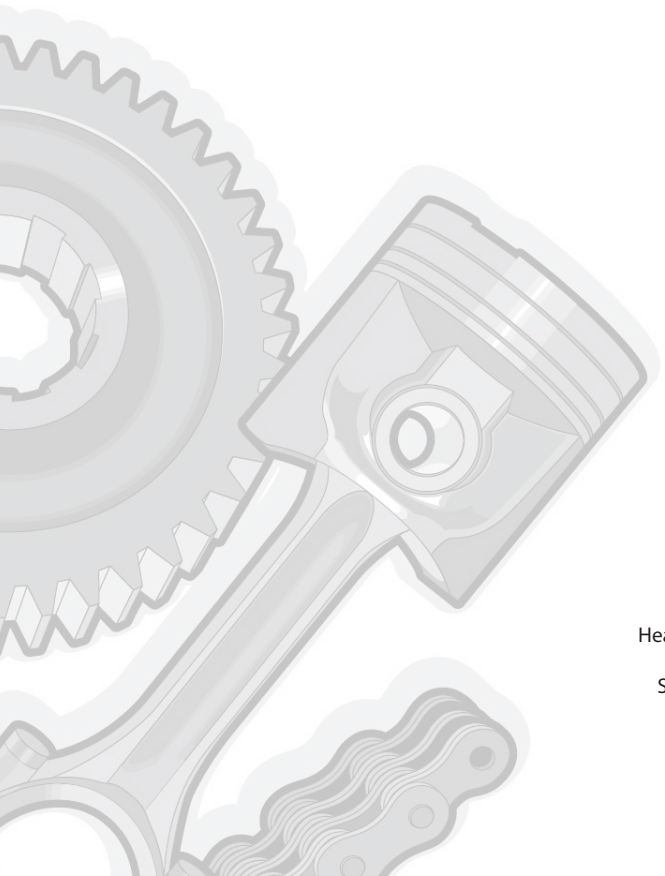
MANITOU

HANDLING YOUR WORLD

REPAIR MANUAL
MANUEL DE RÉPARATION
REPARATURANLEITUNG
MANUAL DE REPARACIÓN
MANUALE RIPARAZIONE



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Compression test data

Many factors affect compression pressures, the battery, starter motor condition, ambient conditions and the type of gauge used can give a wide variation of results for a given engine.

Standard value	To be repaired
>2940 kPa (426.6 lbf / in²) @ 250 rpm	<2450 kPa (355.5 lbf / in²) @ 250 rpm

Compression tests should only be used to compare between cylinders of an engine. If one or more cylinders vary by more than 350 kPa (50 lbf / in²) then those cylinders may be faulty.

Compression tests should not be the only method used to show the condition of an engine, but they should be used together with other symptoms and tests.

How to do a compression test

Note: Before the compression test, ensure that the battery is in good condition and fully charged. Also ensure the starter motor is in good condition.

1 Ensure that the valve tip clearances are set correctly.

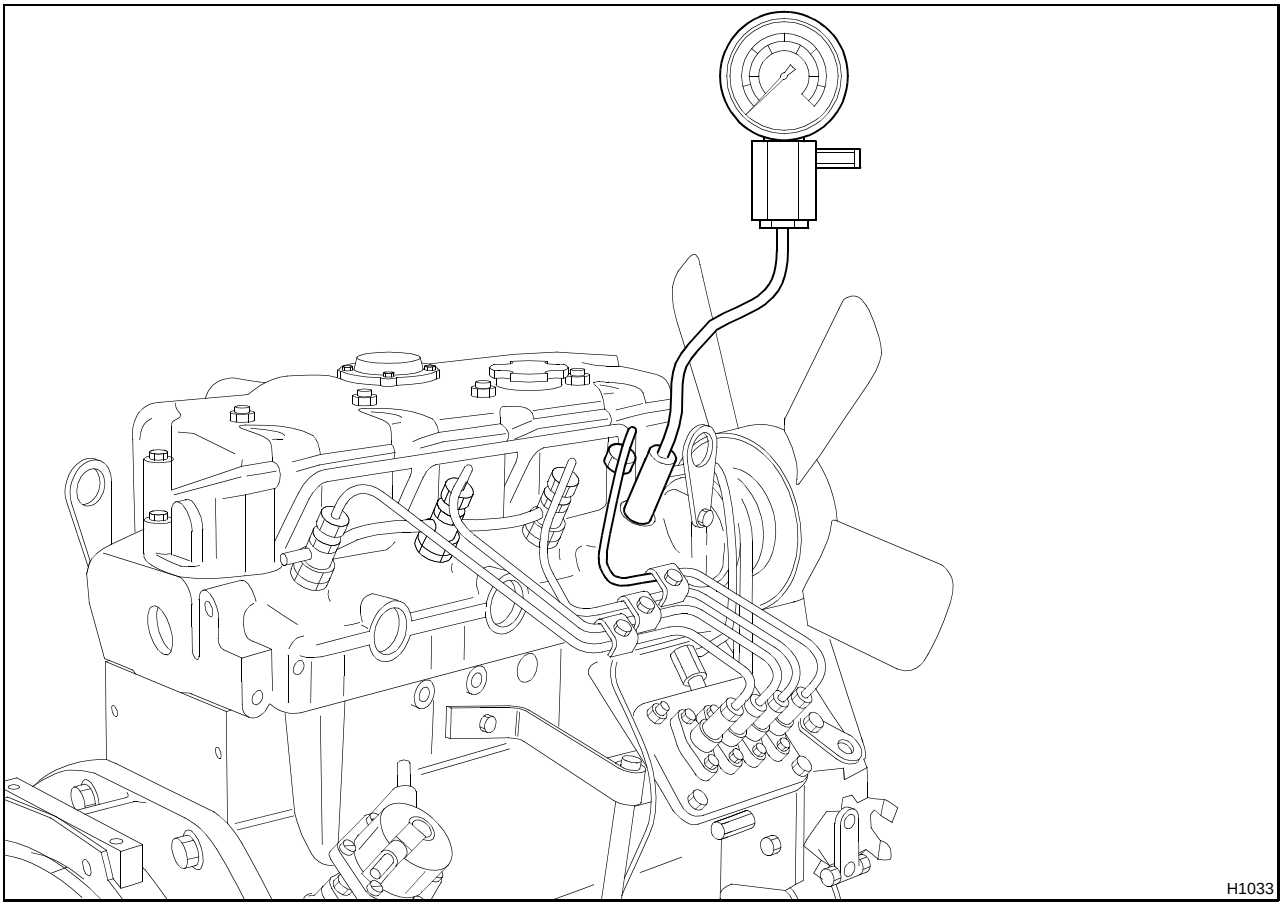
2 Remove the atomisers, see Operation 11-1.

