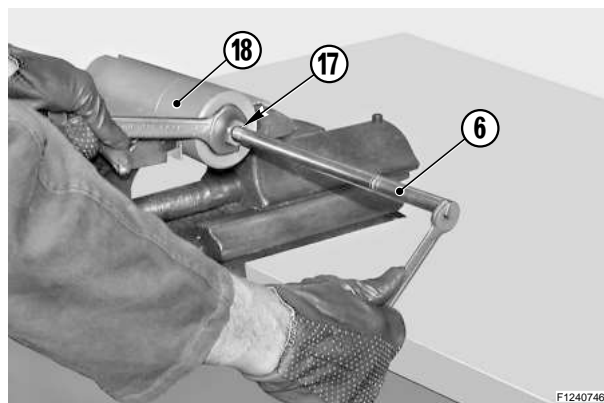
F1240745



GB

c

Slowly release nut "B" and disassemble the check unit.



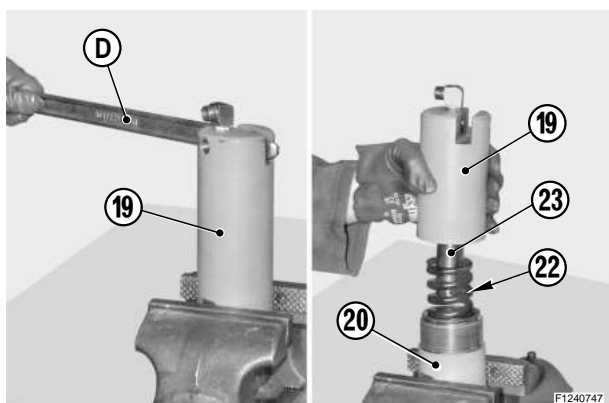
F1240746



GB

d

Loosen nut (17) and remove stem (6) from the cylinder (18).



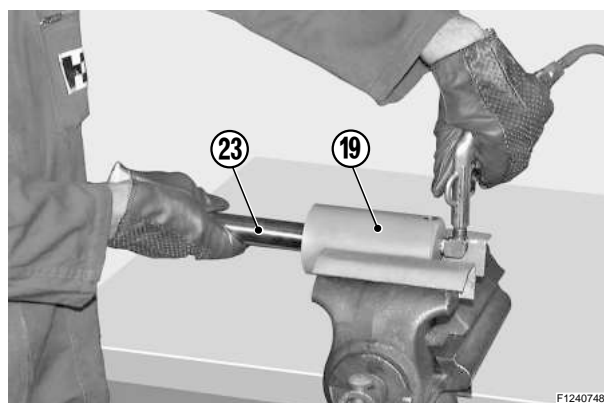
F1240747



GB

e

Place the cylinder in a vice with the spring seat (20) side engaged in it and, using a bar "D", loosen and remove the cylinder unit (19) complete with piston (23) and spring (22).



F1240748



GB

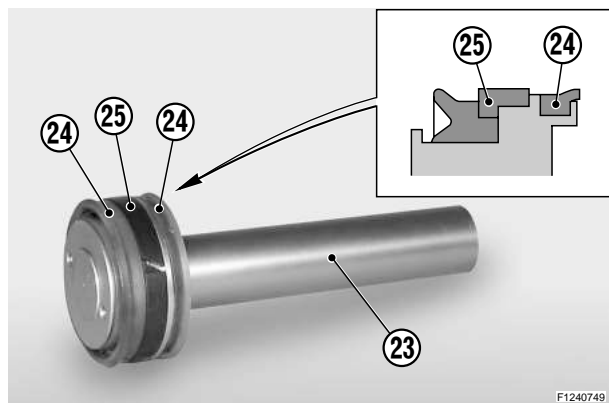
f

Slowly introduce air through the union piece of the cylinder unit (19) to expel the piston (23).

CAUTION! Hold the piston as it may be rapidly ejected and damaged.



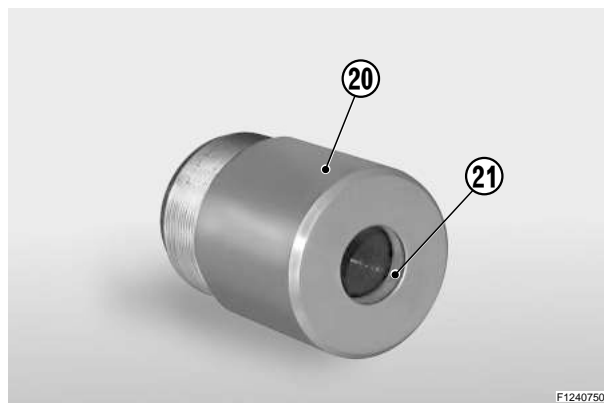
HOW TO DISASSEMBLE THE EXTERNAL HYDRAULIC NEGATIVE BRAKE WITH QUICK RELEASE - SMONTAGGIO FRENO NEGATIVO IDRAULICO ESTERNO CON SBLOCCAGGIO RAPIDO - ÄUßERE HYDRAULISCHE NEGATIVBREMSE MIT SCHNELLENTSICHERUNG ABMONTIEREN - DESMONTAJE FRENO NEGATIVO IDRAULICO ESTERNO CON SBLOQUEO RAPIDO - ENLEVER ET DEMONTER DU FREIN NEGATIF HYDRAULIQUE EXTERNE AVEC DEBLOCAGE RAPIDE



GB

a

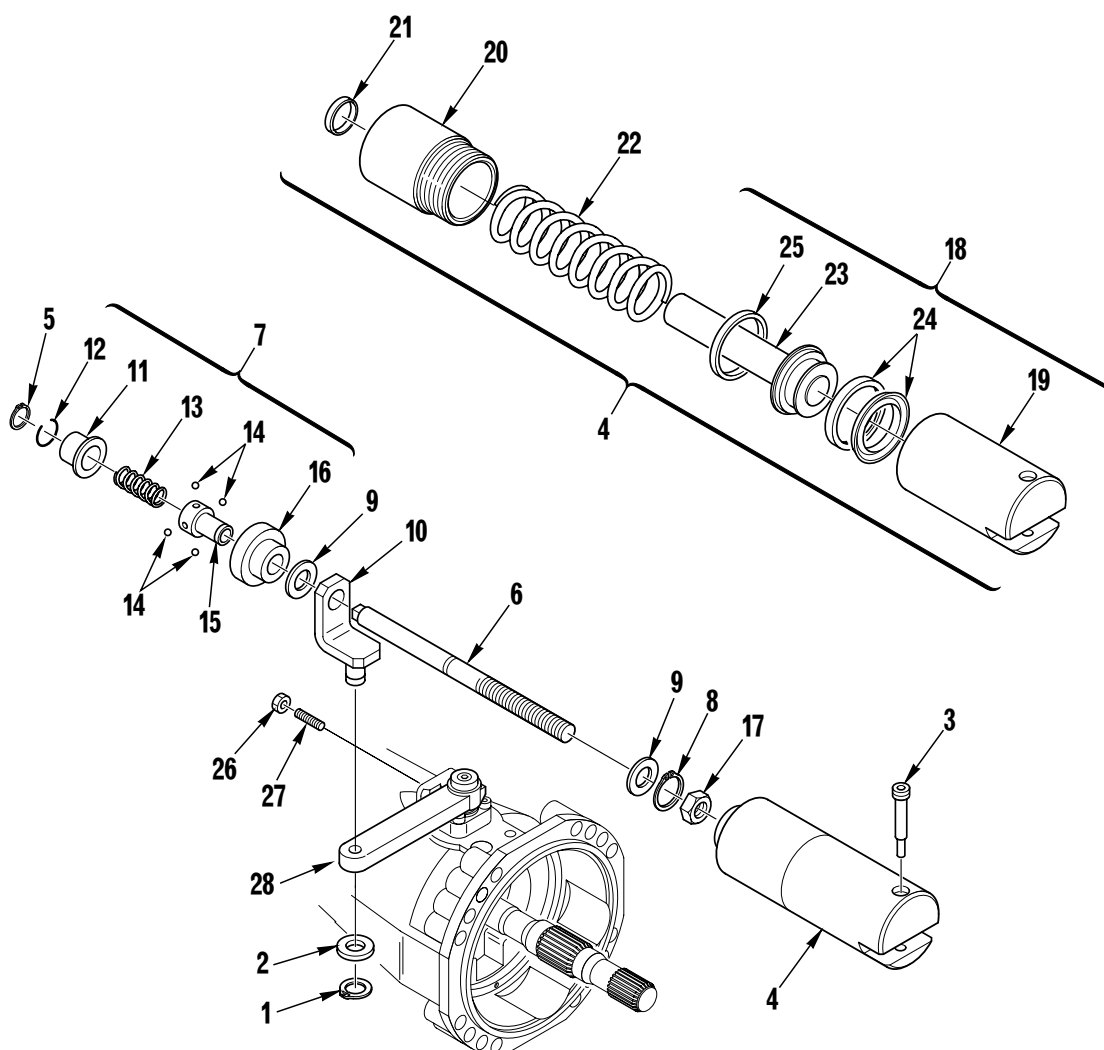
Remove seals (24) and guide ring (25) from the piston (23).
NOTE. Note down seals installation direction.



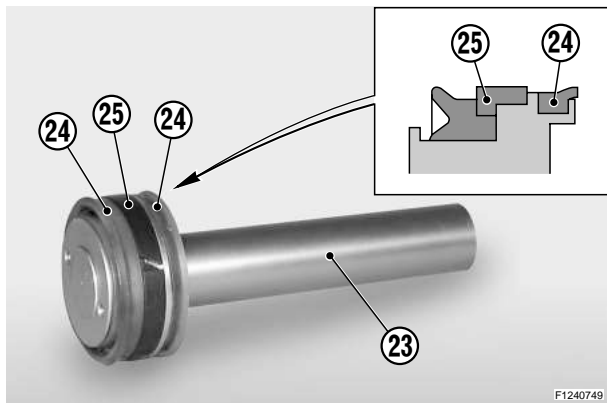
GB

b

ONLY IF NECESSARY
Remove guide ring (21) from spring seat (20).
CAUTION! If guide ring (21) is taken out, it must be replaced.

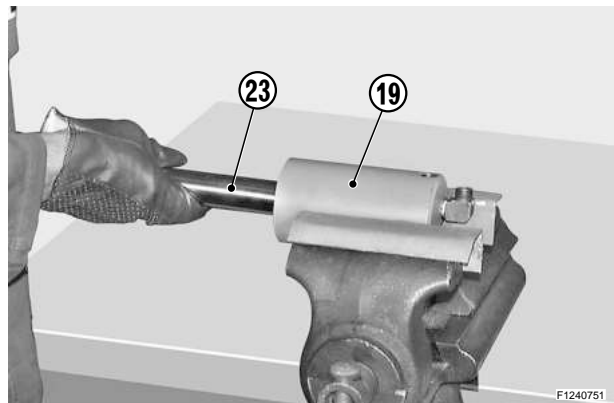


D1240091



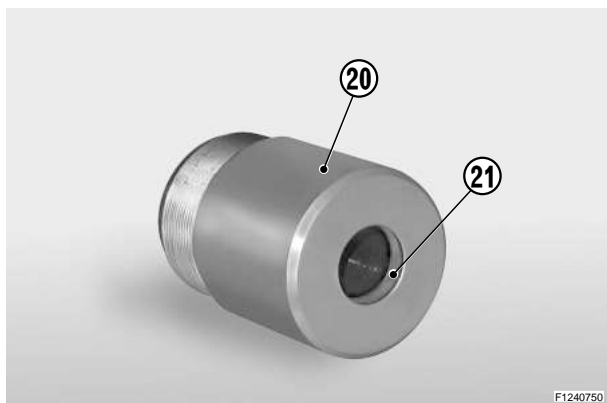
Fit guide ring (25) and seals (24) onto the piston (23).
CAUTION! Carefully check seals installation direction.

a



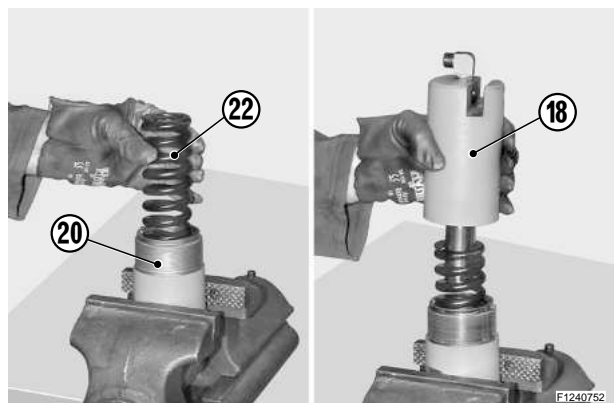
Lubricate seals (24) and the inside part of the cylinder (19); introduce the whole piston and move it to end of stroke.

b



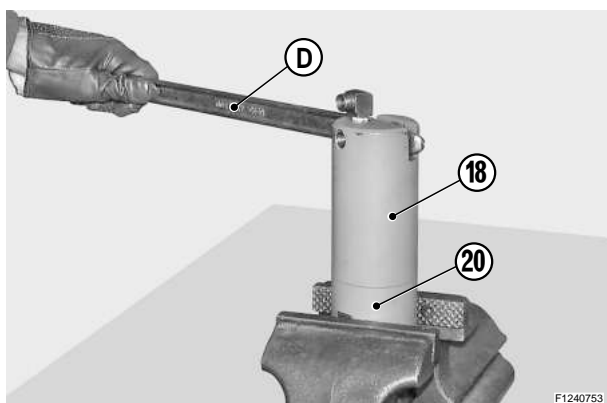
It the guide ring has been taken out, fit a new one (21) into the spring seat (20).
Lubricate the guide ring.

c



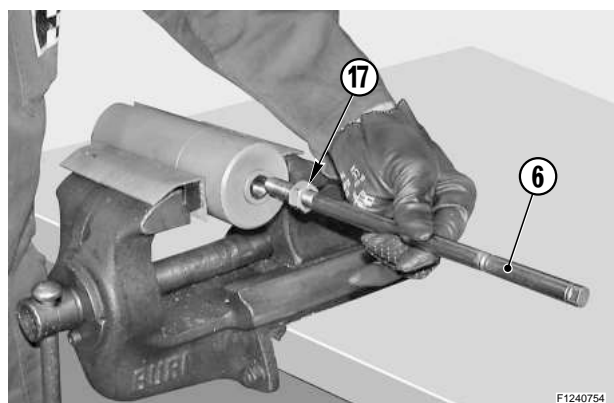
Position the spring seat (20) in a vice and insert spring (22).
Lubricate the thread. Install the whole cylinder (18).

d



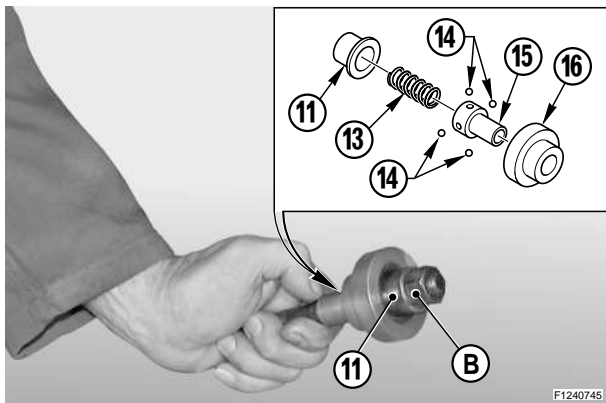
Screw the cylinder (18) into the spring seat (20) and lock it using a bar "D".

e



Screw stem (6) into the piston without locking the nut (17).

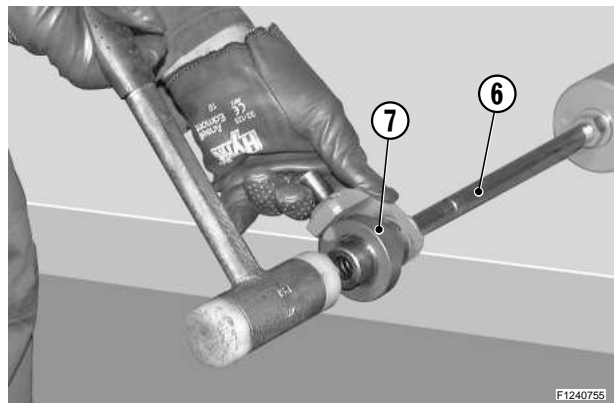
f



GB

a

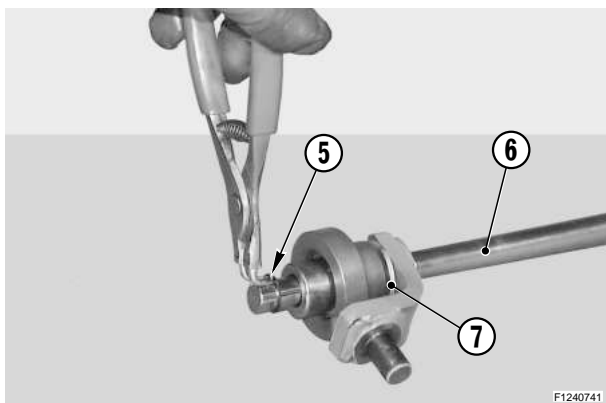
Assemble the check unit (7) by inverting the steps followed in the disassembly procedure.



GB

b

Using a plastic hammer, install the check unit (7) onto the stem (6).



GB

c

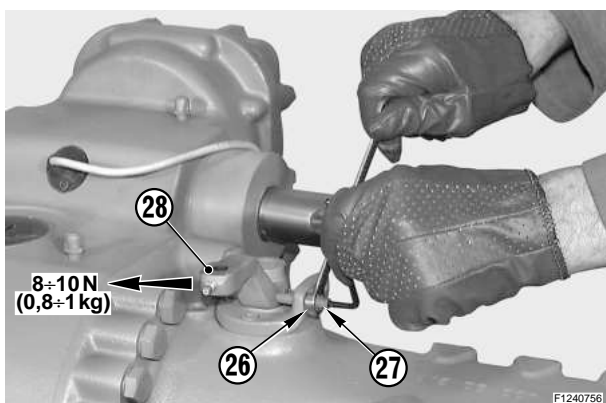
Fit the safety snap ring (5) onto the stem (6).



GB

d

CAUTION! In case the braking disks have been replaced or if brake pistons have been removed: before adjusting the negative braking unit, apply the brakes several times at maximum pressure in order to set clearances.

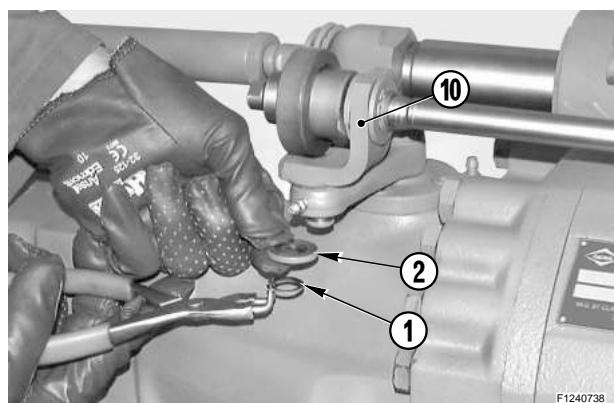


GB

e

Loosen nuts (26) and apply a force of 8–10 N (0.8–1 kg) to levers (28). Direct the force towards the braking direction to eliminate the clearances by using dowels (27); lock nuts (26) to a torque wrench setting of 20–25 Nm.

CAUTION! The idle stroke should be eliminated without causing any preloading.



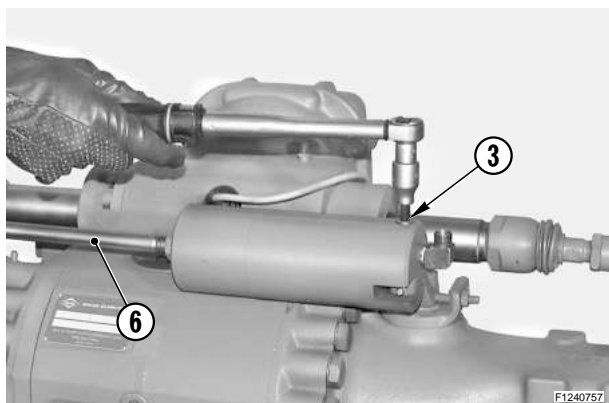
GB

f

Fit the distance piece (2) and insert the pin of support (10) in the right-hand braking lever. Fit the snap ring (1).



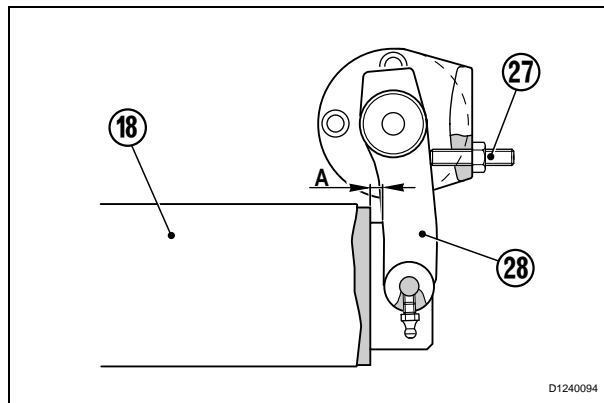
HOW TO ASSEMBLE THE EXTERNAL HYDRAULIC NEGATIVE BRAKE WITH QUICK RELEASE - ASSEMBLAGGIO FRENO NEGATIVO IDRAULICO ESTERNO CON SBLOCCAGGIO RAPIDO - ÄußERE HYDRAULISCHE NEGATIVBREMSE MIT SCHNELLENTSICHERUNG MONTIEREN - ASEMBLAJE FRENO NEGATIVO IDRAULICO ESTERNO CON SBLOQUEO RAPIDO - ASSEMBLAGE ET INSTALLATION DU FREIN NEGATIF HYDRAULIQUE EXTERNE AVEC DEBLOCAGE RAPIDE



GB

a

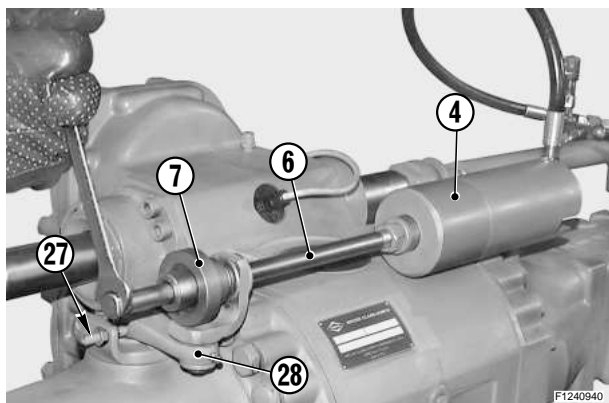
Rotate stem (6) to centre the hole of the fulcrum pin (3). Apply Loctite 242 to the thread of the fulcrum pin (3), screw and tighten pin with a dynamometric wrench set to 25–30 Nm.



GB

b

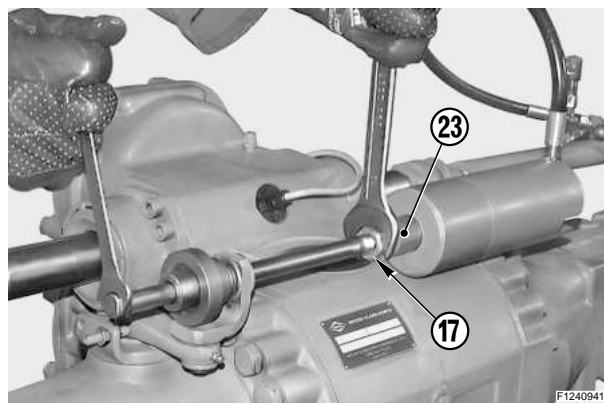
Check that a clearance "A" is left between the lever (28) on the cylinder side (resting against the adjustment dowel) and cylinder (18). If necessary, remove the lever, turn it by one tooth in relation to the spline and repeat idle stroke elimination procedure.



GB

c

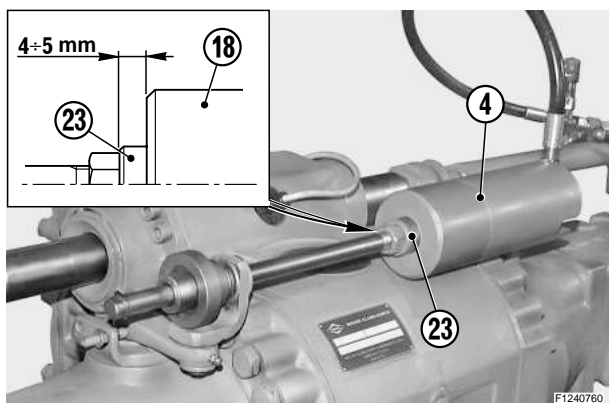
Introduce pressure into the cylinder (4) and, with the levers (28) resting against the adjustment dowels (27), screw rod (6) to engage the quick release (7) in the slot.



GB

d

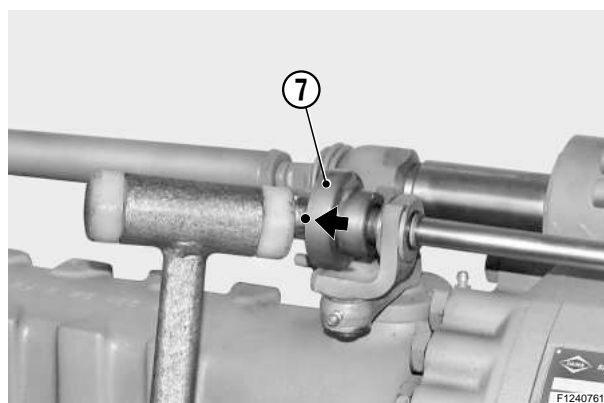
Lock nut (17) in position against the stem of the piston (23). Torque wrench setting for the nut: max. 40 Nm.



GB

e

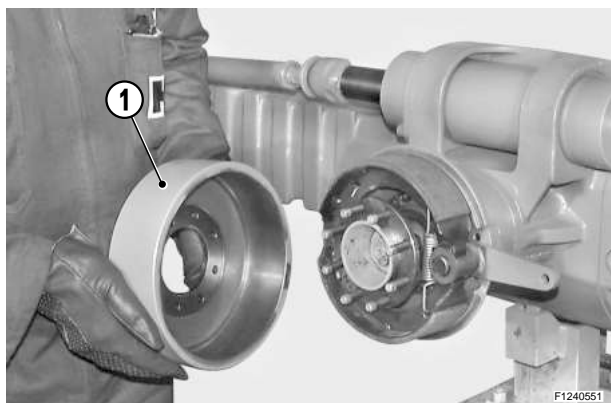
Release the pressure and check that piston (23) returns and stops in a position where it projects out from the cylinder head (4) by 4–5 mm.



GB

f

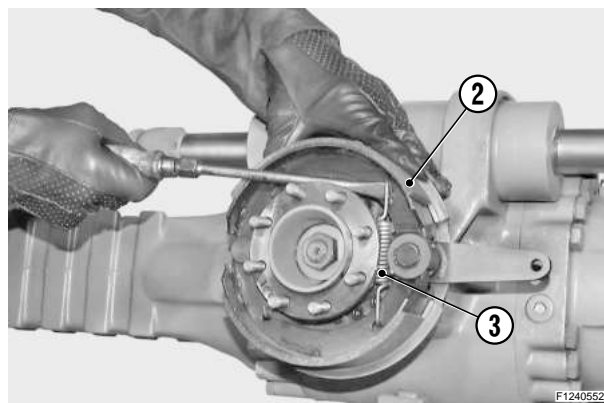
Release the check unit (7) by giving a hammer blow to the external ring. Introduce pressure again and check that at the end of piston stroke, the check unit (7) is actually engaged onto the rod (6).



GB

a

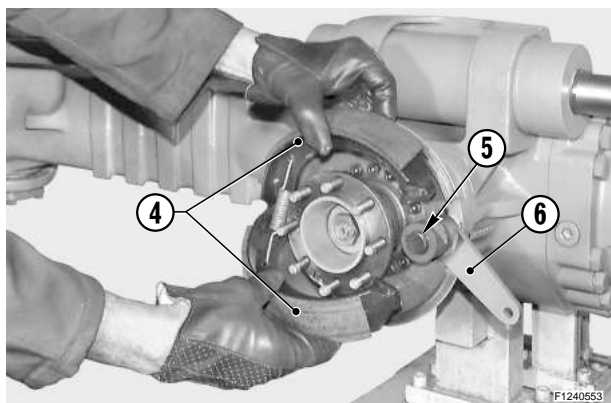
Pull out the drum (1) and remove dust from friction surfaces.
CAUTION! Use only brush-type vacuum cleaners.



GB

b

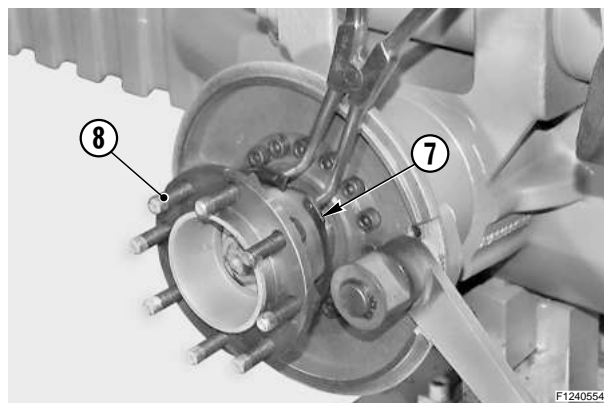
Hold the upper shoe into position (2) and release the spring (3)



GB

c

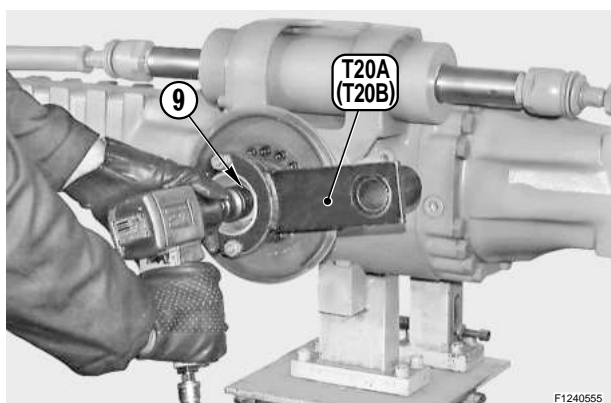
Remove the shoe assembly (4).
If necessary, remove the snap ring (5) and pull out the lever (6)



GB

d

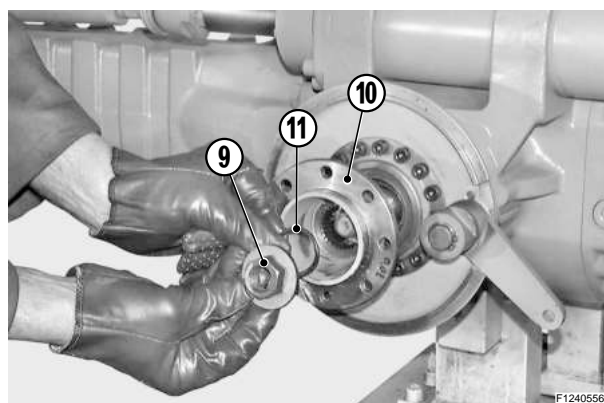
Remove the snap ring (7) from its seat around the screws (8).
Remove the screws (8).



GB

e

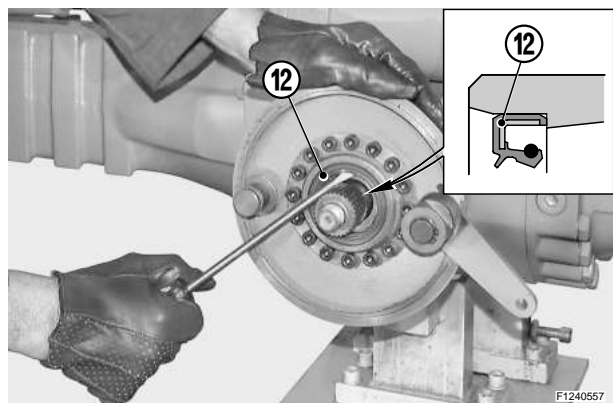
Fit tool **T20A (T20B)**, engage the stop rod and loosen the check nut (9) of the flange (10).



GB

f

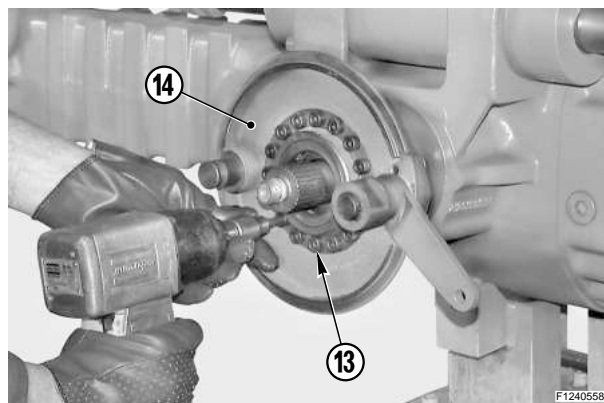
Remove parts in the following sequence: nut (9), O-ring (11), flange (10) and stop ring (7).



GB

a

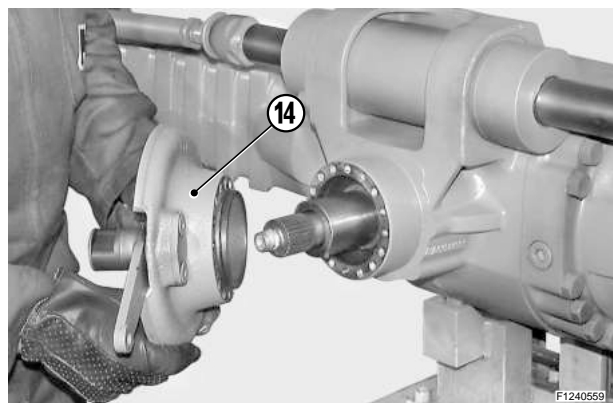
Remove the seal (12) and discard it.
NOTE. Note down assembly direction.



GB

b

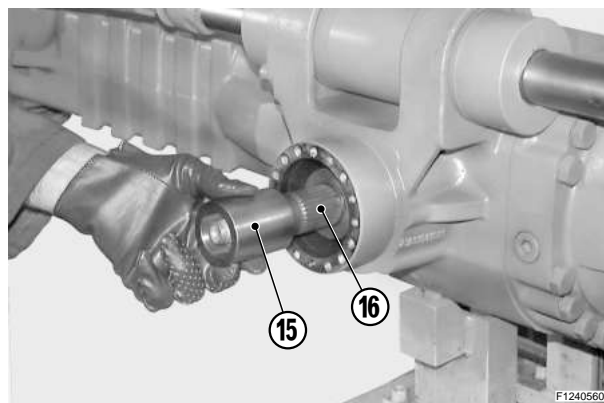
Remove the securing screws (13) from brake support (14).



GB

c

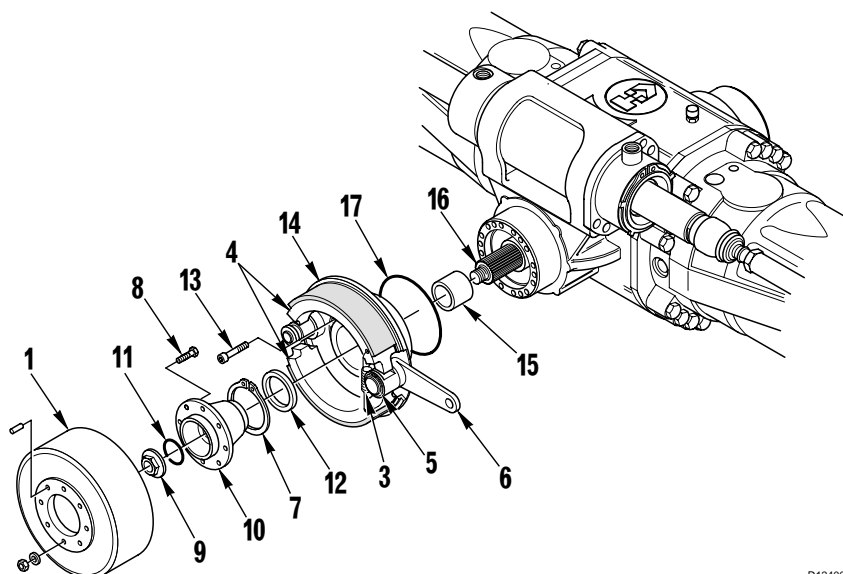
Remove brake support (14).



GB

d

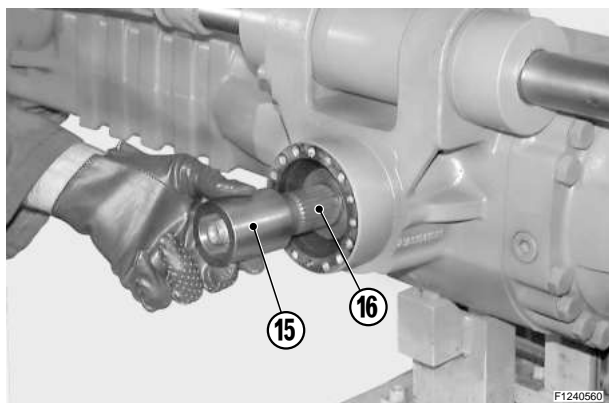
Remove the distance piece (15).
NOTE. If operations are to be carried out the bevel pinion, see the specific axle section.



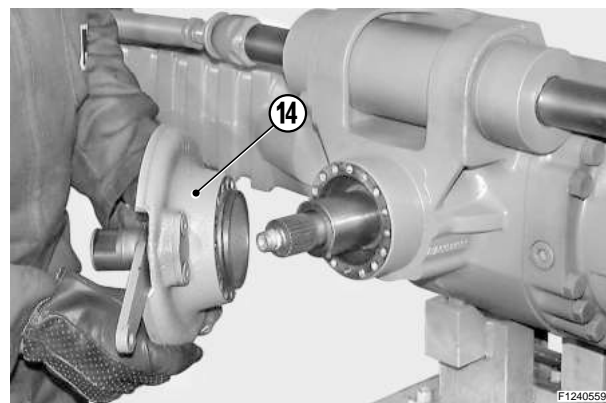
D1240077



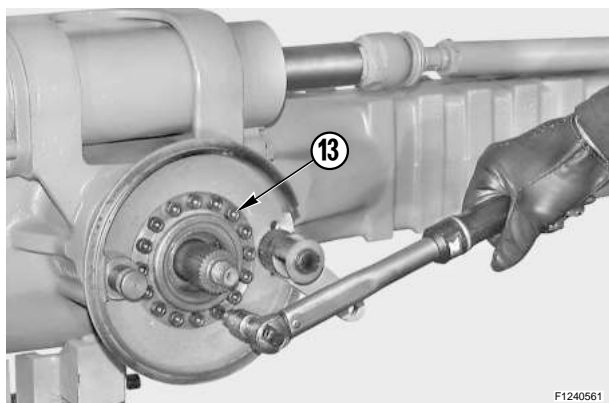
ASSEMBLING THE INCOMING DRUM BRAKE - ASSEMBLAGGIO FRENO A TAMBURO IN ENTRATA - TROMMELBREMSE AM EINGANG
MONTIEREN - MONTAJE DEL FRENO DE TAMBOR EN ENTRADA - ASSEMBLAGE DU FREIN D'ENTRÉE A TAMBOUR



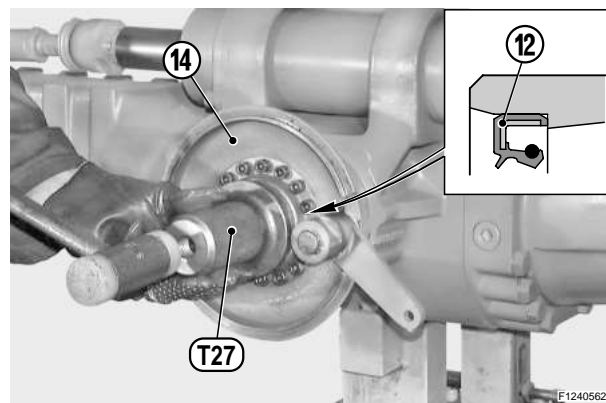
Fit the distance piece (15) onto the pinion (16).



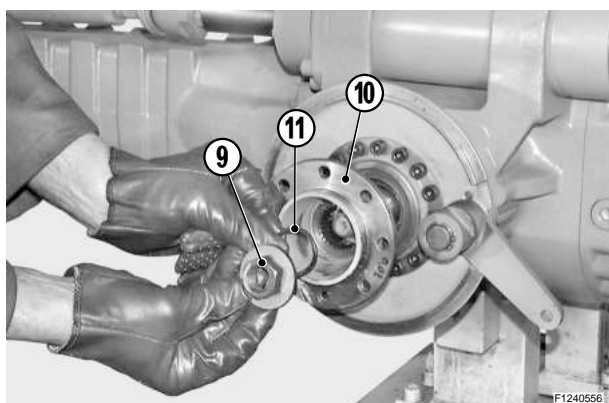
Lubricate the coupling surfaces and position brake support (14). Check that the O-ring (17) is intact.



