PREVENTION OF BURNS

The battery electrolyte generates severe burns.

The battery contains sulphuric acid.

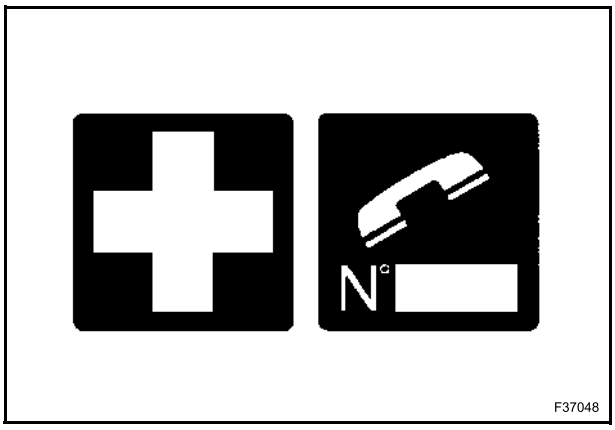
Avoid any contact with the skin, eyes or clothing.

Antidote:

- EXTERNAL: rinse well with water, removing any soiled clothing.
- INTERNAL: avoid vomiting. Drink water to rinse your mouth. Consult a doctor.
- EYES: rinse thoroughly with water for 15 minutes and get prompt medical attention.

When the electrolyte of a battery is frozen, it can explode if you attempt to charge the battery or if you try to start the engine using a booster battery.

Always keep the battery charged to prevent the electrolyte freezing.



Batteries generate explosive gases.

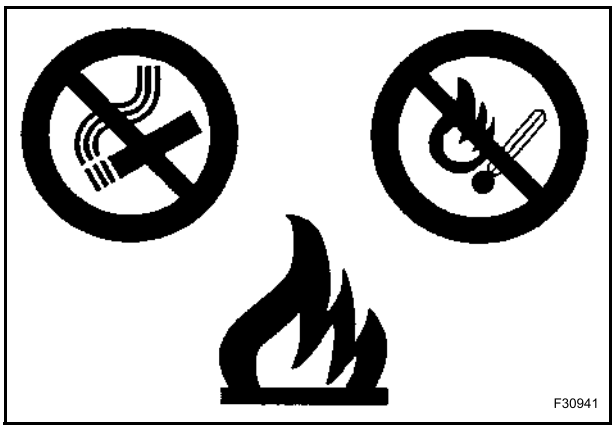
Keep all flames, sparks and cigarettes away.

Provide good ventilation when changing a battery or using a battery in an enclosed space.

Always protect your eyes when working near a battery.

Never touch the battery terminals with your hands.

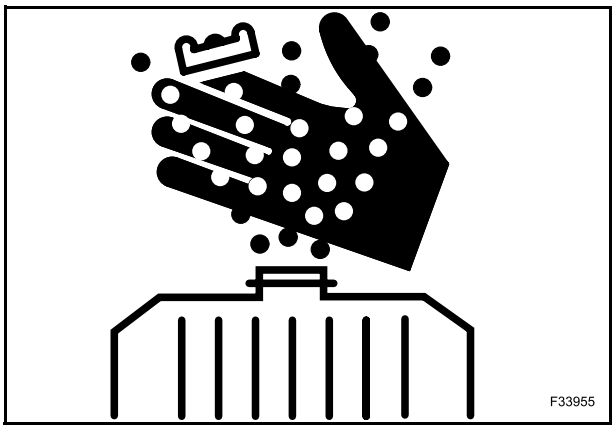
This can induce a state of electrolysis and impair the main organs of the body.



Hot coolant could spray out if the radiator cap is removed while the system is still hot.

To remove the cap: allow the system to cool down, turn the cap to the first notch and wait until there is no more pressure.

Then remove the cap.



O-RING FLAT FACE SEAL FITTING

O-RING FLAT SEAL FITTING TORQUE VALUES					
Nominal		Dash size	Thread size (inch)	Swivel nut torque	
O.D. (inch)	Tube (mm)			lbf·ft	Nm
0.250	6.35	-4	9/16-18	12	16
0.375	9.52	-6	11/16-16	18	24
0.500	12.70	-8	13/16-16	37	50
0.625	15.88	-10	1-14	51	69
0.750	19.05	-12	1 3/16-12	75	102
0.875	22.22	-14	1 3/16-12	75	102
1.000	25.40	-16	1 7/16-12	105	142
1.250	31.75	-20	1 11/16-12	140	190
1.500	38.10	-24	2-12	160	217

MINIMUM HARDWARE TIGHTENING TORQUES lfb·ft (Nm)

INCH HARDWARE AND LOCKNUTS									
	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS		
Nominal Size	Unplated or plated silver	Plated with zinc-chrome gold	Unplated or plated silver	Plated with zinc-chrome gold	Unplated or plated silver	Plated with zinc-chrome gold	Gr.B with Grade 5 bolt	Gr.C with Grade 8 bolt	Nominal Size
1/4	55* (6.2)	72* (8.1)	86* (9.7)	112* (13)	121* (14)	157* (18)	61* (6.9)	86* (9.8)	1/4
5/16	115* (13)	149* (17)	178* (20)	229* (26)	250* (28)	324* (37)	125* (14)	176* (20)	5/16
3/8	17 (23)	22 (30)	26 (35)	34 (46)	37 (50)	48 (65)	19 (26)	26 (35)	3/8
7/16	27 (37)	35 (47)	42 (57)	54 (73)	59 (80)	77 (104)	30 (41)	42 (57)	7/16
1/2	42 (57)	54 (73)	64 (87)	83 (113)	91 (123)	117 (159)	45 (61)	64 (88)	1/2
9/6	60 (81)	77 (104)	92 (125)	120 (163)	130 (176)	169 (229)	65 (88)	92 (125)	9/16
5/8	83 (112)	107 (145)	128 (174)	165 (224)	180 (244)	233 (316)	90 (122)	127 (172)	5/8
3/4	146 (198)	189 (256)	226 (306)	293 (397)	319 (432)	413 (560)	160 (217)	226 (306)	3/4
7/8	142 (193)	183 (248)	365 (495)	473 (641)	515 (698)	667 (904)	258 (350)	364 (494)	7/8
1	213 (289)	275 (373)	547 (742)	708 (960)	773 (1048)	1000 (1356)	386 (523)	545 (739)	1