3 Fit a suitable gauge into the atomiser hole of the cylinder to be tested.

4 Disconnect the stop solenoid or put the stop solenoid in the no fuel position. Operate the starter motor and record the pressure indicated on the gauge.

Caution: *Do not remove the stop solenoid as this will allow the engine to start.*

5 Repeat for each cylinder.



Cylinder head gasket

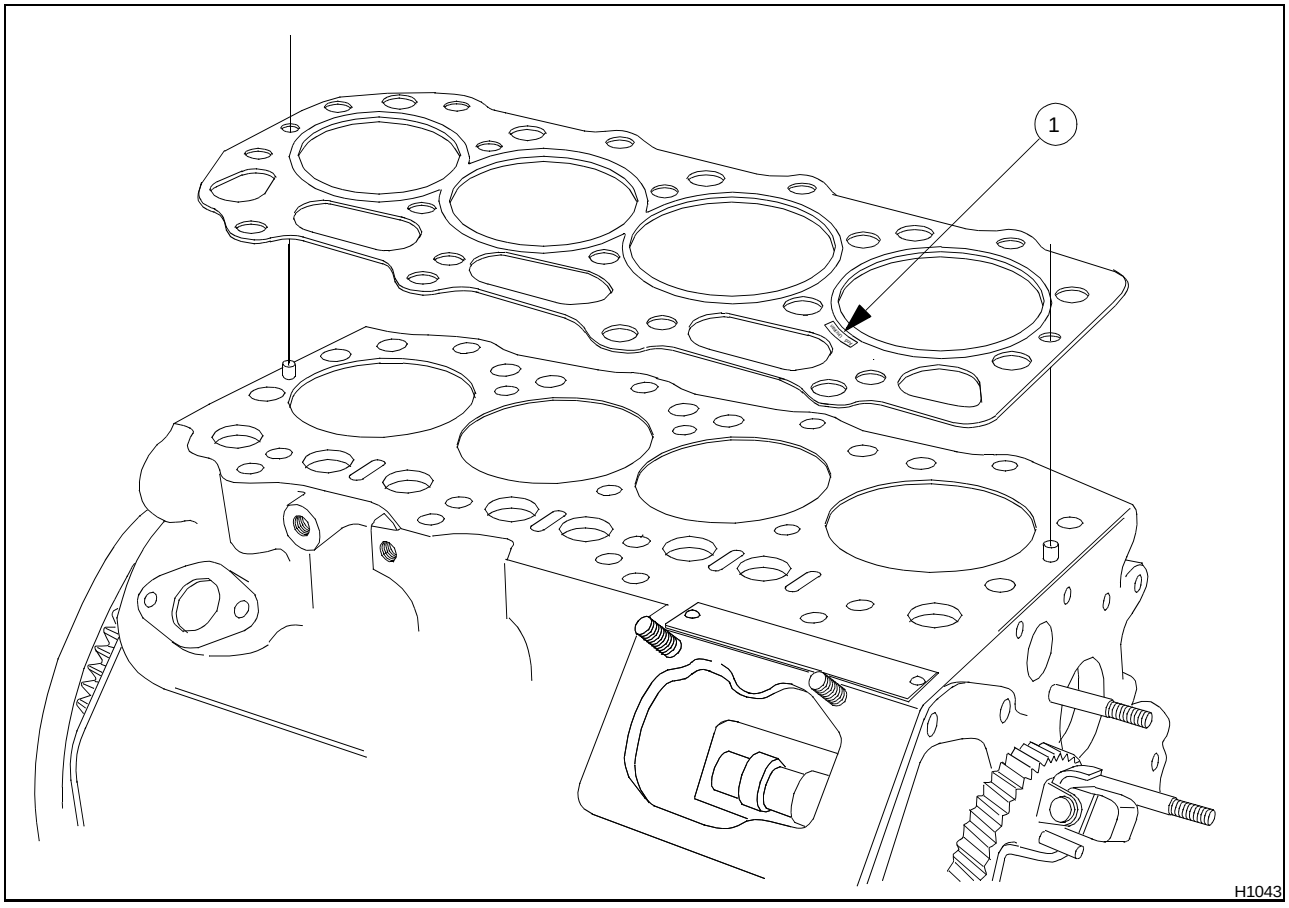
To remove and to fit **Operation 3-10**

Align the gasket on the dowels in the cylinder block.

***Cautions*:**

- *The gasket must only be fitted with the markings (1) facing up.*
- *When fitting a new gasket it must be replaced with a gasket of the same thickness as originally fitted. The gasket thickness can be identified by the part number that is stamped on the gasket.*
- *The correct piston height must be maintained to prevent damage to the pistons and valves and ensure that the engine conforms to emission legislation.*

Note: Always fit dry.



Valve tip clearance

To check and to adjust **Operation 3-20**

The valve adjustment sequence is viewed from the front of the engine.