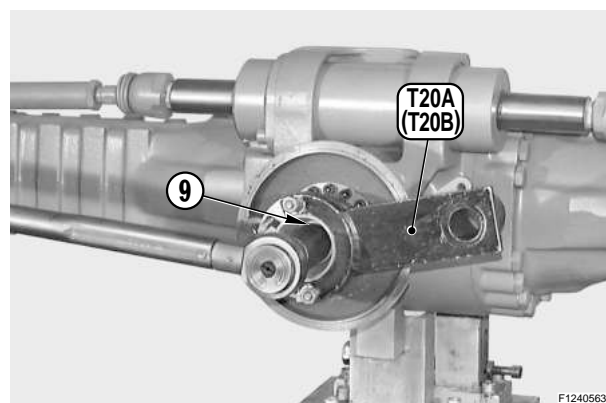
Apply Loctite 242 to the screws (13) and tighten using the criss-cross method. Torque wrench setting: 34.2–37.8 Nm



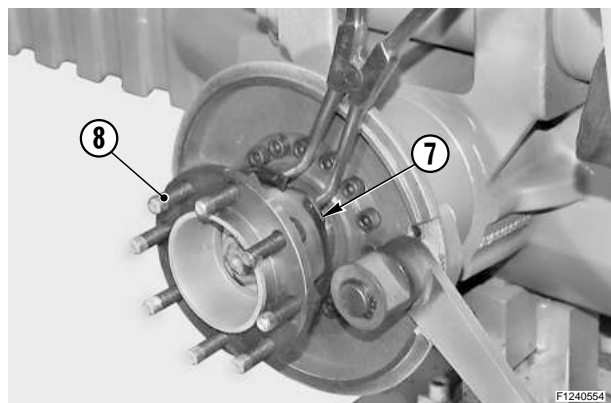
Lubricate the outer part of the seal (12) and insert it into the brake support (14) using tool **T27**.
NOTE. Carefully check assembly direction.



Install parts in the following sequence: flange (10), O-ring (11) and nut (9). Spread Loctite 242 on the threaded portion of the pinion (16)



Fit tools **T20A** (or **T20B**), engage the stop rod and tighten the nut (9). Torque wrench setting: 280–310 Nm

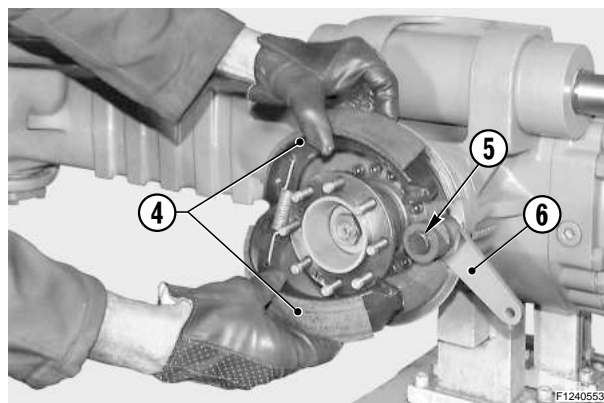


GB

a

Insert the screws (8) and hold them in position with the snap ring (7).

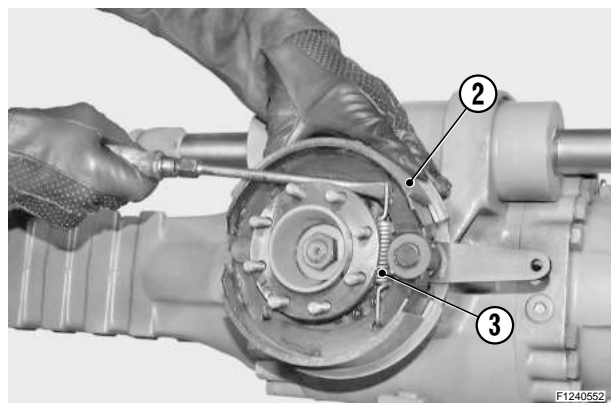
NOTE. Make sure that the ring is properly set in its seat.



GB

b

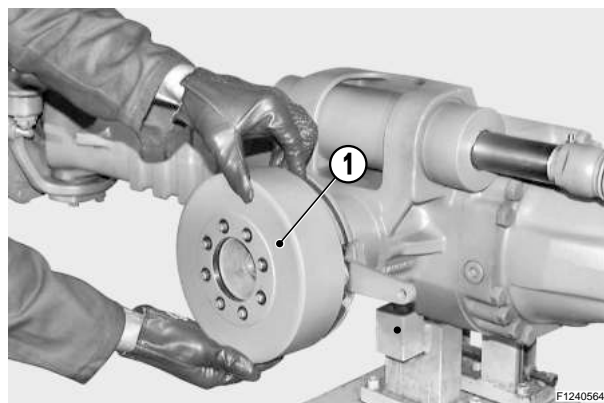
If the lever (6) has been removed, install it and hold it in position with the snap ring (5). Fit the shoes assembly (4).



GB

c

Make sure that the shoes (4) centre the slot of the fulcrum pin and rest on the surface of the lever (6).



GB

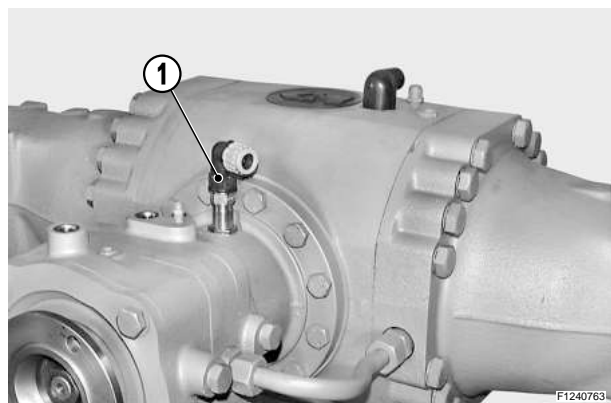
d

Fit the drum (1).

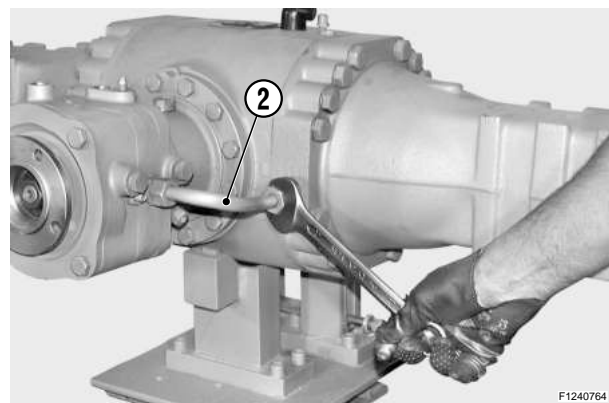
NOTE. Make sure that the friction surface of the drum carries no trace of grease and is perfectly clean.



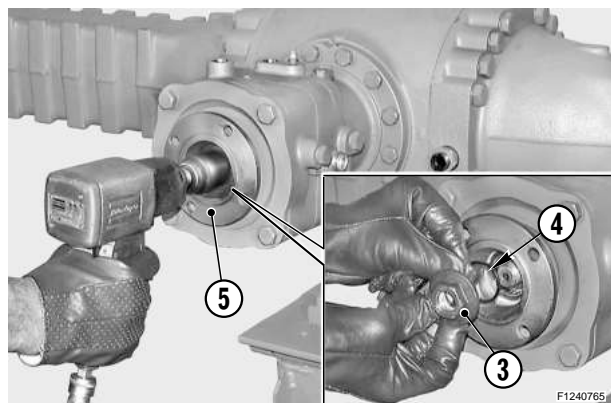
HOW TO DISASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - SMONTAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) ABMONTIEREN - DESMONTAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - DESMONTAJE FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



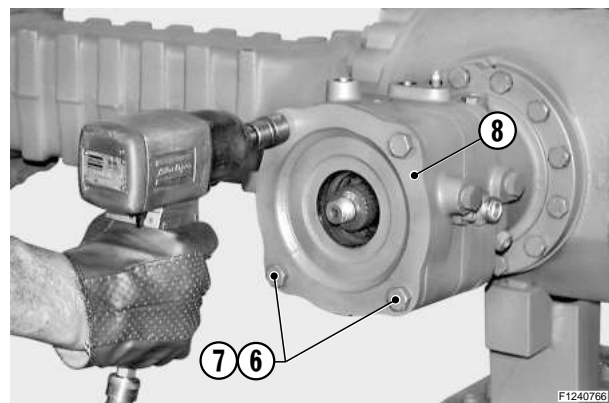
Remove movement sensor (1), if fitted.



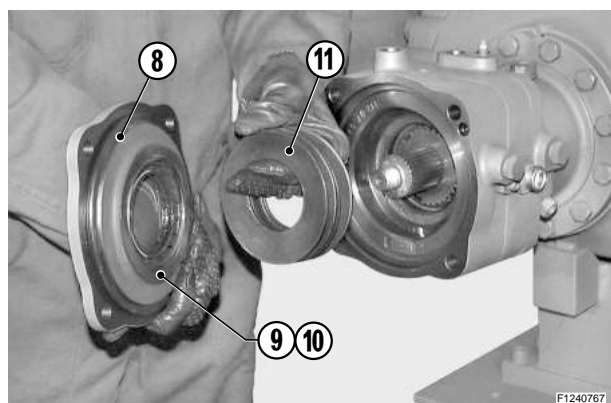
Loosen the two nuts and remove lubrication tube (2).



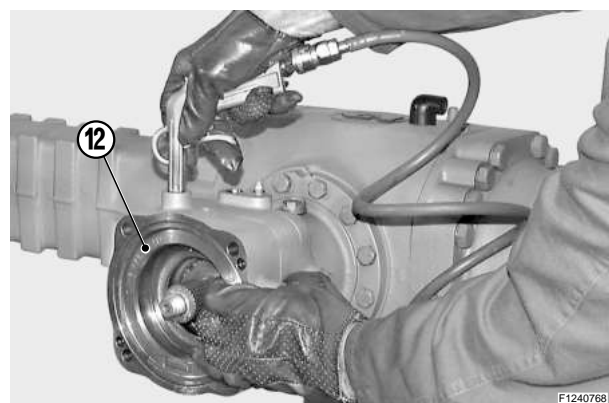
Remove nut (3), O-ring (4) and flange (5).
NOTE. If disassembly is awkward, heat nut (3) at about 80°C.



Loosen screws (6) in an alternate and criss-cross manner until the action of Belleville washers (11) becomes null.
Remove screws (6) and spring washers of cover (8).



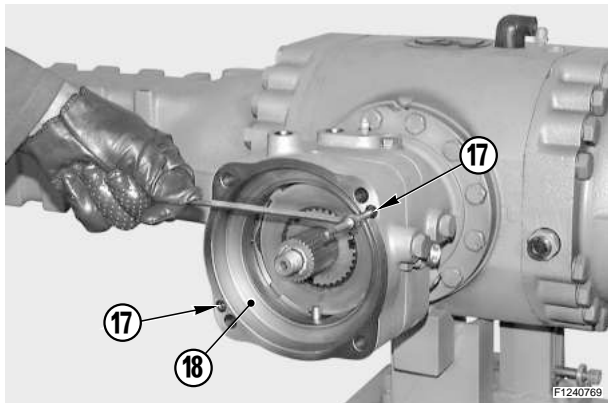
Pull out cover (8), shims (9) separating ring (10) and Belleville washers (11).
NOTE. Take note of the assembly direction of: shims (9) and Belleville washers (11).



Slowly introduce compressed air through the negative brake connection point in order to extract the piston (12).
CAUTION! Hold piston (12) as it may be rapidly ejected and damaged.



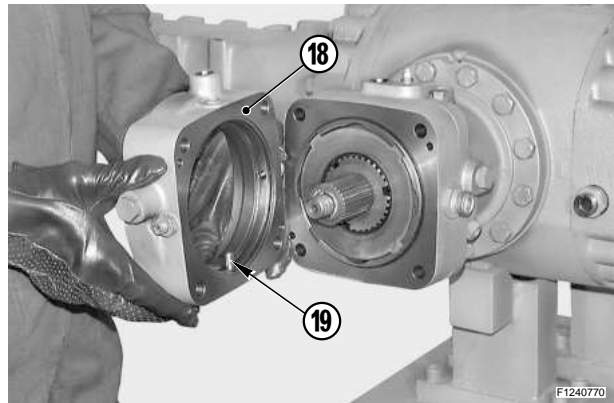
HOW TO DISASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - SMONTAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) ABMONTIEREN - DESMONTAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - DESMONTAJE FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



GB

a

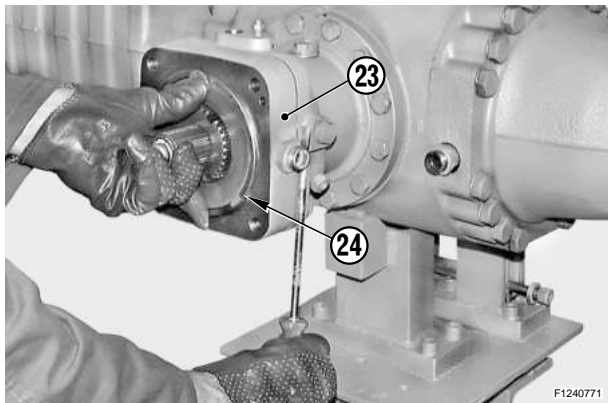
Remove check screws (17) from cylinder (18).



GB

b

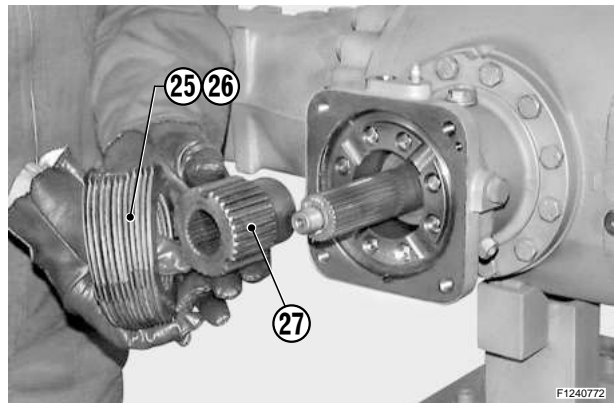
Remove cylinder (18) complete with guide pin (19) of piston (12).
NOTE. Take note of direction of assembly.



GB

c

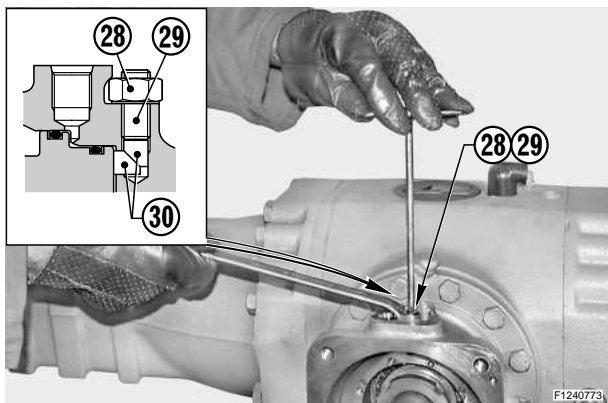
With the help of a lever, prize off the distance piece (23) complete with O-ring (24).
NOTE. Thoroughly clean the face of bevel pinion support where the hub rests, check the O-ring (24) and replace it if necessary.



GB

d

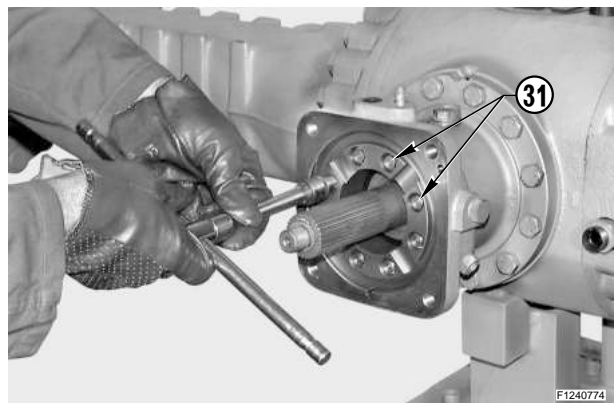
Remove friction discs (25), (26) and hub (27).



GB

e

3-FUNCTION VERSION ONLY
Loosen nuts (28) (no. 3) and unscrew dowels (29) (no. 3) to retract the adjustment points (30).
NOTE. Loosen dowels (29) in an alternate manner until the piston comes to end of backstroke.
ONLY IF NECESSARY. Remove points (30).



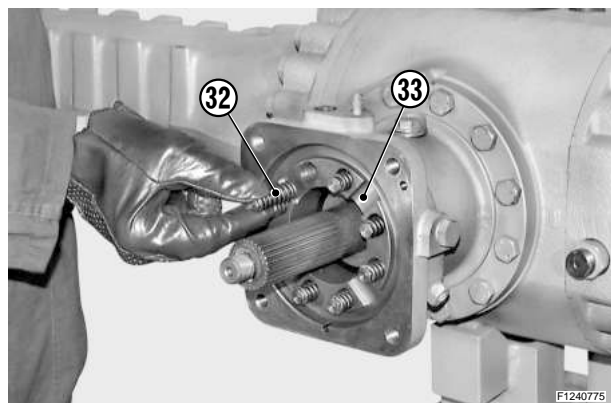
GB

f

3-FUNCTION VERSION ONLY
Loosen and remove the pin-type screws (31).
NOTE. Loosen screws (31) in an alternate and criss-cross manner.



HOW TO DISASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - SMONTAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) ABMONTIEREN - DESMONTAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - DESMONTAJE FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)

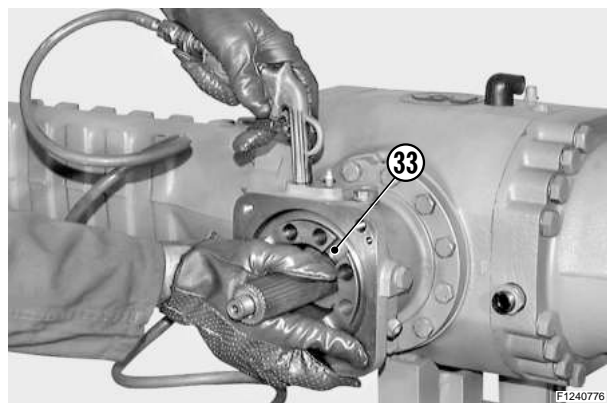


GB

a

3-FUNCTION VERSION ONLY

Remove springs (32) of piston (33) backward movement.



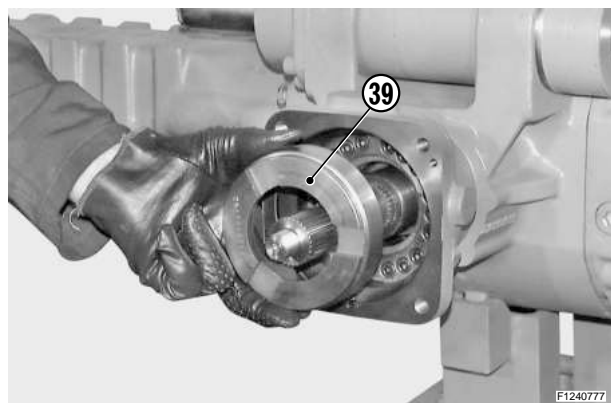
GB

b

3-FUNCTION VERSION ONLY

Slowly introduce compressed air through the connection point of the service brake to extract the piston (33).

CAUTION! Hold piston (33) as it may be rapidly ejected and damaged.

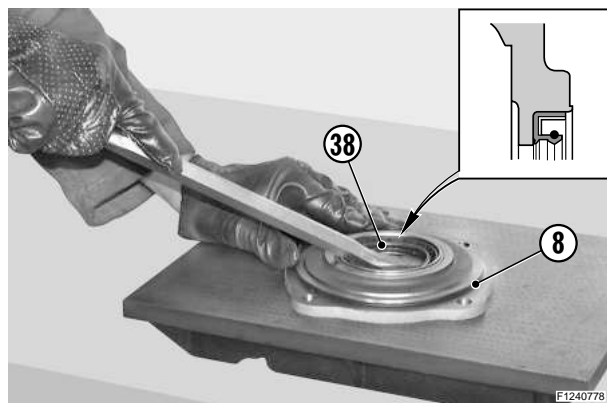


GB

c

2-FUNCTION VERSION ONLY

Remove the distance piece (39).

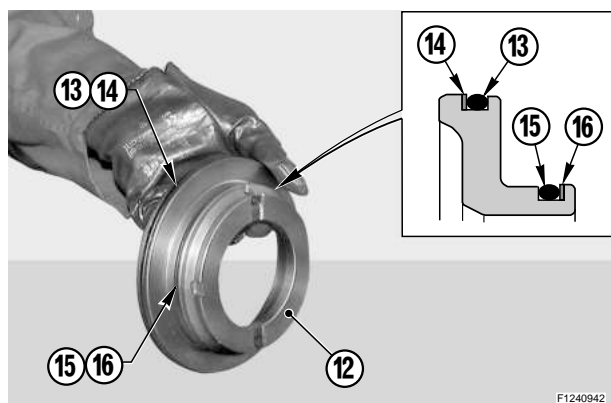


GB

d

Remove sealing ring (38) from cover (8).

NOTE. Take note of direction of assembly of ring (38) and replace ring every time the unit is disassembled.

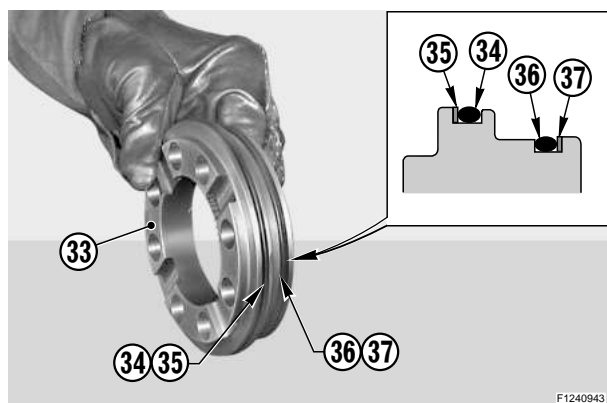


GB

e

Remove sealing rings (13) and (15) and anti-extrusion rings (14) and (16) from the piston (12).

NOTE. Sealing rings (13) and (15) and anti-extrusion rings (14) and (16) must be replaced each time the unit is disassembled.



GB

f

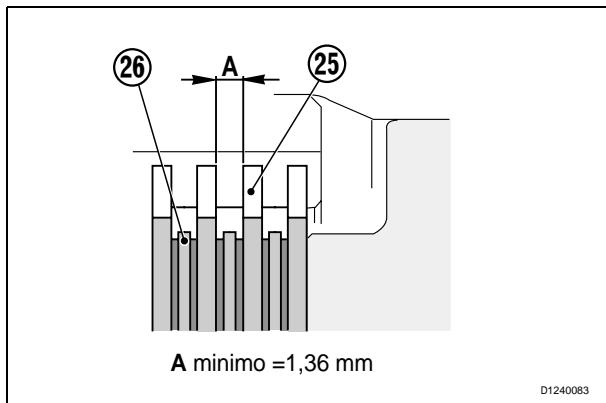
3-FUNCTION VERSION ONLY

Remove sealing rings (34) and (36) and anti-extrusion rings (35) and (37) from piston (33).

NOTE. Sealing rings (34), (36) and anti-extrusion rings (35), (37) must be replaced each time the unit is disassembled.



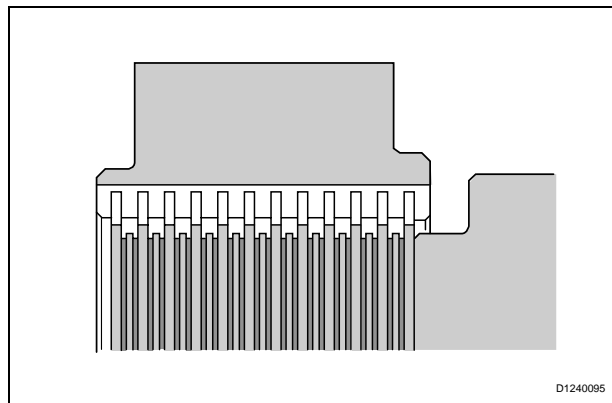
HOW TO DISASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - SMONTAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) ABMONTIEREN - DESMONTAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - DESMONTAJE FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



GB

a

CAUTION! Always check the thickness of braking discs (26), even if the braking unit is being disassembled for other reasons than this.
If thickness "A" of one of the discs (26) is close to the minimum admissible size of 1.36 mm, replace the whole pack.

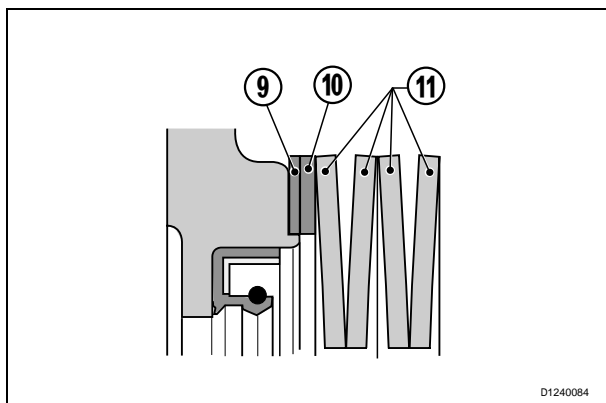


GB

b

BRAKING DISCS PACK CONTENTS

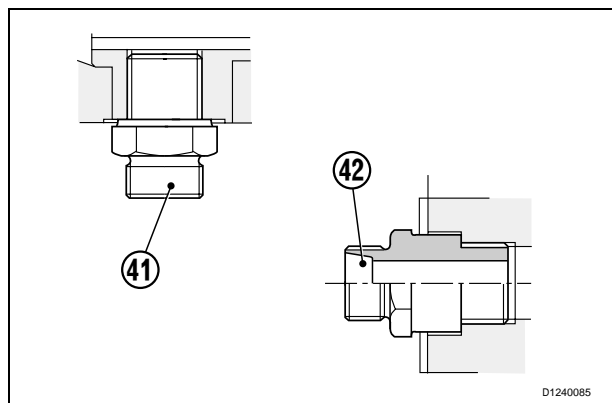
The braking discs pack is comprised of: 11 braking discs and 12 steel counterdiscs.



GB

c

CAUTION! If the braking discs unit is replaced, shims (9) - which determine the preloading of Belleville washers (11) - must be restored.



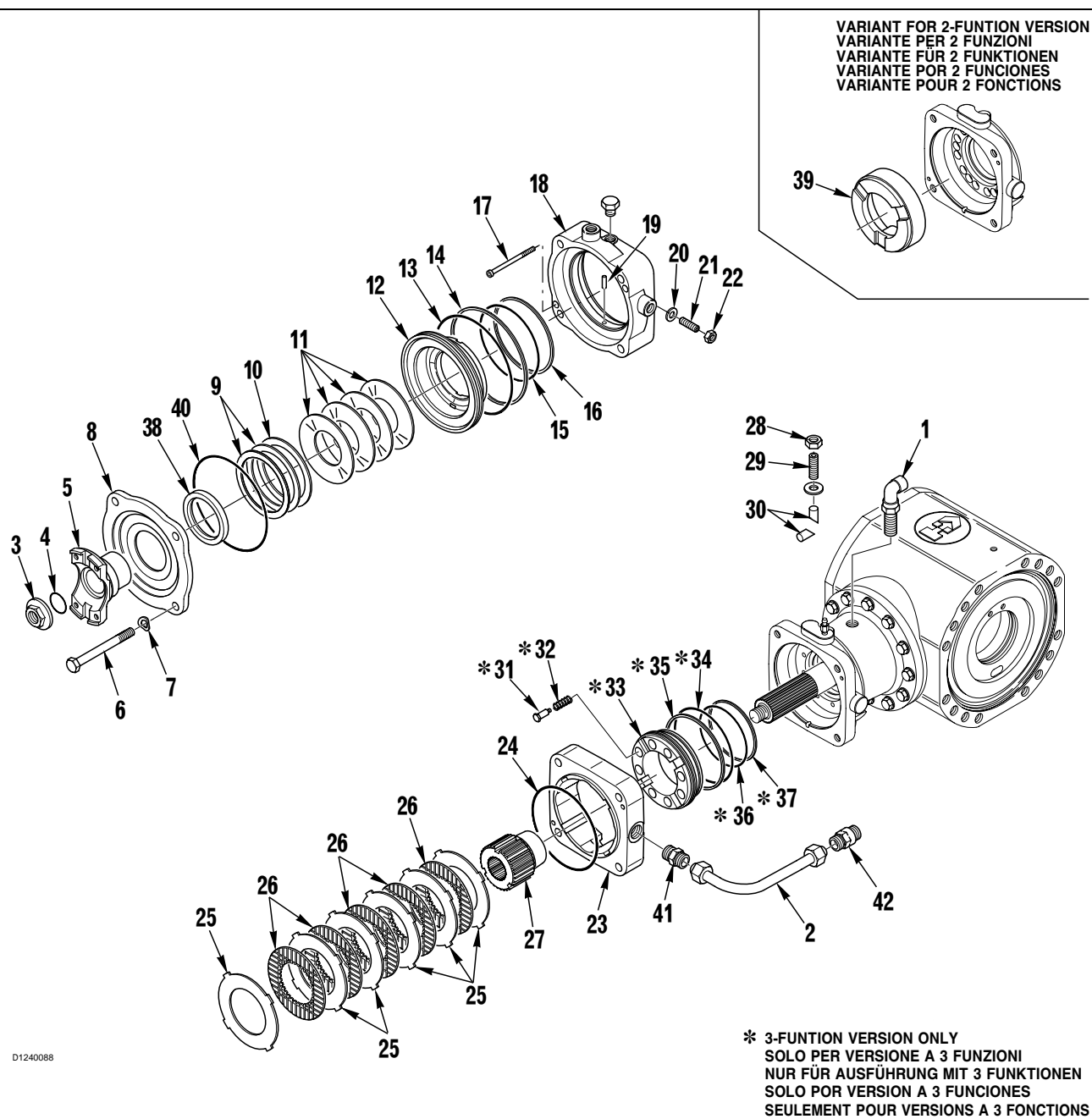
GB

d

ONLY WHEN REPLACEMENT IS NECESSARY

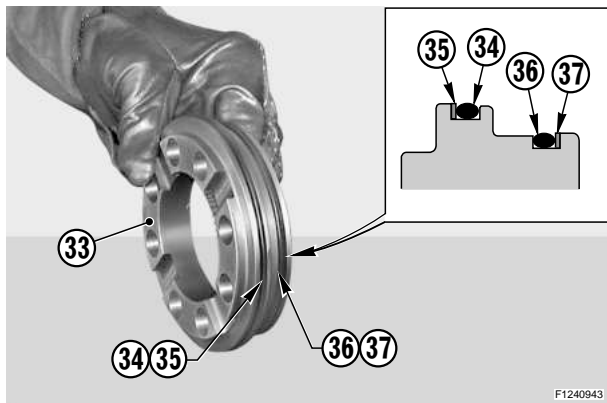
Remove the union pieces (41) and (42) connecting the lubrication tube (2).

NOTE. During the assembly stage, union pieces (41) and (42) must be coated with Loctite 577 and tightened to a torque wrench setting of 35 – 50 Nm.





HOW TO ASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - ASSEMBLAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) MONTIEREN - ASEMBLAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - MONTAJE DEL FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



F1240943



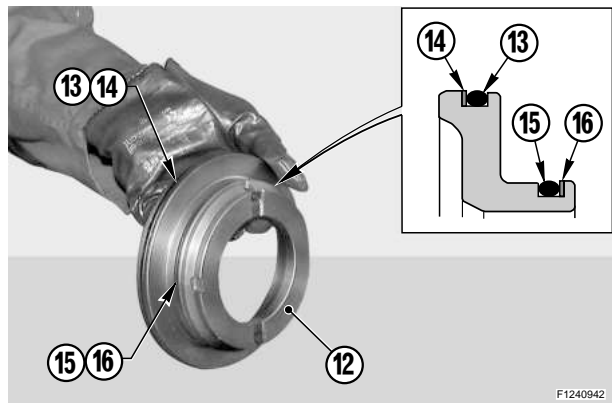
GB

a

3-FUNCTION VERSION ONLY

Fit the sealing rings (34), (36) and the anti-extrusion rings (35), (37) onto the piston (33) of the service brake.

NOTE. Carefully check the assembly position of anti-extrusion rings.



F1240942

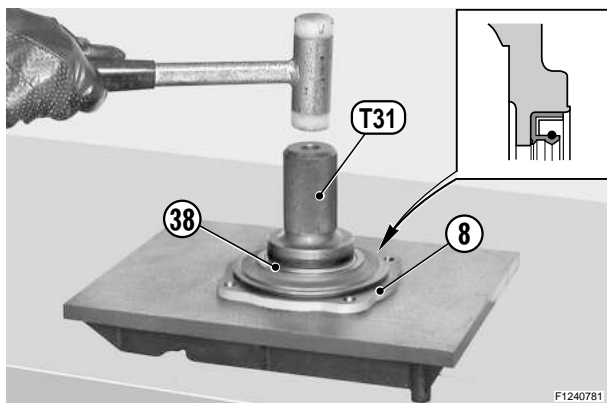


GB

b

Fit the sealing rings (13), (15) and the anti-extrusion rings (14), (16) onto the piston (12) of the negative brake.

NOTE. Carefully check the assembly position of the anti-extrusion rings.



F1240781

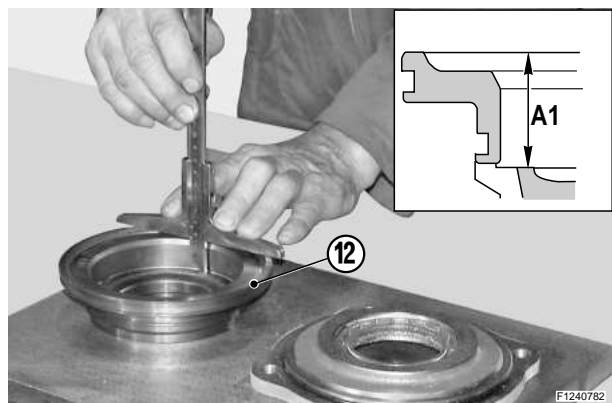


GB

c

Lubricate sealing ring (38) and, using tool T31, fit it into the cover (8).

NOTE. Carefully check the direction of ring (38).



F1240782

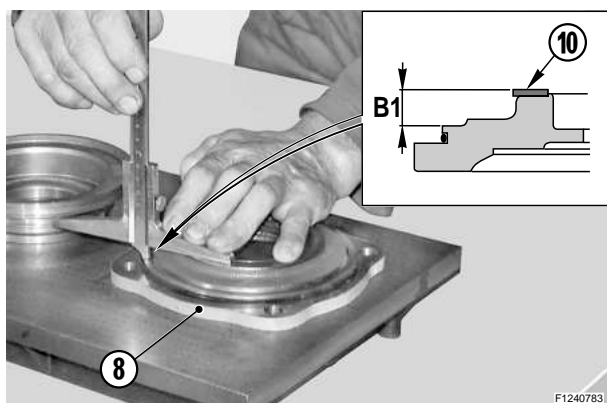


GB

d

3-FUNCTION VERSION ONLY

Measure size "A1" of piston (12) and note it down.



F1240783

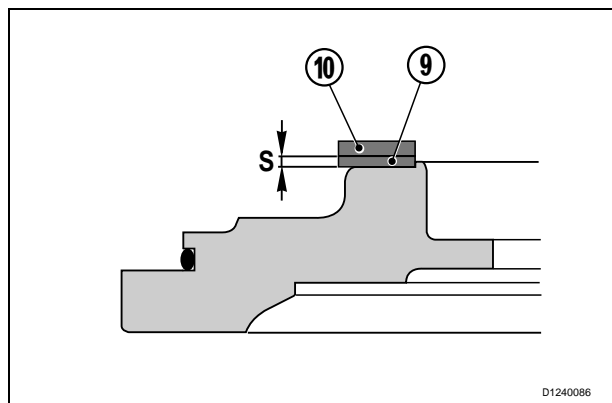


GB

e

3-FUNCTION VERSION ONLY

Fit the separating ring (10) of Belleville washers onto the cover (8), measure size "B1" and note it down.



D1240086



GB

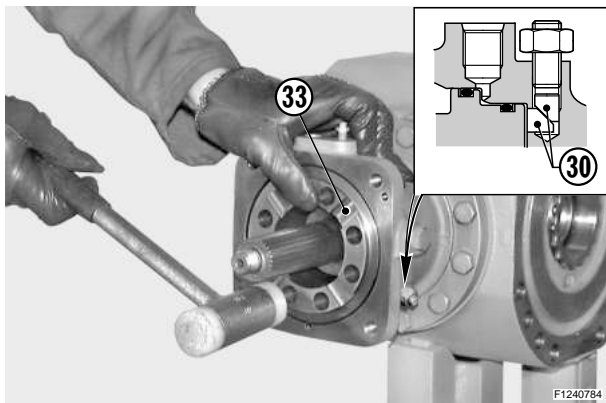
f

3-FUNCTION VERSION ONLY

Using the measurements just taken, calculate thickness "S" of shims (9) as follows: $S = (A1 + 1.5) - (B1 + 18.4)$ where:
S = Shim thickness - 1.5 mm = fixed measure of braking discs clearance - 18.4 mm = fixed measure of Belleville washers.



HOW TO ASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - ASSEMBLAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) MONTIEREN - ASEMBLAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - MONTAJE DEL FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



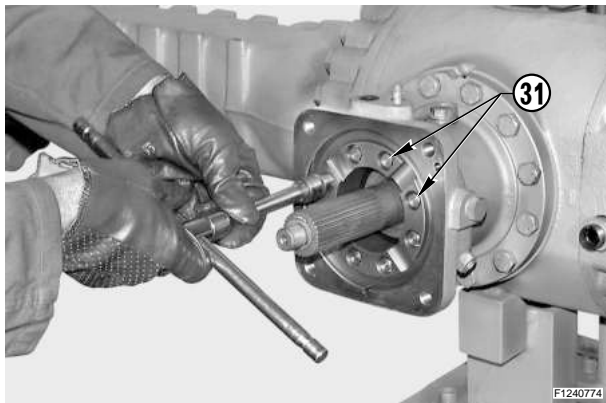
GB

a

3-FUNCTION VERSION ONLY

Lubricate the O-rings and install the whole piston (33). Orient the piston with the help of a lever and push it to end of stroke with a plastic hammer.

CAUTION! Check that the adjusting stakes (30) are thoroughly inserted and make sure they perform a sliding motion in relation to each other.



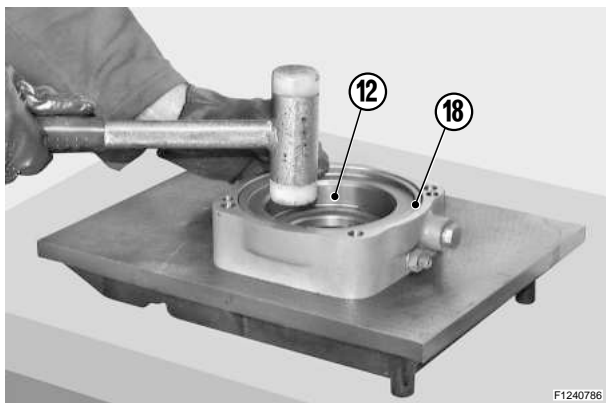
GB

c

3-FUNCTION VERSION ONLY

Apply Loctite 242 to the thread of screws (31) and tighten.

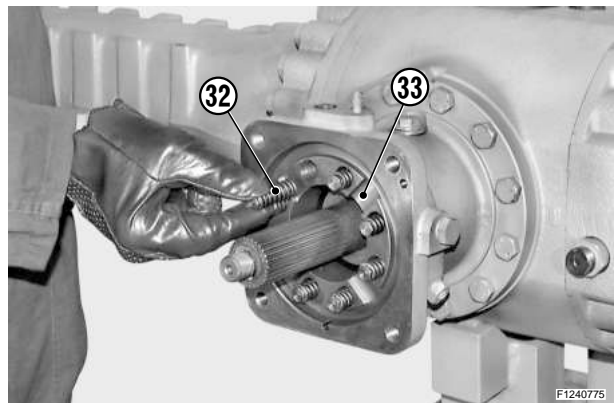
NOTE. Tighten the screws with a normal wrench in an alternate and criss-cross manner.



GB

e

Lubricate seals (13), (15) and fit the piston (12) into the cylinder (18). Engage piston on the pin (19). For the assembly, use a plastic hammer and push the piston (12) to end of stroke.

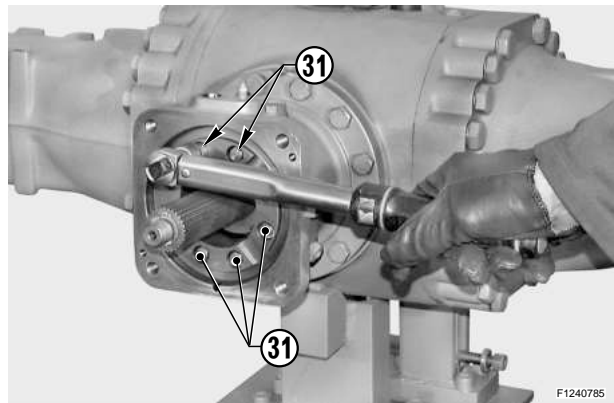


GB

b

3-FUNCTION VERSION ONLY

Insert springs (32) for piston (33) backward movement.



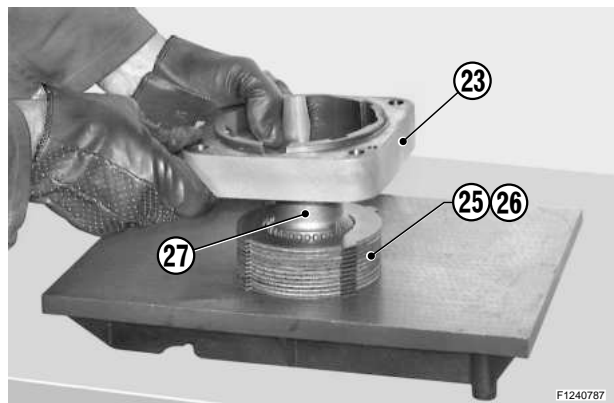
GB

d

3-FUNCTION VERSION ONLY

Lock screws (31) in a criss-cross manner by using a dynamometric wrench set to a max. torque of 10 Nm.