METRIC HARDWARE AND LOCKNUTS							
	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 with Class 8.8 bolt
Nominal Size	Unplated	Plated with zinc-chrome	Unplated	Plated with zinc-chrome	Unplated	Plated with zinc-chrome	
M4	15* (1.7)	19* (2.2)	23* (2.6)	30* (3.4)	33* (3.7)	42* (4.8)	16* (1.8)
M6	51* (5.8)	67* (7.6)	79* (8.9)	102* (12)	115* (13)	150* (17)	56* (6.3)
M8	124* (14)	159* (18)	195* (22)	248* (28)	274* (31)	354* (40)	133* (15)
M10	21 (28)	27 (36)	32 (43)	41 (56)	45 (61)	58 (79)	22 (30)
M12	36 (49)	46 (63)	55 (75)	72 (97)	79 (107)	102 (138)	39 (53)
M16	89 (121)	117 (158)	137 (186)	177 (240)	196 (266)	254 (344)	97 (131)
M20	175 (237)	226 (307)	277 (375)	358 (485)	383 (519)	495 (671)	195 (265)
M24	303 (411)	392 (531)	478 (648)	619 (839)	662 (897)	855 (1160)	388 (458)

NOTA: *there is no note on the page that * indicates lb·in and not lb·ft.*

IMPORTANT: *the powershuttle lever is equipped with a neutral lock to prevent an accidental engagement of the transmission. With this design, the powershuttle lever moves through a "T" slot to the forward or reverse positions.*

IMPORTANT: *when operating at low environmental temperatures with cold transmission oil, allow the oil to warm up before attempting to shift the powershuttle lever. The transmission can be shifted normally after the oil warms up.*

IMPORTANT: *the horn will sound if the powershuttle lever is operated with the parking brake engaged.*

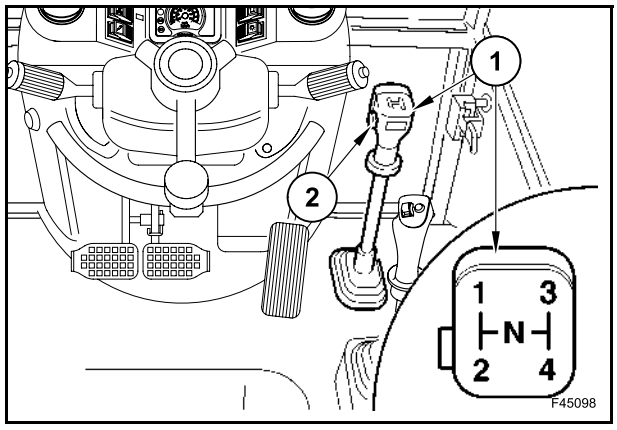
IMPORTANT: *the powershuttle lever can be shifted at any engine speed; however, as a safety and precautionary measure, the engine must run at approximately 1200 rpm.*
This action is easily controlled by means of the foot accelerator to control engine and ground speed.

TRANSMISSION DISCONNECTION

The 4x4 transmission provides for easy upward and downward gear ratio changes on the move.

However, as a clutch is not used between the engine and transmission, the power flow from the engine to the transmission must be interrupted to shift from one gear ratio to another. This is accomplished by means of a transmission disconnect (dump) button.

The finger operated button (2) on the main gearshift lever knob (1) is easy to operate.



⚠ WARNING ⚠

To avoid personal injury do not use the disconnect switch control to coast down hill. Excessive speed may cause loss of control, personal injury to a bystander or failure of the transmission.

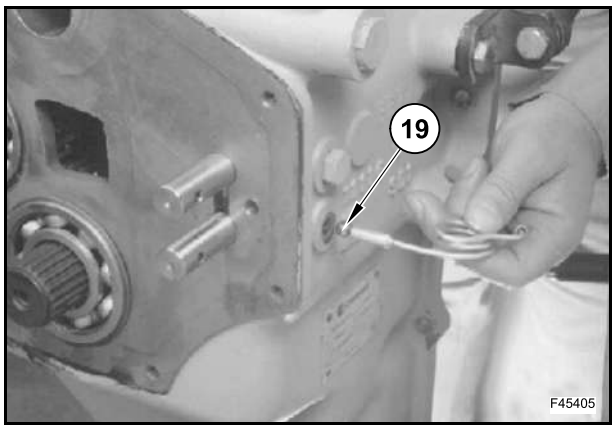
To make upward gear ratio changes simply depress and hold the button (2) on the gearshift lever (1), while moving the lever from one gear ratio to another.

When the desired gear ratio has been selected release the button and allow the unit to gain engine speed and ground speed.

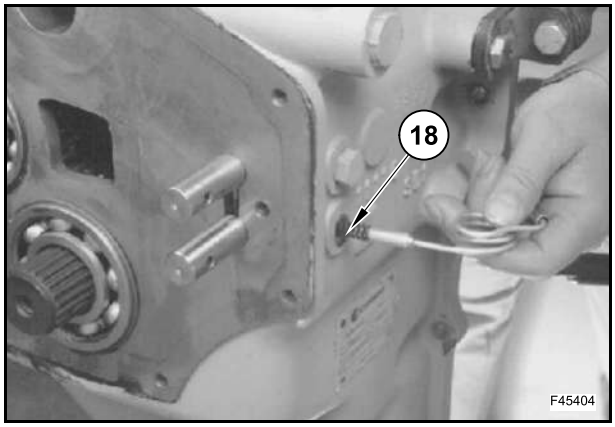
If another higher ratio is required repeat the procedure.

Insert the ball (19).