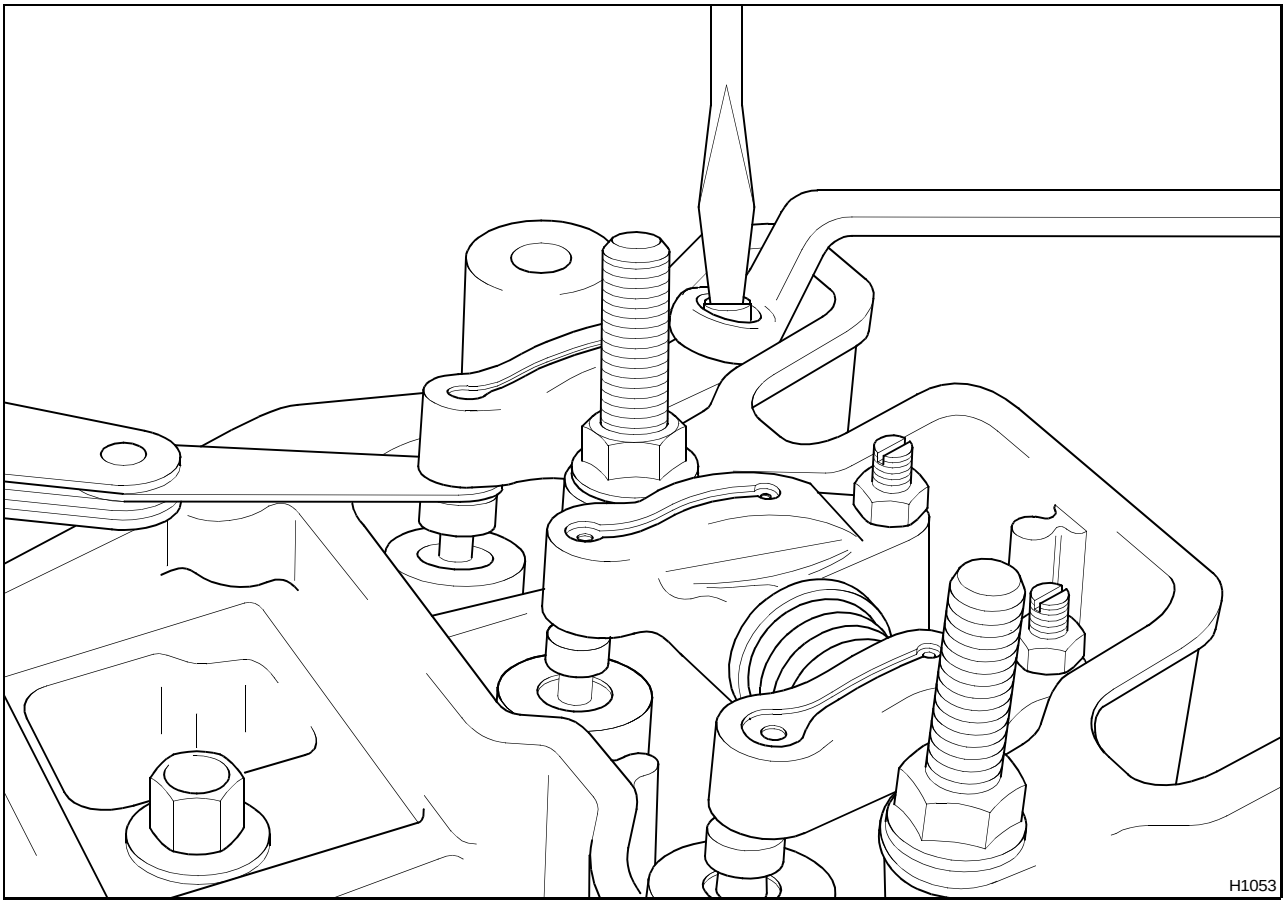
Rotate the crankshaft clockwise when viewed from the front.

Caution: *Only adjust the valve clearances when the engine is cold.*

Engine	Valve overlap	Adjust valves
403C-11 403C-15	No. 1 Cylinder	3 and 6
	No. 2 Cylinder	2 and 5
	No. 3 Cylinder	1 and 4
404C-22 404C-22T	No. 4 Cylinder	1 and 2
	No. 2 Cylinder	5 and 6
	No. 1 Cylinder	7 and 8
	No. 3 Cylinder	3 and 4

Valve tip clearance (cold)	
Inlet	0,2 mm (0.0078 in)
Exhaust	0,2 mm (0.0078 in)

Torque Nm (lbf ft) kgf m	
Tappet adjustment nut	14 (10.3) 1,4



Connecting rod bearing clearance

To check **Operation 4-10**

To check the clearance between the crankshaft bearing journal and the bearing cap.

1 Clean the bearing surfaces and the exposed half of the crankshaft journal.

2 Fit the bearing caps and tighten the bearing cap to torque.

3 Remove the bearing cap of the clearance to be checked.

4 Place a piece of Plastigauge ® across the full width of the bearing surface on the crankshaft journal, fit the bearing cap and tighten the bearing cap setscrew to the specified torque.