CAUTION! Do not exceed the specified torque setting.



GB

f

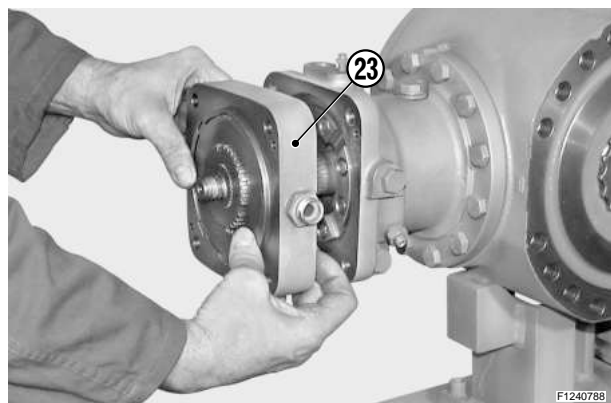
Lightly lubricate the braking discs (25), (26) and fit them onto the hub (27).

Align discs (25) and fit the distance piece (23).

NOTE. The braking discs pack starts and ends with steel discs (25).



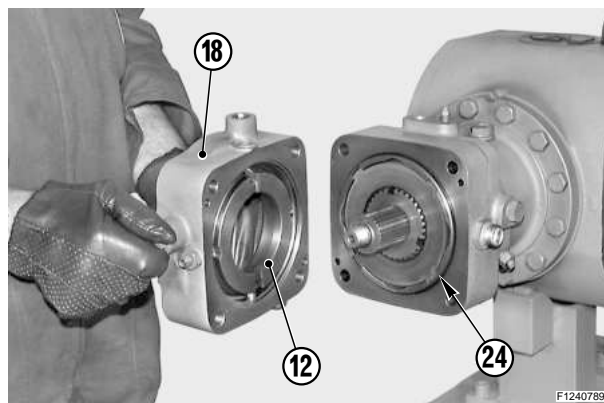
HOW TO ASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - ASSEMBLAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) MONTIEREN - ASEMBLAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - MONTAJE DEL FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



GB

a

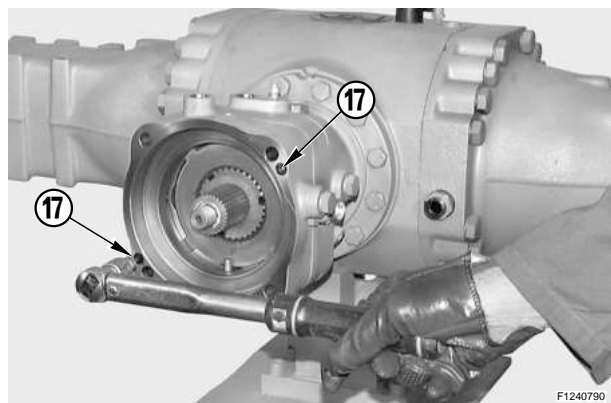
Apply Loctite 510 on the face of the distance piece (23). Fit the discs-hub-distance piece assembly prepared in the previous stages onto the pinion and engage it.



GB

b

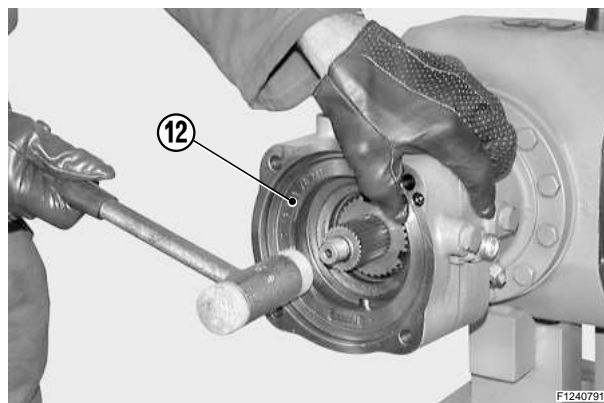
Lubricate the O-ring (24) and fit cylinder (18) complete with piston (12).



GB

c

Introduce screws (17) and tighten in a criss-cross manner: use a torque wrench setting of 9.5 – 10.5 Nm.
NOTE. Before giving the final tightening, align the external surfaces of the components.

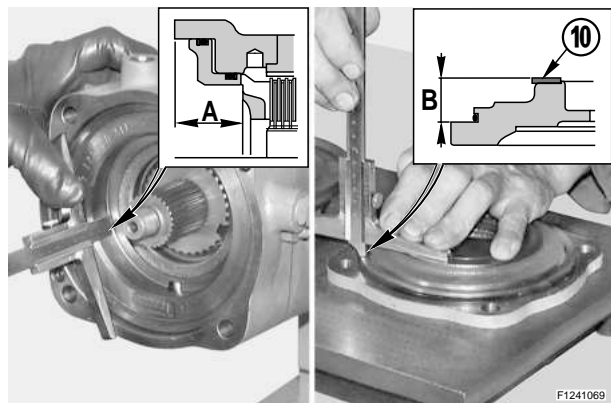


GB

d

3-FUNCTION VERSION ONLY

Using a plastic hammer, push the piston (12) to the end of stroke.

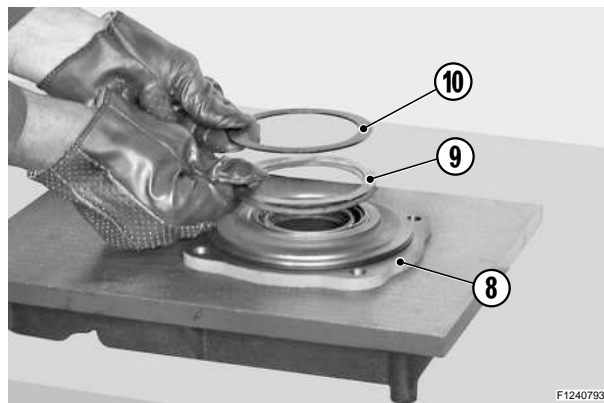


GB

e

2-FUNCTION VERSION ONLY

Fit the separating ring (10) of Belleville washers onto the cover (8), measure size "B" and note it down. Measure size "A" which you will need for calculating the shims (9) according to the following:
 $S = A - (B + 18.4)$ where: S = Shim thickness - 18.4 mm = fixed measure of Belleville washers.



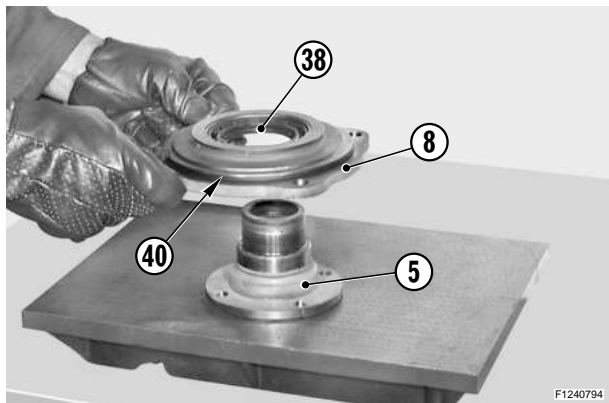
GB

f

Lightly lubricate the shims (9) required according to calculations and the separating ring (10) of the Belleville washers. Fit shims and ring on the cover (8).
NOTE. Position the larger shim so that it leans against the cover.



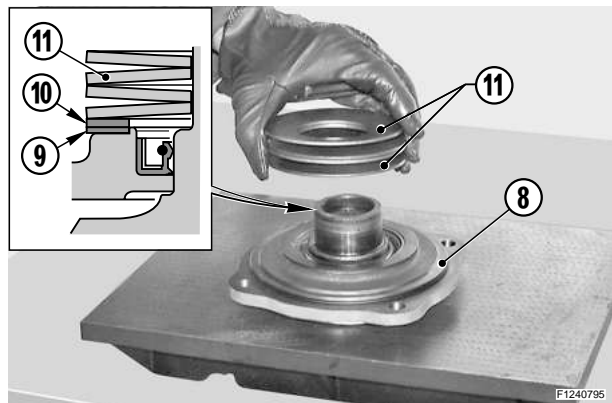
HOW TO ASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - ASSEMBLAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) MONTIEREN - ASEMBLAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - MONTAJE DEL FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



GB

a

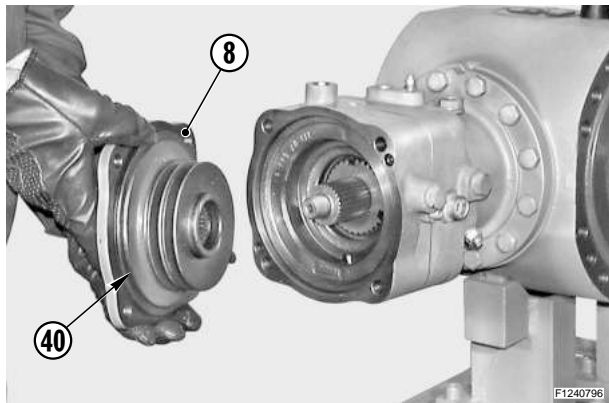
Check the state of the O-ring (40).
Lubricate sealing ring (38) and fit flange (5) into the cover (8).



GB

b

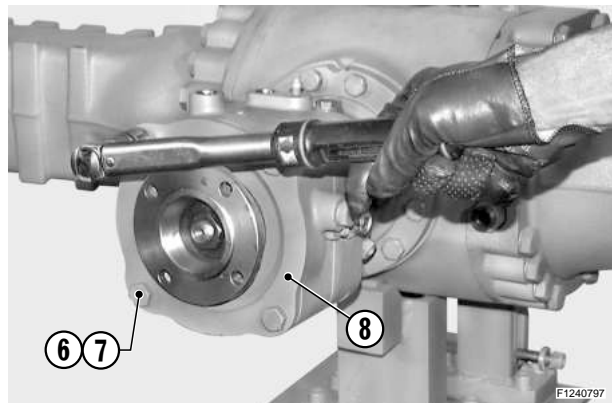
Fit the Belleville washers (11) onto the cover (8), thoroughly checking washers orientation.



GB

c

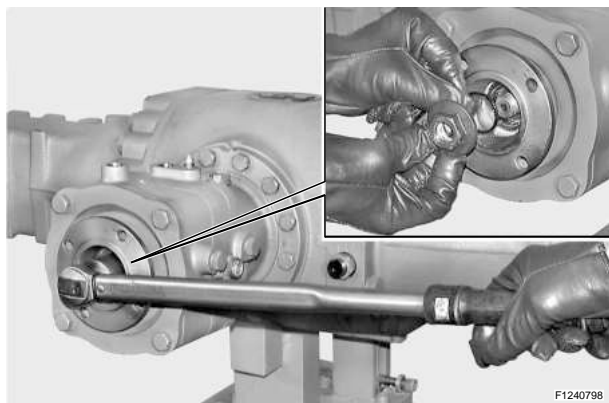
Lubricate the O-ring (40) and install the cover assembly (8).



GB

d

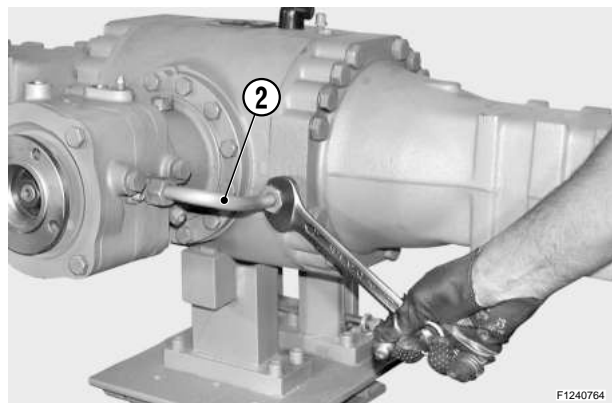
Fit screws (6) and washers (7); lock the cover with a torque wrench setting of 116 – 128 Nm.
NOTE. Tighten in an alternate and criss-cross manner.



GB

e

Apply Loctite 242 to the threaded portion of the pinion, fit O-ring (4) and nut (3); tighten the nut with a dynamometric wrench set to 280 – 310 Nm.
NOTE. Use tools T21-T22.



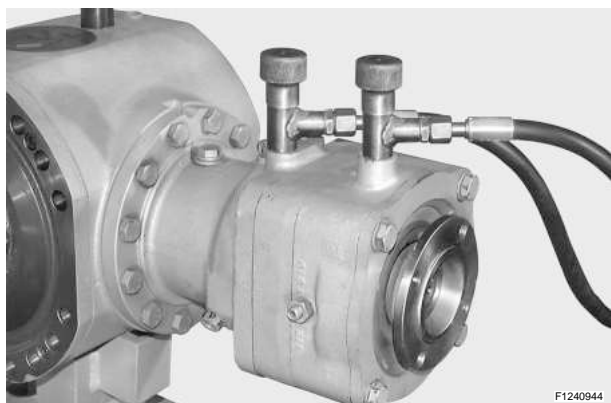
GB

f

Install the lubrication tube (2).



HOW TO ASSEMBLE THE 4" INCOMING BRAKE (2 AND 3 FUNCTION VERSIONS) - ASSEMBLAGGIO FRENO IN ENTRATA DA 4" (A 2 E 3 FUNZIONI) - BREMSE AM EINGANG ZU 4" (MIT 2 UND 3 FUNKTIONEN) MONTIEREN - ASEMBLAJE FRENO EN ENTRADA DE 4" (A 2 Y 3 FUNCIONES) - MONTAJE DEL FREIN EN ENTREE 4" (A 2 ET 3 FONCTIONS)



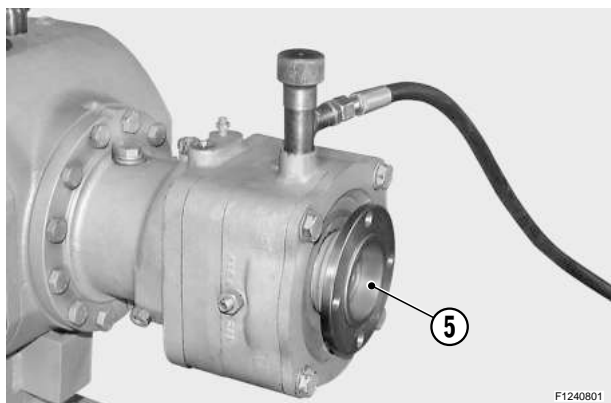
GB

a

3-FUNCTION VERSION ONLY

Connect the service and negative brakes to an external pump; introduce pressure up to a value of 20–25 Nm.

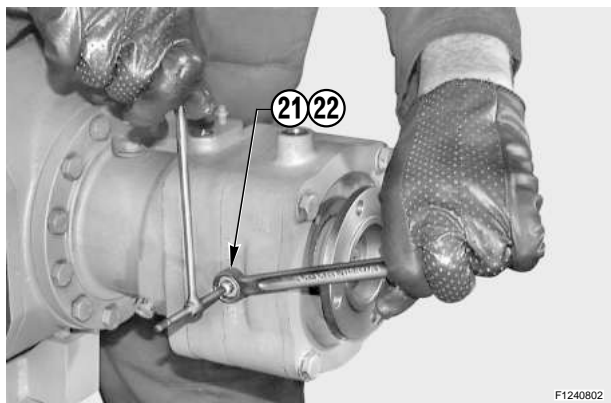
NOTE. Check that pressure is kept stable for at least 5 minutes and make sure there are no leaks.



GB

c

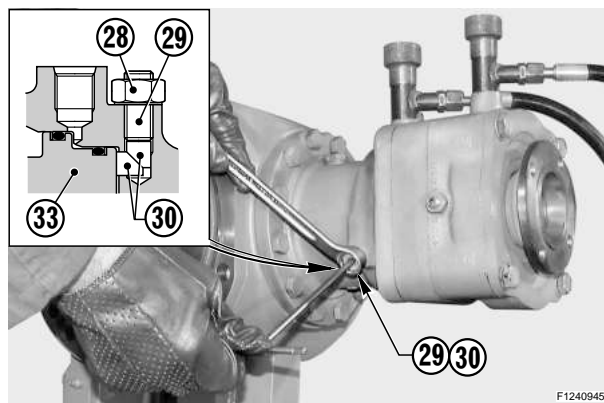
Check negative brake release by introducing a pressure of 16÷35 bar and by manually rotating the flange (5). Release pressure.



GB

e

CAUTION! To release the negative brake during an emergency, (lack of pressure due to vehicle breakdown), loosen nuts (22) and screw dowels (21) in an alternate and gradual manner until you notice some preloading; continue by giving another 1.5 turns.



GB

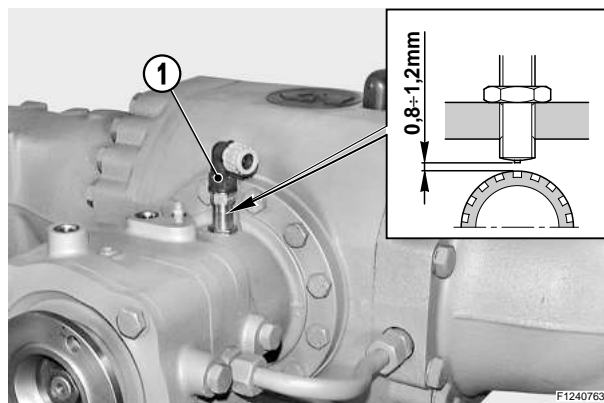
b

3-FUNCTION VERSION ONLY

Screw dowels (29) until pins (30) position themselves against the piston (33), then unscrew dowels by one turn to obtain a 1.5 mm stroke.

Lock dowels (29) into position with the nuts (28) tightened at 15 Nm.

Release pressure.

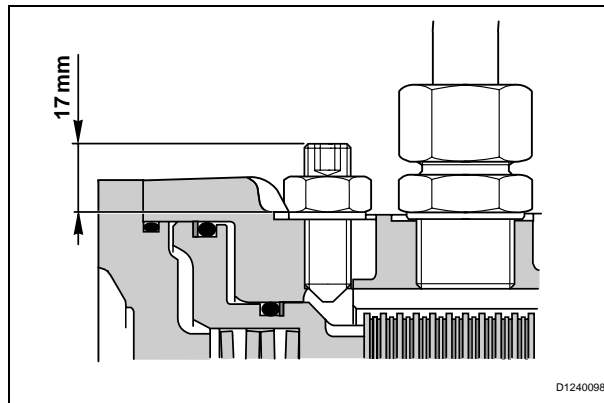


GB

d

Fit the movement sensor (1) and screw it up to the limit stop. Unscrew sensor by 3/4 turn and lock into position with nut. Locking torque: MAX 30 Nm.

CAUTION! Do not exceed the specified torque setting.



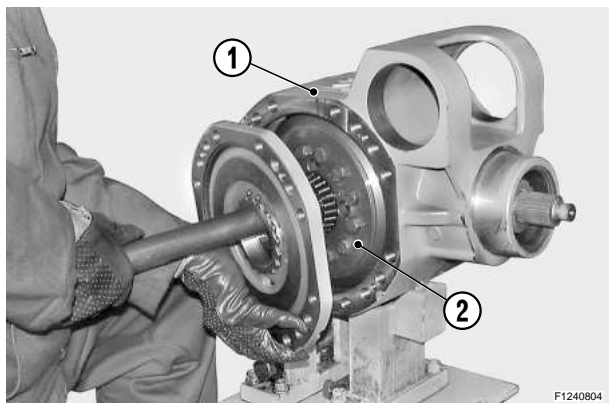
GB

f

When the emergency is over, loosen the dowels in an alternate manner until a 17 mm projection is obtained; lock into position with the nuts (22) tightened to 15 Nm.



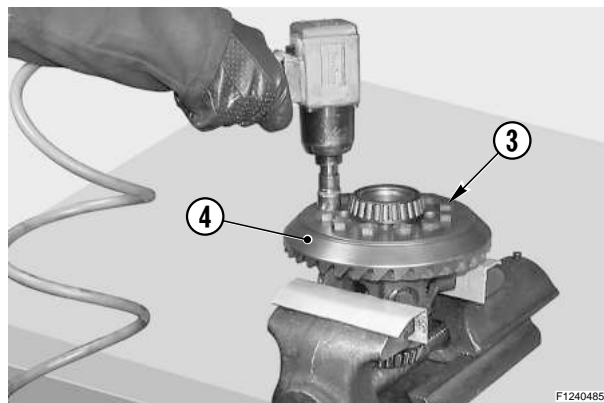
HOW TO DISASSEMBLE THE LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%) - SMONTAGGIO DIFFERENZIALE A SLITTAMENTO LIMITATO (25% E 45%) - DIFFERENTIAL MIT BEGRENZTEM GLEITVERMÖGEN (25% UND 45%) ABMONTIEREN - DESMONTAJE DIFERENCIAL A DESLIZAMIENTO LIMITADO (25% Y 45%) - DESMONTAJE DIFFERENTIEL A GLISSEMENT REDUIT (25% ET 45%)



GB

a

Remove the whole differential unit (2) from the central axle unit (1). For details, see «REMOVING THE DIFFERENTIAL UNIT».

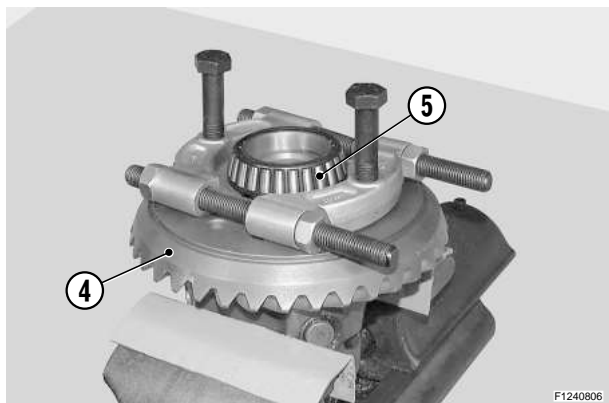


GB

b

Remove the check screws (3) of the crown (4).

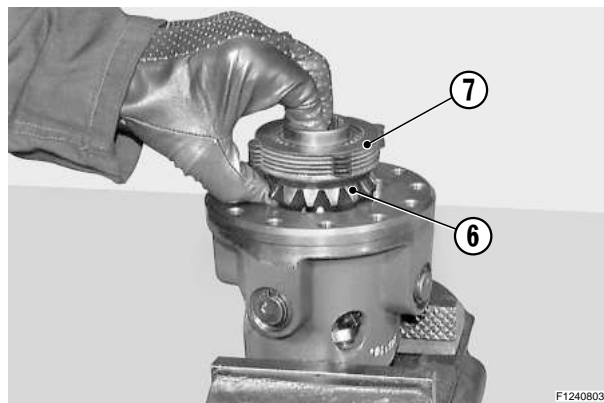
NOTE. Note down the position of the niches of the central hole in relation to the protrusions of the friction unit steel discs.



GB

c

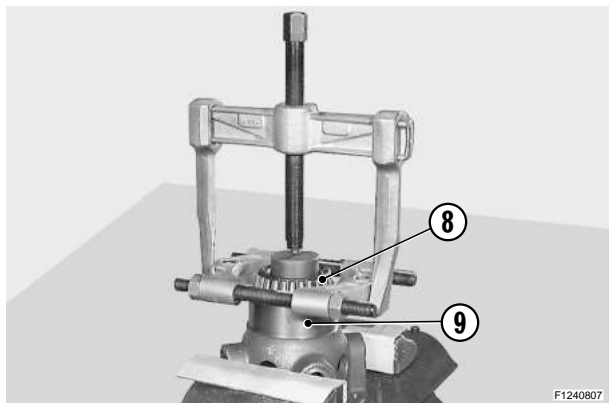
If bearing (5) needs replacing, remove it; remove crown (4).



GB

d

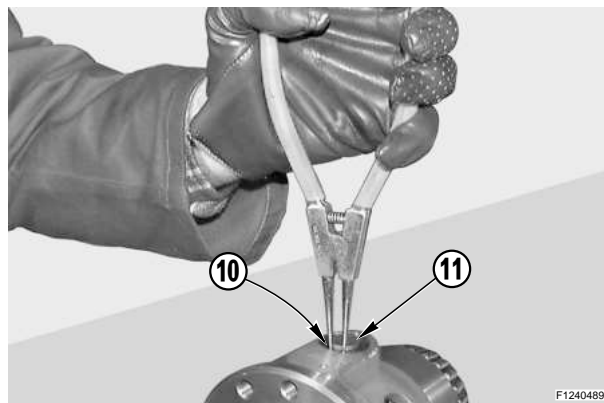
Remove the planetary gear (6) and the whole friction unit (7).



GB

e

If bearing (8) needs replacing, extract it from the differential unit (9).



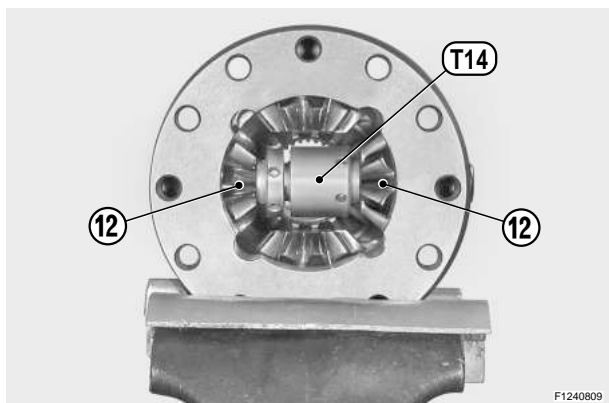
GB

f

Remove the snap rings (10) from the pins (11) of the planet gears (12).



HOW TO DISASSEMBLE THE LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%) - SMONTAGGIO DIFFERENZIALE A SLITTAMENTO LIMITATO (25% E 45%) - DIFFERENTIAL MIT BEGRENZTEM GLEITVERMÖGEN (25% UND 45%) ABMONTIEREN - DESMONTAJE DIFERENCIAL A DESLIZAMIENTO LIMITADO (25% Y 45%) - DESMONTAJE DIFFERENTIEL A GLISSEMENT REDUIT (25% ET 45%)



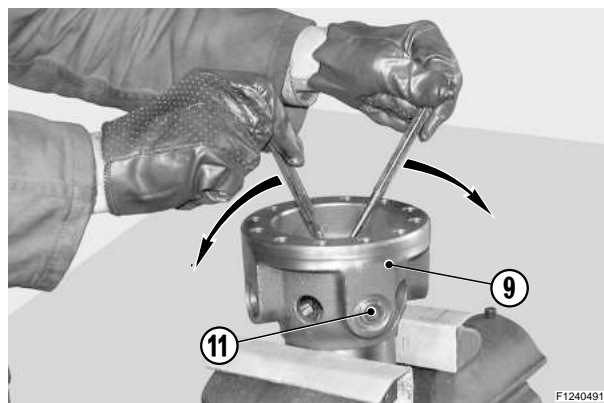
F1240809



GB

a

Introduce tool **T14** in-between the planet gears (12).



F1240491

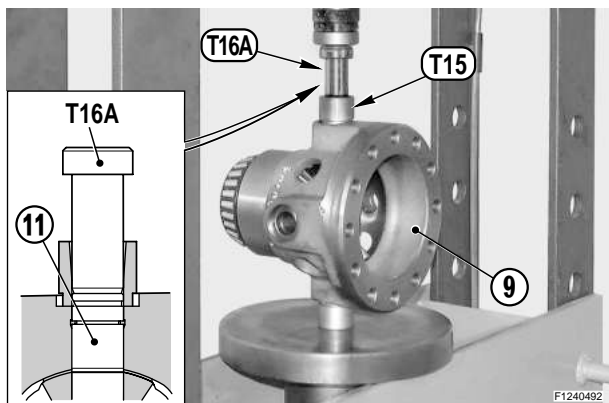


GB

b

Using two pin-drivers, engage tool **T14** in-between the planet gears (12).

CAUTION! Carefully check that tool **T14** keeps in an aligned position with the pins (11) when locked.



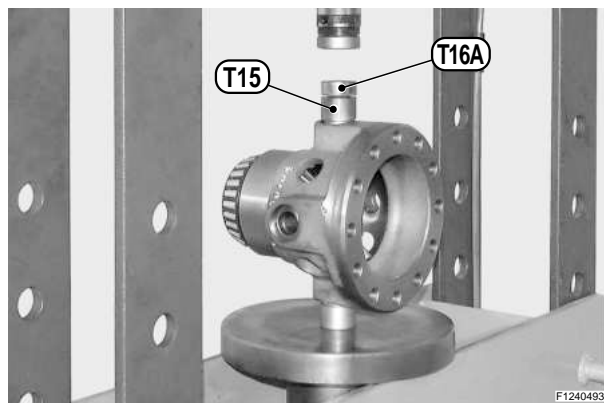
F1240492



GB

c

Place the differential unit (9) under a press, position bush **T15** and insert gudgeon **T16A**. Press gudgeon **T16A** to end of stroke.



F1240493

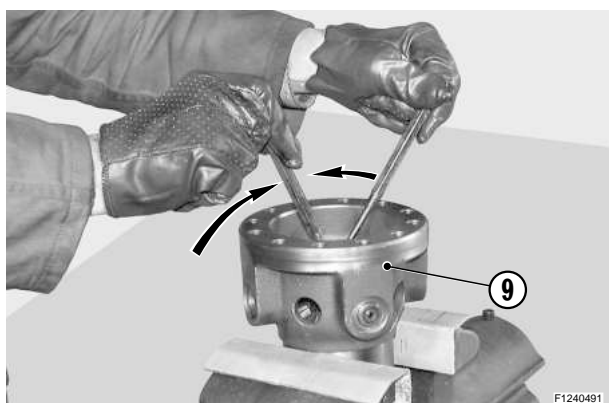


GB

d

Remove gudgeon **T16A** and bush **T15**.

NOTE. In this state, the pin (11) is contained within tool **T14**.



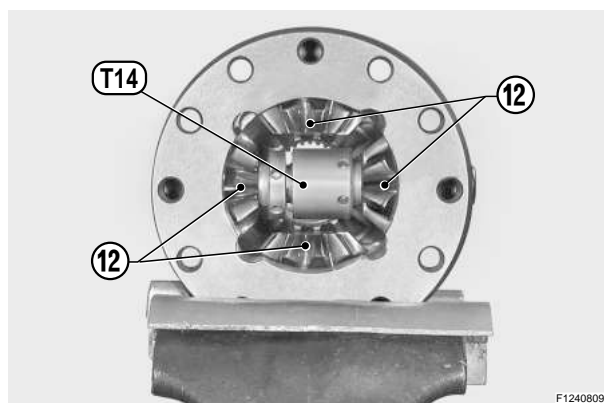
F1240491



GB

e

Remove tool **T14** and planet pin (11) with it.



F1240809



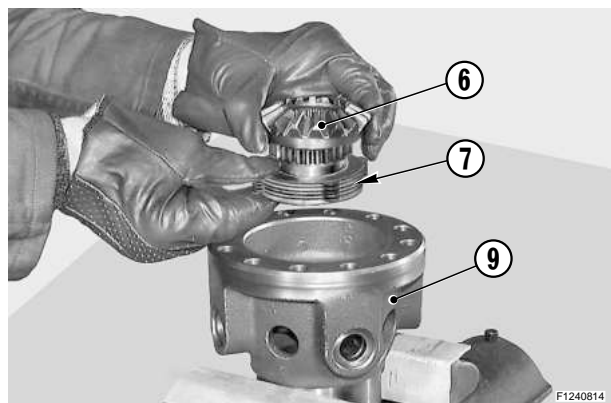
GB

f

Leaving the released planet in its position, lock again tool **T14**. Repeat pin extraction operation on the second planet pin (11). Repeat the same operations on the remaining pins.



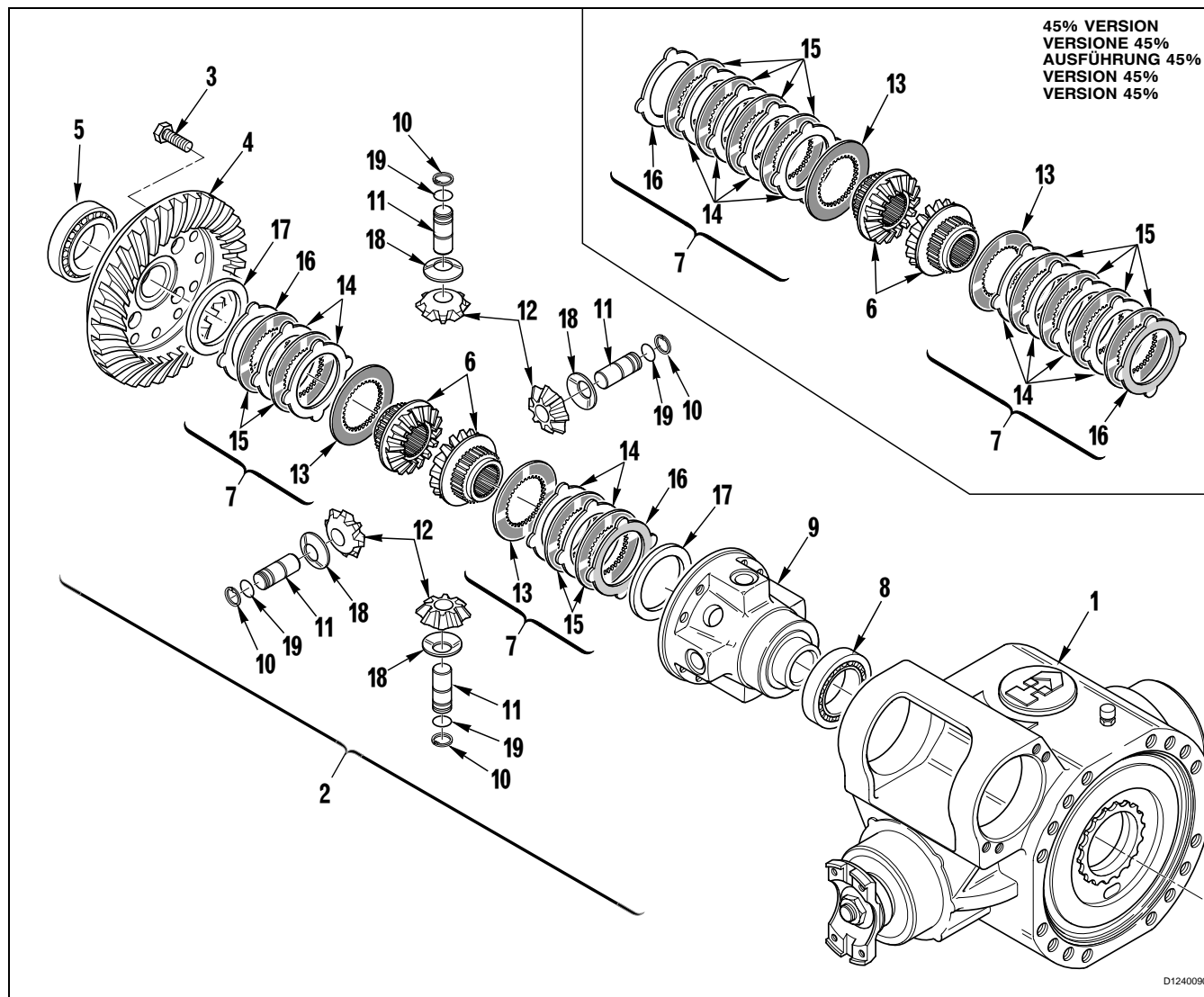
HOW TO DISASSEMBLE THE LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%) - SMONTAGGIO DIFFERENZIALE A SLITTAMENTO LIMITATO (25% E 45%) - DIFFERENTIAL MIT BEGRENZTEM GLEITVERMÖGEN (25% UND 45%) ABMONTIEREN - DESMONTAJE DIFERENCIAL A DESLIZAMIENTO LIMITADO (25% Y 45%) - DESMONTAJE DIFFERENTIEL A GLISSEMENT REDUIT (25% ET 45%)

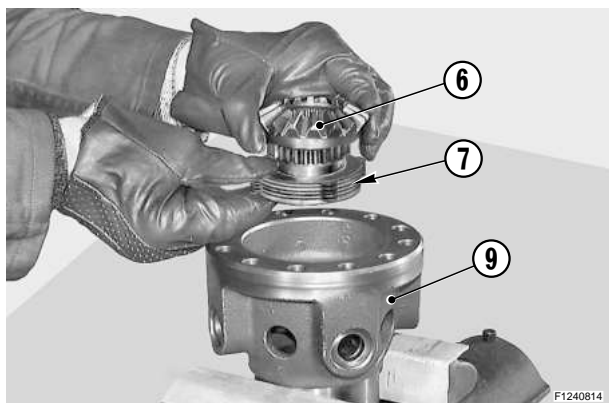


GB

a

Remove tool **T14** and extract from the differential unit (9) the two final planet gears (12), the 2nd planet gear (6) and the whole friction assembly concerned (7).

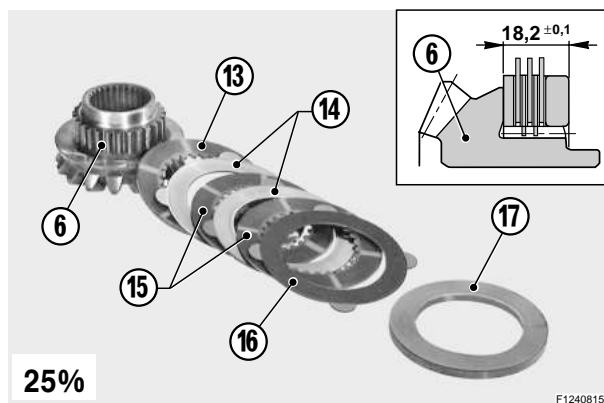




GB

a

Place a friction unit (7) - suitable for the specific type of slipping - and planetary gear (6) into the differential unit (9).
The composition of the unit is illustrated in the points below.



25%



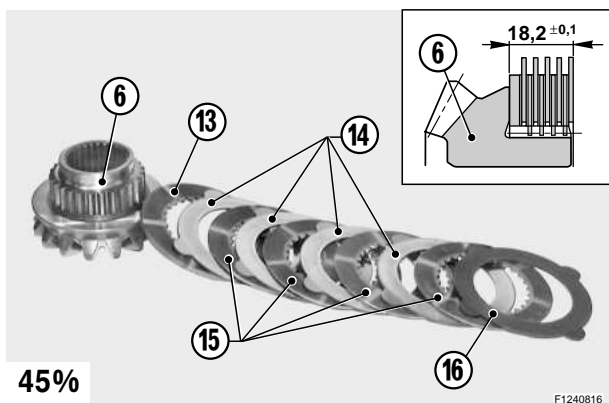
GB

b

25% FRICTION UNIT COMPOSITION

Friction ring with increased shim (13), steel rings (14) and friction rings (15) alternated, end ring (16) and distance piece (17).

CAUTION! As to rings (13) and (16), the side without notches must face outwards.



45%



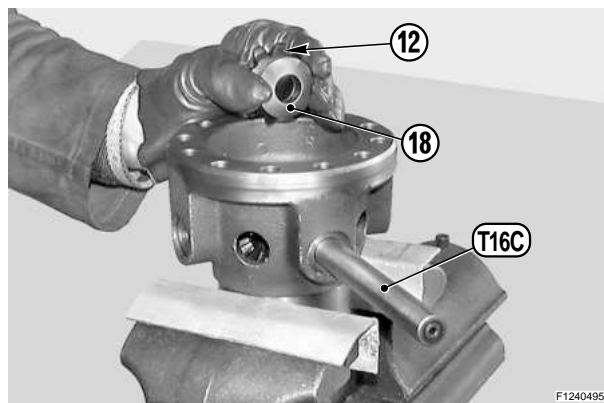
GB

c

45% FRICTION UNIT COMPOSITION

Friction ring with increased shim (13), steel rings (14) and friction rings (15) alternated, end ring (16) and distance piece (17).

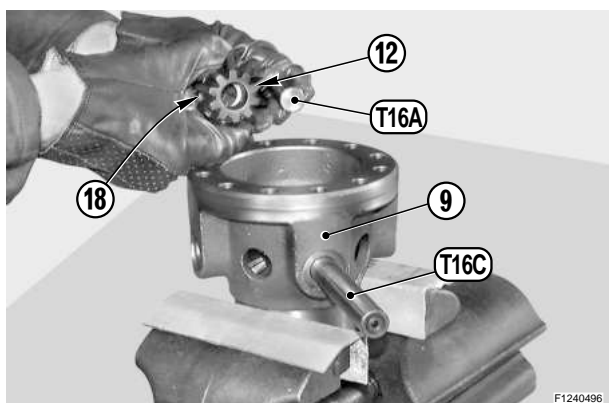
CAUTION! As to rings (13) and (16), the side without notches must face outwards.



GB

d

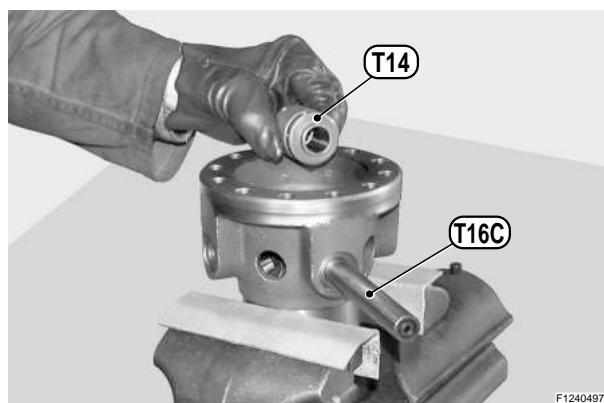
Position shim washer (18) and the first planet gear (12).
Hold them in position with bar **T16C**.