NOTE: *previously, the parts of the 1st and 2nd gear lower control have been installed. It is necessary to install both the upper control parts for 3rd and 4th speed and the lower ones for 1st and 2nd speed, according to the instructions given by the procedure. Make sure that you start with both shift rods in the neutral position.*

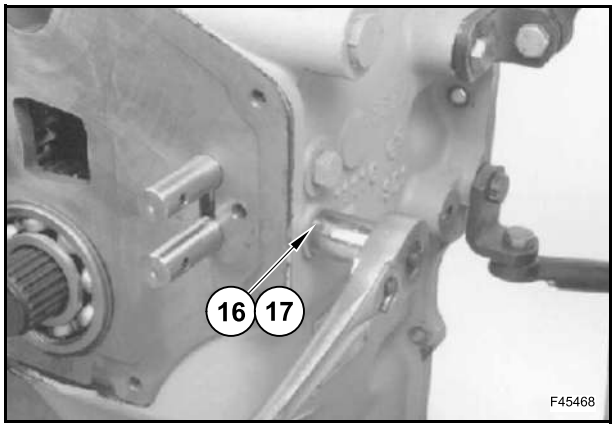


Insert the spring (18).



Assemble the washer (17) and the screw (16).

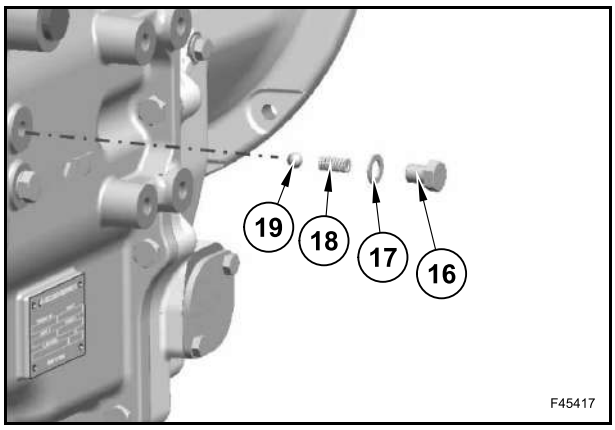
Tighten the screw (16) to a tightening torque of 80 Nm (59 lbf·ft).



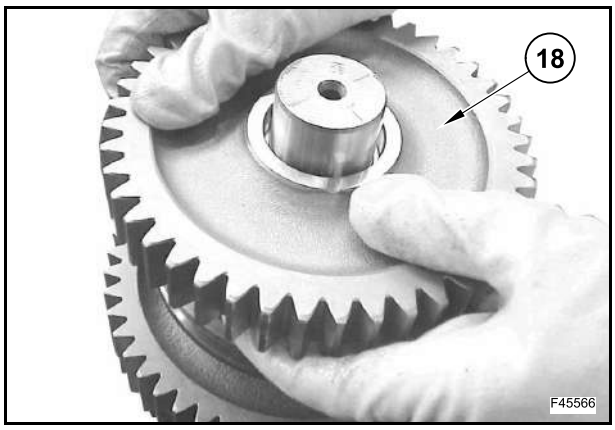
Insert the ball (19) and the spring (18).

Assemble the screw (16) and the washer (17).

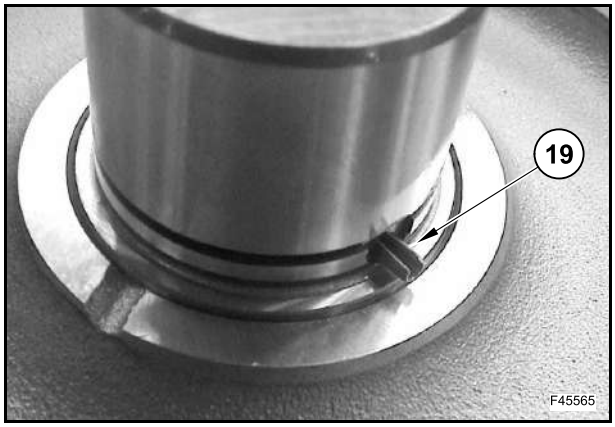
Tighten the screw (16) to a tightening torque of 80 Nm (59 lbf·ft).



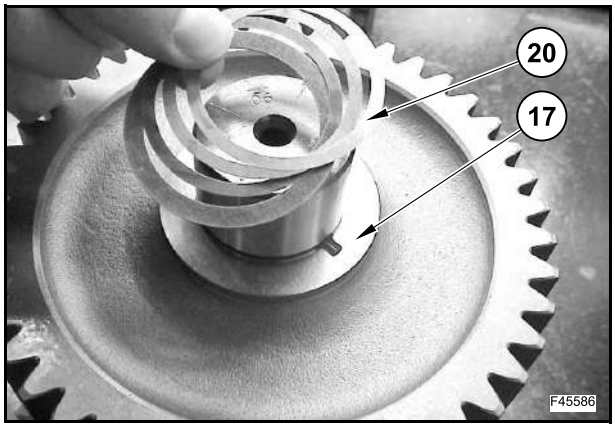
Assemble the 2nd speed gear (18).



Assemble the pin (19).



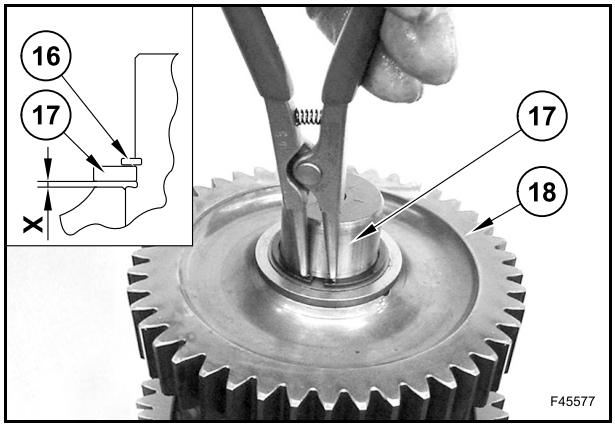
Assemble the thrust washer (17) and the shims (20).



Assemble the snap ring (16).