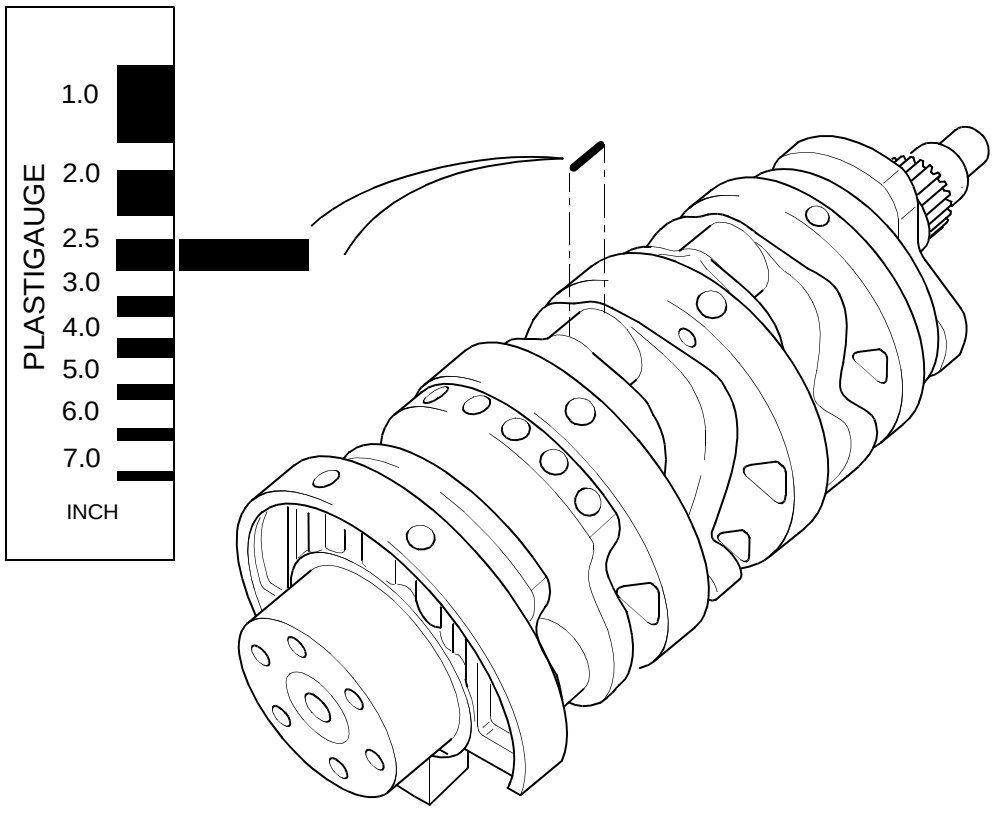
5 Remove the bearing cap but **do not move** the Plastigauge ®.

6 Use the Plastigauge ® envelope to measure the widest point of the Plastigauge ®. This reading indicates the bearing clearance in thousandths of an inch.

7 If the bearing clearance is not within the specifications the crankshaft must be reground and undersize bearings fitted.

Engine	Torque Nm (lbf ft) kgf m	
403C-11	Bearing carrier setscrew	23 (16.9) 2,3
403C-15, 404C-22 and 404C-22T	Bearing carrier setscrew	52 (38.3) 5,2

Engine	Journals	Standard clearance	Service limit
403C-11	1 and 2	0,039 - 0,092 mm (0.00150 - 0.00360 in)	0,20 mm (0.0079 in)
	3	0,029 - 0,082 mm (0.00110 - 0.00320 in)	0,20 mm (0.0079 in)
403C-15, 404C-22 and 404C-22T	All	0,035 - 0,085 mm (0.00138 - 0.00335 in)	0,20 mm (0.0079 in)



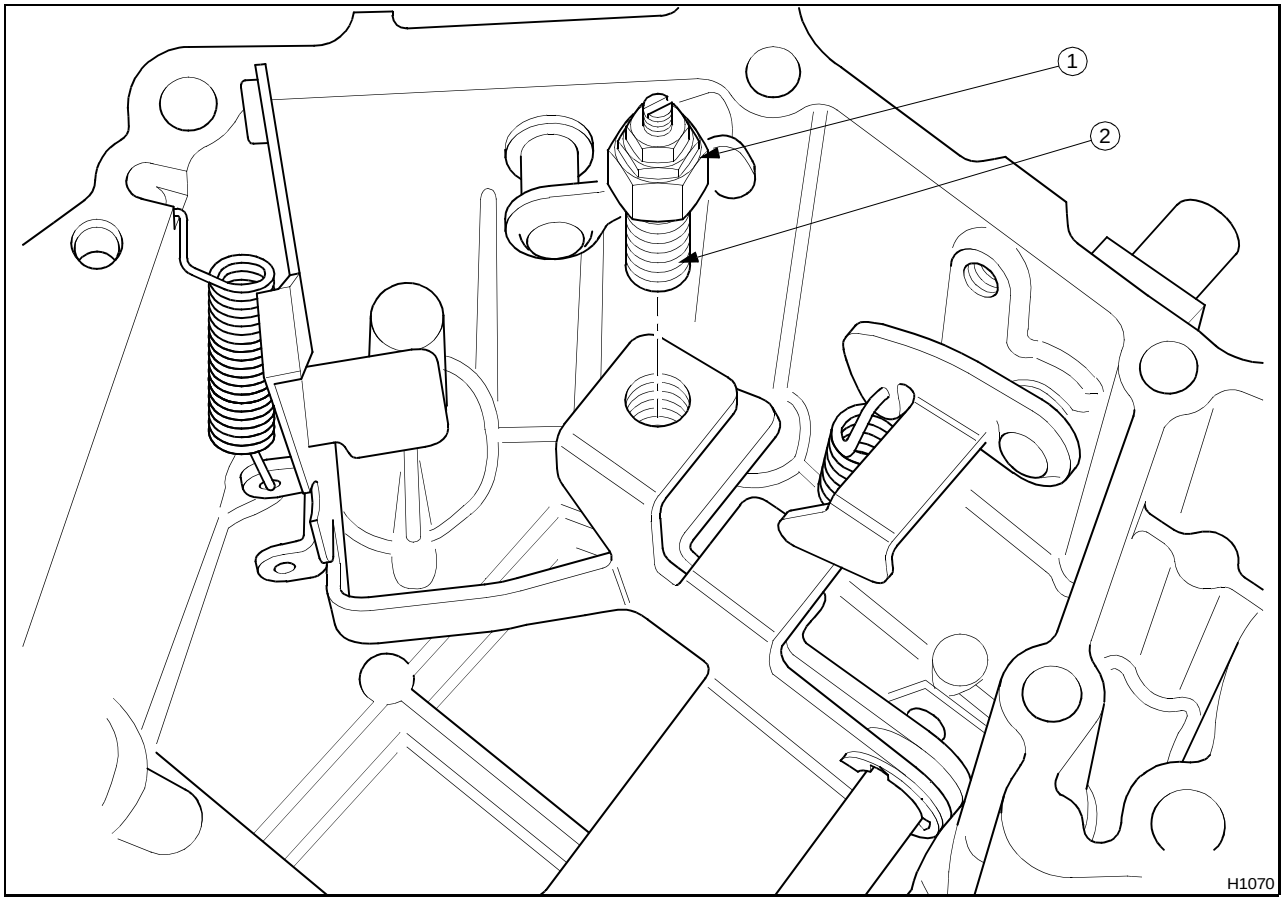
Angleich

To remove and to fit **Operation 6-3**

Engine	Torque Nm (lbf ft) kgf m	
403C-15, 404C-22 404C-22T	Angleich (1)	5 (3.6) 0,5

Notes:

- The internal setting for the Angleich must not be altered.
- Apply a little Loctite 275 to threads (2) before assembly.
- The Angleich is not fitted to the 403C-11 engine.