GB

e

Using gudgeon **T16A**, position the second planet gear (12) and relative shim washer (18).



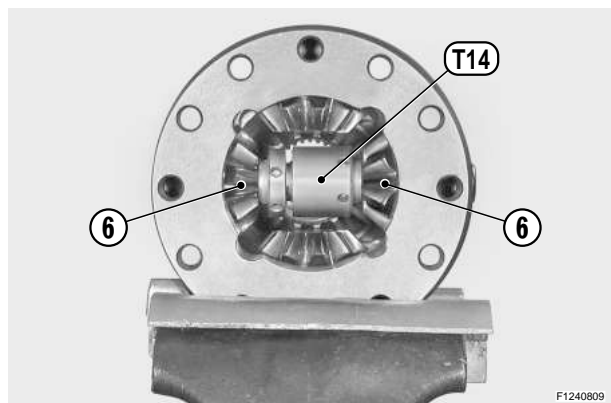
GB

f

Insert tool **T14** in-between the two planet gears (12). Align the whole unit, pushing bar **T16C** in as far as it will go, until gudgeon **T16A** is expelled.



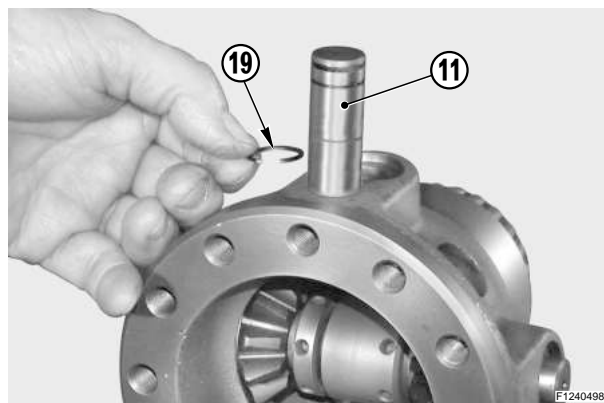
HOW TO ASSEMBLE THE LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%) - ASSEMBLAGGIO DIFFERENZIALE A SLITTAMENTO LIMITATO (25% E 45%) - DIFFERENTIAL MIT BEGRENZTEM GLEITVERMÖGEN (25% UND 45%) MONTIEREN - ASEMBLAJE DIFERENCIAL A DESLIZAMIENTO LIMITADO (25% Y 45%) - MONTAJE DIFFERENTIEL A GLISSEMENT REDUIT (25% ET 45%)



GB

a

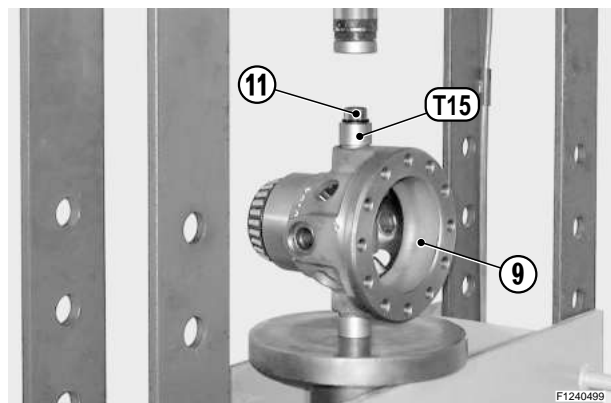
Lock tool **T14** behind the planet gears (12).
After locking the tool, remove bar **T16C**.



GB

b

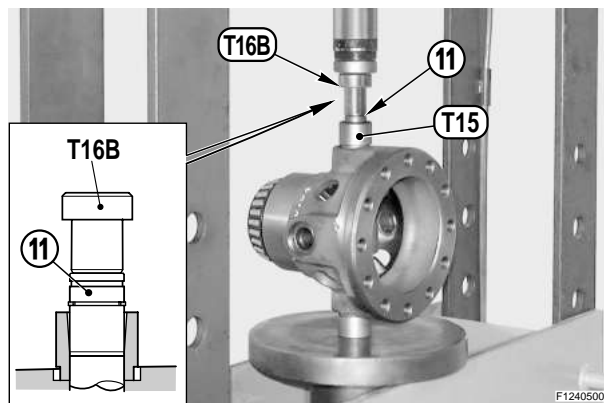
Fit snap rings (19) onto the pins (11).



GB

c

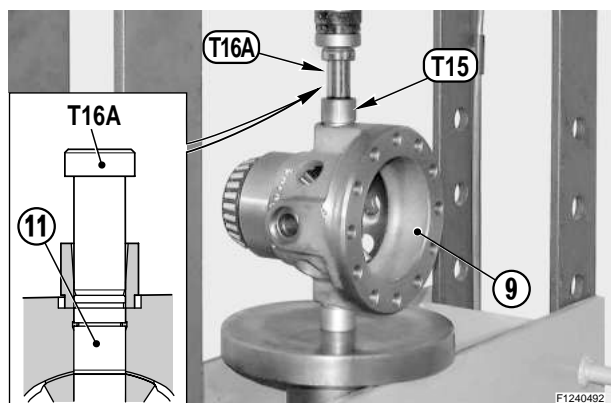
Position the differential unit (9) under the press, position bush **T15** and insert the planet pin (11).



GB

d

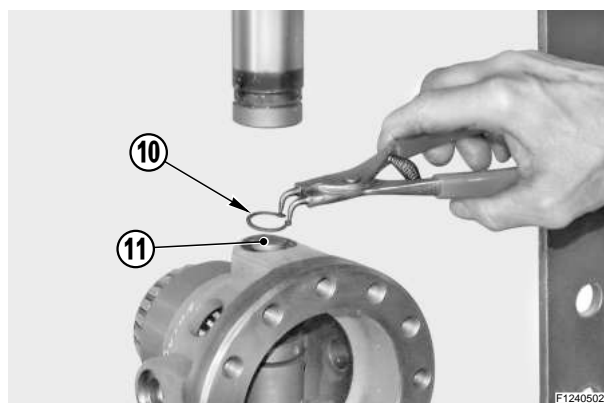
Place gudgeon **T16B** on top of the planet pin (11).



GB

e

Press gudgeon **T16B** as far down as it will go.



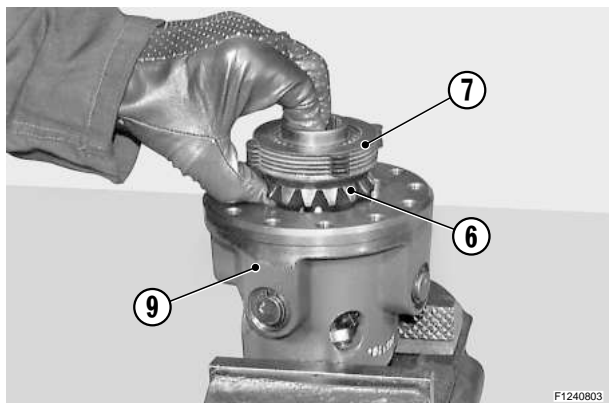
GB

f

Remove gudgeon **T16B**, bush **T15**, and fit the snap ring (10) onto the pin (11).
CAUTION! Make sure that the snap ring centers the seat and positions itself on the differential unit face.
Repeat the operations on the other planet pin and on the other planet unit.



HOW TO ASSEMBLE THE LIMITED SLIP DIFFERENTIAL UNIT (25% AND 45%) - ASSEMBLAGGIO DIFFERENZIALE A SLITTAMENTO LIMITATO (25% E 45%) - DIFFERENTIAL MIT BEGRENZTEM GLEITVERMÖGEN (25% UND 45%) MONTIEREN - ASEMBLAJE DIFERENCIAL A DESLIZAMIENTO LIMITADO (25% Y 45%) - MONTAJE DIFFERENTIEL A GLISSEMENT REDUIT (25% ET 45%)



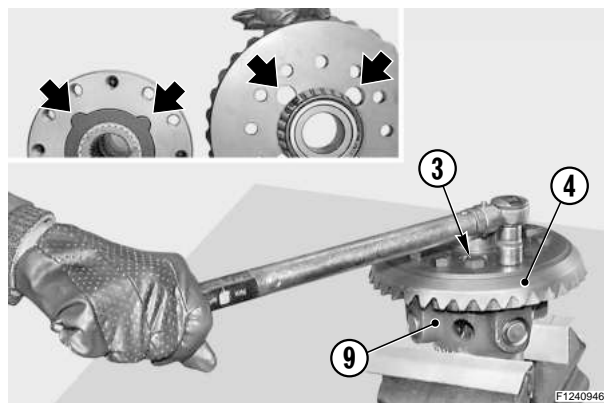
F1240803



GB

a

Check that planets have a light clearance in relation to the first planet gear.
Position the second planetary gear (6) and the second friction unit (7) into the differential unit (9).



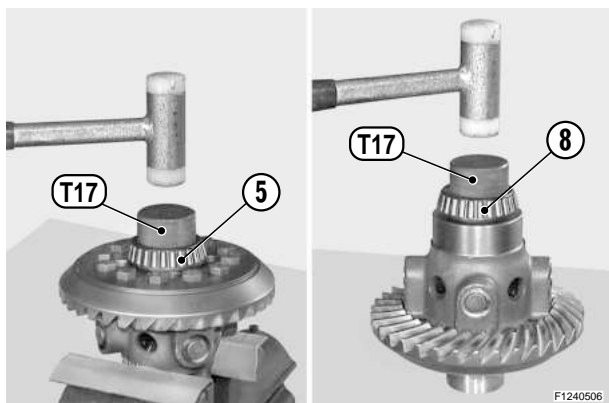
F1240946



GB

b

Line the lubrication holes up with the slots in the differential carrier.
Orient the holes of the crown (4) towards the protrusions of the braking unit.
Position the crown (4) on the differential unit (9) and lock it with the screws (3) previously coated with Loctite 242.
Torque wrench setting for screws: 128 – 142 Nm.
NOTE. Tighten screws using the criss-cross method.



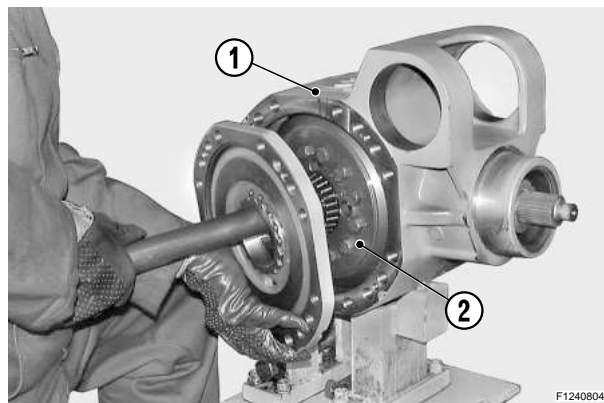
F1240506



GB

c

If bearings (5) and (8) have been removed, install them using tool T17.



F1240804



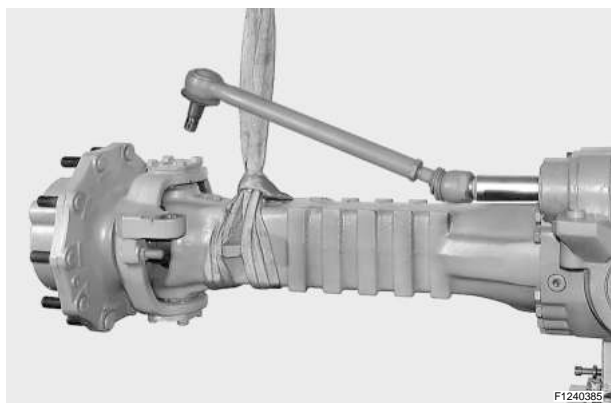
GB

d

Install the whole differential assembly (2) into the central body (1).
For details, see «INSTALLING THE DIFFERENTIAL UNIT».



HOW TO DISASSEMBLE THE HYDRAULIC DIFFERENTIAL LOCK - SMONTAGGIO BLOCCAGGIO DIFFERENZIALE A COMANDO IDRAULICO -
DIFFERENTIALBLOCKIERUNG MIT HYDRAULISCHER STEUERUNG ABMONTIEREN - DESMONTAJE BLOQUEO DIFERENCIAL A MANDO
HYDRAULICO - DESMONTAJE BLOQUEO DIFFERENTIEL A COMMANDE HYDRAULIQUE



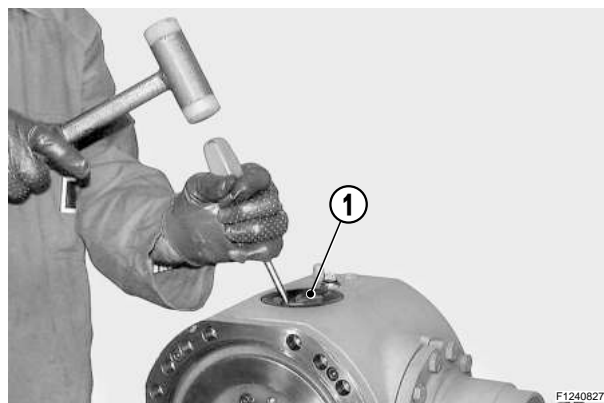
F1240385



GB

a

Remove the arms.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISCS».



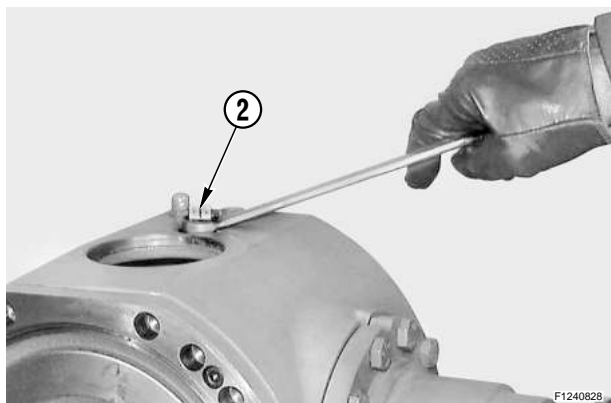
F1240827



GB

b

Remove the top cap (1).
NOTE. The cap must be replaced each time the unit is disassembled.



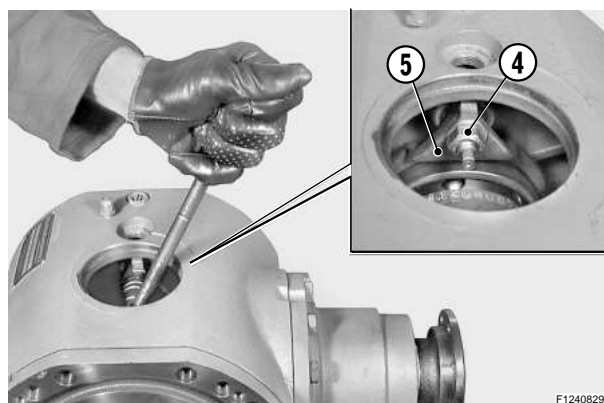
F1240828



GB

c

Remove the microswitch (2), signalling differential lock operation.
NOTE. Check the state of the O-ring (3).



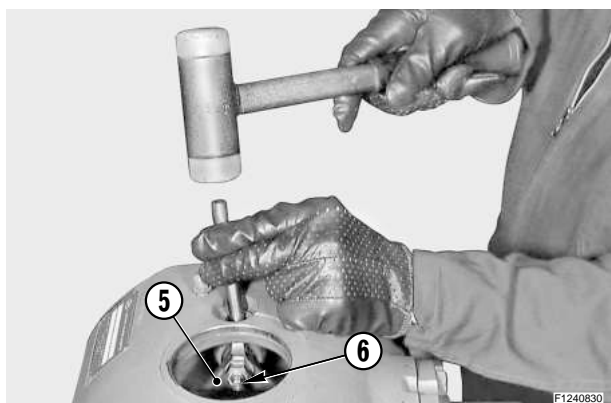
F1240829



GB

d

Loosen the lock nut (4) of fork (5) by about 2 turns.



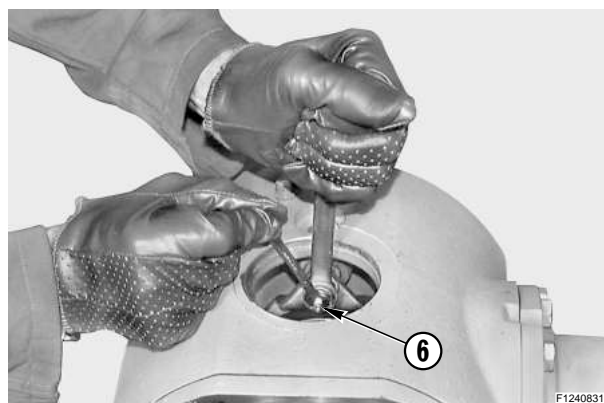
F1240830



GB

e

Using a metal punch and a hammer, disengage fork (5) from piston cone (6).



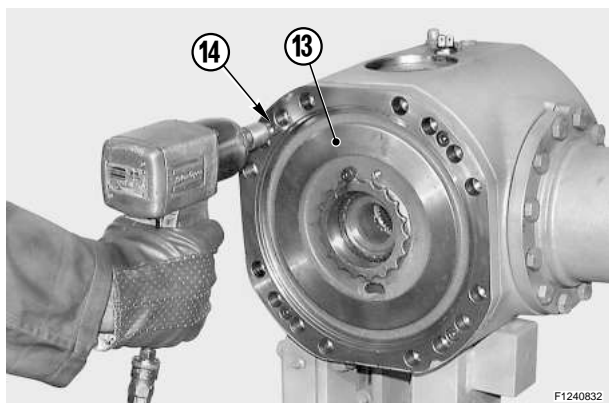
F1240831



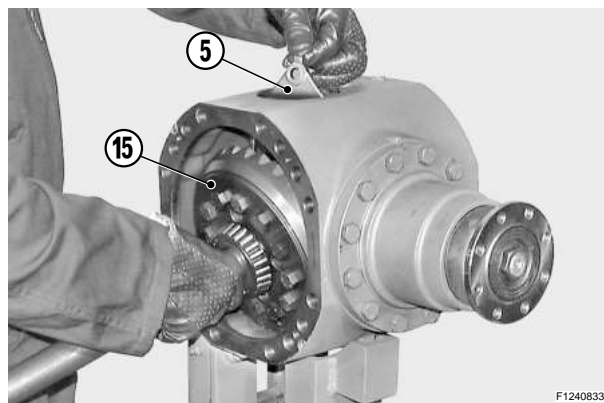
GB

f

Using two wrenches, lock piston (6) and remove nut (4).



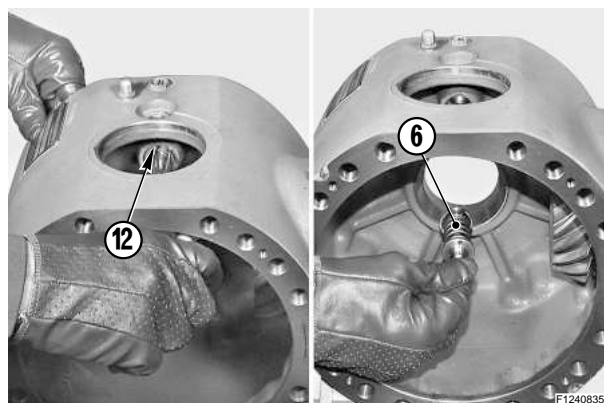
Remove screws (14) and remove the intermediate cover (13).
NOTE. Support the differential unit with a lever.



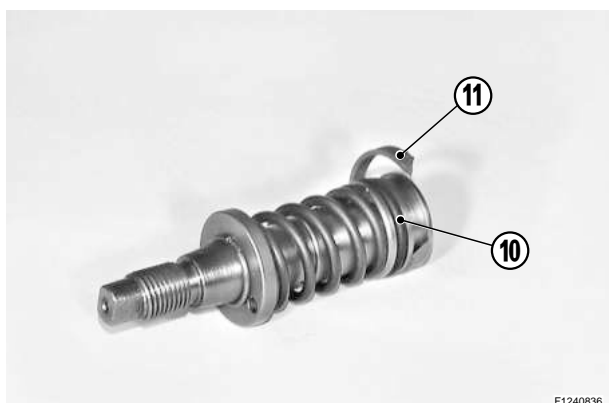
Disconnect fork (5) from piston (6). While holding the fork up, remove the differential unit (15).



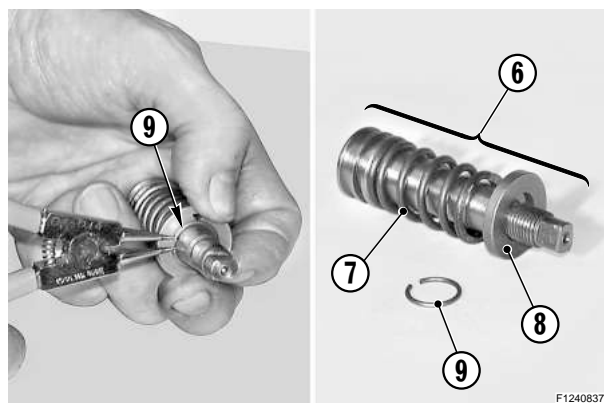
Extract fork (5).



Remove snap ring (12) and whole piston (6).



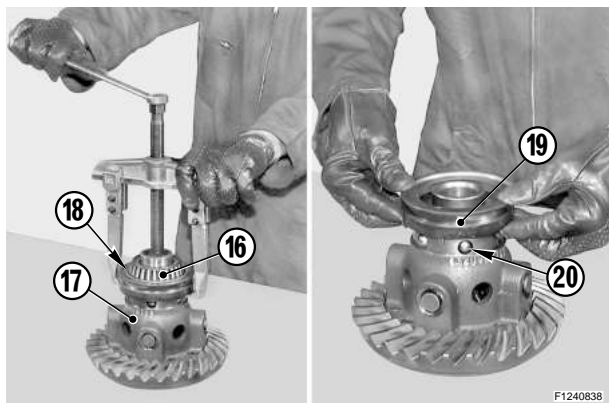
Remove guide ring (11) and O-ring (10).
NOTE. The guide ring (11) and O-ring (10) must be replaced each time the unit is disassembled.



Remove snap ring (9) and take piston unit (6) apart. Remove all component parts.



HOW TO DISASSEMBLE THE HYDRAULIC DIFFERENTIAL LOCK - SMONTAGGIO BLOCCAGGIO DIFFERENZIALE A COMANDO IDRAULICO -
DIFFERENTIALBLOCKIERUNG MIT HYDRAULISCHER STEUERUNG ABMONTIEREN - DESMONTAJE BLOQUEO DIFERENCIAL A MANDO
HYDRAULICO - DESMONTAJE BLOCAGE DIFFERENTIEL A COMMANDE HYDRAULIQUE



F1240838

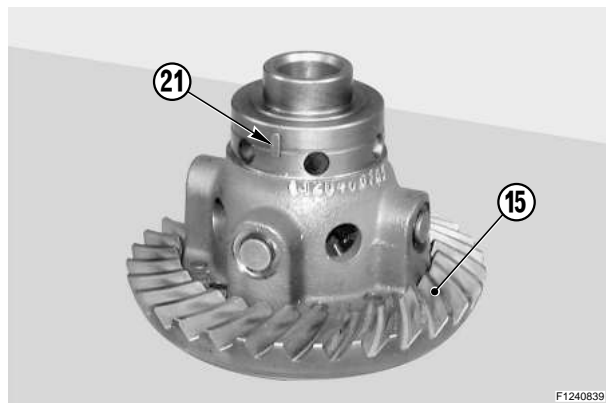


GB

a

Remove bearing (16) from the differential carrier (17) as well as the stop ring (18), the coupling (19) and the spheres (20).

NOTE. Note down the direction of assembly of the stop ring (18).



F1240839



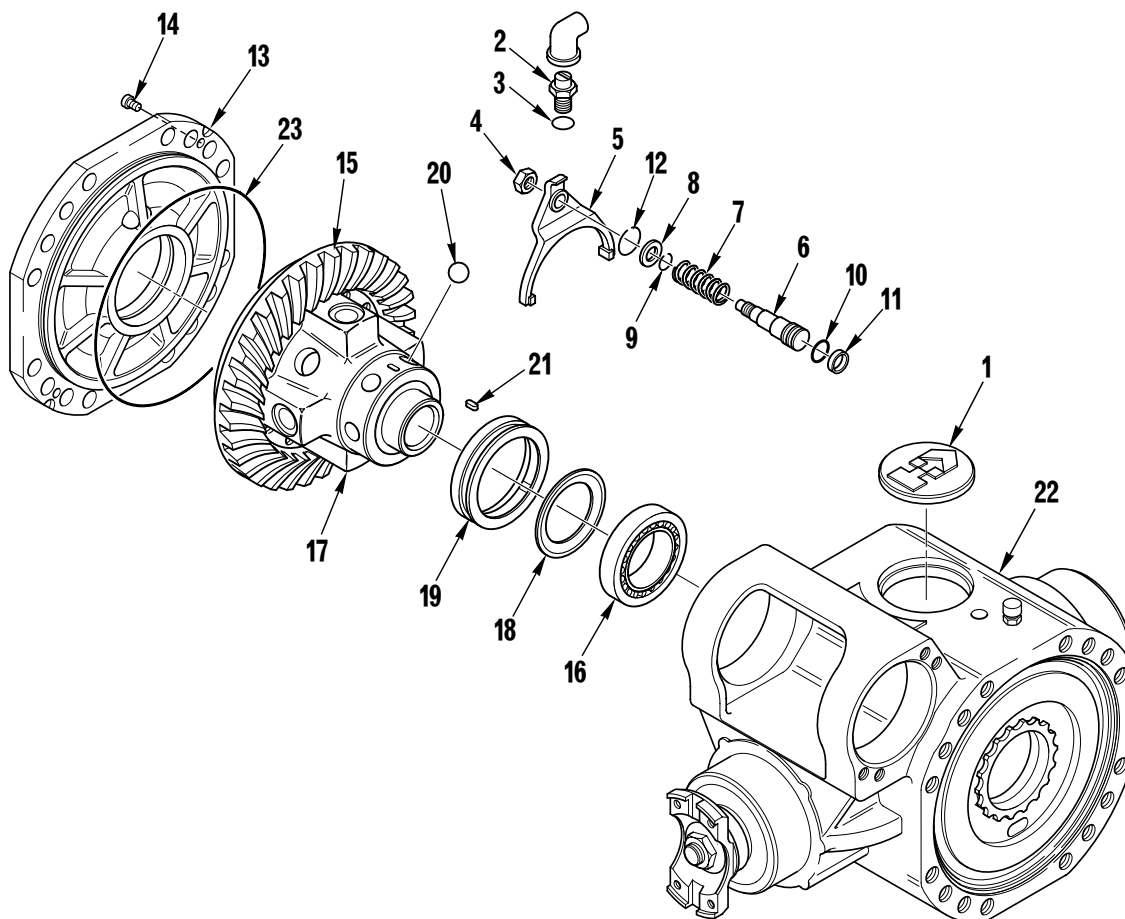
GB

b

ONLY IF NECESSARY

Remove the coupling guide key (21) and disassemble the differential unit (15).

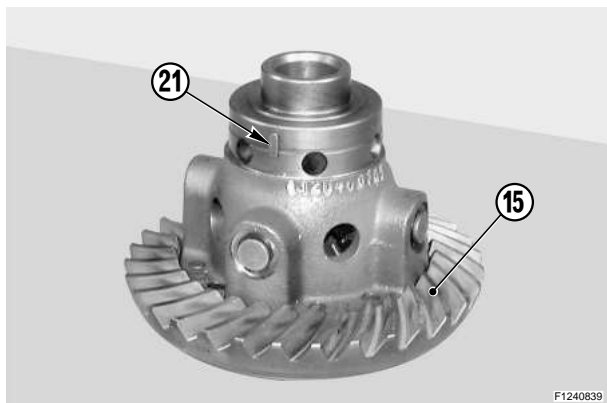
(For details, see «HOW TO DISASSEMBLE THE DIFFERENTIAL UNIT».



D1240092



HOW TO ASSEMBLE THE HYDRAULIC DIFFERENTIAL LOCK - ASSEMBLAGGIO BLOCCAGGIO DIFFERENZIALE A COMANDO IDRAULICO -
DIFFERENTIALBLOCKIERUNG MIT HYDRAULISCHER STEUERUNG MONTIEREN - ASEMBLAJE BLOQUEO DIFERENCIAL A MANDO
HYDRAULICO - MONTAJE BLOCAGE DIFFERENTIEL A COMMANDE HYDRAULIQUE



F1240839



GB

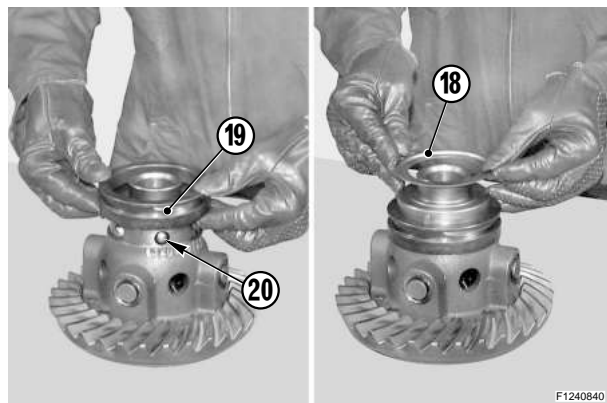
a

ONLY IF PREVIOUSLY DISASSEMBLED

Assemble the differential unit (15).

(For details, see «HOW TO ASSEMBLE THE DIFFERENTIAL UNIT»).

Position the guide key (21) of coupling (19).



F1240840

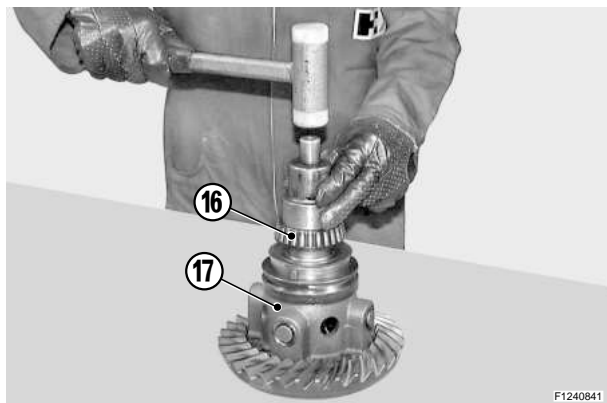


GB

b

Install spheres (20), coupling (19) and stop ring (18).

NOTE. Pay great attention to ring orientation (18).



F1240841

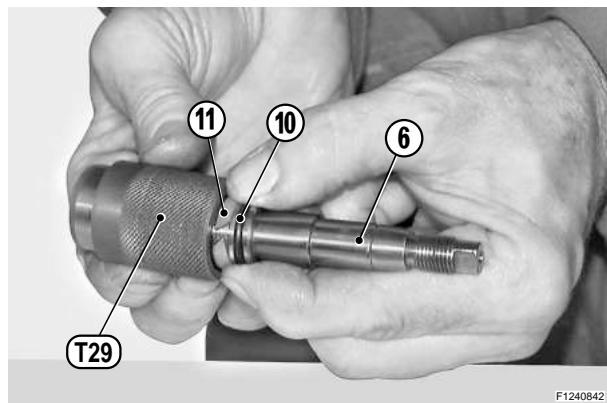


GB

c

Fit bearing (16) onto the differential carrier (17).

NOTE. Make sure that the bearing is well set in the differential carrier.



F1240842



GB

d

Fit O-ring (10) and guide ring (11) onto the piston (6). Lubricate seal seals and insert the assembly into tool T29.



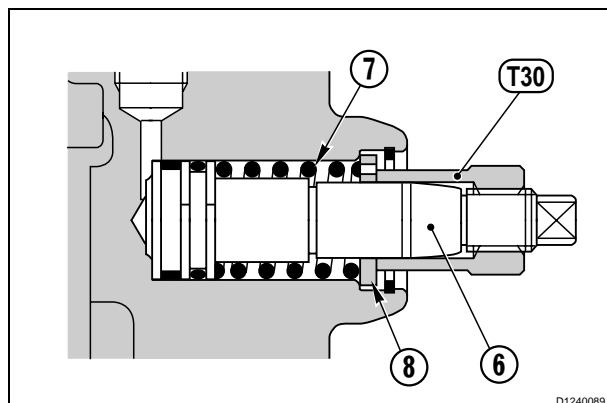
F1240843



GB

e

Insert tool T29 in the central unit (22) and push the piston (6) into the seat.
Remove tool T29.



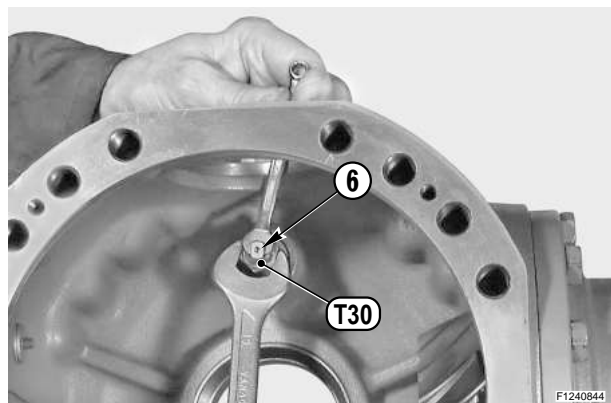
D1240089



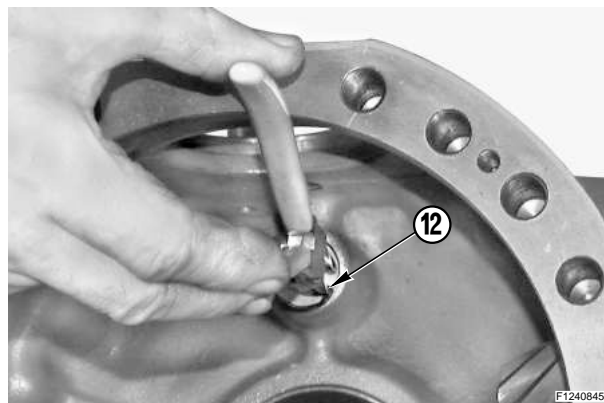
GB

f

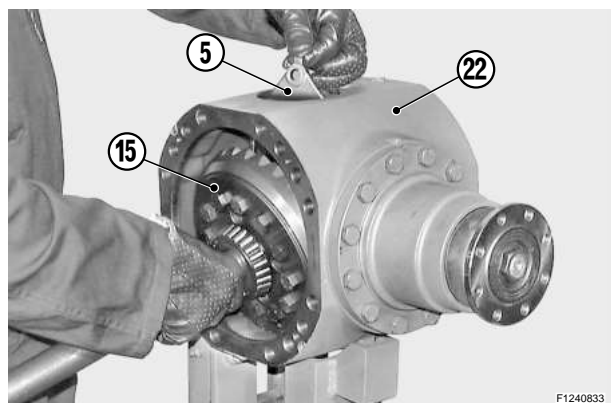
Fit spring (7) and washer (8) on the piston (6) and install tool T30.



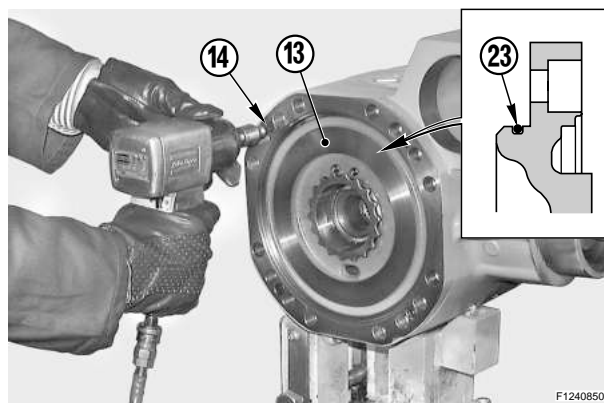
Screw tool **T30** on the thread of the piston (6) to compress spring (7) and vacate the seat for introducing the snap ring (12).



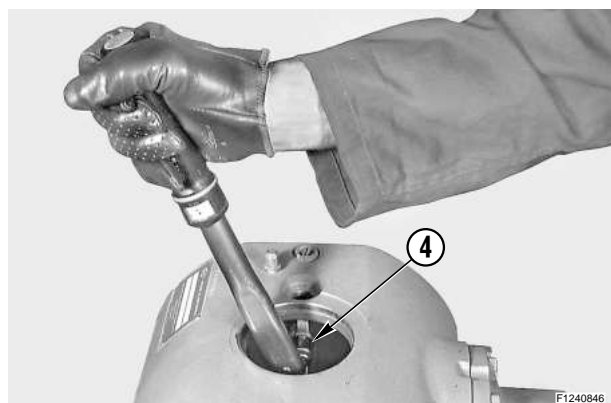
Fit the snap ring (12) of the unit.
Remove tool **T30** and fit the snap ring (9) of spring (7).



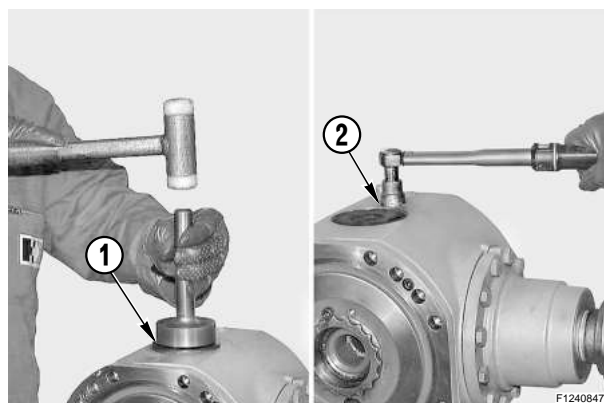
Insert the fork (5) and the differential unit (15) into the central unit (22).
Engage the fork (5) in the coupling (19) and on the piston (6).



Fit the intermediate cover (13) and lock it with screws (14). Tighten screws using a torque wrench setting of 23.8 – 26.2 Nm.
NOTE. Carefully check the state of the O-ring (23).



Fit the lock nut (4) of the fork (5) and lock it with a dynamometric wrench set to a torque of 70 – 75 Nm.



Fit the microswitch (2) complete with O-ring; torque wrench setting: max. 30 Nm.
If necessary, adjust differential unit clearances. (see «DIFFERENTIAL UNIT ASSEMBLY».)
Fit the top cap (1) and the arms. (For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISKS».)



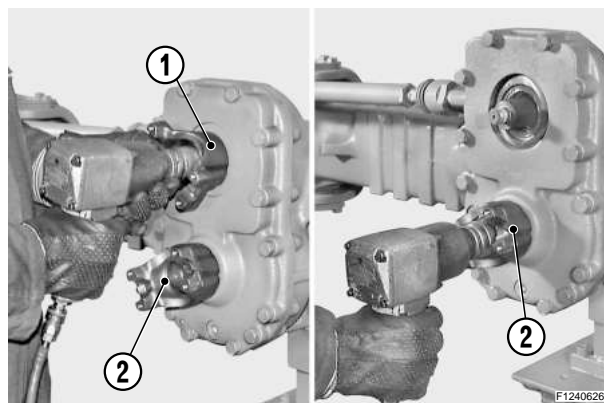
F1240625



GB

a

The figure shows the axle with incorporated reduction gear with Mechanic flanges; disassembly and assembly procedures also apply to DIN flanges.

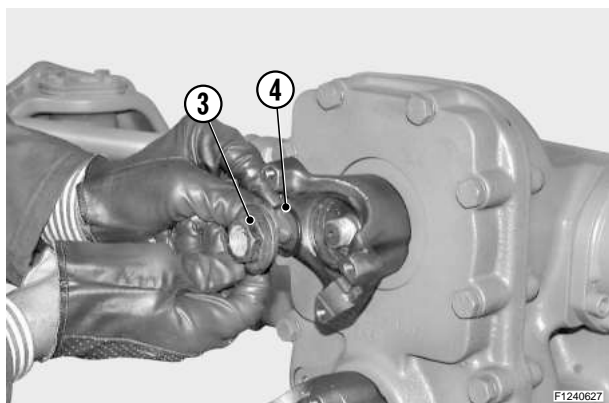


F1240626

GB

b

Unloose the check nuts on upper (1) and lower (2) flange.



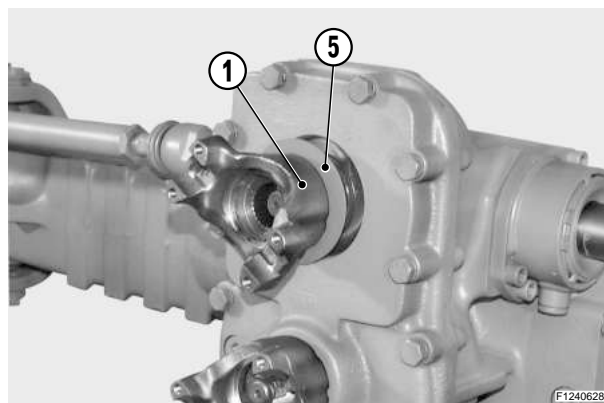
F1240627



GB

c

Draw out nuts (3) and O-rings (4).

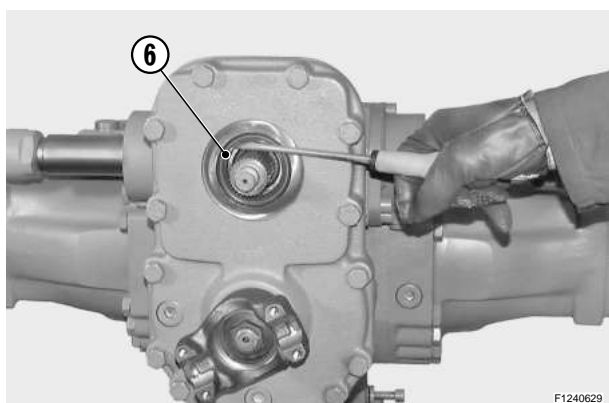


F1240628

GB

d

Remove the upper flange (2) together with dust ring (5).