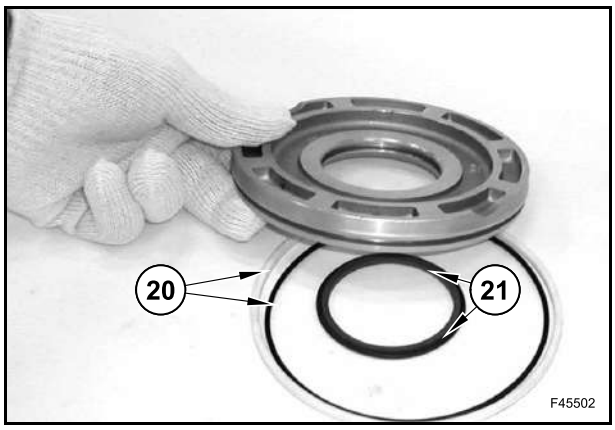
Measure the backlash “X” between gear (18) and thrust washer (17):

the value must be between 0.2 ÷ 0.42 mm (0.01 ÷ 0.02 in).



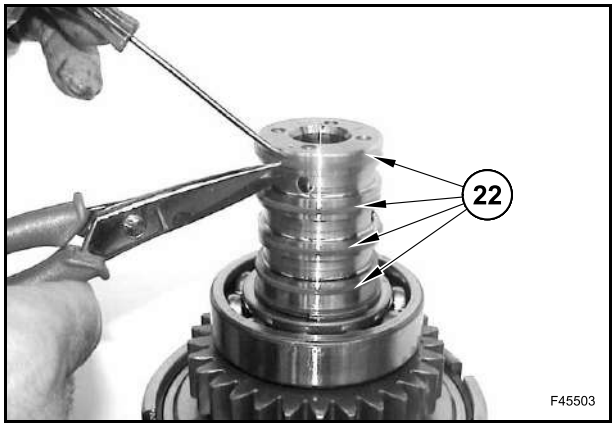
If necessary, remove the seal ring (20) with the inner O-ring from the outside seat of the piston and the seal ring (21) with the relevant O-ring from the inner seat of the piston.

To remove the rings it is necessary to cut them.

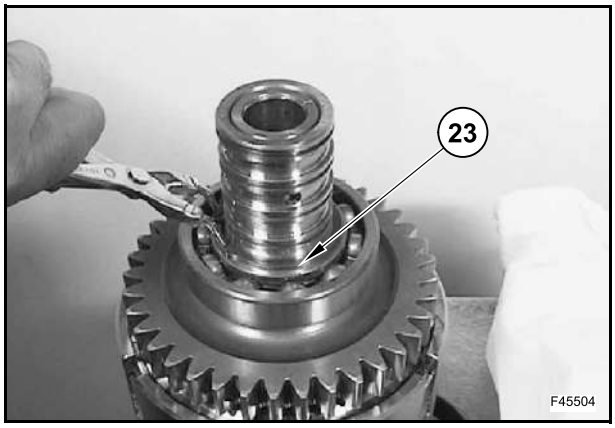


Turn the shaft.

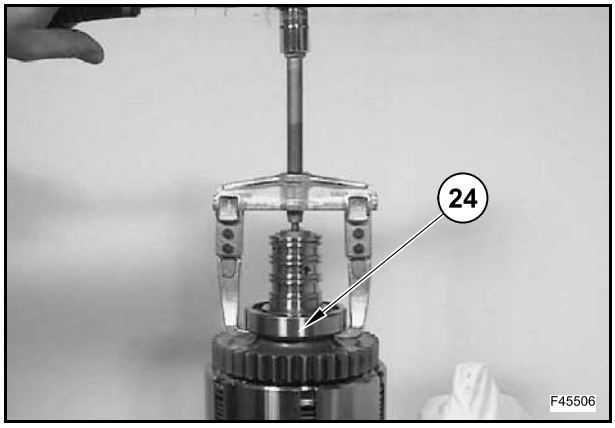
If necessary, remove the seal rings (22).



Remove the snap ring (23).

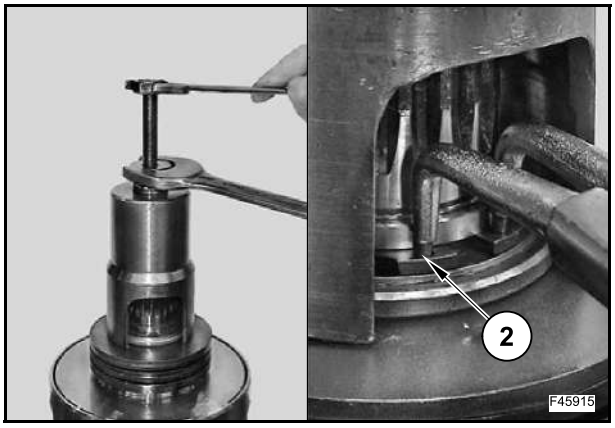


Remove the bearing (24) by means of a puller.

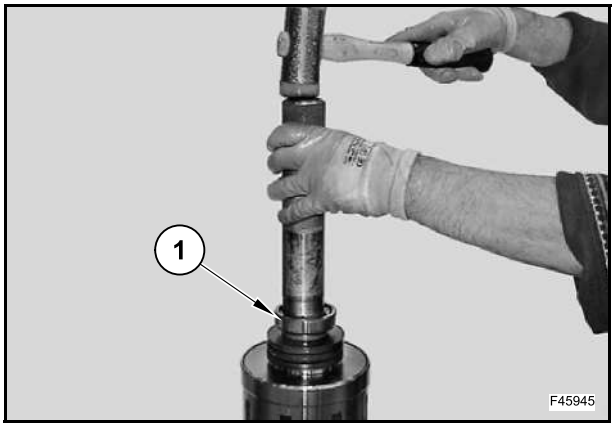


Press the Belleville washers and fit the snap ring (2) by means of tool 380200275.

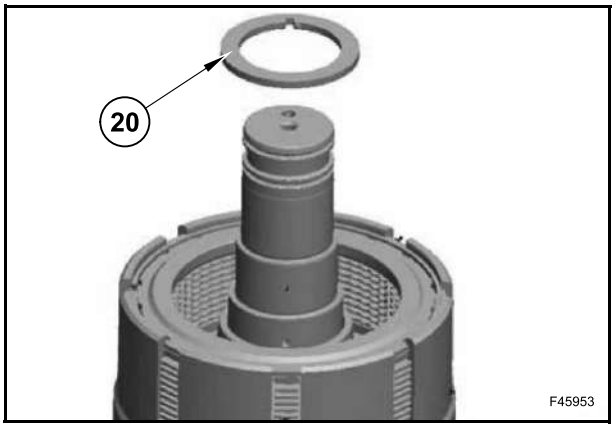
The springs can cause damages to persons if the snap ring is not assembled correctly.