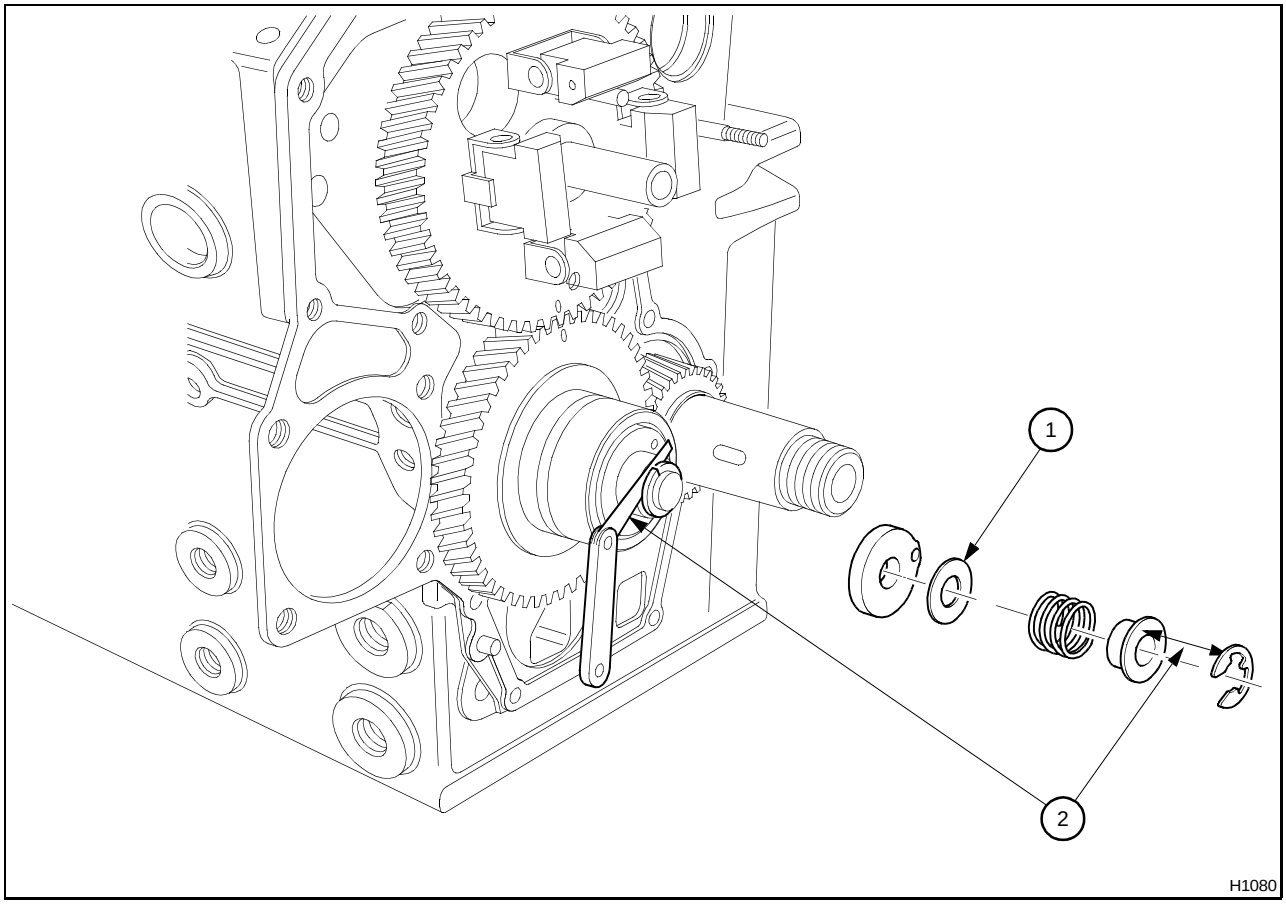
Oil pump end float

To check and adjust — Operation 6-13

Use a feeler gauge to check the oil pump end float (2).

Adjust with 0,1 - 0,15 - 0,2 and 0,5 mm shims (1).

Engine	Standard clearance mm (in)	Service limit mm (in)
All models	0,10 - 0,15 (0.0040 - 0.0060)	0,20 (0.0079)



9

Aspiration system

Breather system

Closed circuit, naturally aspirated - to clean and to renew **Operation 9-1**

To clean the engine breather assembly

The breather assembly should be renewed every 2000 hours.