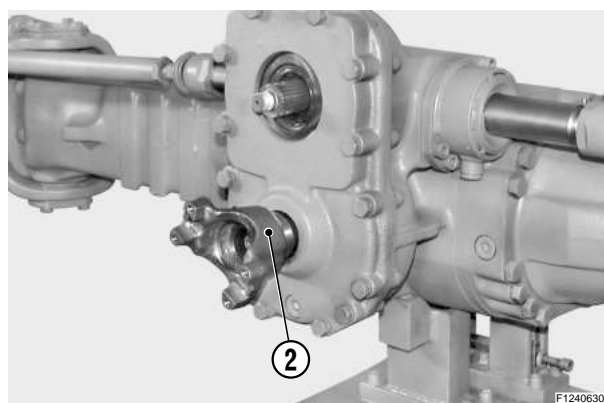
F1240629



GB

e

Remove the snap ring (6) and discard it.

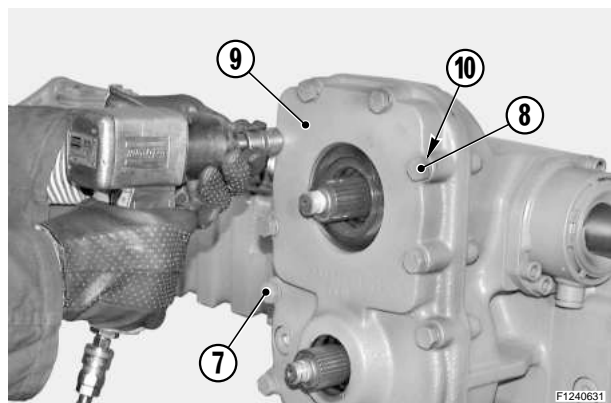


F1240630

GB

f

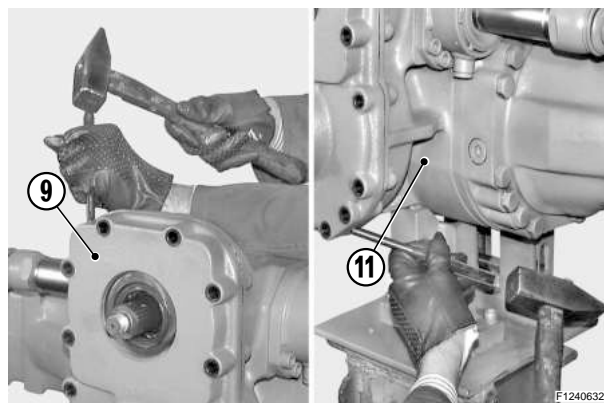
Remove the lower flange (2)



GB

a

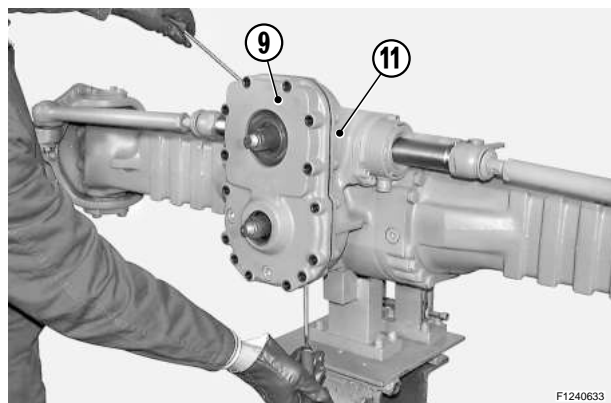
Remove check screws (7), (8) and relative washers (10) from cover (9).



GB

b

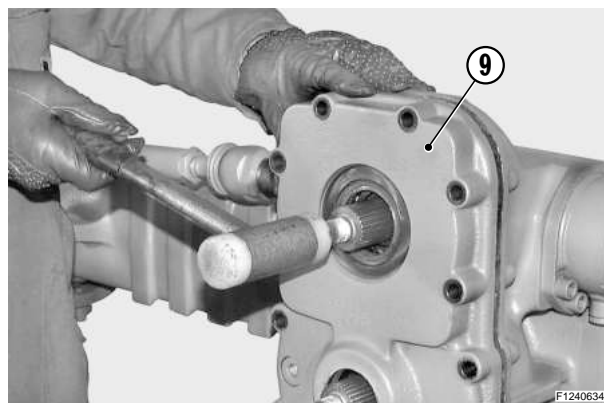
In turn, insert a punch in the slots provided and, tapping lightly with a hammer, separate the cover (9) from the body of the reduction gear (11).



GB

c

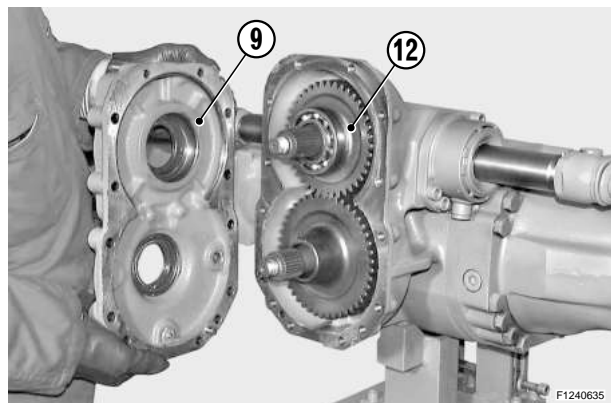
Insert two levers in the provided slots and move the cover (9) away from the body of the reduction gear (11).



GB

d

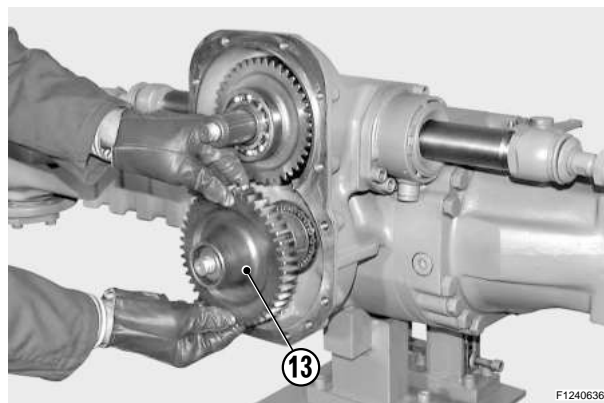
Lightly tap with a hammer to disengage cover (9) from upper gear (12).



GB

e

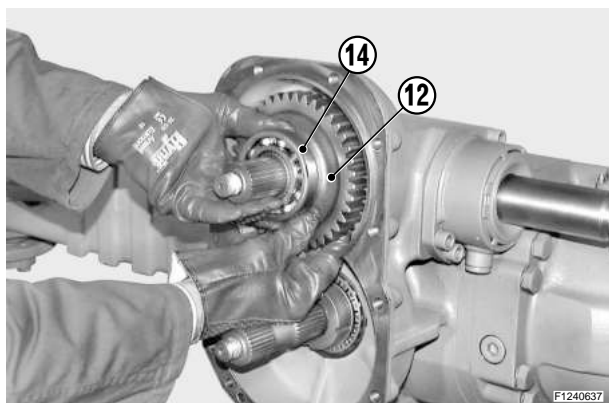
Draw out cover (9) and remove any sealant left.



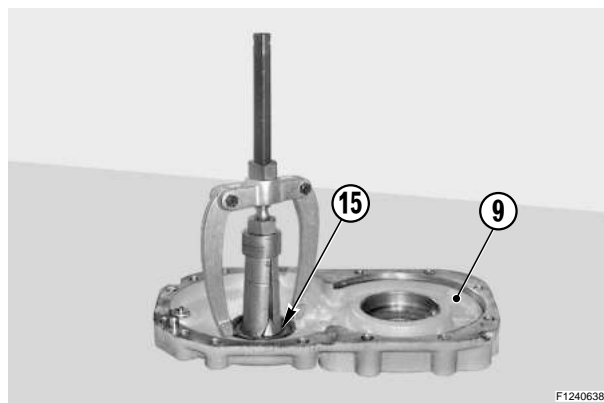
GB

f

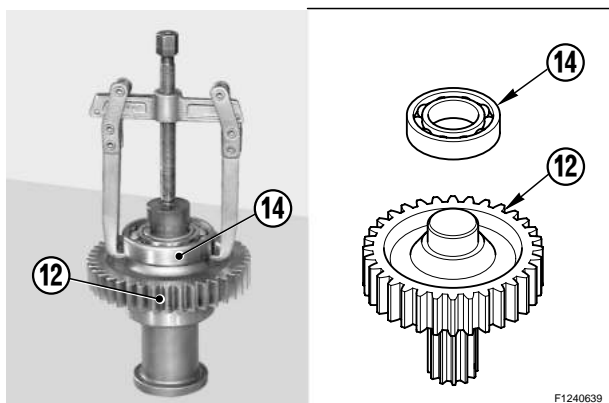
Remove lower gear (13).



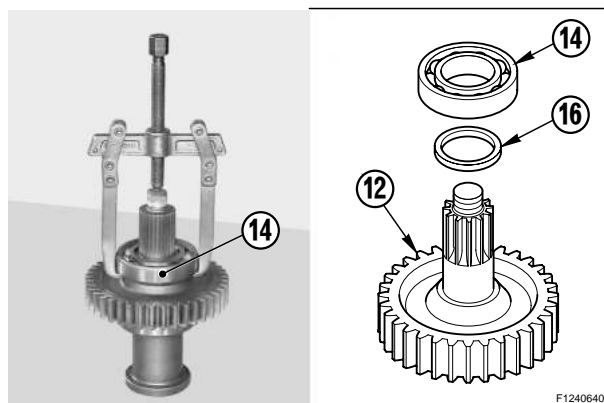
Remove upper gear assembly (12) complete with bearings (14).



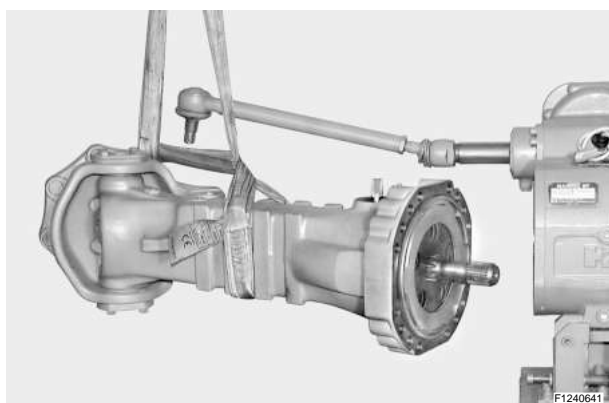
Using a puller, remove snap ring (15) from cover (9) and discard it.
NOTE. Note down direction of installation.



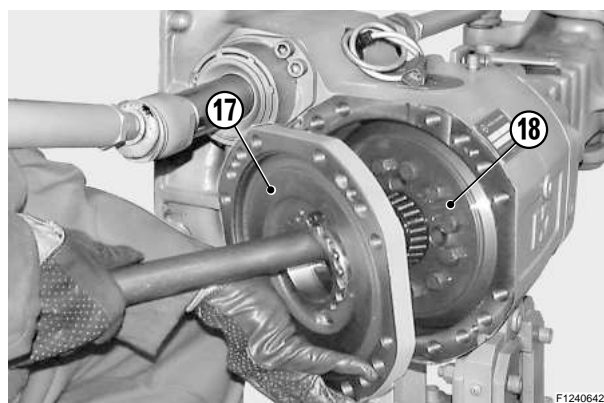
Remove inner bearing (14) from gear assembly (12).



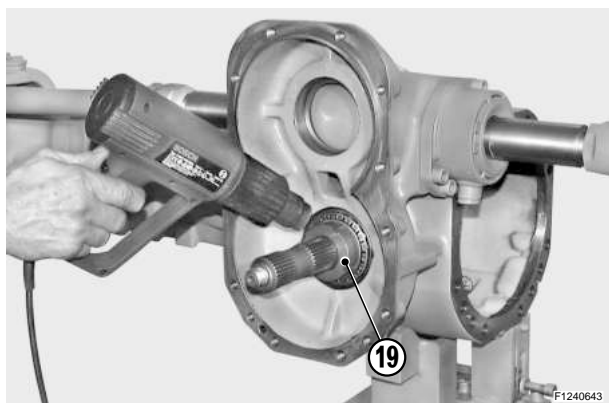
Remove outer bearing (14) and distance piece (16).



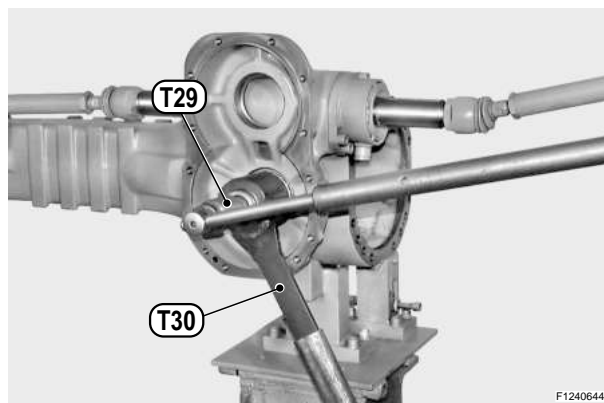
Disjoin from the steering case the steering bar located by the side of the intermediate cover (17).
Remove the complete arm.
For details, see «CHECKING WEAR AND REPLACING THE BRAKING DISCS».



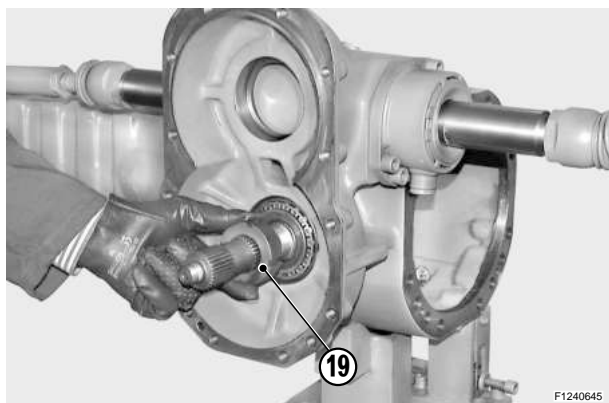
Remove the intermediate cover (17) and the whole differential unit (18).
For details, see «HOW TO REMOVE THE DIFFERENTIAL UNIT».



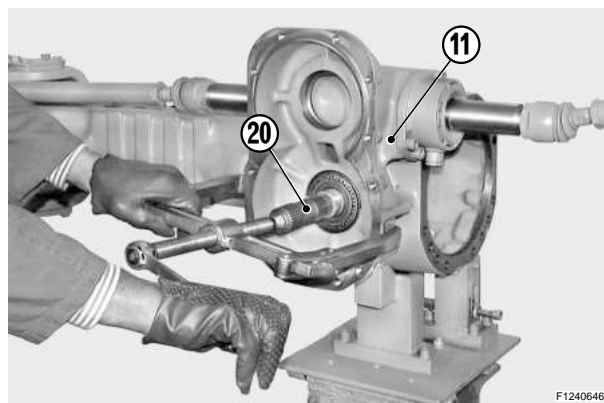
Heat the ring nut (19) at approx. 80°C.



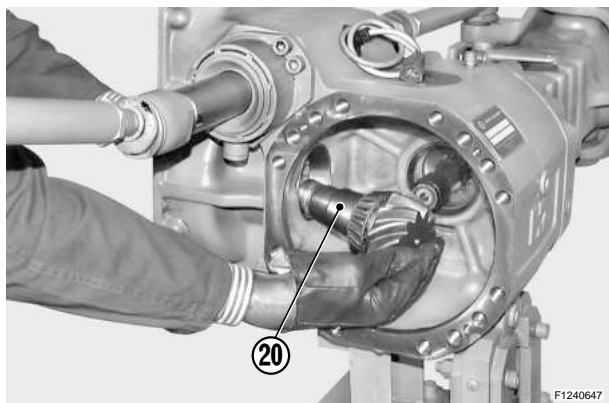
Engage special wrench **T30** on the ring nut (19) and apply bar-hold **T29** on the pinion (20).



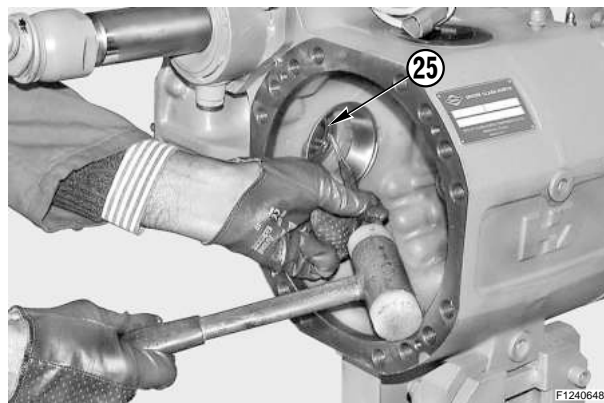
Remove ring nut (19)



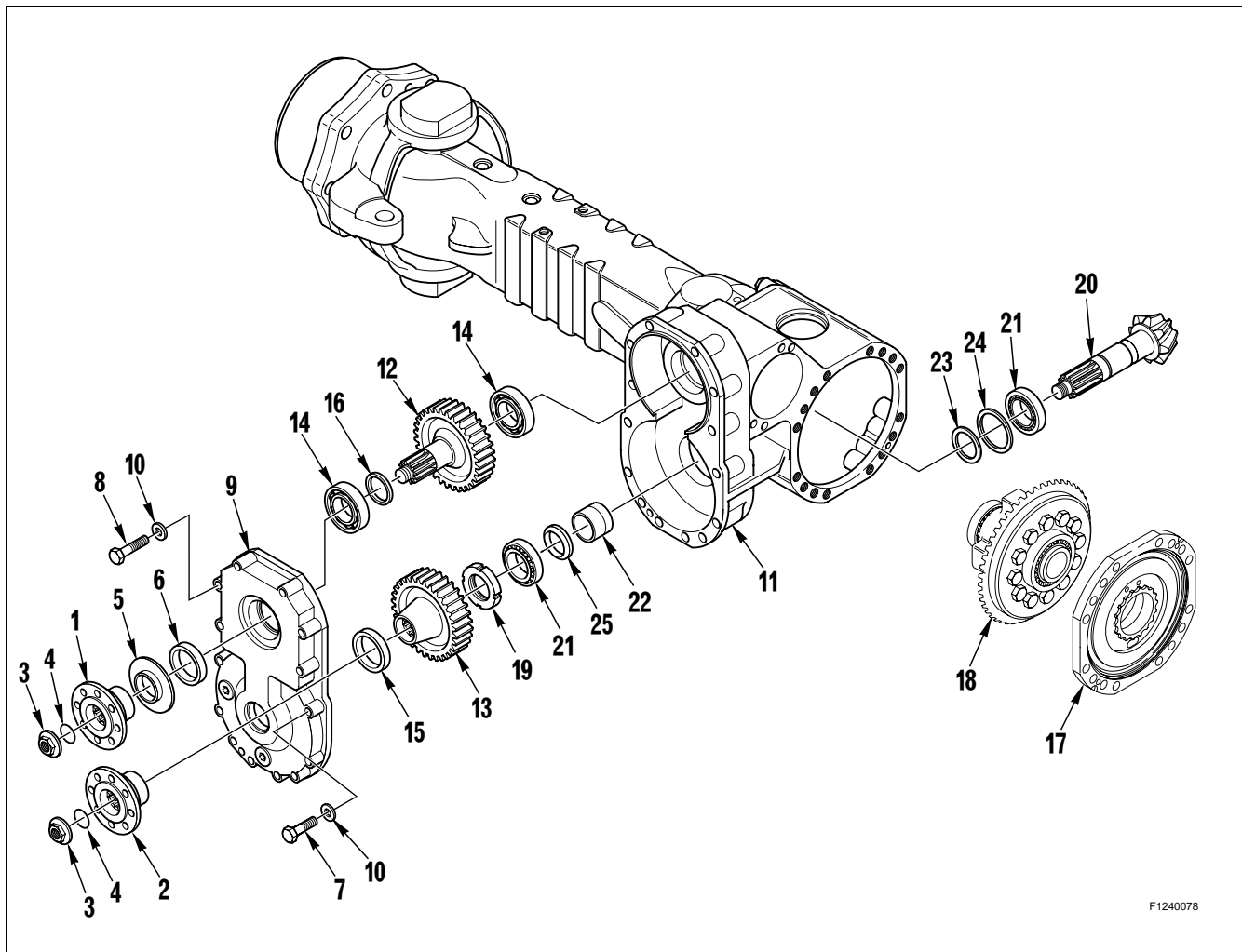
Using a puller, extract pinion (20) complete with inner bearing (21), distance piece (22) and distance washers.
NOTE. The thrust blocks of the bearings remain in the central body (11).



Remove the complete pinion (20).
NOTE. Carefully check and note direction of installation of distance piece.



Using a punch and a hammer, extract the snap ring (25).
NOTE. Note direction of installation of snap ring (24).



GB

CAUTION! 1 - If disassembly has been carried out only as a means to replace the snap ring (24), position the new ring and reassemble the unit by keeping to the torque wrench settings indicated in the following section and using the prescribed locking products.

2 - If disassembly is carried out in order to replace crown wheel and pinion, bearings, or planetary gear, break up distance washers and calculate clearances as indicated in the sections regarding removal, disassembly, assembly and installation of differential unit and bevel pinion.

ITA

ATTENZIONE! 1 - Se lo smontaggio è stato eseguito solo per la sostituzione dell'anello di tenuta (24), procedere al posizionamento del nuovo anello e rimontare il gruppo rispettando le coppie di serraggio indicate nel paragrafo seguente ed utilizzando i prodotti di bloccaggio prescritti.

2 - Se lo smontaggio viene eseguito per la sostituzione della coppia conica, dei cuscinetti o degli ingranaggi satelliti, procedere alla scomposizione ed alla ricerca degli spessori e dei giochi come indicato nei paragrafi riguardanti la rimozione, lo smontaggio, l'assemblaggio e l'installazione del differenziale e del pignone conico.

D

ACHTUNG! 1 - Falls die Teile nur abmontiert worden sind, um den Kolbenring (24) auszuwechseln, den neuen Kolbenring einsetzen und das Aggregat wieder zusammenbauen; dabei die im nachfolgenden Paragraph angegebene Anzugsmomente beachten und die vorgeschriebenen Befestigungsprodukte verwenden.

2 - Falls die Teile abmontiert worden sind, um den Kegelradtrieb, die Lager oder die Planetengetriebe auszuwechseln, die Unterlegscheiben auseinander nehmen und die Spiele beachten, die in den Paragraphen zum Entfernen, Abmontieren, Zusammenbau und zur Installation des Differentials und des Kegelrads angegeben sind.

ESP

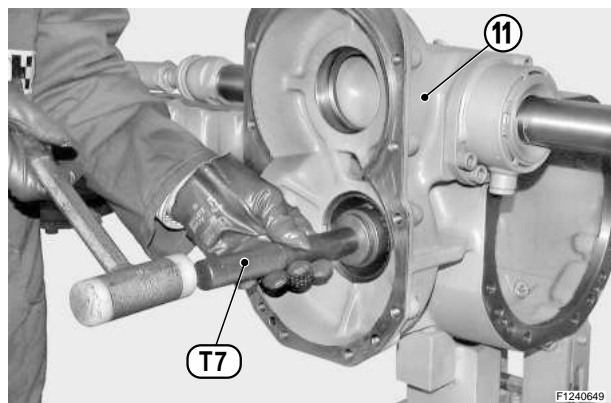
CUIDADO! 1 - Si el desmontaje ha sido efectuado solo por la sustitucion del segmento de compresion (24), remontar el grupo respetando los pares de torsion indicadas en el capitulo siguiente y utilizando los productos de bloque descritos.

2 - Si el desmontaje viene efectuado para la sustitucion del par conico, de los cojinetes o de los engranajes satelites, proceder a la descomposicion y a la busqueda de los espesores y de los juegos como indicados en los capitulos concernientes la remociòn, el desmontaje, el ensamblaje y la instalacion del diferencial y del pinòn conico.

F

ATTENTION! 1 - Si le démontage n'a eu lieu que pour la substitution de la bague d'étanchéité (24), positionner la bague d'étanchéité et remonter le groupe en respectant les couples de serrage indiqués dans le paragraphe suivant et en utilisant les produits de blocage préconisés.

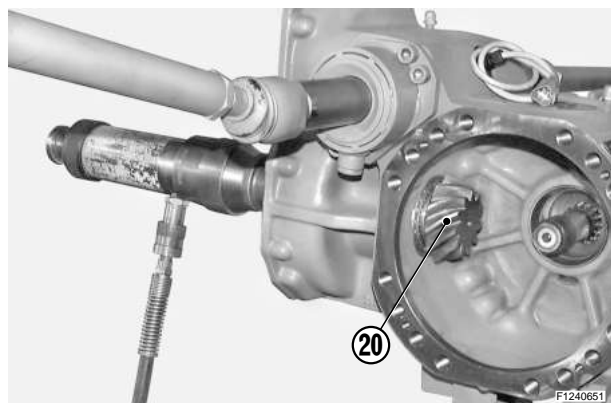
2 - Si le démontage a lieu pour substituer le couple conique, les paliers ou les engrenages satellites, désassembler et rechercher les cales et les jeux comme indiqué dans les paragraphes ayant trait à la dépose, au démontage, à l'assemblage et à l'installation du différentiel et du pignon conique.



GB

a

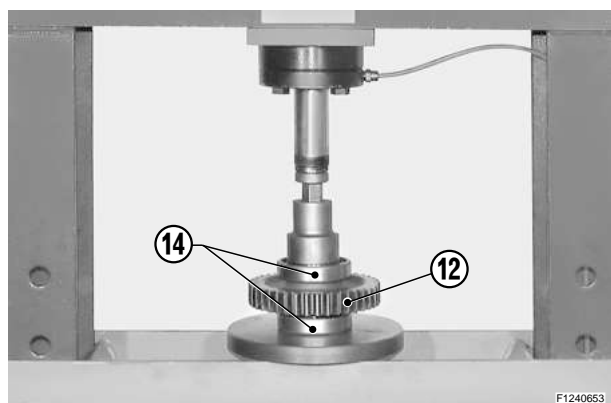
Find the value of the distance washers (23) and (24) and insert the thrust blocks of the conical bearing of the pinion into the body of the reduction gear (11) (See «HOW TO INSTALL AND ADJUST THE BEVEL PINION»).
Using tool **T7** insert the snap ring (25) previously lubricated with grease.



GB

c

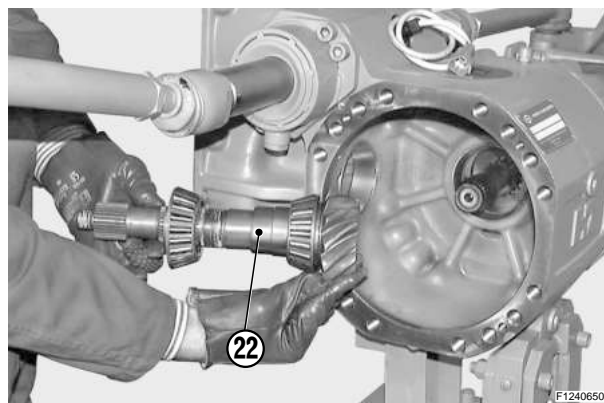
With tools **T28C**, **T28D** and **T28B** connected to a press, insert the complete pinion assembly (20).



GB

e

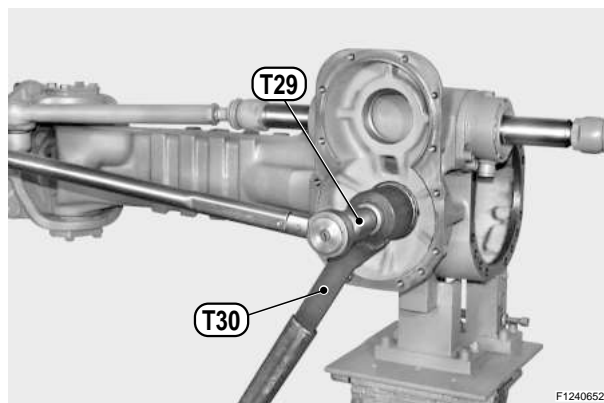
Using a press, fit the bearings (14) and the distance piece (16) on the upper gear (12).
CAUTION! The distance piece (16) must be positioned between the outer bearing and the gear.



GB

b

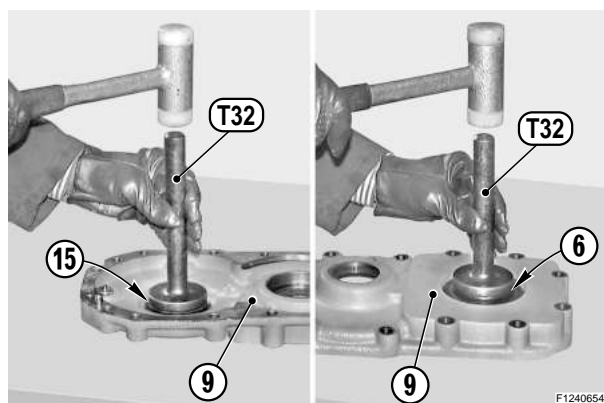
Assemble the pinion assembly as shown in the picture, checking that distance piece (22) is correctly oriented.
NOTE. Apply grease to the outer surface of the distance piece (22).



GB

d

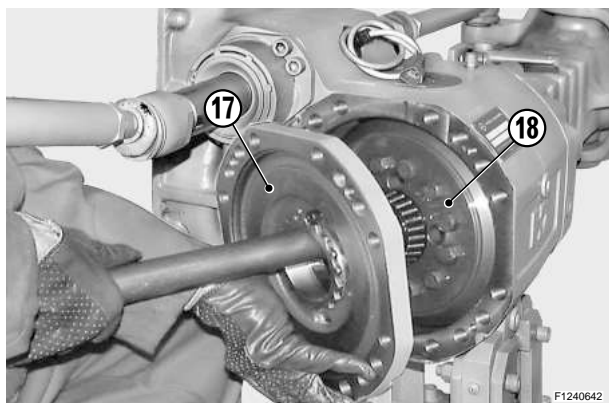
Apply Loctite 242 to the thread of the pinion and screw the ring nut (19). Engage special wrench **T30** on the ring nut and apply bar-hold **T29** to the pinion (20). Tighten the ring nut (19) following the appropriate procedure (See «HOW TO INSTALL AND ADJUST THE BEVEL PINION») and check that torque is 170 – 220Ncm.



GB

f

Grease snap rings (15) and (6); position the snap rings in the cover (9) using tool **T32**.



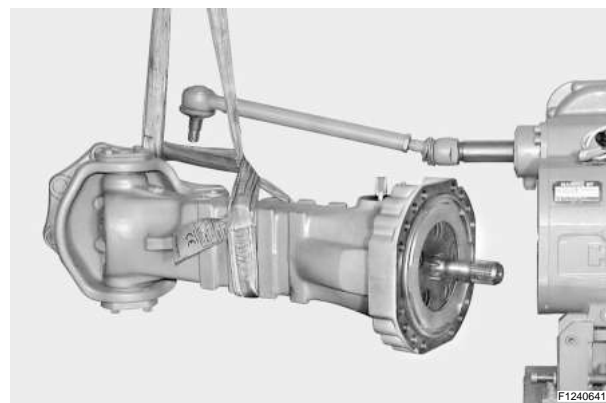
GB

a

Re-install the differential unit (18) and the intermediate cover (17).

CAUTION! If the crown has been replaced, reinstate clearances.

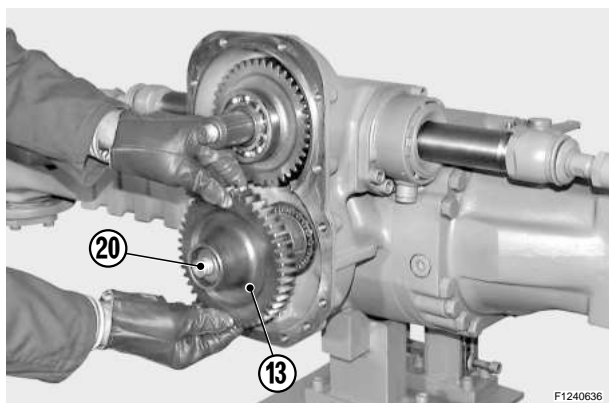
For details, see «HOW TO ASSEMBLE AND ADJUST THE DIFFERENTIAL UNIT».



GB

b

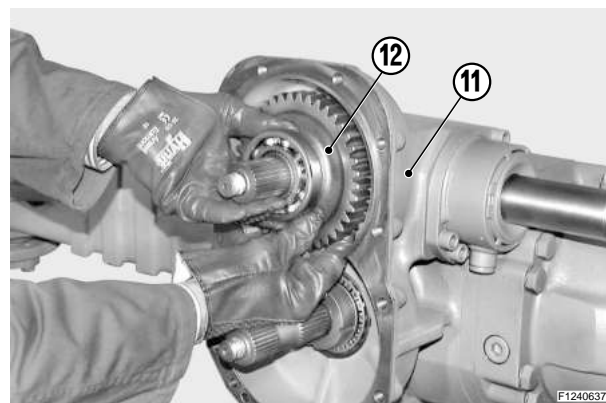
Re-install the complete arm checking flatness and blocking the arm by keeping to the appropriate procedures illustrated in section «HOW TO ASSEMBLE THE BRAKING UNITS». Also connect the steering bar.



GB

c

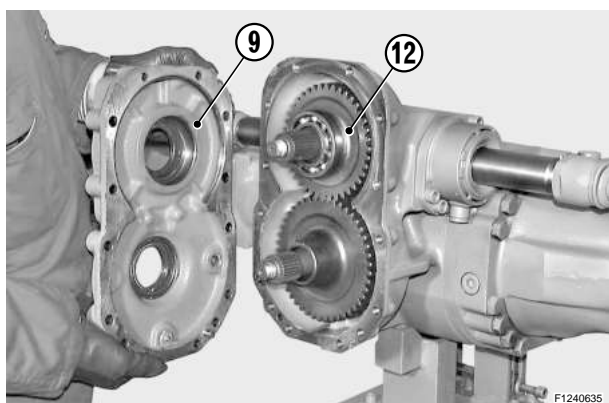
Fit the lower gear (13) onto the pinion (20).



GB

d

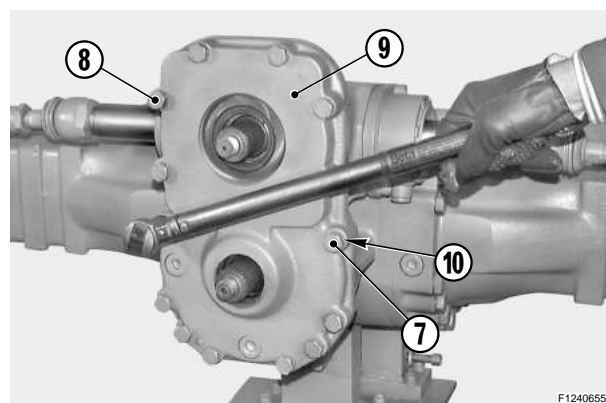
Insert the upper gear unit (12) into the body of the reduction gear (11).



GB

e

Apply Loctite 510 to the locking surface of the body of the reduction gear (11).
Lubricate snap rings (6) and (15); fit cover (9) and set cover (if necessary) by lightly tapping with a plastic hammer.



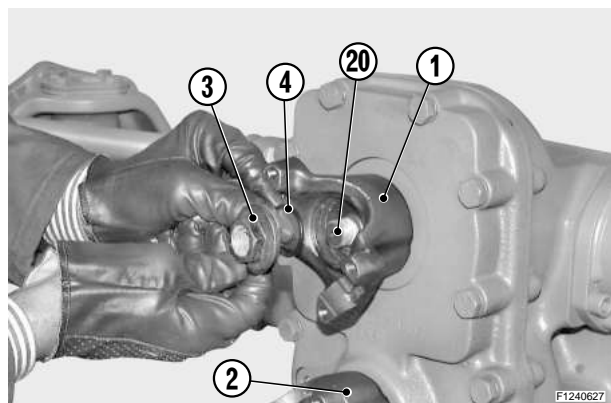
GB

f

Block cover (9) with screws (7) and (8) and relative washers (10). Tighten using the criss-cross method.
Torque wrench setting: 82–91 Nm



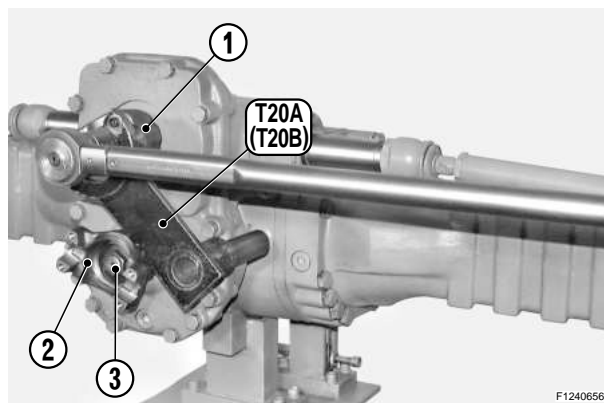
HOW TO ASSEMBLE INCORPORATED REDUCTION GEAR AND PINION - ASSEMBLAGGIO RIDUTTORE INTEGRATO (602) - INTEGRIERTER REDUZIERER MONTIEREN (602) - ASEMBLAJE REDUCTOR INCORPORADO Y PINON - MONTAJE REDUCTEUR INTEGRE (602)



GB

a

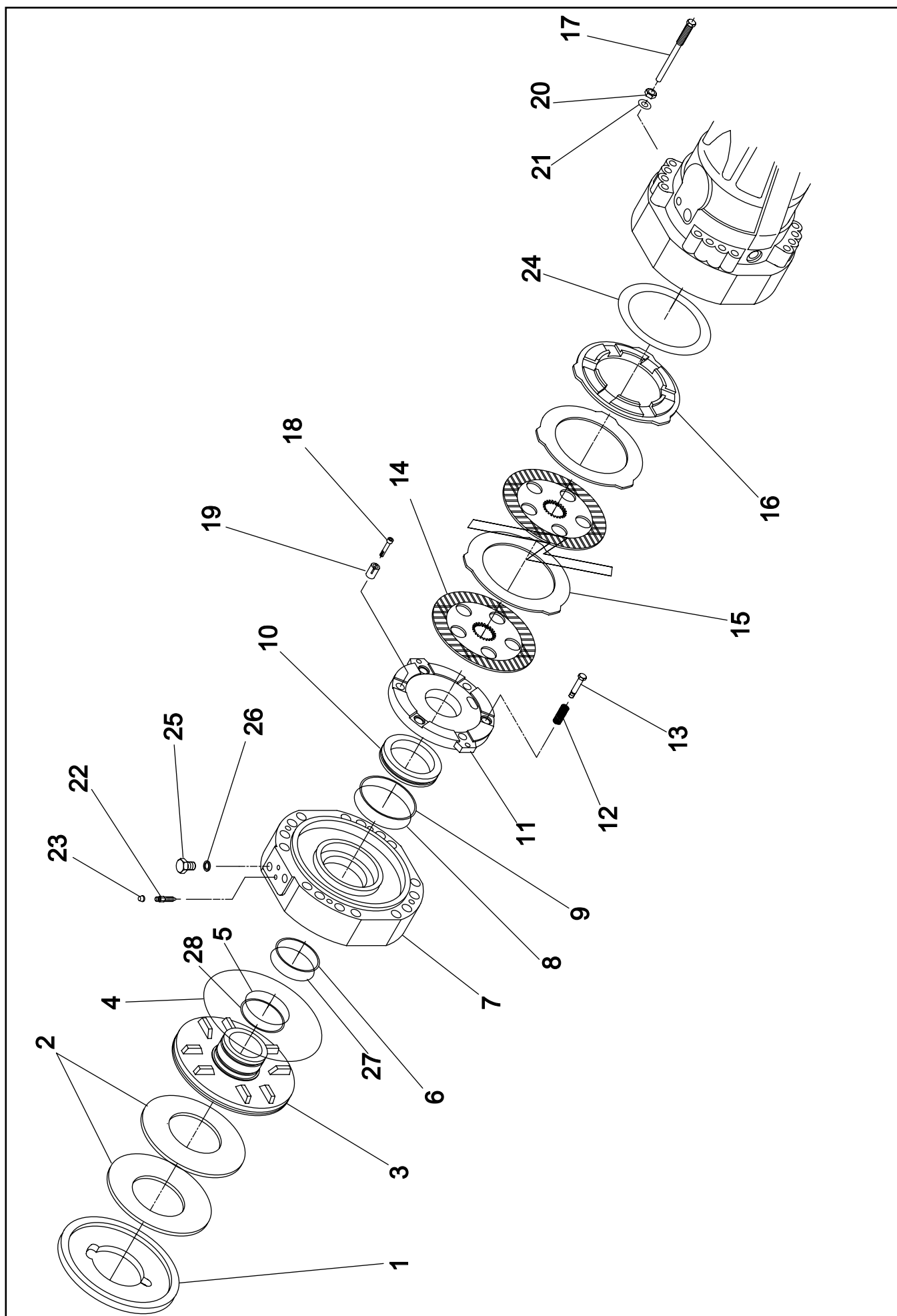
Fit the upper (1) and lower (2) flanges.
Apply Loctite 242 to the threaded portion of pinion (20) and upper gear (12). Fit O-rings (4) and nuts (3).