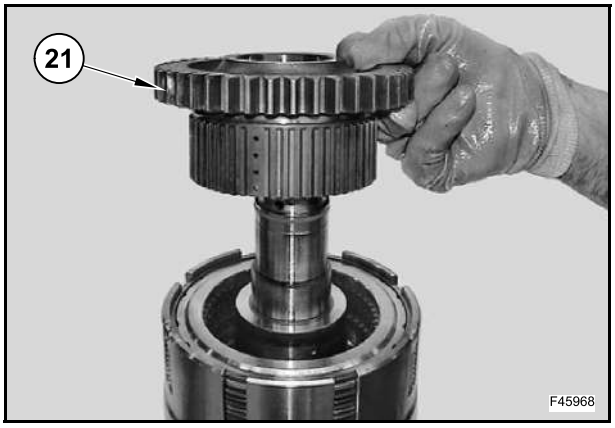
Assemble the bearing (1) by means of tool 380200203.



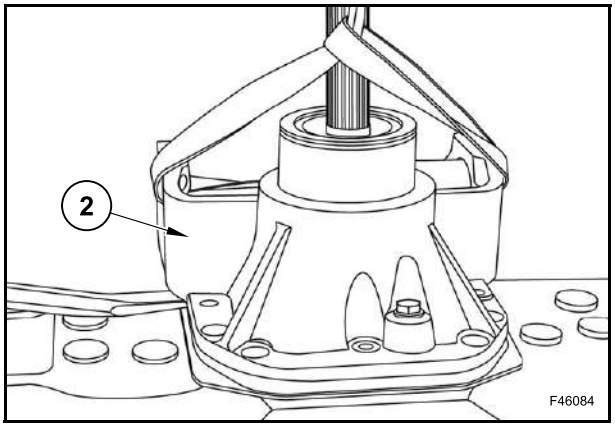
Assemble the thrust washer (20).



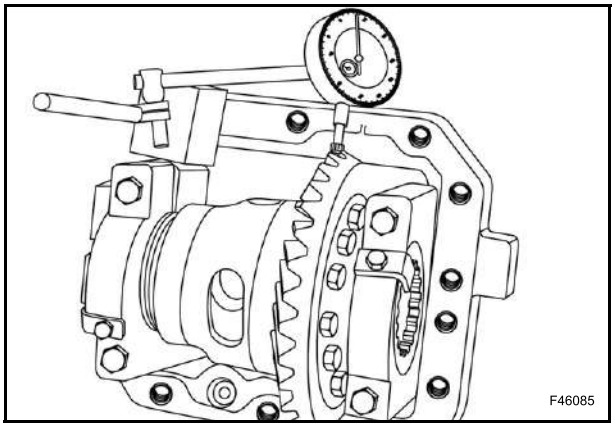
Assemble the gear (21).



Remove the differential carrier (2) by means of a suitable lifting device.



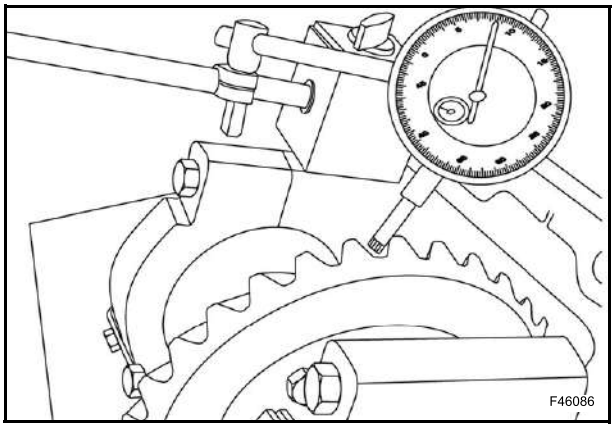
Place the differential on an approved working area.



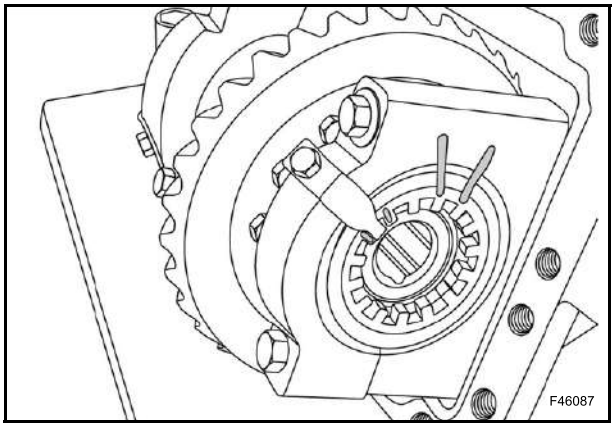
Prevent the pinion from turning.

Measure the backlash of the ring gear.

Record the reading.

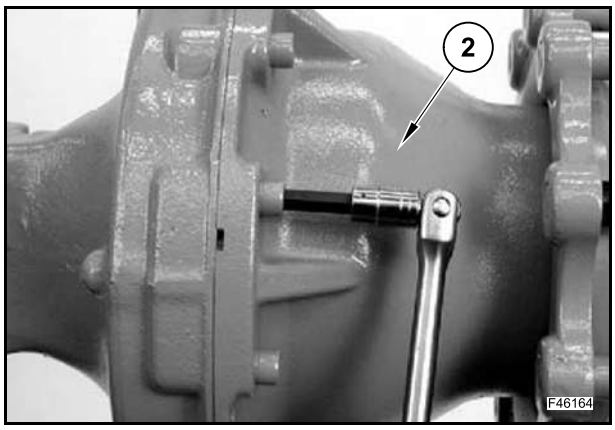


Make an identification mark on the supports and ring nut on one side of the differential carrier.