Caution: *Ensure that the components of the breather assembly are fitted in their correct position (1 - 6). If they are incorrectly fitted, the engine may be damaged.*

1 Release the four setscrews (2) and remove the breather cover (1), the spring (6) and the diaphragm assembly (4).

Caution: *It is important that the area around the vent hole (3) is clean.*

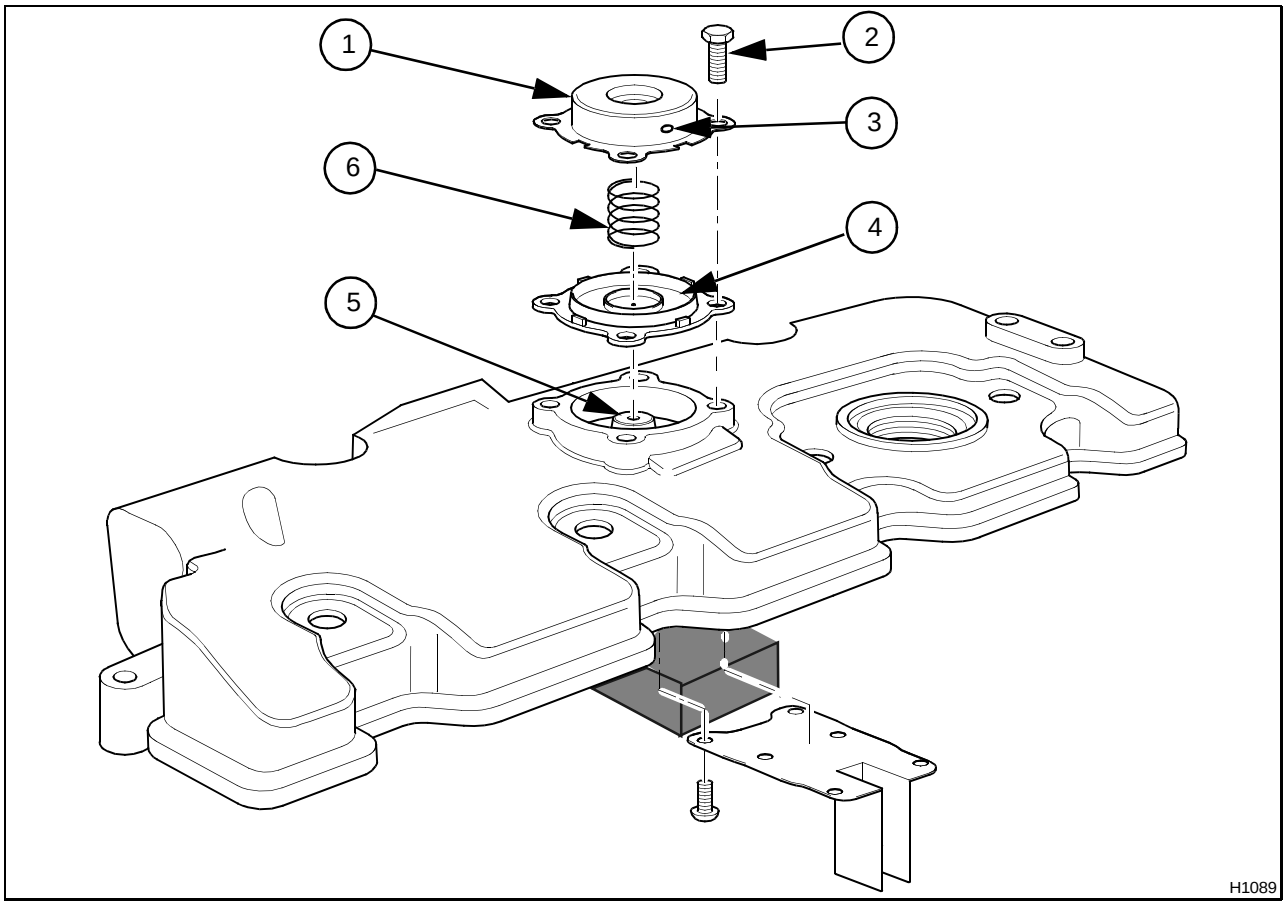
2 Clean the breather cavity (5) in the rocker cover.

3 Clean the breather in clean diesel fuel

4 Fit the breather assembly into the cavity in the rocker cover, ensuring that the breather cover, diaphragm and spring are assembled correctly and that the vent hole (3) faces towards the flywheel.

Tighten the four setscrews.

Clean the breather only with a clean diesel fuel. If the breather is damaged or the diaphragm perforated, renew the breather.