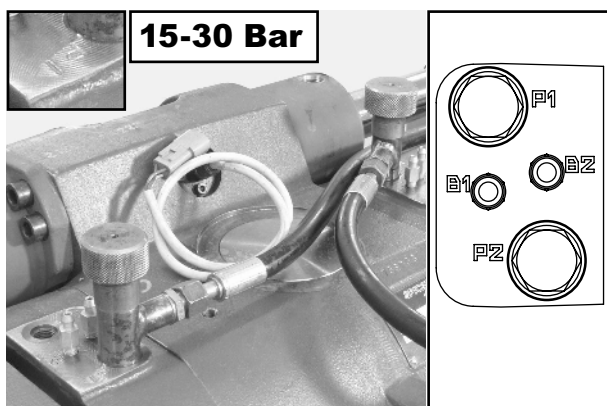


GB

b

Apply tool **T20A** (or **T20B**) to flanges (1) and (2) and tighten nuts (3) using a dynamometric wrench.
Torque wrench setting: 280 – 310 Nm



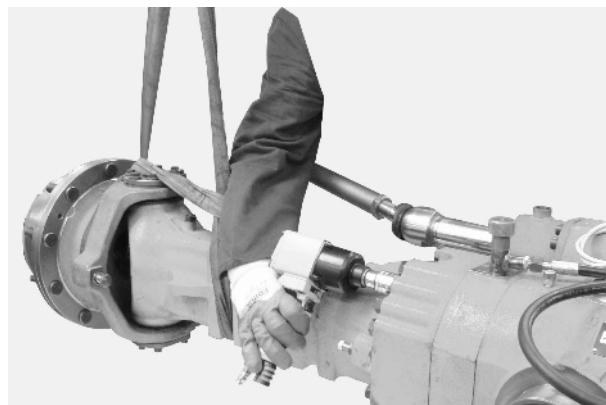


GB

a

ADJUSTING THE BRAKES

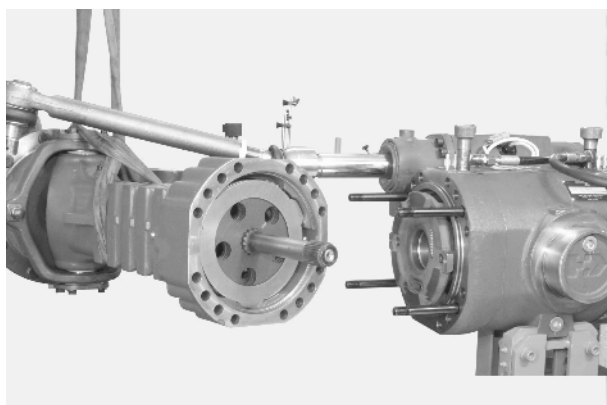
Connect an external pump to the union piece " P1 " of the negative brake and introduce a pressure of 15 - 30 bar to eliminate the pressure of the Belleville washers (2).



GB

b

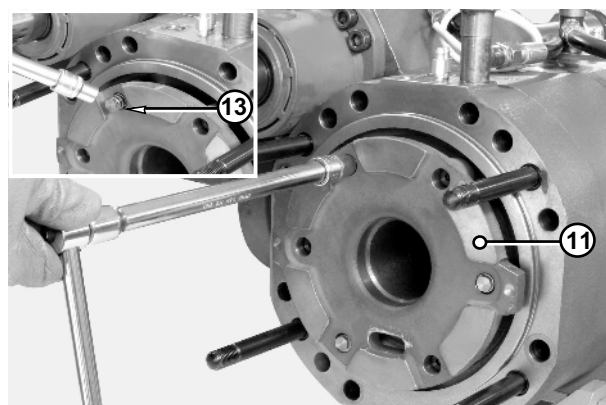
Sling the arm to be removed and connect it to a hoist.
Loosen and remove screws (17) .



GB

c

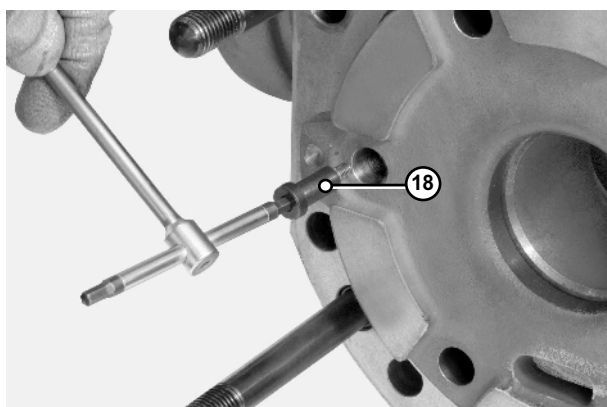
Remove arm together with brakes and axle shafts; lay down the arm vertically.
Release pressure.



GB

d

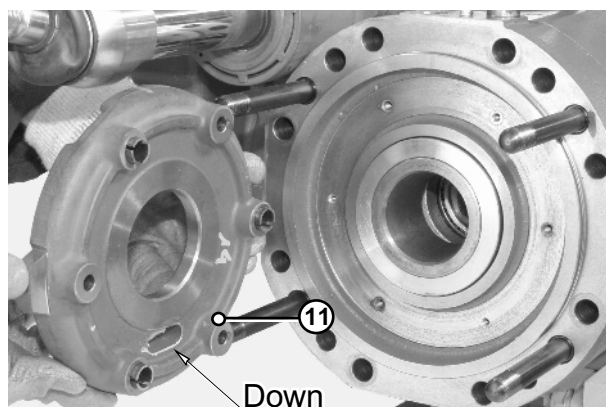
Remove the reversal springs (13) from the piston (11).



GB

e

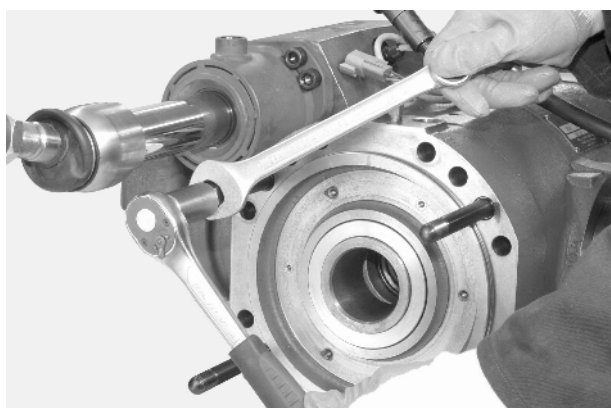
Remove the pin screws (18) guiding the piston (10).
CAUTION! If the screws are to be replaced, note down the different colours for the different brake gaps.



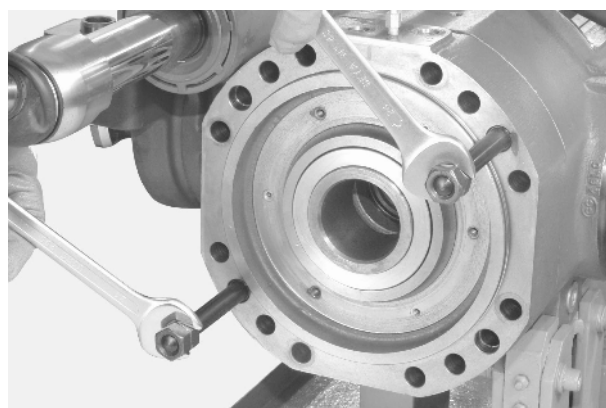
GB

f

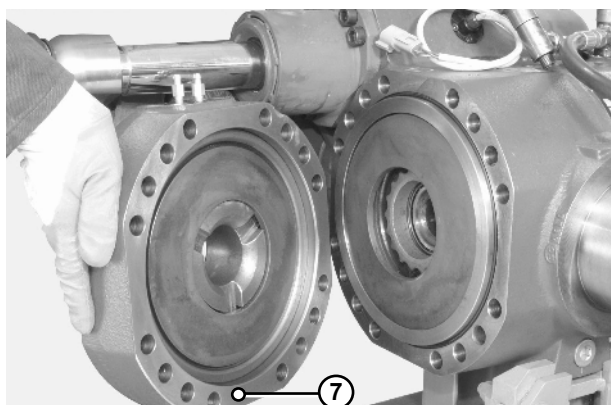
Note down their order of assembly and remove the countervasher (11).



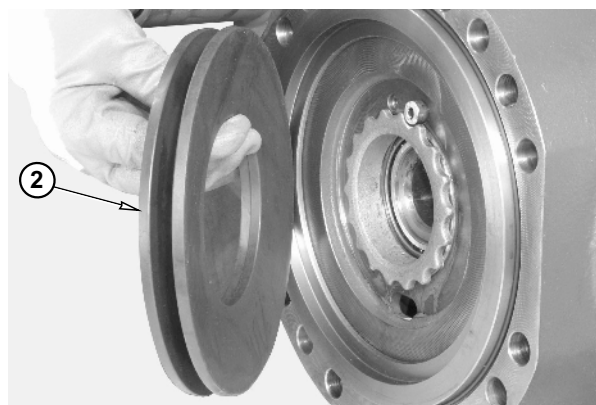
Loose the studs and remove two of them.



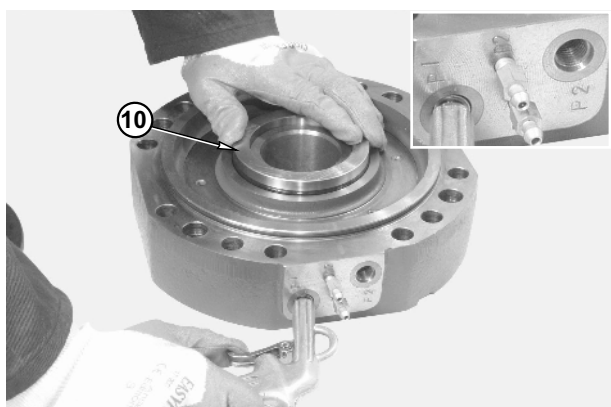
Remove the studs



Move the cylinder (7) outwards while .



Remove the Belleville washers (2) and note down direction of assembly.



Slowly introduce low-pressure compressed air through the connection member for the service brake, in order to extract the piston (10).

CAUTION! Hold the piston (10) back, as it may be suddenly ejected and damaged.



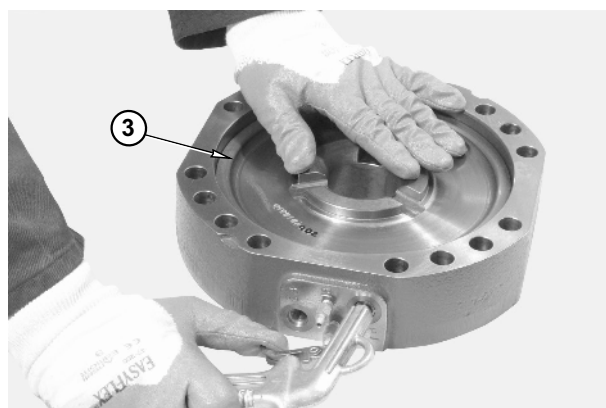
NOTE. The O-rings must be replaced each time the unit is disassembled.



GB

a

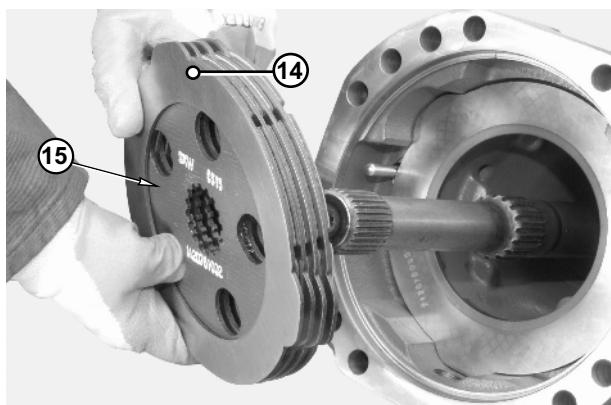
Note down their order of assembly and remove negative piston sign the position.



GB

b

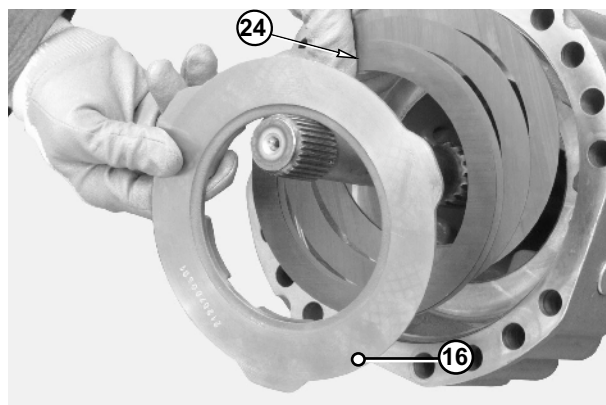
Slowly introduce low-pressure compressed air through the connection member for the negative brake, in order to extract the piston (3).
CAUTION! Hold the piston (3) back, as it may be suddenly ejected and damaged.



GB

c

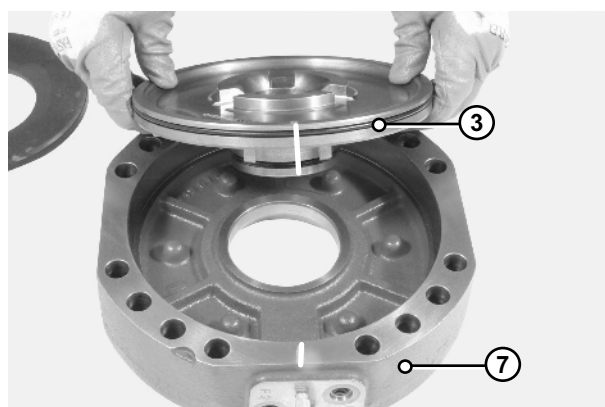
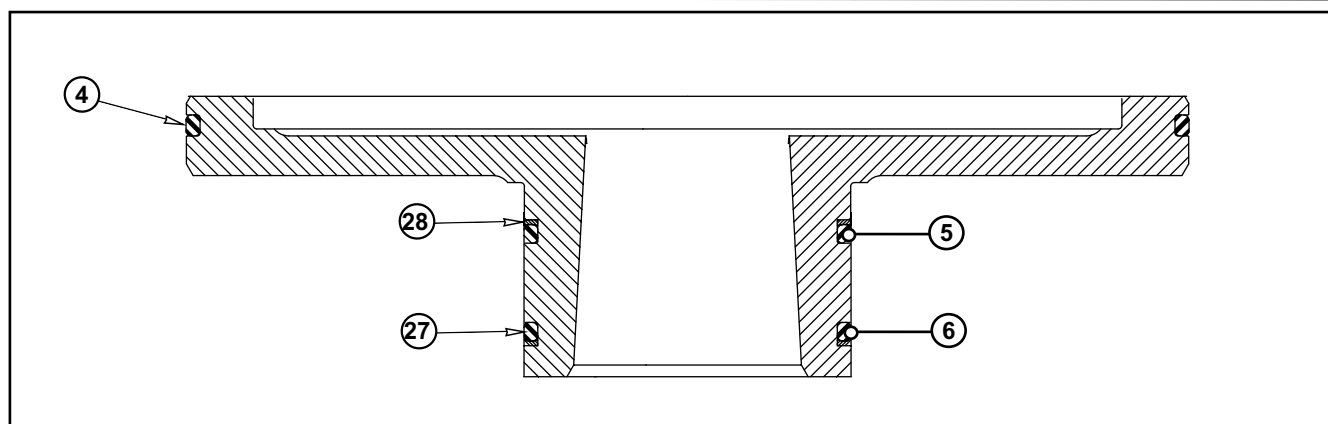
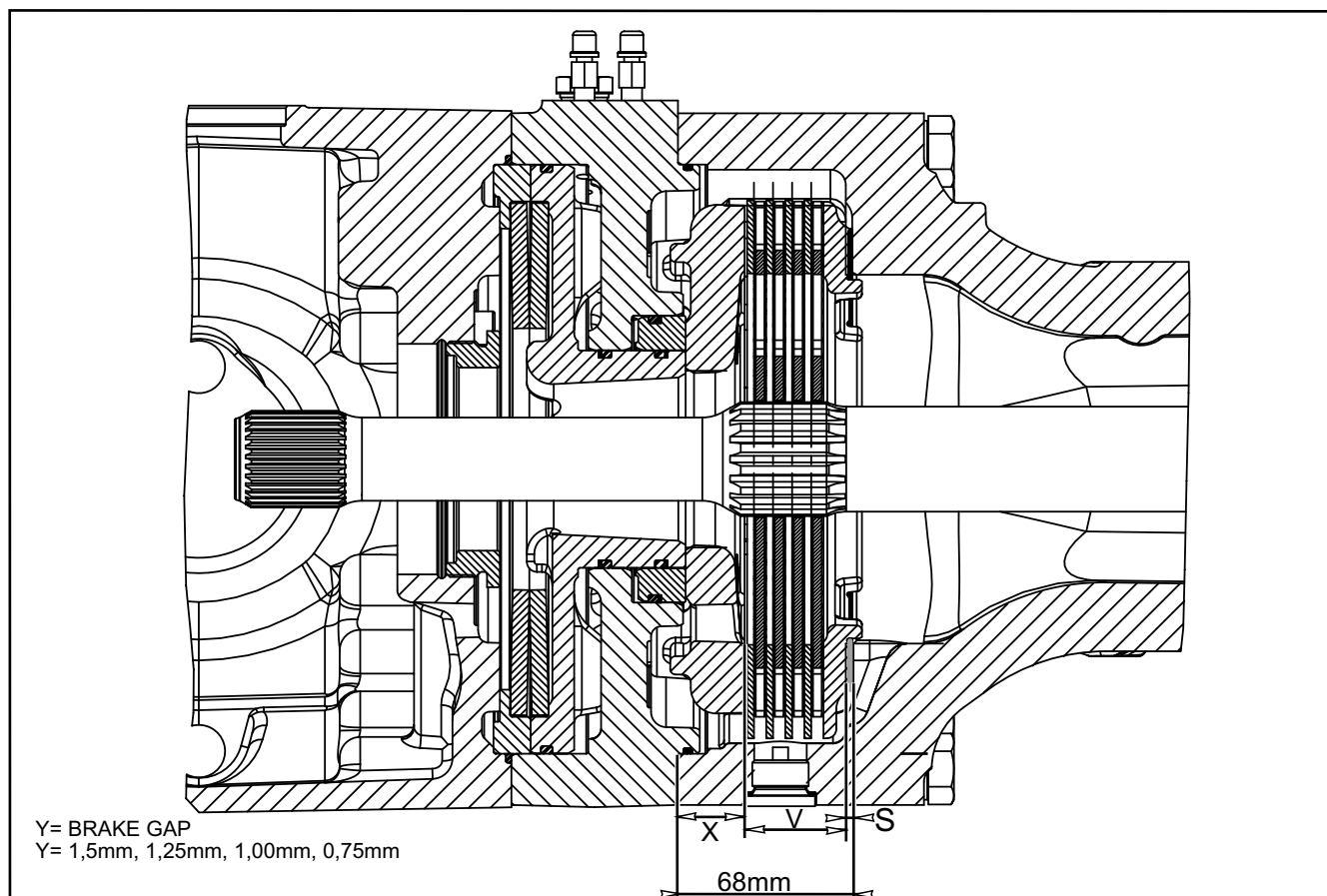
Remove braking discs (14) and (15), noting down direction of assembly.
NOTE. If disks are not to be replaced, avoid changing their position.



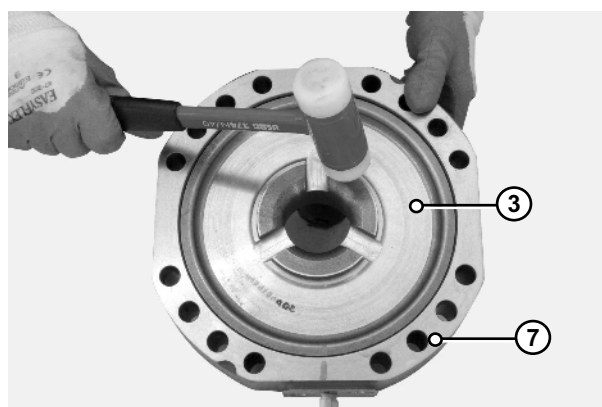
GB

d

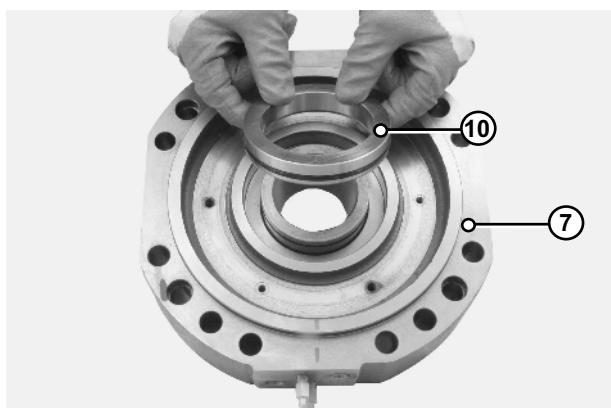
Remove braking discs (16) and shims (24), noting down direction of assembly.
NOTE. If disks are not to be replaced, avoid changing their position.



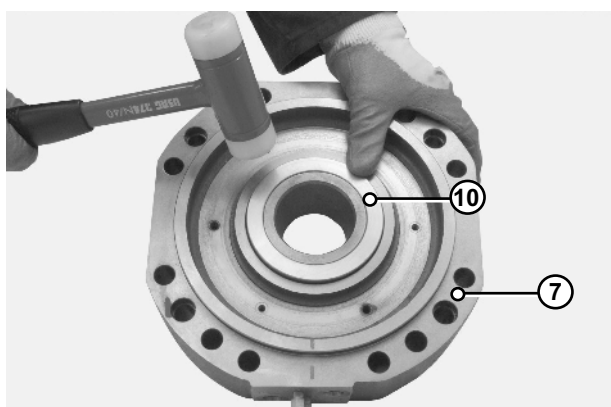
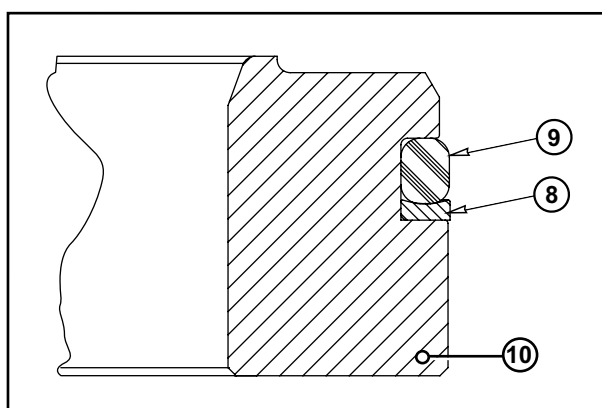
Fit O-rings (4)(28)(27)(5)(6) onto the piston (3).
Lubricate the piston and the O-rings and install the unit into the cylinder (7).



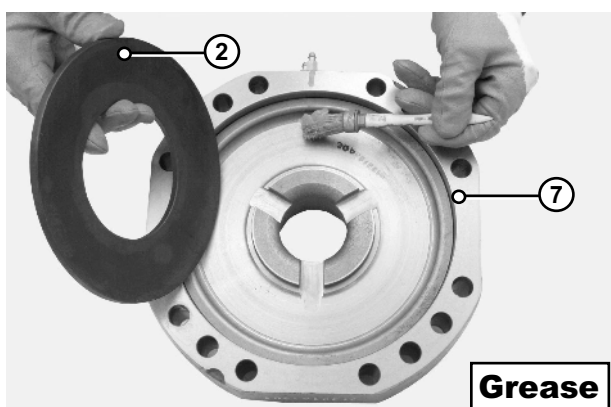
Using a plastic hammer, ram the piston (3) into the cylinder (7).
NOTE. Lightly hammer all around the edge in an alternate sequence.



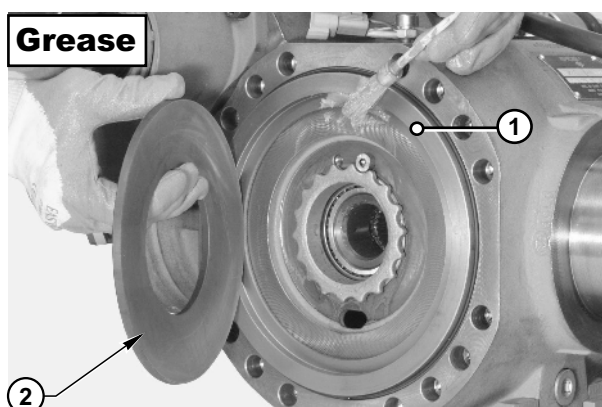
Fit O-rings (9) and (8) onto the piston (10).
Lubricate the piston and the O-rings and install the unit into the cylinder (7).



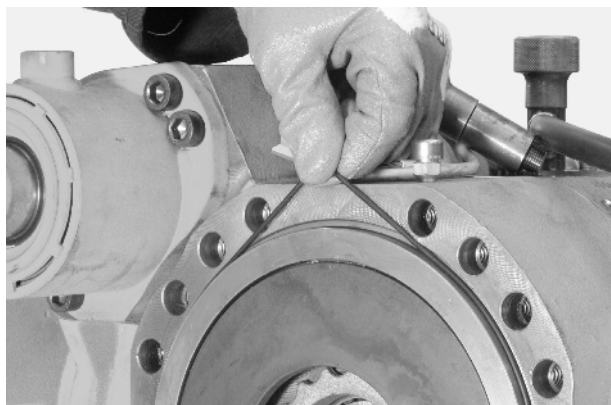
Using a plastic hammer, ram the piston (10) into the cylinder (7).
NOTE. Lightly hammer all around the edge in an alternate sequence.



Position the Belleville washers (2) and engage the cylinder (7).
NOTE. Check the sense of direction of washers (7) and relative centring.



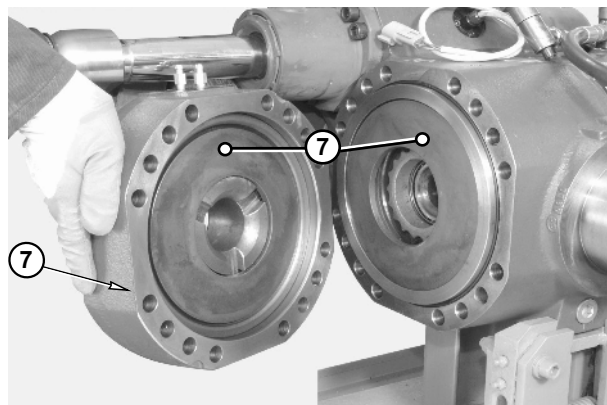
Position the Belleville washers (2) and engage the cylinder (1).
NOTE. Check the sense of direction of washers (2) and relative centring.



GB

a

Check integrity and position of the cylinder's O-ring.



GB

b

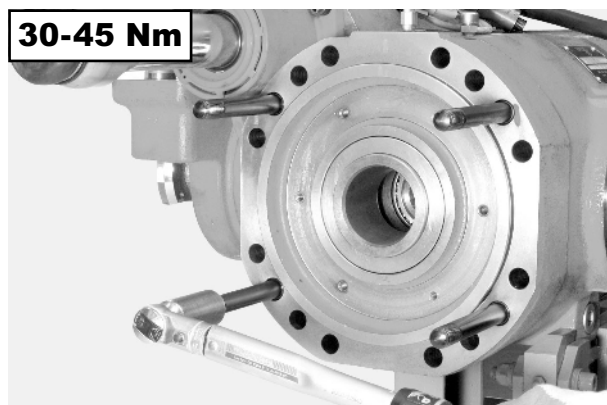
Position the Belleville washers (2) and engage the cylinder (7).
NOTE. Check the sense of direction of washers (2) and relative centring.



GB

c

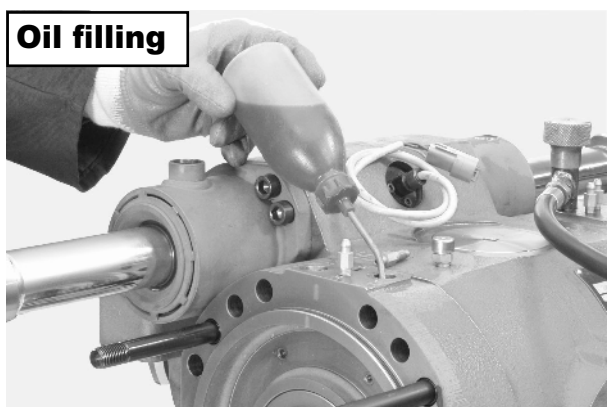
Lock the cylinder.



GB

d

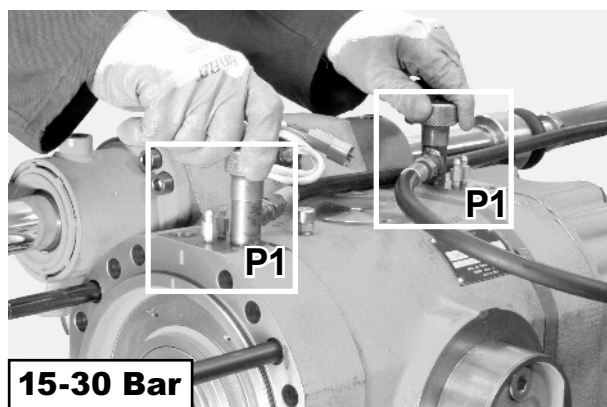
Tightening the studs with a dynamometric wrench set to a torque of 30 ± 45 Nm.



GB

e

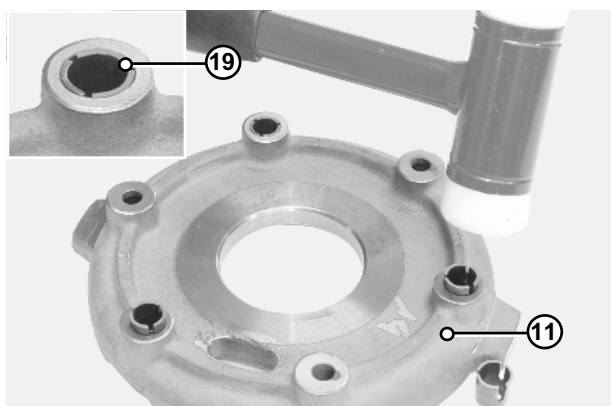
Oil filling



GB

f

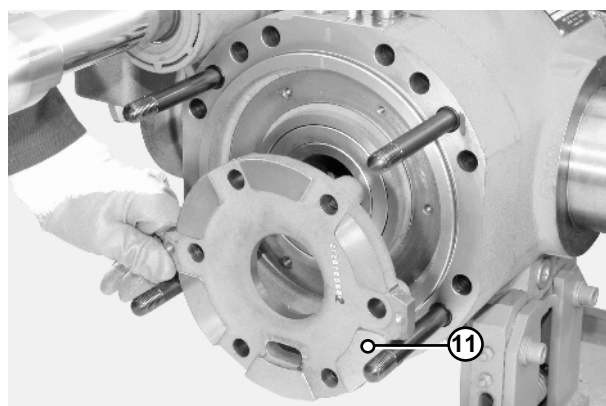
Connect an external pump to the negative brake and introduce pressure to 15 - 30 bar.



GB

a

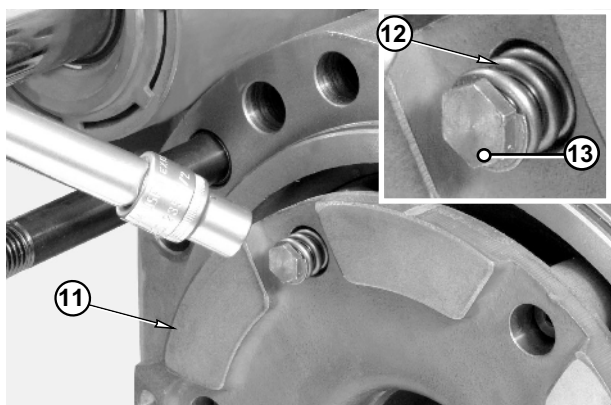
Insert the stroke automatic regulation springs (19); place them in line with the piston (11).



GB

b

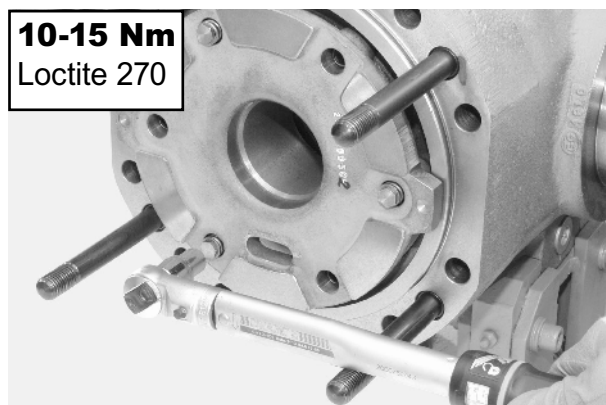
Insert the intermediate disk (11).



GB

c

Fit the reversal springs (12)(13) on the piston (11).



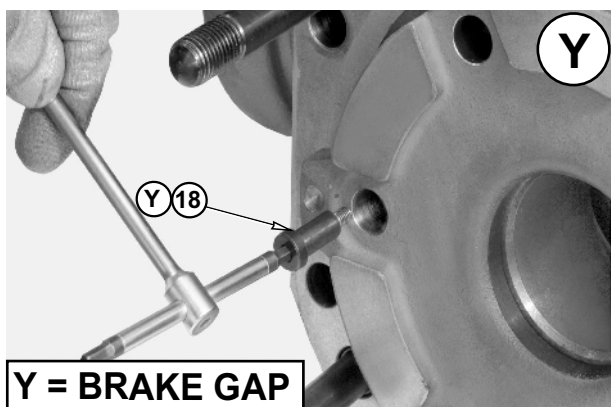
10-15 Nm
Loctite 270



GB

d

Apply LOCTITE 270 to the thread of the piston adjustment nut.
Tighten with torque wrench setting of 10 - 15 Nm



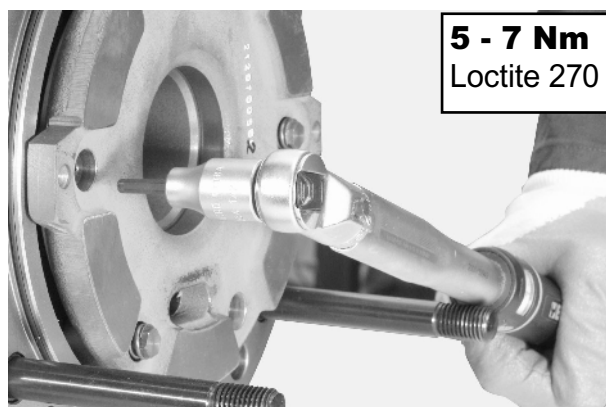
Y = BRAKE GAP



GB

e

Y=brake gap
0,75mm 1,00mm 1,25mm 1,50mm
depending on axle configuration.



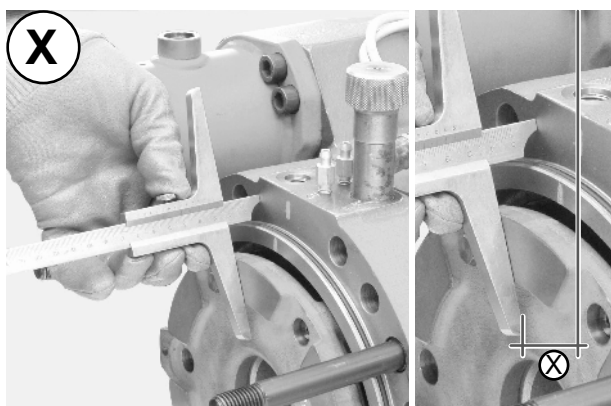
5 - 7 Nm
Loctite 270



GB

f

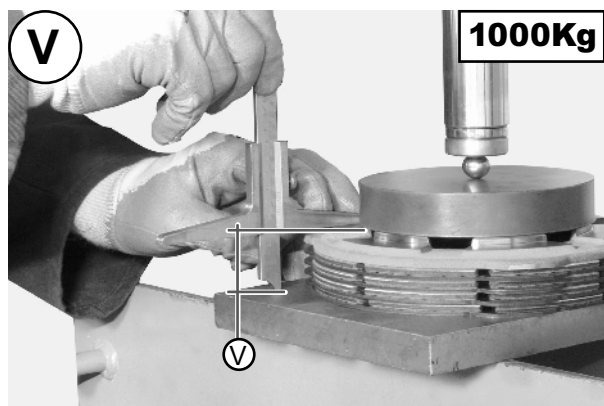
Fit the pin screws making sure that they are all of the same colour.
Apply Loctite 270 to the thread.
Torque wrench setting: 5±7 Nm.



GB

a

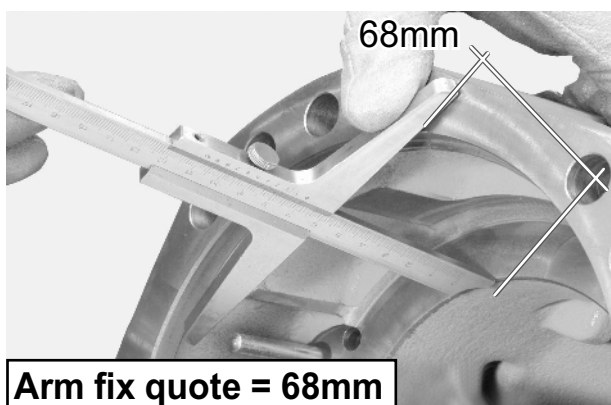
Take the measure from the surface of the intermediate disk to the cover sealing surface with 30 bar of pressure introduced.
EXAMPLE: 25.4 mm



GB

b

Put the brake disc pack including the shim under a press, load with 1000 kg and take the measure "V".
EXAMPLE: V = 40 mm



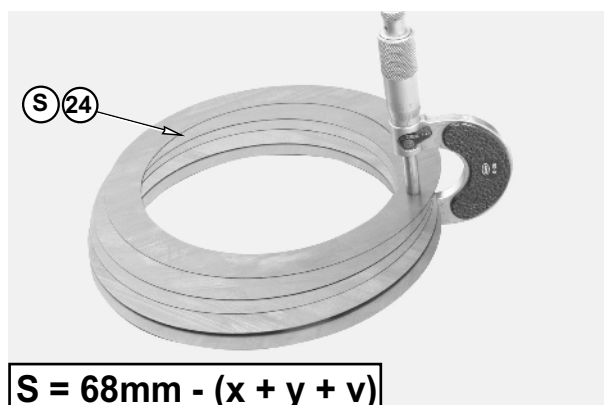
Arm fix quote = 68mm



GB

c

Arm fix quote = 68 mm



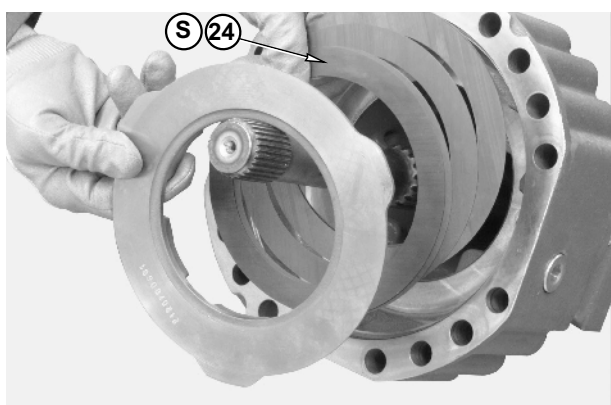
$S = 68\text{mm} - (x + y + v)$



GB

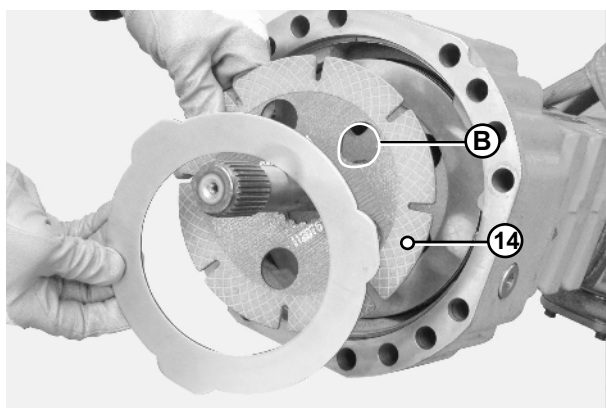
d

$S = 68\text{ mm} - (x + y + v) =$ Thickness of shims to insert under the shim washer.



GB

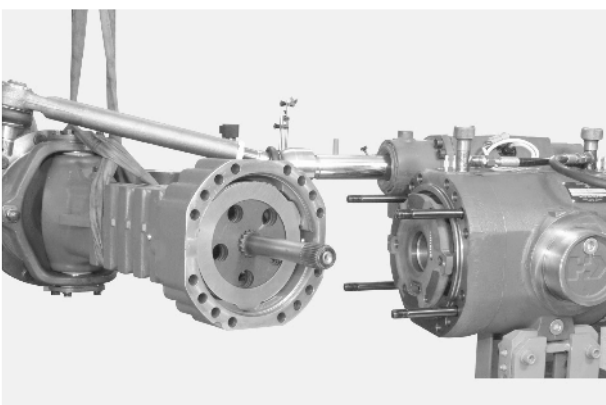
e



GB

a

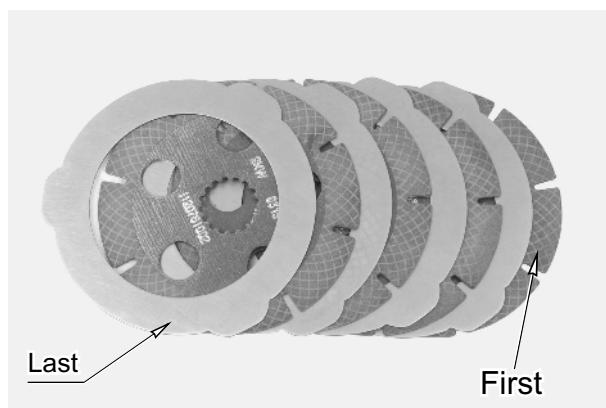
Slightly lubricate the braking disks (14) and fit them in the arm following the correct sequence; orient them so that the oil circulation holes and the marks "B" are perfectly lined up.
NOTE. When installing the steel discs, the slot corresponding to the oil level cap should always be kept free.