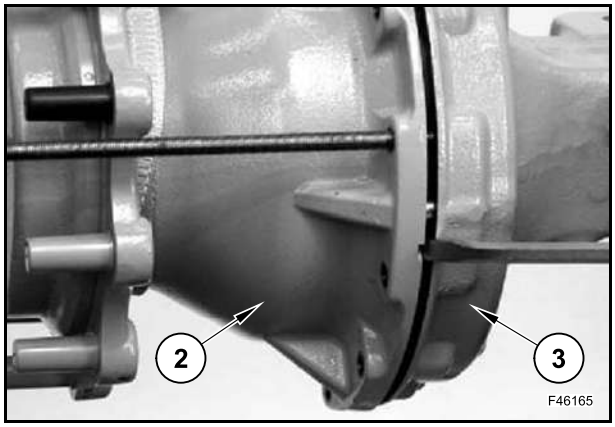


Connect the wheel hub (2) to a lifting device and tension the rope.

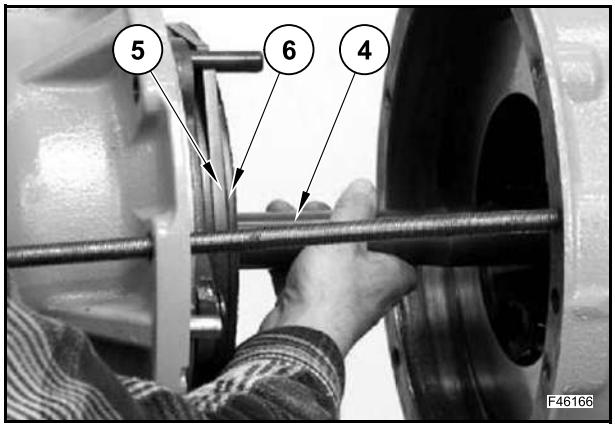
Insert 2 opposed threaded rods to enable removal.



Remove the 2 last screws (1) and separate the wheel hub assy (2) from the axle body (3).



Slowly remove the wheel hub assy and the half axle (4), make sure that the braking discs (5) and the counterdiscs (6) stay on the wheel hub assy.

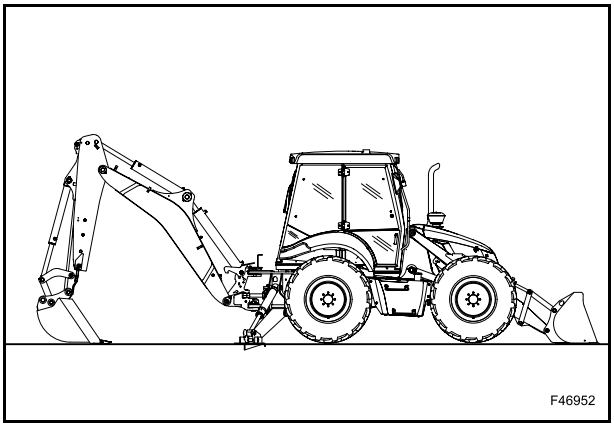


Place the wheel hub assy vertically and mark the counterdisc (5) assembled to the axle body side (3).

Remove the discs (6), the counterdiscs (5) and the dowel pins (7).

REMOVAL FROM MACHINE

Move the machine to a level and firm ground, away from any soft ground, excavations and poorly shored cavity.



Lower the loader attachment to the ground.

Lower the backhoe attachment to the ground.

Lower the stabilizers until the rear wheels are slightly lifted from the ground (they are free from machine weight).

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter key.

Release the hydraulic pressure by operating the control levers in all directions.

On hydraulically controlled machines, turn the key to ON and release the pressure by moving the hydraulic control levers in all directions.

Disconnect the electric system by disconnecting the battery master switch.

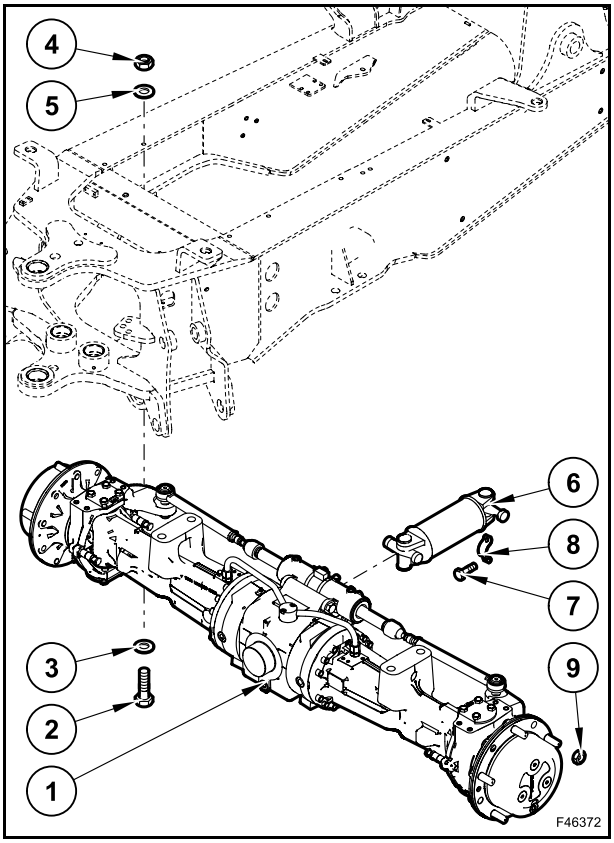
Fasten the rear axle to a lifting hoist or to a support.

Now it is possible to carry out the disassembly of the 2 rear tyres by loosening and removing the relevant fixing nuts (9) [tightening torque = 700 Nm (516 lbf·ft)].

Disconnect the cardan joint (6) by unlocking and removing the screws (7) and the bracket (8).

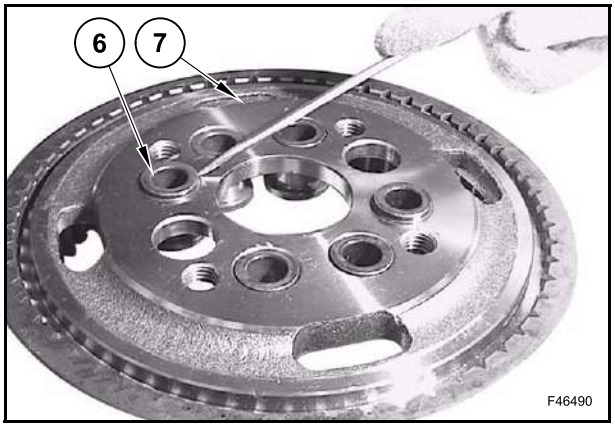
Unscrew and remove the screws (2) with the nuts (4) and the washers (3) and (5) [tightening torque = 830 ÷ 970 Nm (612 ÷ 715 lbf·ft)].