Lubricating oil pipes

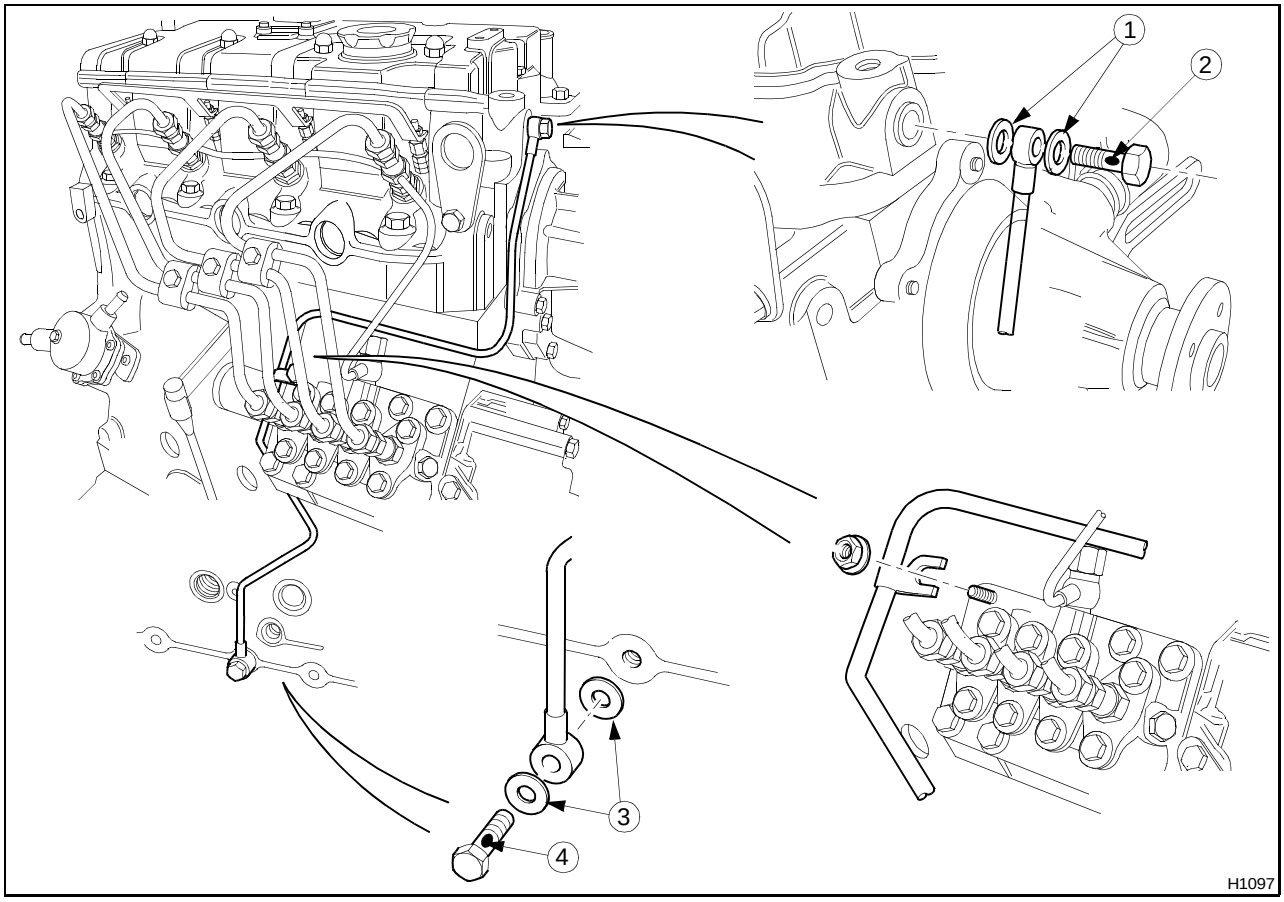
To remove and to fit **Operation 10-8**

Engine	Torque Nm (lbf ft) kgf m	
All models	Banjo bolt	12 (8.8) 1,2

Note: The lubricating oil flow through the banjo bolt (2 and 4) is restricted.

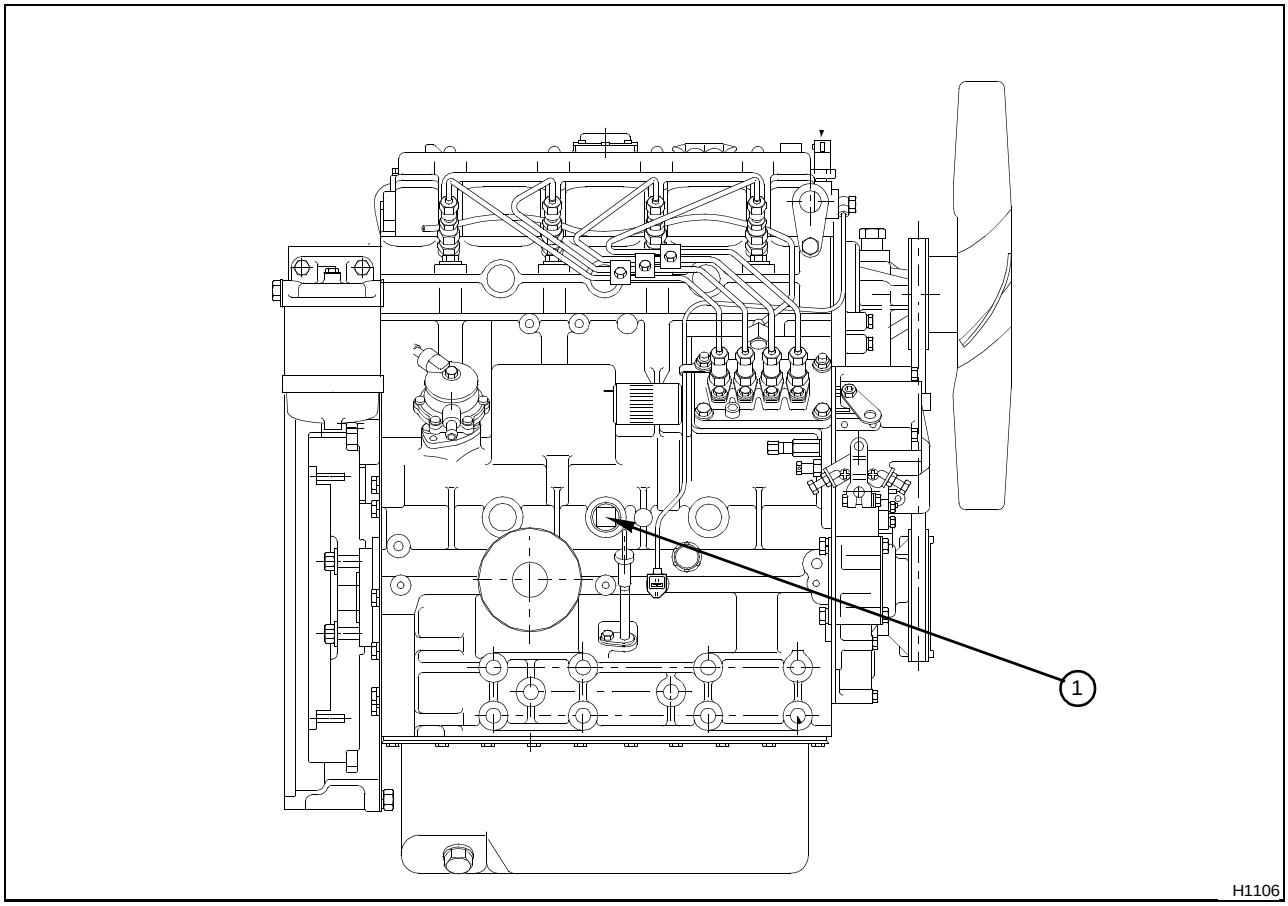
Check the pipe for leaks and damage.

When fitting use new washers (1) and (3).