GB

c

Check integrity and position of the arm's O-ring; install the complete arm.
NOTE. To assist axle shaft centring, slightly move the wheel hub.



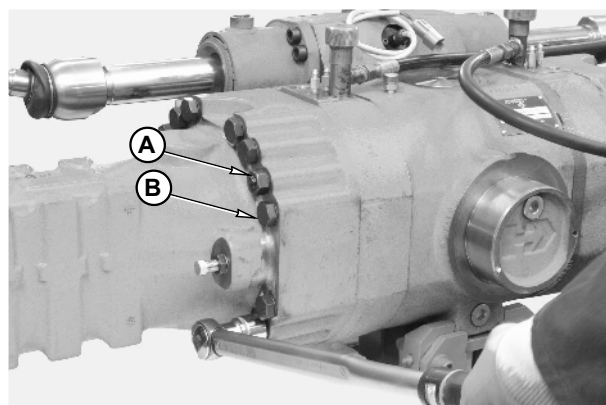
Last

First



GB

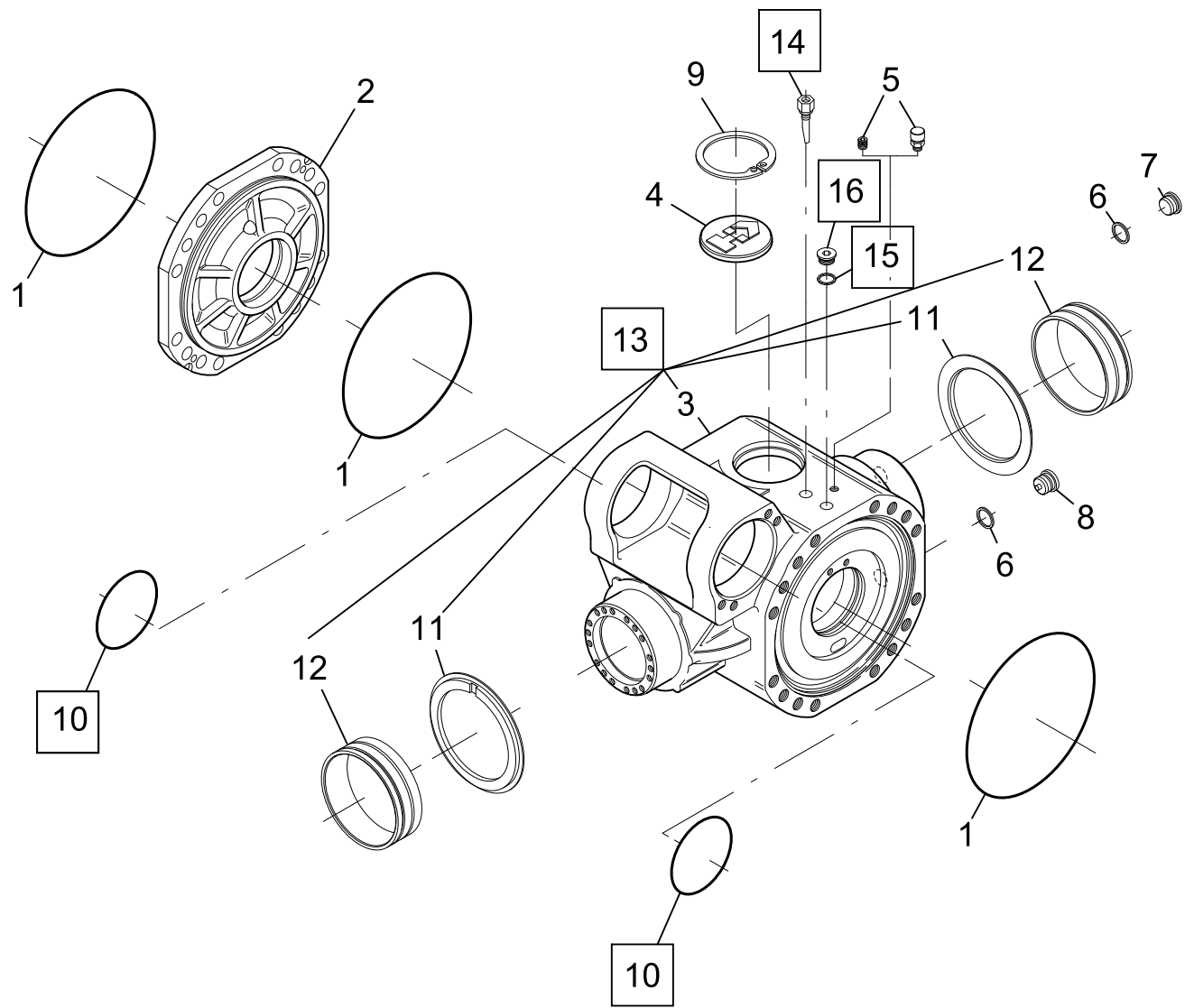
b



GB

d


Torque wrench setting:
A = 200 Nm
B = 283 Nm.
NOTE. Tighten using the criss-cross method.



13 Optional KIT = 3+11+12

10 14 15 16

OPTIONAL

	DANA ITALIA S.P.A.		CENTRAL HOUSING	
	TECHNICAL DOCUMENTATION	Type 212	Tav. 212-01-0002	

For position mounting cover number 2 see sketch of bevel gear set on page 1



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIÉCES DE RECHANGE
LIST OF SPARE PARTS

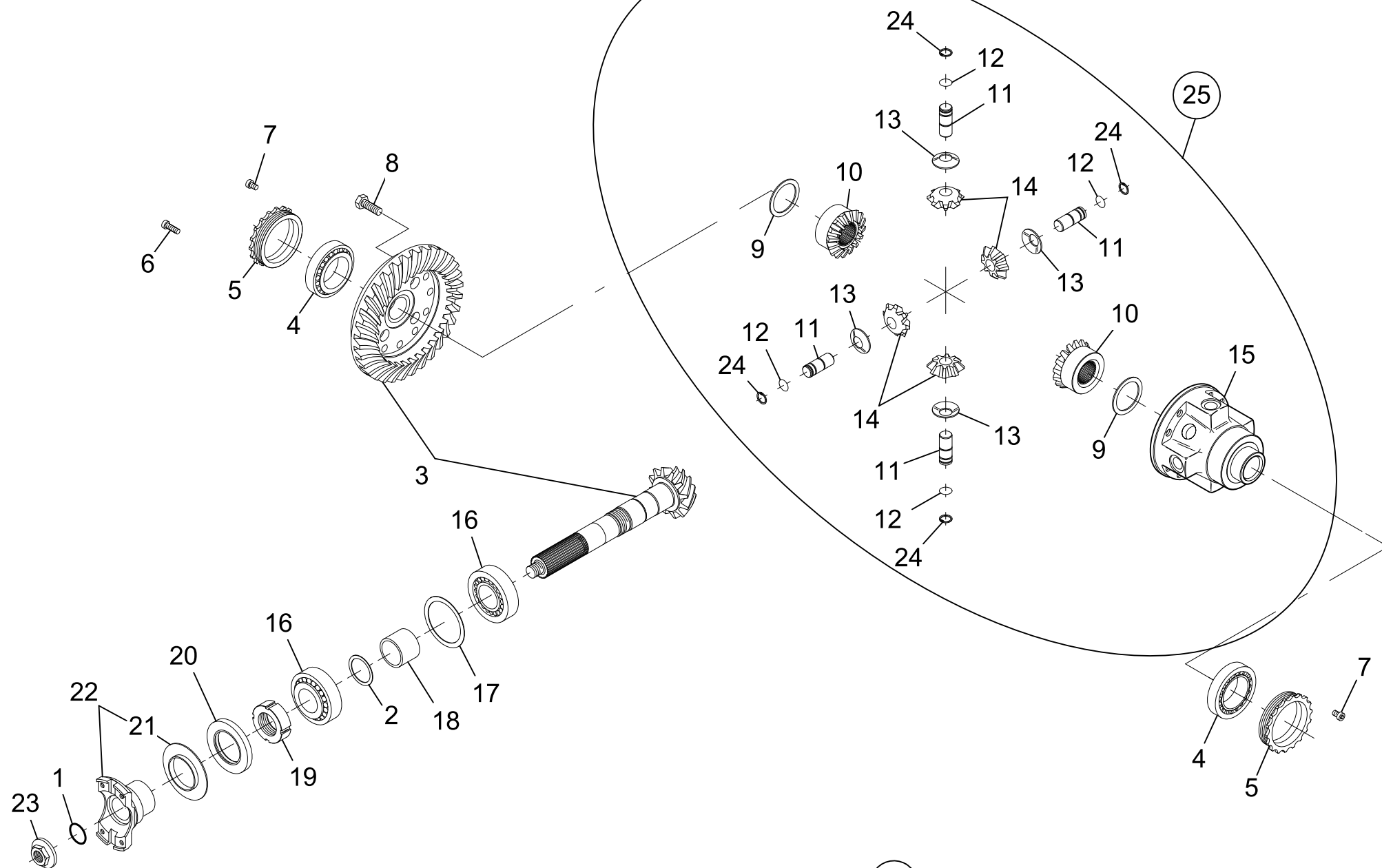
Descr. CENTRAL HOUSING

Drawing
212-01-0002

Page N. 1

Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-01/88
1	001.05.1178	3	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
2	112.01.074.01	1	COPERCHIO COUVERCLE COVER TAPA DECKEL		
3	212.01.001.35	1	SCATOLA CARTER HOUSING CAJA GEHAEUSE		
4	171.01.015.04	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
5	112.01.018.06	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
6					
7	112.01.610.01	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
8	112.01.610.03	1	TAPPO MAGNETICO BOUCHON MAGNETIQUE MAGNETIC PLUG TAPÓN MAGNÉTICO MAGNETSTOPFEN		
9	002.02.0088	1	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



25 Kit = 9+10+11+12+13+14+15+24



DANA ITALIA S.P.A.

DIFFERENTIAL

TECHNICAL DOCUMENTATION

Type **212**

Tav. **212-04-0002**

See mounting position of bevel crown wheel on sketch page 1



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

Descr. DIFFERENTIAL

Drawing
212-04-0002

Page N. 1

Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
1	001.05.3158	1	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
2	123.04.400.02	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
3	112.04.500.58	1	COPPIA CONICA COUPLE CONIQUE BEVEL GEAR SET PAR CONICO KEGEL- UND TELLERRADPAAR		
4	725.04.011.02	2	CUSCINETTO A RULLI CONICI ROULEMENT A R. CONIQUES TAPER ROLLER BEARING COJINETE DE BOLAS KEGELROLLENLAGER		
5	112.04.016.02	2	GHIERA ECROU RING NUT ABRAZADERA WELLENMUTTER		
6	016.04.0417	4	VITE A TESTA CILINDRICA VIS A TETE CYLINDRIQUE CYLINDER BOLT TORNILLO DE CABEZA CILÍNDRICA ZYLINDERSCHRAUBE		
7	016.30.4162	2	VITE VIS BOLT TORNILLO SCHRAUBE		
8	016.28.3390	12	VITE VIS BOLT TORNILLO SCHRAUBE		



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIÉCES DE RECHANGE
LIST OF SPARE PARTS

Descr. DIFFERENTIAL

Drawing
212-04-0002

Page N. 2

Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
9	112.04.007.01	2	RONDELLA DI RASAMENTO RONDELLE FRICTION WASHER ARANDELA DE FRICCIÓN ANLAUFSCHEIBE		
10	112.04.005.09	2	PLANETARIO PLANETAIRE DIFFERENTIAL SIDE GEAR PLANETARIO AUSGLEICHSWELLENRAD		
11	112.04.706.02	4	PERNO AXE PIN PERNO BOLZEN		
12	002.06.3163	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
13	112.04.008.01	4	RONDELLA DI RASAMENTO RONDELLE FRICTION WASHER ARANDELA DE FRICCIÓN ANLAUFSCHEIBE		
14	112.04.004.05	4	SATELLITE SATELLITE DIFFERENTIAL PINION ENGRANAJE SATÉLITE AUSGLEICHSCHEGELRAD		
15	112.04.001.04	1	SCATOLA DIFFERENZIALE CARTER DIFFERENTIEL DIFFERENTIAL CARRIER CAJA DE DIFERENCIAL DIFFERENTIALGEHAEUSE		
16	005.10.0162	2	CUSCINETTO A RULLI CONICI ROULEMENT A R. CONIQUES TAPER ROLLER BEARING COJINETE DE BOLAS KEGELROLLENLAGER		



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

Descr. DIFFERENTIAL

Drawing
212-04-0002

Page N. 3

Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
17	112.04.400.04	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
18	112.04.009.02	1	DISTANZIALE ENTRETOISE SPACER DISTANCIADOR DISTANZRING		
19	953.04.012.01	1	GHIERA ECROU RING NUT ABRAZADERA WELLENMUTTER		
20	001.03.3221	1	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
21					
22	112.04.712.03	1	FLANGIA BRIDE FLANGE BRIDA FLANSCH		
23	357.14.139.02	1	DADO ECROU NUT TUERCA MUTTER		
24	002.14.3244	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
25	112.04.702.03	1	DIFFERENZIALE DIFFERENTIEL DIFFERENTIAL DIFERENCIAL DIFFERENTIAL		



Long

OPTIONAL

Brake with anular piston

OPTIONAL

DANA ITALIA S.P.A.

HUB REDUCTION

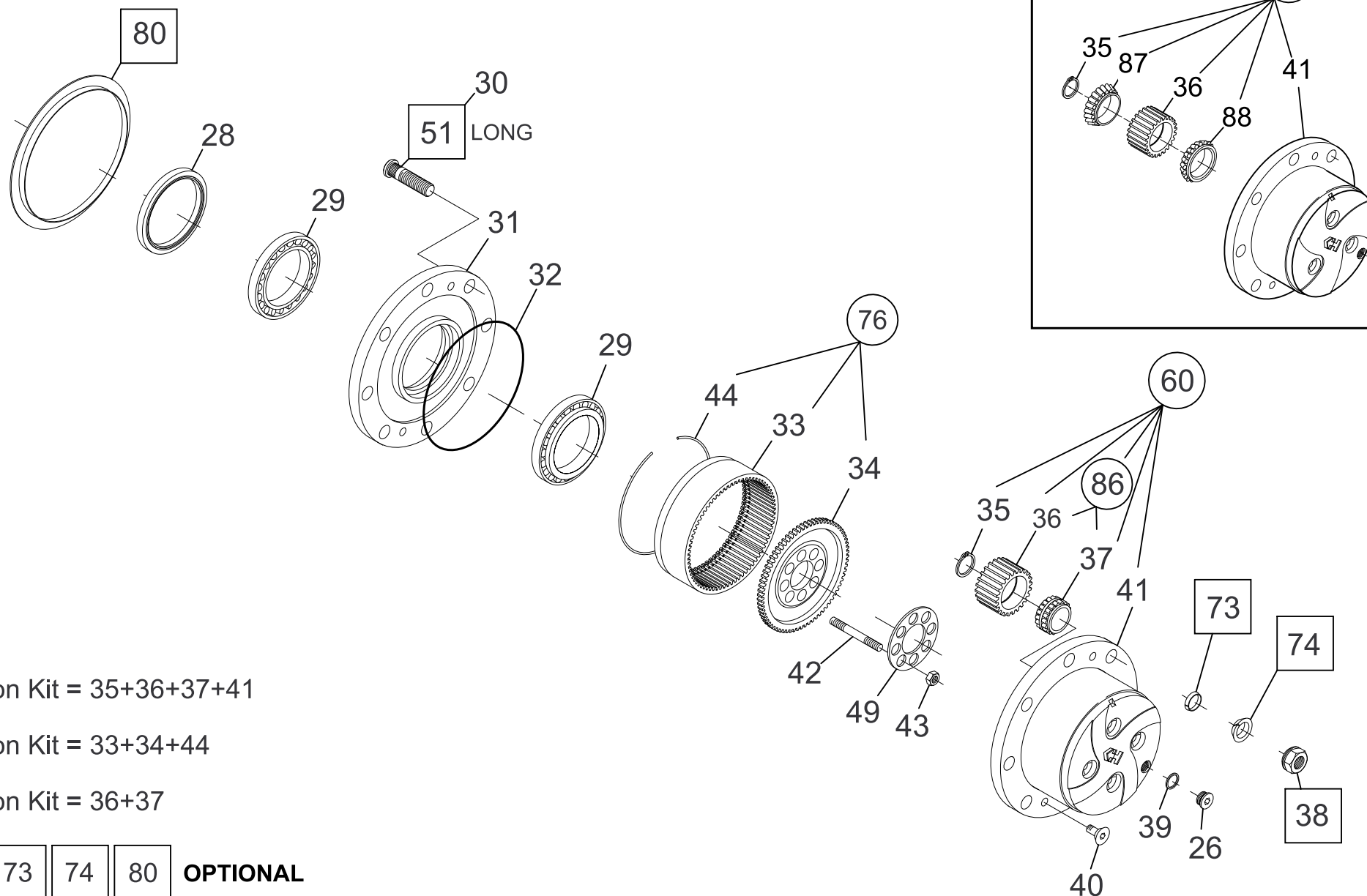
TECHNICAL DOCUMENTATION

Type **212**

Tav. **212-06-0002 1 of 2**

(65) Kit = 22+12 (6) Kit = 7+8+10+50
 (72) Kit = 45+46 (66) Kit = 27+12

WITH TAPERED BEARINGS



60 Position Kit = 35+36+37+41

76 Position Kit = 33+34+44

86 Position Kit = 36+37

38 51 73 74 80 **OPTIONAL**



DANA ITALIA S.P.A.

HUB REDUCTION

TECHNICAL DOCUMENTATION

Type **212**

Tav. **212-06-0002 2 of 2**



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

Descr. HUB REDUCTION

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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
1	006.03.0197	2	DADO ECROU NUT TUERCA MUTTER		
2	016.13.3271	2	VITE VIS BOLT TORNILLO SCHRAUBE		
3					
4	112.06.070.04	24	VITE VIS BOLT TORNILLO SCHRAUBE		
5	011.17.2952	8	RONDELLA RONDELLE WASHER ARANDELA SCHEIBE		
6	212.06.700.01	2	BUSSOLA MANCHON DE REDUCTION REDUCTION BUSHING CASQUILLO ZWISCHENBUCHSE		
7	729.06.009.01	2	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
8	005.01.0121	2	CUSCINETTO A SFERE ROULEMENT A BILLES BALL BEARING COJINETE DE BOLAS RILLENKUGELLAGER		
9	002.01.0078	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIÉCES DE RECHANGE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
10	001.05.1389	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
11	212.06.624.08	2	DOPPIO GIUNTO CARDANICO DOUBLE JOINT CARDAN DOUBLE UNIVERSAL JOINT JUNTA CARDAN DE DOBLE CRUCETA KARDAN-DOPPELGELENKWELLE		
12	290.06.020.03	1 1	BRONZINA DOUILLE THRUST BUSHING BUJE ANLAUFBUCHSE		
13	212.06.023.03	2	BOCCOLA DOUILLE BUSHING CASQUILLO GUÍA BUCHSE		
14	016.34.4287	24	VITE VIS BOLT TORNILLO SCHRAUBE		
15	212.06.007.04	2	COPERCHIO COUVERCLE COVER TAPA DECKEL		
16	734.07.015.01	2	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
17	008.01.0213	2 2	INGRASSATORE GRAISSEUR GREASE FITTING ENGRASADOR KEGEL - SCHMIERNIPPEL		



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DISTINTA PEZZI DI RICAMBIO
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
18	223.06.702.01	2	PERNO SNODO PIVOT DE DIRECTION PIVOT PIN PERNO DE DIRECCIÓN ACHSSCHENKELBOLZEN		
19	223.06.701.02	2	PERNO SNODO PIVOT DE DIRECTION PIVOT PIN PERNO DE DIRECCIÓN ACHSSCHENKELBOLZEN		
20	213.06.006.03	2 2	ANELLO PARAPOLVERE BAGUE ANTI-POUSSIÈRE DUST EXCLUDER ANILLO DE POLVO STAUBABWEHRRING		
21	290.06.016.01	2	CUSCINETTO ROULEMENT BEARING COJINETE LAGER		
22					
23	213.06.015.01	2	ANELLO DI TENUTA JOINT D'ÉTANCHEITÉ SEAL ANILLO DE ESTANQUEIDAD DICHRING		
24					
25	112.01.610.03	2	TAPPO MAGNETICO BOUCHON MAGNETIQUE MAGNETIC PLUG TAPÓN MAGNÉTICO MAGNETSTOPFEN		
26	112.01.610.01	4	TAPPO BOUCHON PLUG TAPÓN STOPFEN		



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Technical documentation

DISTINTA PEZZI DI RICAMBIO
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
27					
28	212.06.055.01	2	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
29	112.06.109.02	4	CUSCINETTO A RULLI ROULEMENT A ROULEAUX ROLLER BEARING RODAMIENTO DE RODILLOS RILLENROLLENLAGER		
30	176.06.006.01	20	COLONNETTA GOIJON DE ROUE WHEEL STUD PRISIONERO RADBOLZEN		
31	112.06.053.03	2	MOZZO RUOTA MOYEU DE ROUE WHEEL HUB CUBO DE MAZA RADNABE		
32	001.05.1119	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
33	112.06.005.04	2	CORONA DENTATA COURONNE DENTEE RING GEAR CORONA DENTADA ZAHNKRANZ		
34	112.06.007.08	2	SUPPORTO PORTACORONA SUPPORT PORTE COURONNE RING GEAR SUPPORT SOPORTE DE CORONA HOHLRADTRAEGER		
35	002.14.3191	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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Technical documentation

DISTINTA PEZZI DI RICAMBIO
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LISTE DES PIECES DE RECHANGE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
36	112.06.006.06	8	SATELLITE (PLAN.) SATELLITE PLANET GEAR ENGRANAJE PLANETARIO PLANETENRAD		
37	730.06.026.04	8	CUSCINETTO ROULEMENT BEARING COJINETE LAGER		
38	006.08.2833	20	DADO A SEDE SFERICA ECROU DEMI-SPHERIQUE WHEEL NUT TURCA ASIANTA ESFÉRICA KUGELBUNDMUTTER		
39					
40	016.06.0442	4	VITE A TESTA CONICA VIS A TETE CONIQUE COUNTERSUNK BOLT TORNILLO DE CABEZA CONICA SENKSCRAUBE		
41	112.06.052.04	1	SUPPORTO SATELLITI SUPPORT SATELLITES PLANET GEAR CARRIER TAPA PORTASATÉLITES PLANETENGAEUSE		
42	112.06.025.03	20	PRIGIONIERO GOIJON STUD PRISIONERO STIFTSCHRAUBE		
43	006.22.4380	20	DADO ECROU NUT TUERCA MUTTER		
44	002.06.3193	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
45	213.06.011.01	4	VITE VIS BOLT TORNILLO SCHRAUBE		
46	006.05.1521	4	DADO ECROU NUT TUERCA MUTTER		
47					
48	212.06.043.03	2	BRACCIO CORPS D'ESSIEU AXLE CASE BRAZO ACHSKOERPER		
49	112.06.046.02	2	LAMIERA DI SICUREZZA TOLE DE SECURITE LOCKING PLATE BLOQUEO DE LA CUBIERTA SICHERUNGSBLECH		
50	002.02.0088	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
51					
52					
53					
54					



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DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIÉCES DE RECHANGE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
55					
56					
57	212.06.400.48	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
58					
59					
60	212.06.710.22	2	KIT SUPPORTO SATELLITI SUPPORT SATELLITES KIT PLANET GEAR CARRIER KIT TAPA PORTASATÉLITES KIT KIT PLANETENGEHÄUSE		
61	212.06.044.03	8	PRIGIONIERO GOUJON STUD PRISIONERO STIFTSCHRAUBE		
62	006.03.3208	8	DADO ECROU NUT TUERCA MUTTER		
63	001.05.1178	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		



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DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
64					
65	223.06.708.01	1	KIT SCATOLA SNODO SX BOITIER DE DIRECTION KIT G STEERING CASE KIT LH EJE DE ARTICULACIÓN KIT IZDA KIT GELENKGEHAEUSE LINKS		
66	223.06.709.01	1	KIT SCATOLA SNODO DX BOITIER DE DIRECTION KIT D STEERING CASE KIT RH EJE DE ARTICULACIÓN KIT DCHA GELENKGEHAEUSE KIT RECHTS		
67					
68					
69					
70					
71					
72	213.06.711.01	4	KIT VITE DI FERMO STERZO VIS D'ARRET BRAQUAGE KIT STEERING ADJUST BOLT KIT KIT TORNILLO DE TOPE DE LENKEINSCHLAGSCHRAUBE KIT		
73					



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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
74	212.06.707.08	2	SUPPORTO PORTACORONA SUPPORT PORTE COURONNE RING GEAR SUPPORT SOPORTE DE CORONA HOHLRADTRAEGER		
75					
76					
77					
78					
79					
80					
81					
82					
83					



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

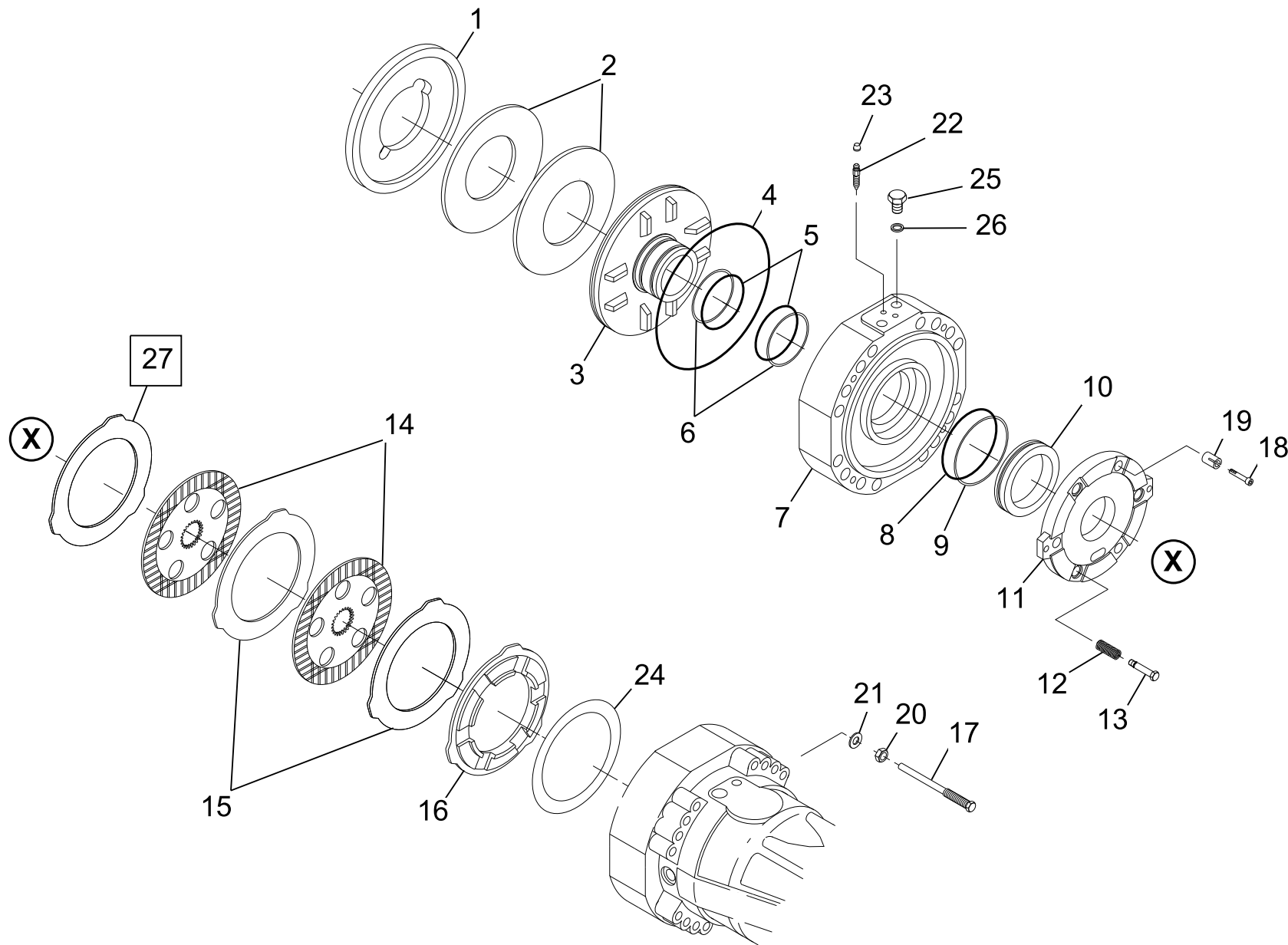
Descr. HUB REDUCTION

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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/803
84					
85					
86	112.06.706.06	8	KIT SATELLITE SATELLITE KIT PLANET GEAR KIT ENGRANAJE PLANETARIO KIT KIT PLANETENRAD		
87					
88					
89	212.06.450.02	2	CROCERA GIUNTO CROISILLON JOINT CROSS CRUCETA DE JUNTA GELENKKREUZ		
90	212.06.450.25	1	CORPO CENTRALE CORPS CENTRAL DU JOINT JOINT CENTER SECTION CUERPO CENTRAL ZENTRAL GEHAEUSE		



27 OPTIONAL



DANA ITALIA S.P.A.

BRAKES

TECHNICAL DOCUMENTATION

Type **112**

Tav. **112-07-0006**



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIÉCES DE RECHANGE
LIST OF SPARE PARTS

Descr. BRAKES

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112-07-0006

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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 112	Subassembly 112-07/99
1	212.07.013.01	1	DISTANZIALE ENTRETOISE SPACER DISTANCIADOR DISTANZRING		
2	176.07.047.01	4	MOLLA RESSORT SPRING MUELLE FEDER		
3	212.07.004.02	2	PISTONE PISTON PISTON PISTÓN KOLBEN		
4	001.05.1642	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
5	112.07.077.01	4	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
6					
7	212.01.013.01	2	COPERCHIO COUVERCLE COVER TAPA DECKEL		
8					
9	112.07.078.01	2	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
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Descr. BRAKES

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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 112	Subassembly 112-07/99
10	212.07.008.02	2	PISTONE PISTON PISTON PISTÓN KOLBEN		
11	212.07.005.02	2	DISCO FRENO INTERMEDIO DISQUE INTERMEDIAIRE INTERMEDIATE BRAKE DISC DISCO DE FRENO INTERMEDIO GEGENLAMELLE		
12	171.07.010.02	6	MOLLA RESSORT SPRING MUELLE FEDER		
13	154.06.014.03	6	VITE REGISTRO VIS DE REGLAGE ADJUSTING BOLT TORNILLO EN REGISTRO NACHSTELLSCHRAUBE		
14	112.07.610.04	8	DISCO DISQUE DISC DISCO SCHEIBE		
15	112.07.006.06	8	DISCO FRENO INTERMEDIO DISQUE INTERMEDIAIRE INTERMEDIATE BRAKE DISC DISCO DE FRENO INTERMEDIO GEGENLAMELLE		
16	212.07.006.01	2	DISTANZIALE ENTRETOISE SPACER DISTANCIADOR DISTANZRING		
17	212.07.009.03	4	VITE VIS BOLT TORNILLO SCHRAUBE		



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

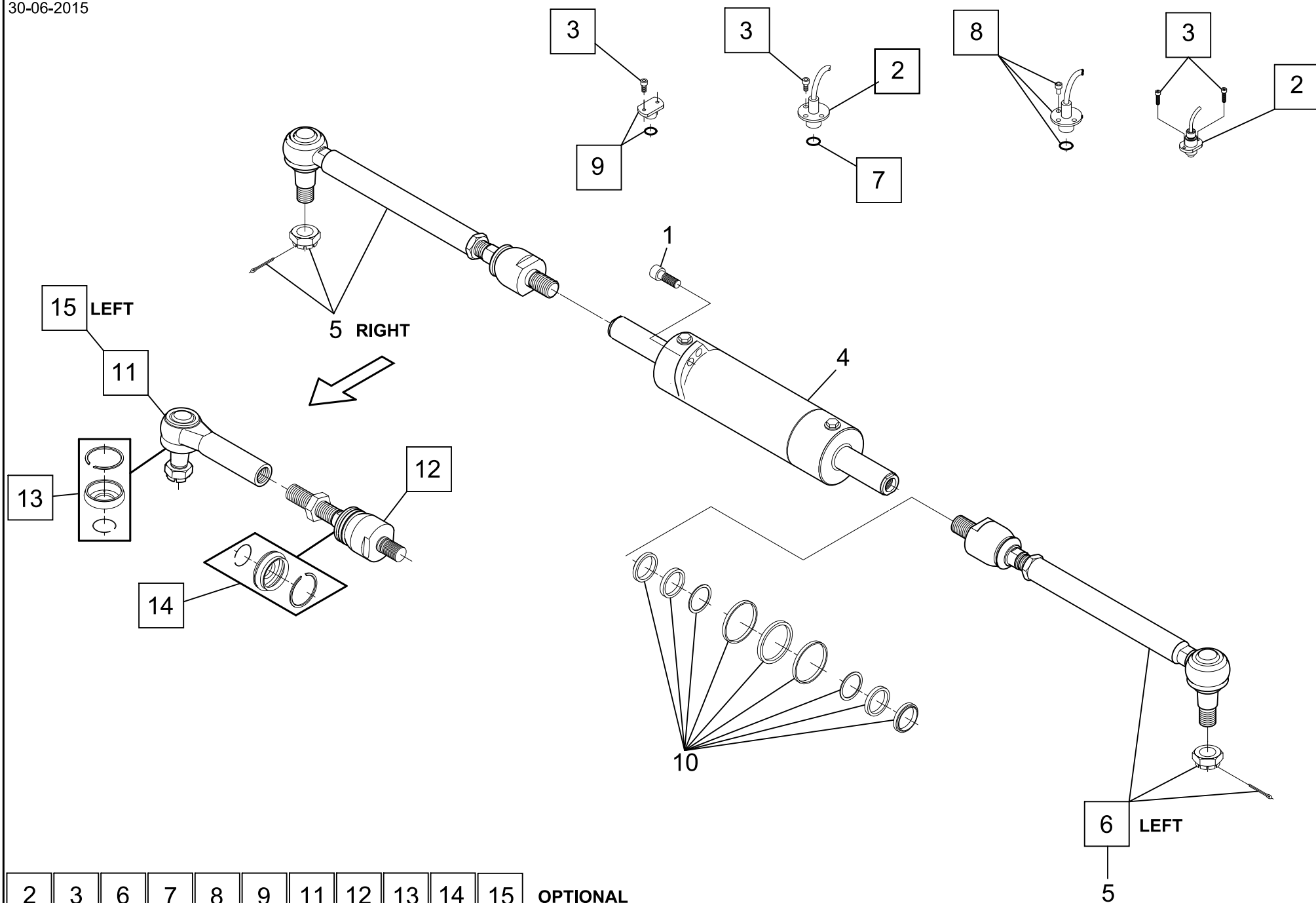
Descr. BRAKES

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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 112	Subassembly 112-07/99
18	112.07.037.14	6	VITE REGISTRO VIS DE REGLAGE ADJUSTING BOLT TORNILLO EN REGISTRO NACHSTELLSCHRAUBE		
19	112.07.002.04	6	MOLLA RESSORT SPRING MUELLE FEDER		
20	006.05.0684	4	DADO ECROU NUT TUERCA MUTTER		
21	011.13.1227	4	ROSETTA RONDELLE LOCK WASHER RONDANA SCHEIBE		
22	734.07.014.01	4	VITE SPURGO VIS DE PURGE BLEEDING BOLT PURGADOR ABBLASESCHRAUBE		
23	734.07.015.01	4	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
24	112.07.400.08	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
25	112.07.615.01	4	TAPPO BOUCHON PLUG TAPÓN STOPFEN		



2	3	6	7	8	9	11	12	13	14	15	OPTIONAL
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DANA ITALIA S.P.A.

STEERING

TECHNICAL DOCUMENTATION

Type **212**Tav. **212-24-0001**



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-24/122
1	016.30.4290	4	VITE VIS BOLT TORNILLO SCHRAUBE		
2					
3					
4	212.24.633.31	1	CILINDRO CILINDRE CYLINDER CILINDRO ZYLINDER		
5	212.24.628.56	2	ASTA TIGE BAR VARILLA STANGE		
6					
7					
8					
9					
10	212.24.450.46	1	KIT GUARNIZIONI KIT GARNITURES SEAL KIT KIT DE GUARNICIÓN DICHTUNGEN KIT		



Mod. 2749540

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
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Descr. STEERING

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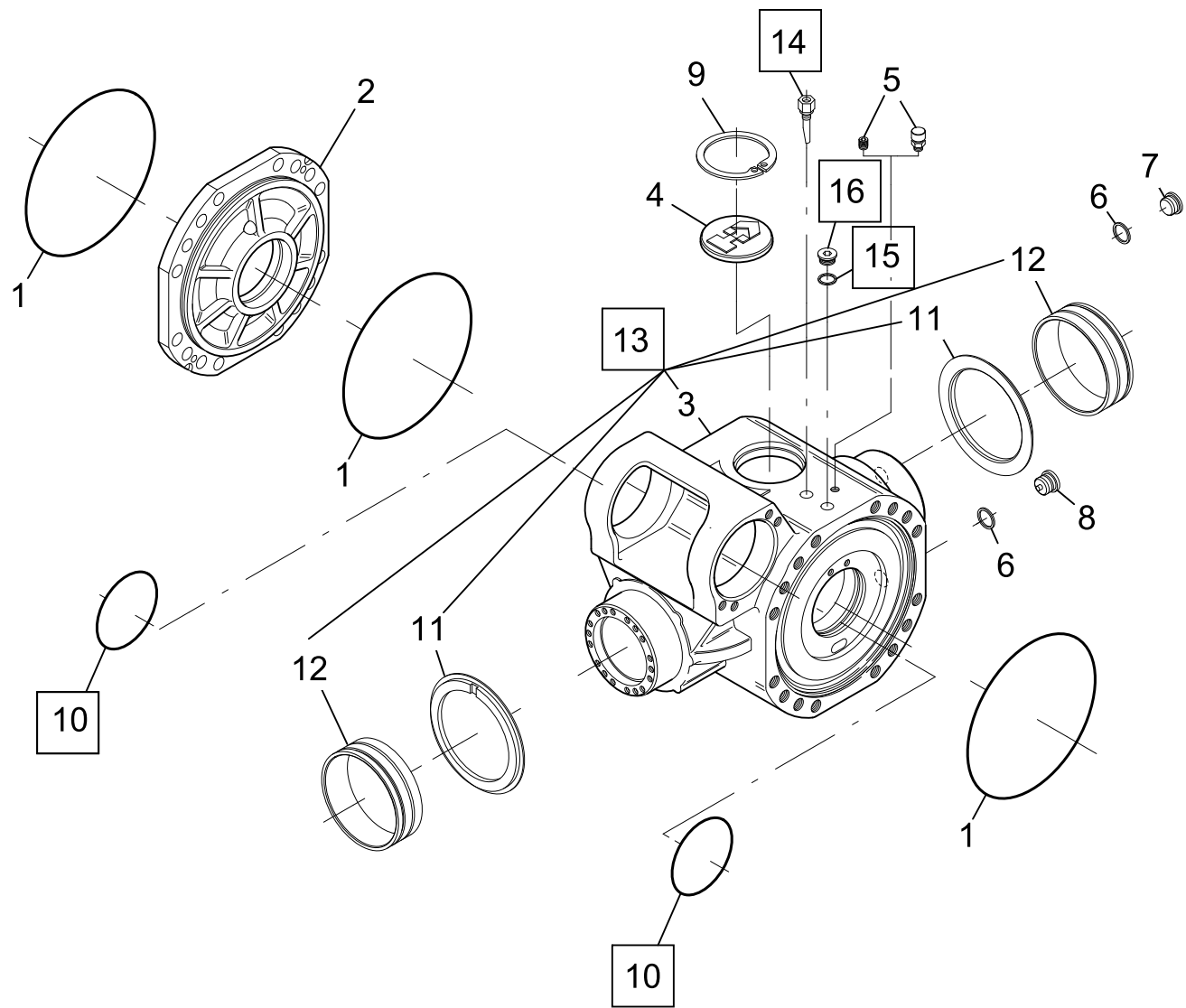
Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-24/122
11	212.24.450.08	1	SNODO 90 ARTICULATION 90 90 DEGREE JOINT CONJUNTO 90 GRADOS GELENK 90		
12	740.24.450.27	1	SNODO ASSIALE ARTICULATION AXIALE AXIAL JOINT CONJUNTA DE EJE AXIAL GELENK		
13	750.24.450.21	1	KIT CUFFIA E ANELLI FERMO KIT PROTECTION ET BAGUES SERR. RUBBER BOOT & LOCKING RING KIT KIT DE ANIL. DE GOMA Y BLOQUEO KASTEN UND HALTERUNGSRINGE KIT		
14	750.24.450.20	1	KIT CUFFIA E ANELLI FERMO KIT PROTECTION ET BAGUES SERR. RUBBER BOOT & LOCKING RING KIT KIT DE ANIL. DE GOMA Y BLOQUEO KASTEN UND HALTERUNGSRINGE KIT		

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13 Optional KIT = 3+11+12

10 14 15 16

OPTIONAL

	DANA ITALIA S.P.A. CENTRAL HOUSING	
	TECHNICAL DOCUMENTATION	Type 212 Tav. 212-01-0002

For position mounting cover number 2 see sketch of bevel gear set on page 1



Mod. 2749541

Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
LIST OF SPARE PARTS

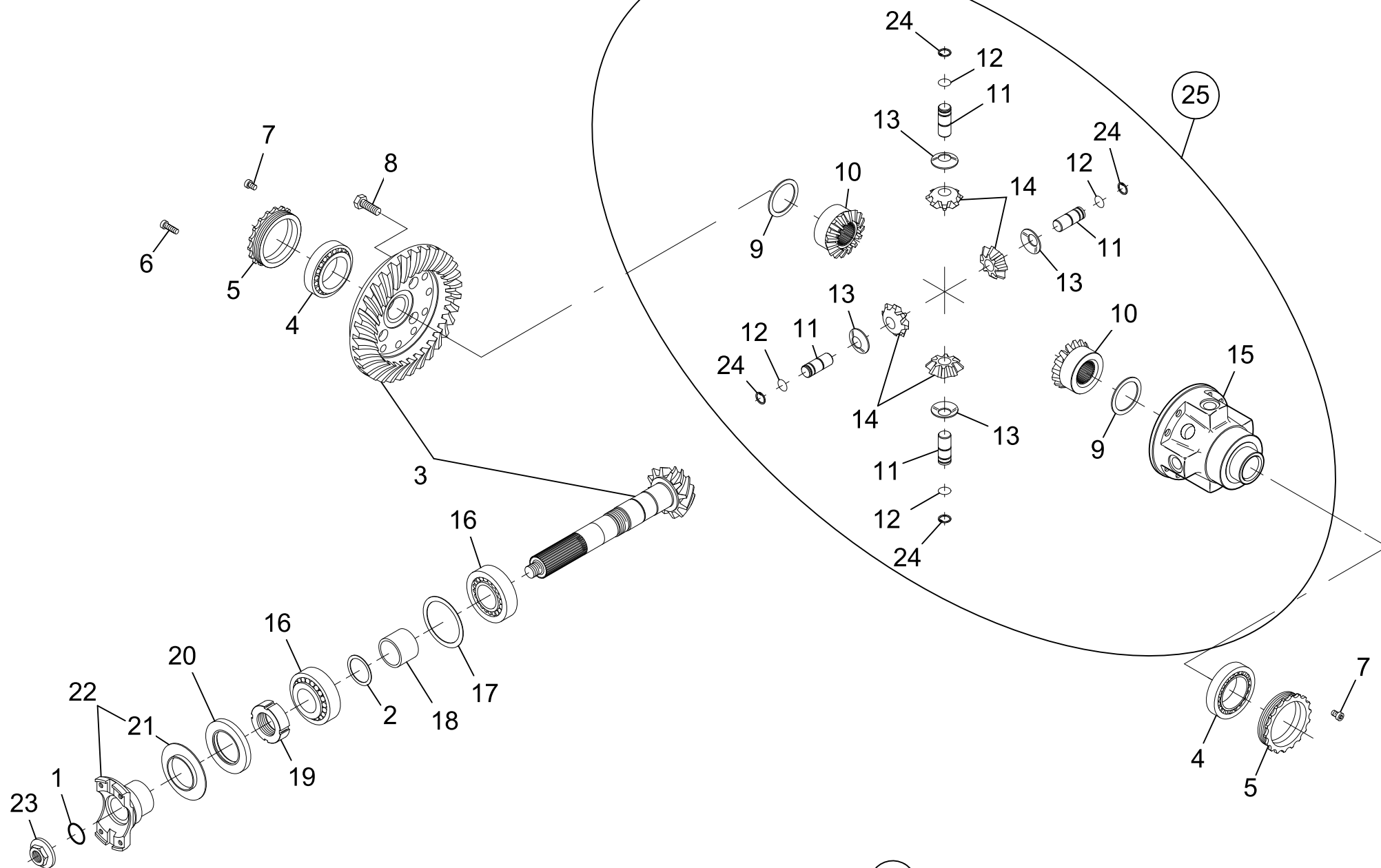
Descr. CENTRAL HOUSING

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Date 17/10/17

Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-01/88
1	001.05.1178	3	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
2	112.01.007.05	1	COPERCHIO COUVERCLE COVER TAPA DECKEL		
3	212.01.001.35	1	SCATOLA CARTER HOUSING CAJA GEHAEUSE		
4	171.01.015.04	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
5	112.01.018.06	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
6					
7	112.01.610.01	1	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
8	112.01.610.03	1	TAPPO MAGNETICO BOUCHON MAGNETIQUE MAGNETIC PLUG TAPÓN MAGNÉTICO MAGNETSTOPFEN		
9	002.02.0088	1	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



25 Kit = 9+10+11+12+13+14+15+24



DANA ITALIA S.P.A.