Remove the rear axle (1).

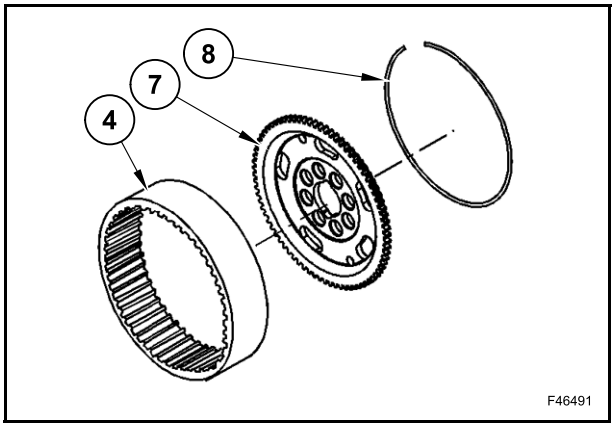


Position the ring gear hub (7) on a workbench and insert the bushings (6) at surface level by means of tool 380200192.

At least two bushings (diametrically-opposed) should be set slightly higher than the carrier surface level to be used as dowel pins.

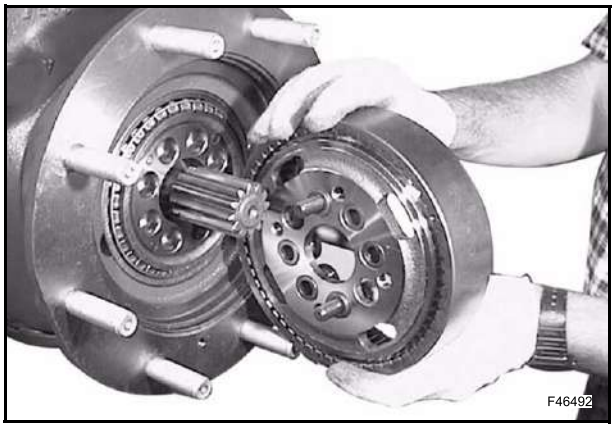


Preassemble the ring gear carrier hub (7) and the ring gear (4) with the snap ring (8).



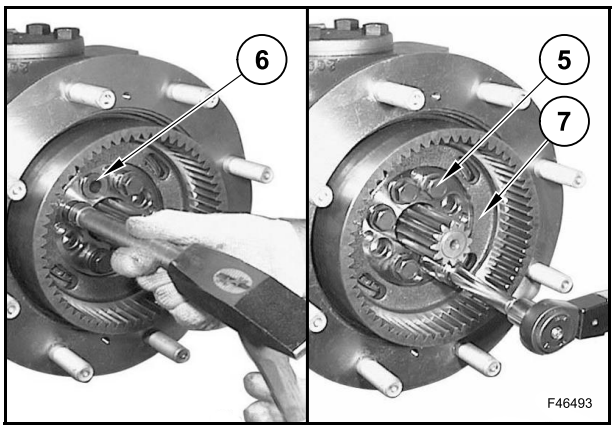
Assemble the ring gear carrier hub assy on the wheel hub using the two projecting bushings as dowel pins.

Screw the relevant screws in order to put in contact the assembly with the wheel hub.



Assemble all bushings (6) up to stroke end by means of tool 380200192 and a hammer.

Screw in and tighten the screws (5) to a tightening torque of 230 Nm (170 lbf·ft).

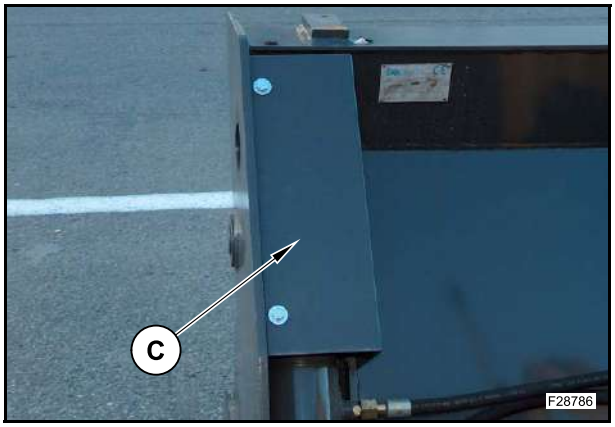


Disconnect the hoses.

Cap or plug all exposed openings.

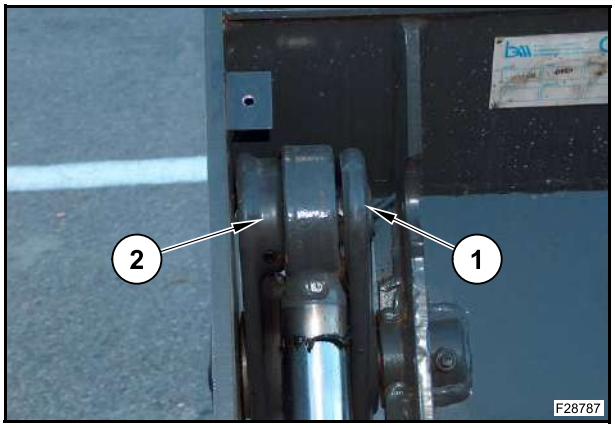
Unscrew and remove the clamping screws of the cover (C).

Remove the cover (C).