DIFFERENTIAL

TECHNICAL DOCUMENTATION

Type **212**

Tav. **212-04-0002**

See mounting position of bevel crown wheel on sketch page 1



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Technical documentation

DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
LISTE DES PIECES DE RECHANGE
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
1	001.05.3158	1	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
2	123.04.400.02	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
3	112.04.500.57	1	COPPIA CONICA COUPLE CONIQUE BEVEL GEAR SET PAR CONICO KEGEL- UND TELLERRADPAAR		
4	725.04.011.02	2	CUSCINETTO A RULLI CONICI ROULEMENT A R. CONIQUES TAPER ROLLER BEARING COJINETE DE BOLAS KEGELROLLENLAGER		
5	112.04.016.02	2	GHIERA ECROU RING NUT ABRAZADERA WELLENMUTTER		
6	016.04.0417	4	VITE A TESTA CILINDRICA VIS A TETE CYLINDRIQUE CYLINDER BOLT TORNILLO DE CABEZA CILÍNDRICA ZYLINDERSCHRAUBE		
7	016.30.4162	2	VITE VIS BOLT TORNILLO SCHRAUBE		
8	016.28.3390	12	VITE VIS BOLT TORNILLO SCHRAUBE		



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DISTINTA PEZZI DI RICAMBIO
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
9	112.04.007.01	2	RONDELLA DI RASAMENTO RONDELLE FRICTION WASHER ARANDELA DE FRICCIÓN ANLAUFSCHEIBE		
10	112.04.005.09	2	PLANETARIO PLANETAIRE DIFFERENTIAL SIDE GEAR PLANETARIO AUSGLEICHSWELLENRAD		
11	112.04.706.02	4	PERNO AXE PIN PERNO BOLZEN		
12	002.06.3163	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
13	112.04.008.01	4	RONDELLA DI RASAMENTO RONDELLE FRICTION WASHER ARANDELA DE FRICCIÓN ANLAUFSCHEIBE		
14	112.04.004.05	4	SATELLITE SATELLITE DIFFERENTIAL PINION ENGRANAJE SATÉLITE AUSGLEICHSGEDELRAD		
15	112.04.001.04	1	SCATOLA DIFFERENZIALE CARTER DIFFERENTIEL DIFFERENTIAL CARRIER CAJA DE DIFERENCIAL DIFFERENTIALGEHAEUSE		
16	005.10.0162	2	CUSCINETTO A RULLI CONICI ROULEMENT A R. CONIQUES TAPER ROLLER BEARING COJINETE DE BOLAS KEGELROLLENLAGER		



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DISTINTA PEZZI DI RICAMBIO
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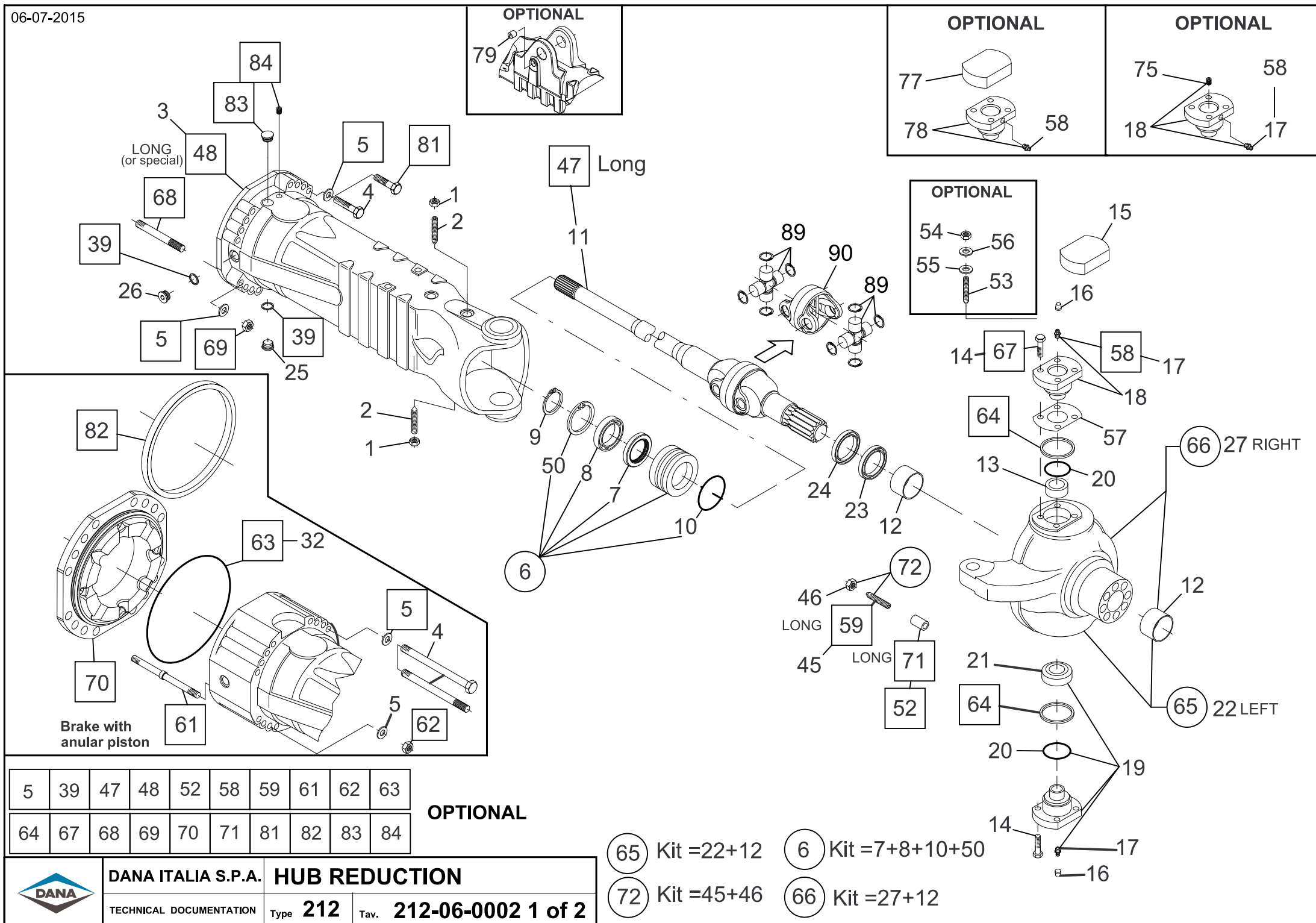
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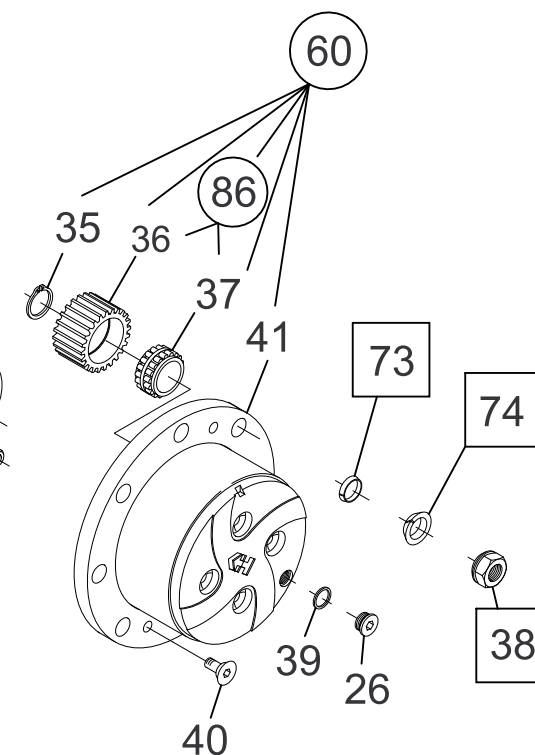
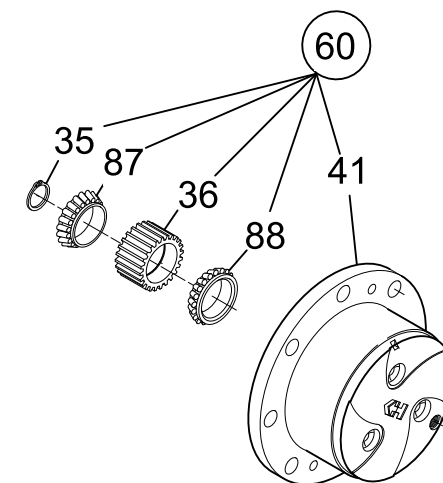
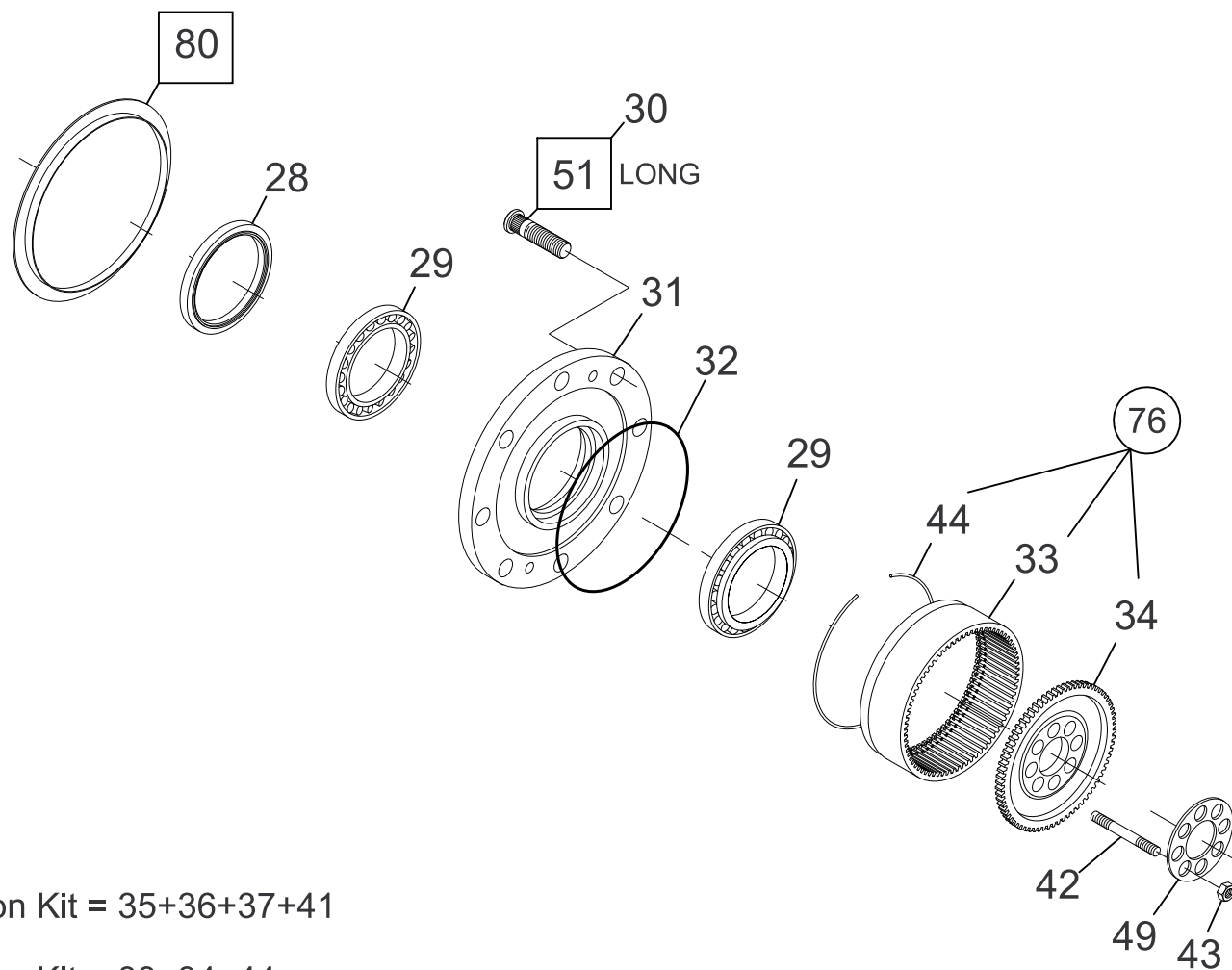
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-04/83
17	112.04.400.04	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
18	112.04.009.02	1	DISTANZIALE ENTRETOISE SPACER DISTANCIADOR DISTANZRING		
19	953.04.012.01	1	GHIERA ECROU RING NUT ABRAZADERA WELLENMUTTER		
20	001.03.3221	1	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
21					
22	112.04.712.03	1	FLANGIA BRIDE FLANGE BRIDA FLANSCH		
23	357.14.139.02	1	DADO ECROU NUT TUERCA MUTTER		
24	002.14.3244	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
25	112.04.702.03	1	DIFFERENZIALE DIFFERENTIEL DIFFERENTIAL DIFERENCIAL DIFFERENTIAL		



WITH TAPERED BEARINGS



60 Position Kit = 35+36+37+41

76 Position Kit = 33+34+44

86 Position Kit = 36+37

38

51

73

74

80

OPTIONAL



DANA ITALIA S.P.A.

HUB REDUCTION

TECHNICAL DOCUMENTATION

Type **212**Tav. **212-06-0002 2 of 2**



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1	006.03.0197	2	DADO ECROU NUT TUERCA MUTTER		
2	016.13.3271	2	VITE VIS BOLT TORNILLO SCHRAUBE		
3	212.06.092.01	2	BRACCIO CORPS D'ESSIEU AXLE CASE BRAZO ACHSKOERPER		
4	112.06.070.12	32	VITE VIS BOLT TORNILLO SCHRAUBE		
5					
6	212.06.700.01	2	BUSSOLA MANCHON DE REDUCTION REDUCTION BUSHING CASQUILLO ZWISCHENBUCHSE		
7	729.06.009.01	2	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
8	005.01.0121	2	CUSCINETTO A SFERE ROULEMENT A BILLES BALL BEARING COJINETE DE BOLAS RILLENKUGELLAGER		
9	002.01.0078	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
10	001.05.1389	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
11	212.06.624.08	2	DOPPIO GIUNTO CARDANICO DOUBLE JOINT CARDAN DOUBLE UNIVERSAL JOINT JUNTA CARDAN DE DOBLE CRUCETA KARDAN-DOPPELGELENKWELLE		
12	290.06.020.03	1 1	BRONZINA DOUILLE THRUST BUSHING BUJE ANLAUFBUCHSE		
13	212.06.023.03	2	BOCCOLA DOUILLE BUSHING CASQUILLO GUÍA BUCHSE		
14	016.34.4287	24	VITE VIS BOLT TORNILLO SCHRAUBE		
15	212.06.007.04	2	COPERCHIO COUVERCLE COVER TAPA DECKEL		
16	734.07.015.01	2	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
17	008.01.0213	2 2	INGRASSATORE GRAISSEUR GREASE FITTING ENGRASADOR KEGEL - SCHMIERNIPPEL		



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
18	223.06.702.01	2	PERNO SNODO PIVOT DE DIRECTION PIVOT PIN PERNO DE DIRECCIÓN ACHSSCHENKELBOLZEN		
19	223.06.701.02	2	PERNO SNODO PIVOT DE DIRECTION PIVOT PIN PERNO DE DIRECCIÓN ACHSSCHENKELBOLZEN		
20	213.06.006.03	2 2	ANELLO PARAPOLVERE BAGUE ANTI-POUSSIÉRE DUST EXCLUDER ANILLO DE POLVO STAUBABWEHRRING		
21	290.06.016.01	2	CUSCINETTO ROULEMENT BEARING COJINETE LAGER		
22					
23	213.06.015.01	2	ANELLO DI TENUTA JOINT D'ÉTANCHEITÉ SEAL ANILLO DE ESTANQUEIDAD DICHRING		
24					
25	112.01.610.03	2	TAPPO MAGNETICO BOUCHON MAGNETIQUE MAGNETIC PLUG TAPÓN MAGNÉTICO MAGNETSTOPFEN		
26	112.01.610.01	4	TAPPO BOUCHON PLUG TAPÓN STOPFEN		



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
27					
28	212.06.055.01	2	ANELLO DI TENUTA JOINT D'ETANCHEITE SEAL ANILLO DE ESTANQUEIDAD DICHRING		
29	112.06.109.02	4	CUSCINETTO A RULLI ROULEMENT A ROULEAUX ROLLER BEARING RODAMIENTO DE RODILLOS RILLENROLLENLAGER		
30	176.06.006.01	20	COLONNETTA GOIJON DE ROUE WHEEL STUD PRISIONERO RADBOLZEN		
31	112.06.053.03	2	MOZZO RUOTA MOYEU DE ROUE WHEEL HUB CUBO DE MAZA RADNABE		
32	001.05.1119	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
33	112.06.005.04	2	CORONA DENTATA COURONNE DENTEE RING GEAR CORONA DENTADA ZAHNKRANZ		
34	112.06.007.08	2	SUPPORTO PORTACORONA SUPPORT PORTE COURONNE RING GEAR SUPPORT SOPORTE DE CORONA HOHLRADTRAEGER		
35	002.14.3191	4	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
36	112.06.006.06	8	SATELLITE (PLAN.) SATELLITE PLANET GEAR ENGRANAJE PLANETARIO PLANETENRAD		
37	730.06.026.04	8	CUSCINETTO ROULEMENT BEARING COJINETE LAGER		
38	006.08.2833	20	DADO A SEDE SFERICA ECROU DEMI-SPHERIQUE WHEEL NUT TURCA ASIANTA ESFÉRICA KUGELBUNDMUTTER		
39					
40	016.06.0442	4	VITE A TESTA CONICA VIS A TÊTE CONIQUE COUNTERSUNK BOLT TORNILLO DE CABEZA CONICA SENKSCRAUBE		
41	112.06.052.04	1	SUPPORTO SATELLITI SUPPORT SATELLITES PLANET GEAR CARRIER TAPA PORTASATÉLITES PLANETENGAEUSE		
42	112.06.025.03	20	PRIGIONIERO GOUJON STUD PRISIONERO STIFTSCHRAUBE		
43	006.22.4380	20	DADO ECROU NUT TUERCA MUTTER		
44	002.06.3193	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
45	213.06.011.01	4	VITE VIS BOLT TORNILLO SCHRAUBE		
46	006.05.1521	4	DADO ECROU NUT TUERCA MUTTER		
47					
48					
49	112.06.046.02	2	LAMIERA DI SICUREZZA TOLE DE SECURITE LOCKING PLATE BLOQUEO DE LA CUBIERTA SICHERUNGSBLECH		
50	002.02.0088	2	ANELLO DI SICUREZZA ARRETOIR CIRCLIP ANILLO DE SEGURIDAD SICHERUNGSRING		
51					
52					
53					
54					



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
55	212.06.400.48	1	KIT SPESSORI KIT CALES SHIM KIT KIT DE ESPESOR PASS-SCHEIBEN KIT		
56					
57					
58	212.06.710.22	2	KIT SUPPORTO SATELLITI SUPPORT SATELLITES KIT PLANET GEAR CARRIER KIT TAPA PORTASATÉLITES KIT KIT PLANETENGEHAEUSE		
59					
60					
61					
62					
63					
64					



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
65	223.06.708.01	1	KIT SCATOLA SNODO SX BOITIER DE DIRECTION KIT G STEERING CASE KIT LH EJE DE ARTICULACIÓN KIT IZDA KIT GELENKGEHAEUSE LINKS		
66	223.06.709.01	1	KIT SCATOLA SNODO DX BOITIER DE DIRECTION KIT D STEERING CASE KIT RH EJE DE ARTICULACIÓN KIT DCHA GELENKGEHAEUSE KIT RECHTS		
67					
68					
69					
70					
71					
72	213.06.711.01	4	KIT VITE DI FERMO STERZO VIS D'ARRET BRAQUAGE KIT STEERING ADJUST BOLT KIT KIT TORNILLO DE TOPE DE LENKEINSCHLAGSCHRAUBE KIT		
73					



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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
74	212.06.707.08	2	SUPPORTO PORTACORONA SUPPORT PORTE COURONNE RING GEAR SUPPORT SOPORTE DE CORONA HOHLRADTRAEGER		
75					
76					
77					
78					
79					
80					
81					
82					
83					



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DISTINTA PEZZI DI RICAMBIO
ERSATZTEILLISTE
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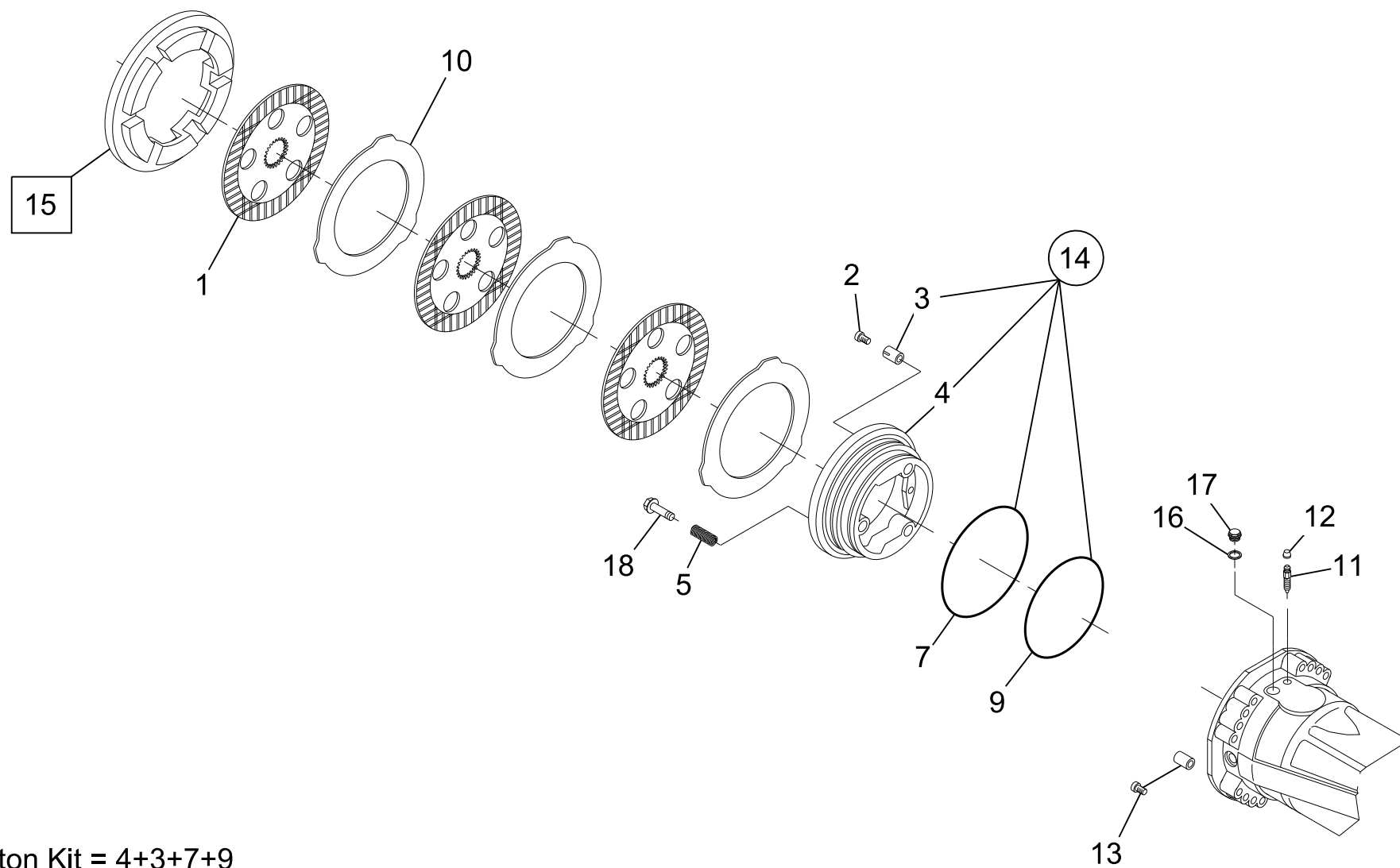
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-06/804
84					
85					
86	112.06.706.06	8	KIT SATELLITE SATELLITE KIT PLANET GEAR KIT ENGRANAJE PLANETARIO KIT KIT PLANETENRAD		
87					
88					
89	212.06.450.02	2	CROCERA GIUNTO CROISILLON JOINT CROSS CRUCETA DE JUNTA GELENKKREUZ		
90	212.06.450.25	1	CORPO CENTRALE CORPS CENTRAL DU JOINT JOINT CENTER SECTION CUERPO CENTRAL ZENTRAL GEHAEUSE		



15 Piston Kit = 4+3+7+9

15 OPTIONAL



DANA ITALIA S.P.A.

BRAKES

TECHNICAL DOCUMENTATION

Type **112**

Tav. **112-07-0009**



Mod. 2749541

Technical documentation

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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 112	Subassembly 112-07/100
1	112.07.610.04	8	DISCO DISQUE DISC DISCO SCHEIBE		
2	112.07.037.09	6	VITE REGISTRO VIS DE REGLAGE ADJUSTING BOLT TORNILLO EN REGISTRO NACHSTELLSCHRAUBE		
3	112.07.002.04	6	MOLLA RESSORT SPRING MUELLE FEDER		
4	212.07.017.01	2	PISTONE PISTON PISTON PISTÓN KOLBEN		
5	171.07.010.02	6	MOLLA RESSORT SPRING MUELLE FEDER		
6					
7	112.07.076.01	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		
8					
9	112.07.075.01	2	ANELLO OR JOINT OR O - RING ANILLO TOROIDAL O - RING		



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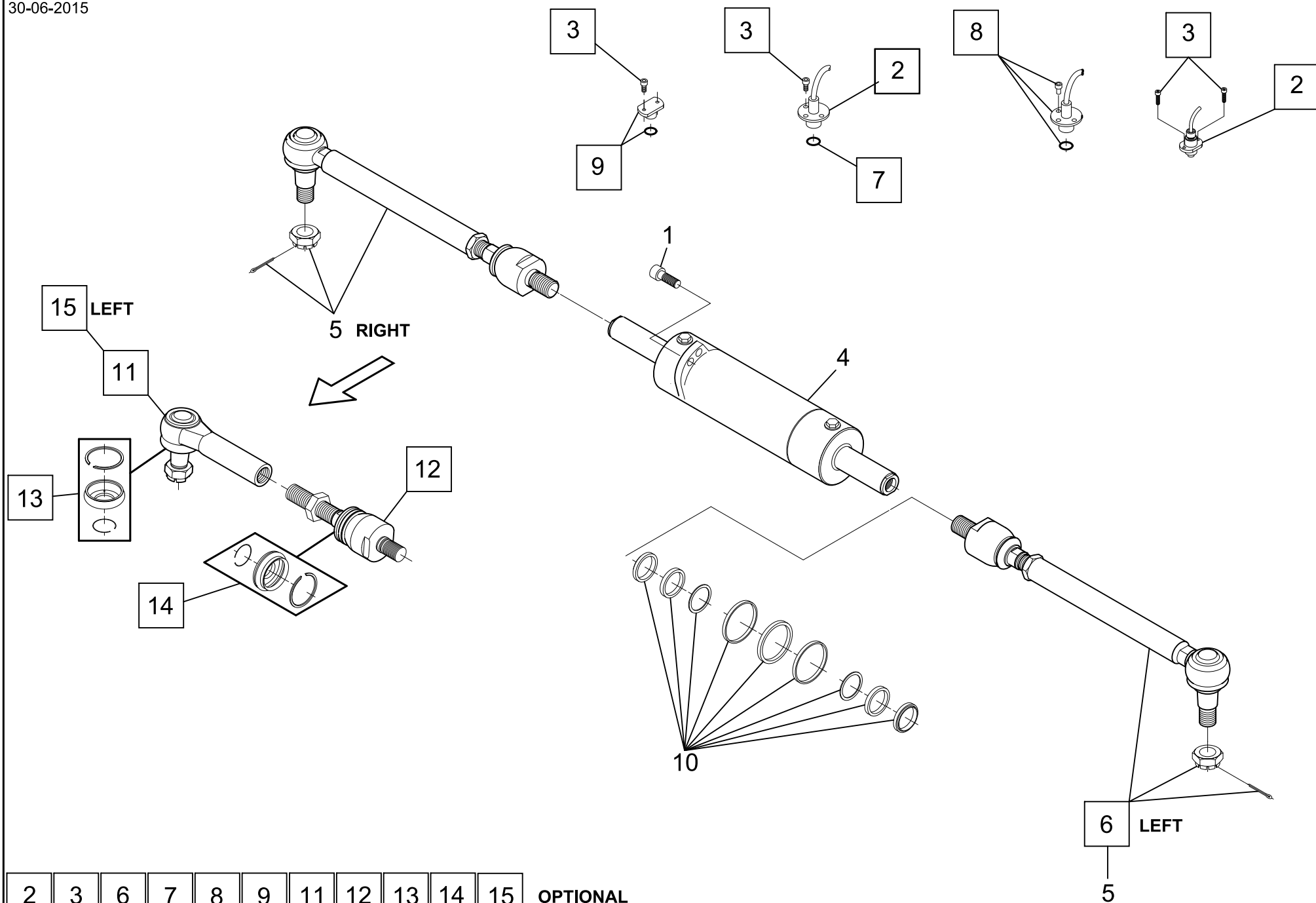
Descr. BRAKES

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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 112	Subassembly 112-07/100
10	112.07.006.06	10	DISCO FRENO INTERMEDIO DISQUE INTERMEDIAIRE INTERMEDIATE BRAKE DISC DISCO DE FRENO INTERMEDIO GEGENLAMELLE		
11	734.07.014.01	2	VITE SPURGO VIS DE PURGE BLEEDING BOLT PURGADOR ABBLASESCHRAUBE		
12	734.07.015.01	2	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
13	162.07.004.05	2	VITE SPINA VIS A BROCHE PILOT BOLT TORNILLO DE ENCHUFE FUEHRUNGSSCHRAUBE		
14	212.07.717.01	2	PISTONE PISTON PISTON PISTÓN KOLBEN		
15					
16					
17	112.07.615.01	2	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
18	154.06.014.03	6	VITE REGISTRO VIS DE REGLAGE ADJUSTING BOLT TORNILLO EN REGISTRO NACHSTELLSCHRAUBE		



DANA ITALIA S.P.A.

STEERING

TECHNICAL DOCUMENTATION

Type **212**Tav. **212-24-0001**



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1	016.30.4290	4	VITE VIS BOLT TORNILLO SCHRAUBE		
2					
3					
4	212.24.633.31	1	CILINDRO CILINDRE CYLINDER CILINDRO ZYLINDER		
5	212.24.628.56	2	ASTA TIGE BAR VARILLA STANGE		
6					
7					
8					
9					
10	212.24.450.46	1	KIT GUARNIZIONI KIT GARNITURES SEAL KIT KIT DE GUARNICIÓN DICHTUNGEN KIT		



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DISTINTA PEZZI DI RICAMBIO
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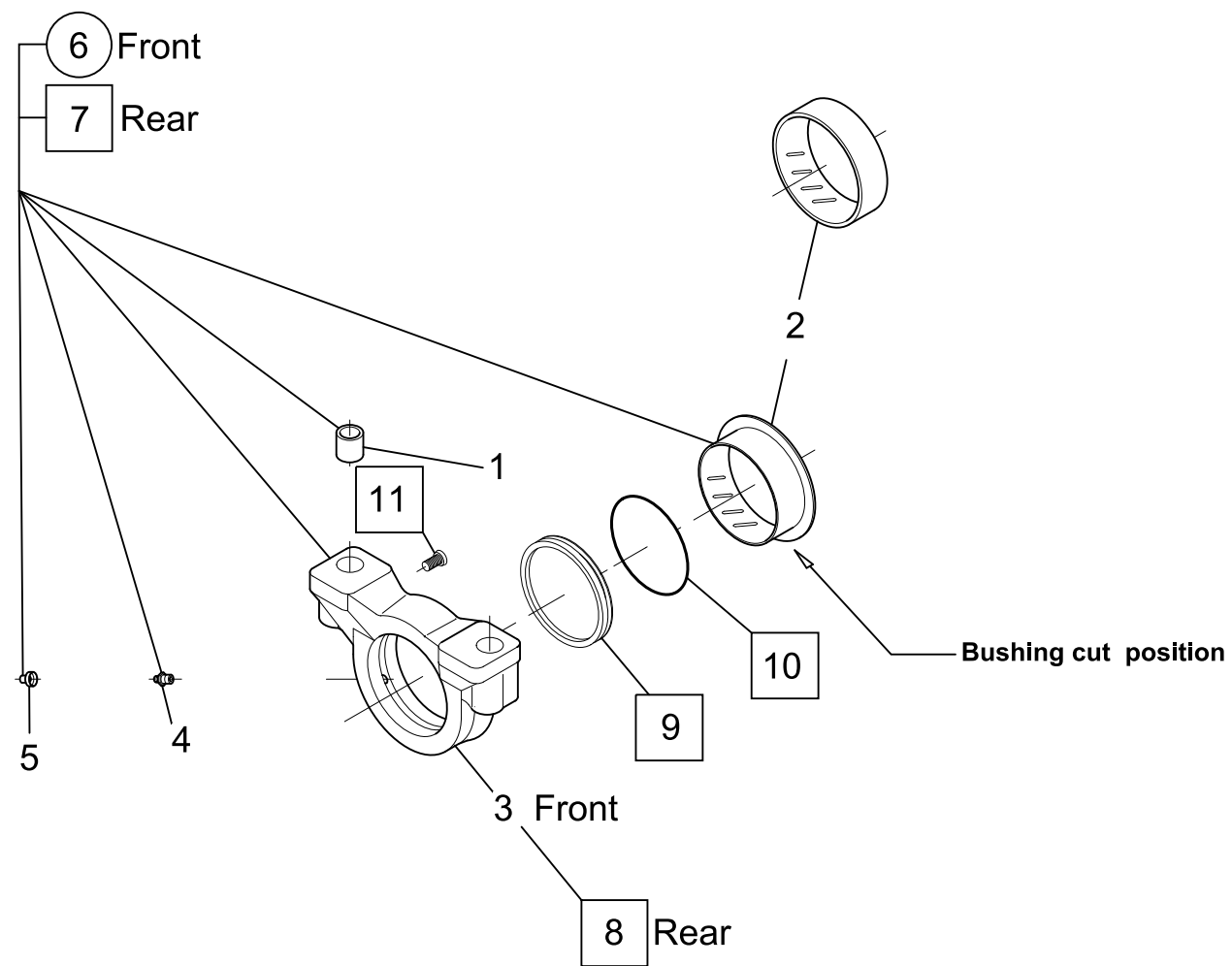
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Pos.	NUMERO DISEGNO BESTELLNUMMER REFERENCE NUMERO PART NUMBER	Q.ty	DENOMINAZIONE BEZEICHNUNG DESCRIPTION DENOMINATION	Type 212	Subassembly 212-24/122
11	212.24.450.08	1	SNODO 90 ARTICULATION 90 90 DEGREE JOINT CONJUNTO 90 GRADOS GELENK 90		
12	740.24.450.27	1	SNODO ASSIALE ARTICULATION AXIALE AXIAL JOINT CONJUNTA DE EJE AXIAL GELENK		
13	750.24.450.21	1	KIT CUFFIA E ANELLI FERMO KIT PROTECTION ET BAGUES SERR. RUBBER BOOT & LOCKING RING KIT KIT DE ANIL. DE GOMA Y BLOQUEO KASTEN UND HALTERUNGSRINGE KIT		
14	750.24.450.20	1	KIT CUFFIA E ANELLI FERMO KIT PROTECTION ET BAGUES SERR. RUBBER BOOT & LOCKING RING KIT KIT DE ANIL. DE GOMA Y BLOQUEO KASTEN UND HALTERUNGSRINGE KIT		



6 Trunion kit Front=1+2+3+4+5+ 11

7 Optional Trunion kit Rear=1+2+4+5+ 8 + 11

7 8 9 10 OPTIONAL



DANA ITALIA S.P.A.

TRUNION

TECHNICAL DOCUMENTATION

Type **212**

Tav. **212-25-0001**



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1	277.25.002.01	4	BUSSOLA MANCHON DE REDUCTION REDUCTION BUSHING CASQUILLO ZWISCHENBUCHSE		
2	277.25.003.02	2	BRONZINA DOUILLE THRUST BUSHING BUJE ANLAUFBUCHSE		
3					
4	008.01.0213	2	INGRASSATORE GRAISSEUR GREASE FITTING ENGRASADOR KEGEL - SCHMIERNIPPEL		
5	734.07.015.01	2	TAPPO BOUCHON PLUG TAPÓN STOPFEN		
6	277.25.610.01	2	SUPPORTO SUPPORT SUPPORT SOPORTE HALTERUNG		
7					
8					
9					
10					



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11	212.25.002.01	2	VITE VIS BOLT TORNILLO SCHRAUBE	212	212-25/01

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