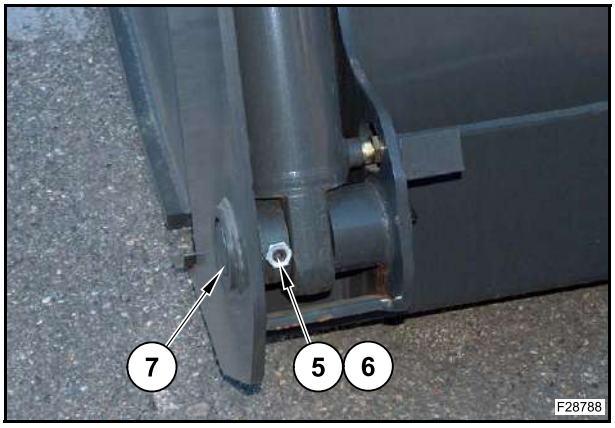
Remove the pin (2).

Slide out the rod pin (1) with an hammer.



Unscrew and remove the nut (6) and the dowel (5).

Slide out the lower pin (7) with an hammer.



Remove the 4x1 bucket cylinder.

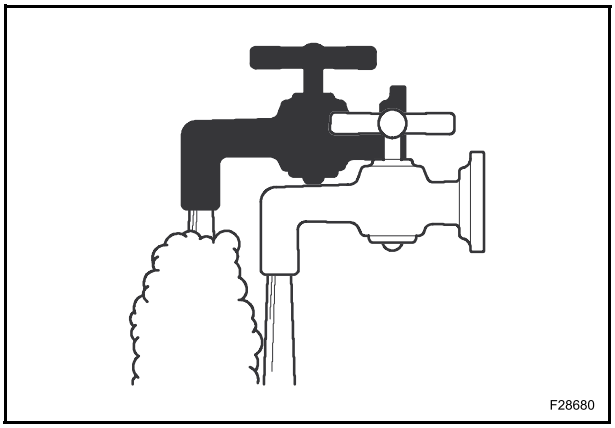
AIR CONDITIONING

PRINCIPLES OF AIR CONDITIONING

The function of the air conditioning system is to improve the operator's comfort by cooling down the air temperature inside the cab and reducing the humidity level.

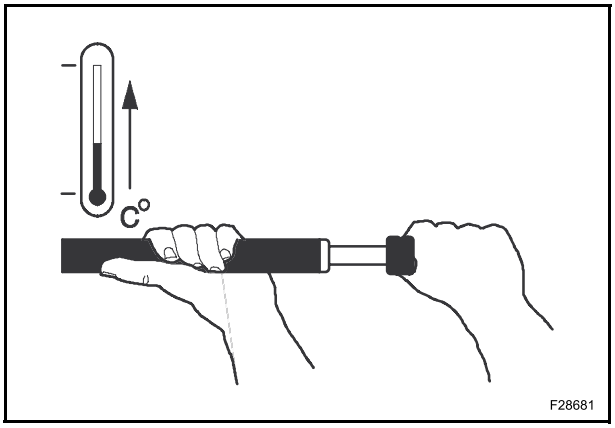
In order to achieve this heat transfer the following principals of heat generation and transfer are applied within the air conditioning system.

When two bodies with a different temperature come together, heat is transferred from one to the other. On air conditioning systems, an evaporator is used to maintain the low temperature of the coolant, which absorbs the heat from the air within the cab.



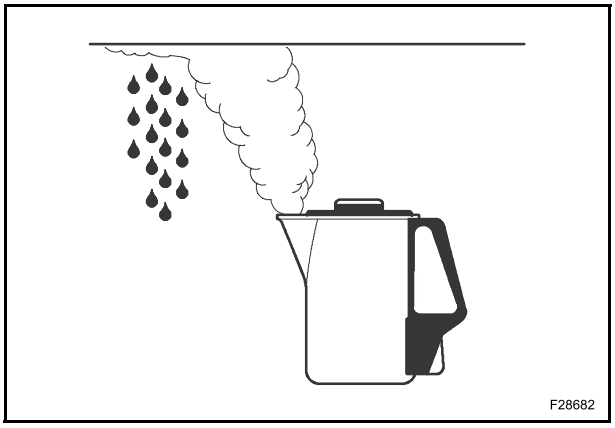
When a gas is pressurized the temperature of the gas will rise.

In air conditioning systems the increase in pressure is achieved using a compressor.



When a gas is cooled it will condense into a liquid.

In the air conditioning system a condenser is used to cool the gas and the resulting liquid is stored in a receiver dryer.



COMPONENTS

NAME	DESCRIPTION
A14	Antitheft unit
A106	Engine control unit
A131	Flasher control unit
B4	Air filter pressure switch
B5	Fuel level sensor
B24	Hand throttle
B25	Foot throttle
B26	Bucket sensor
B33	Engine rpm sensor
B66	Transmission oil temperature switch
B69	Air conditioning pressure switch
B107	Water in fuel sensor
B134	Stop light switch
B159	Stop light switch
B211	Parking brake pressure switch
E16	Rotating beacon
E17	Lamp for socket
E37	Rear right light
E38	Rear right work light
E40	Rear right work light (optional)
E42	Front right indicator
E44	Front right work light
E46	Rear left work light (optional)
E45	Front right work light (optional)
E47	Rear left work light
E48	Rear left light
E51	Front left work light
E52	Front left indicator
E144	Lamp switch block (optional)
F1	Main fuse
F402	ECU main fuse
F403	+30 Electric fan fuse
F31	Diagnostic fuse
F208	Air conditioning fuse 10 A

NAME	DESCRIPTION
F112	Air conditioning fuse
F113	Water in fuel fuse
G1	Battery
G67	Alternator
H7	Reverse travel alarm
H26	Block control lamp
H32	Buzzer (optional)
H121	Horn
K102	Start control relay
K103	Start consent relay
K104	Engine start relay
K105	Air conditioning relay
K224	Differential lock relay
K225	Parking brake relay
K226	4WD relay
K227	Additional relay
K230	Hand hammer relay
M1	Starter motor
M64	Air conditioning motor
M207	Starter motor
P1	Side instrument
P125	Front instrument cluster
R2	Grid heater resistor
S15	Starting switch
S36	Rear hammer button (optional)
S120	Warning switch
S122	4WD switch
S123	Hand hammer switch
S126	Light switch
S127	Rotating beacon switch
S130	Indicator light switch
S132	Gearshift lever switch
S135	Backhoe attachment travel lock switch (optional)

HEATER AND RADIO LINE DIAGRAM