To drain the cylinder block **Operation 12-5**

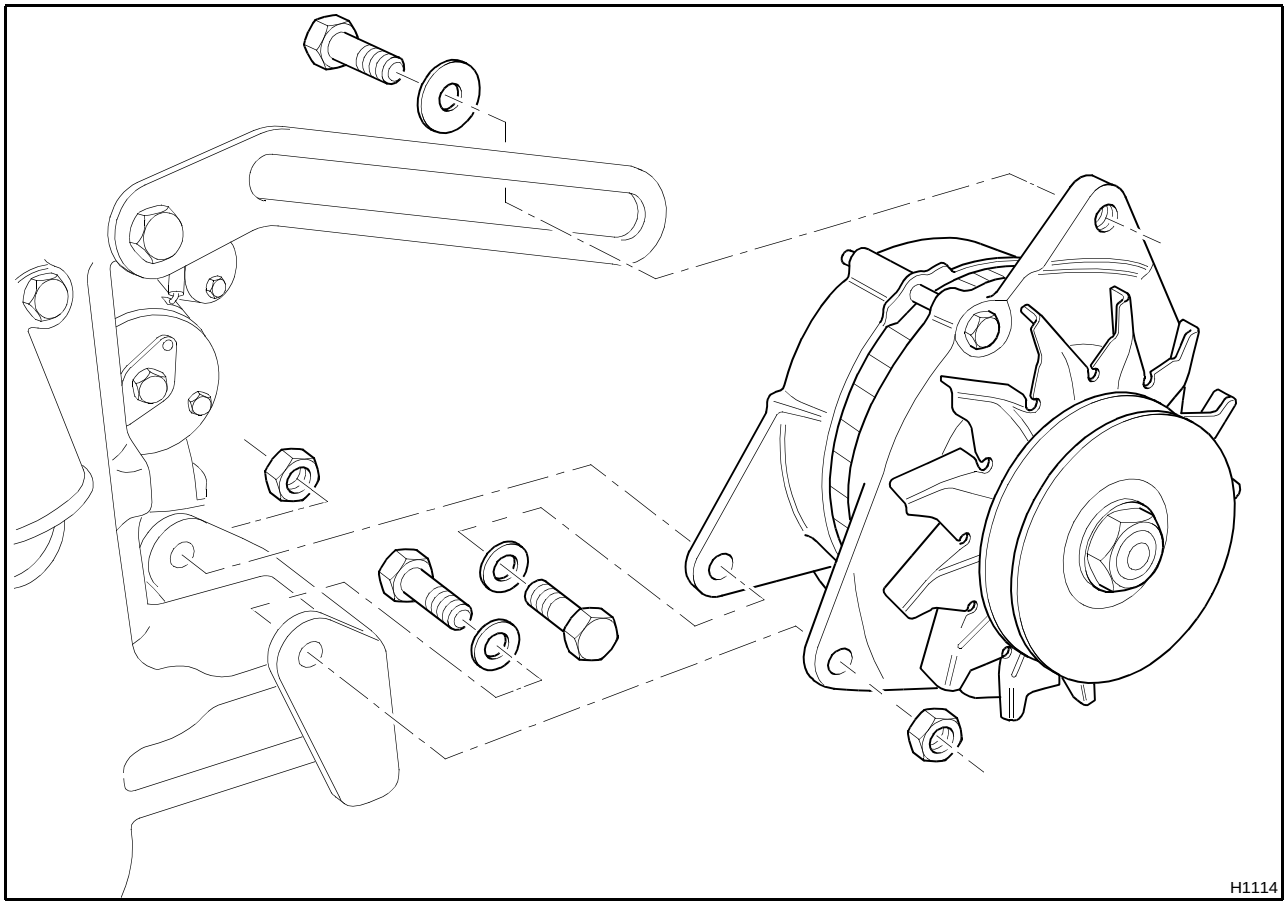
Engine	Torque Nm (lbf ft) kgf m	
All models	Cylinder block drain plug	30 (22,0) 3,0



Alternator

To remove and to fit **Operation 14-4**

On assembly check the tension of the drive belt, see Operation 14-3.



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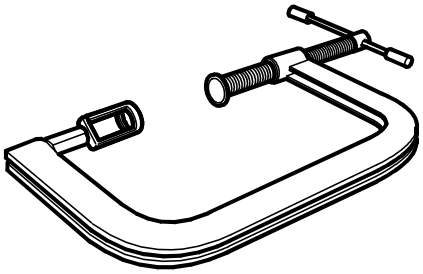
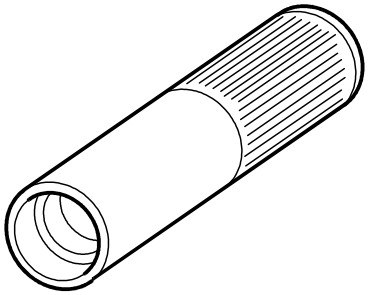
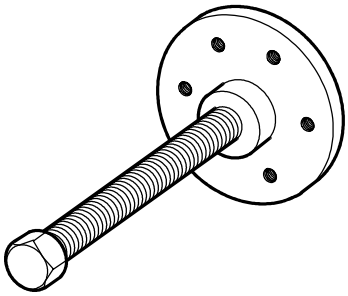
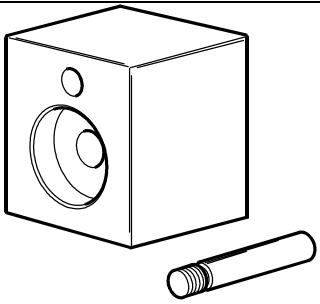
Special tools

Special tools list

These tools are available locally through your Perkins distributor. If you cannot obtain the correct tool locally contact:

The Perkins Service Department, Peterborough, PE1 5NA, England, UK.

Tel. +44 1733583000 Fax +441733582240 Telex 32501 PERKEN G.

Description	Illustration
Valve spring remover Part number 21825663	
Valve stem seal replacer Part number 21825623	
Crankshaft pulley remover Part number 21825619	
Idler hub fitting tool 403C-11 part number 21825625 403C-15 and 404C-22 part number 21825626	

GROUPS 30

AXLE

14

Electrical equipment

Electrical shut off solenoid

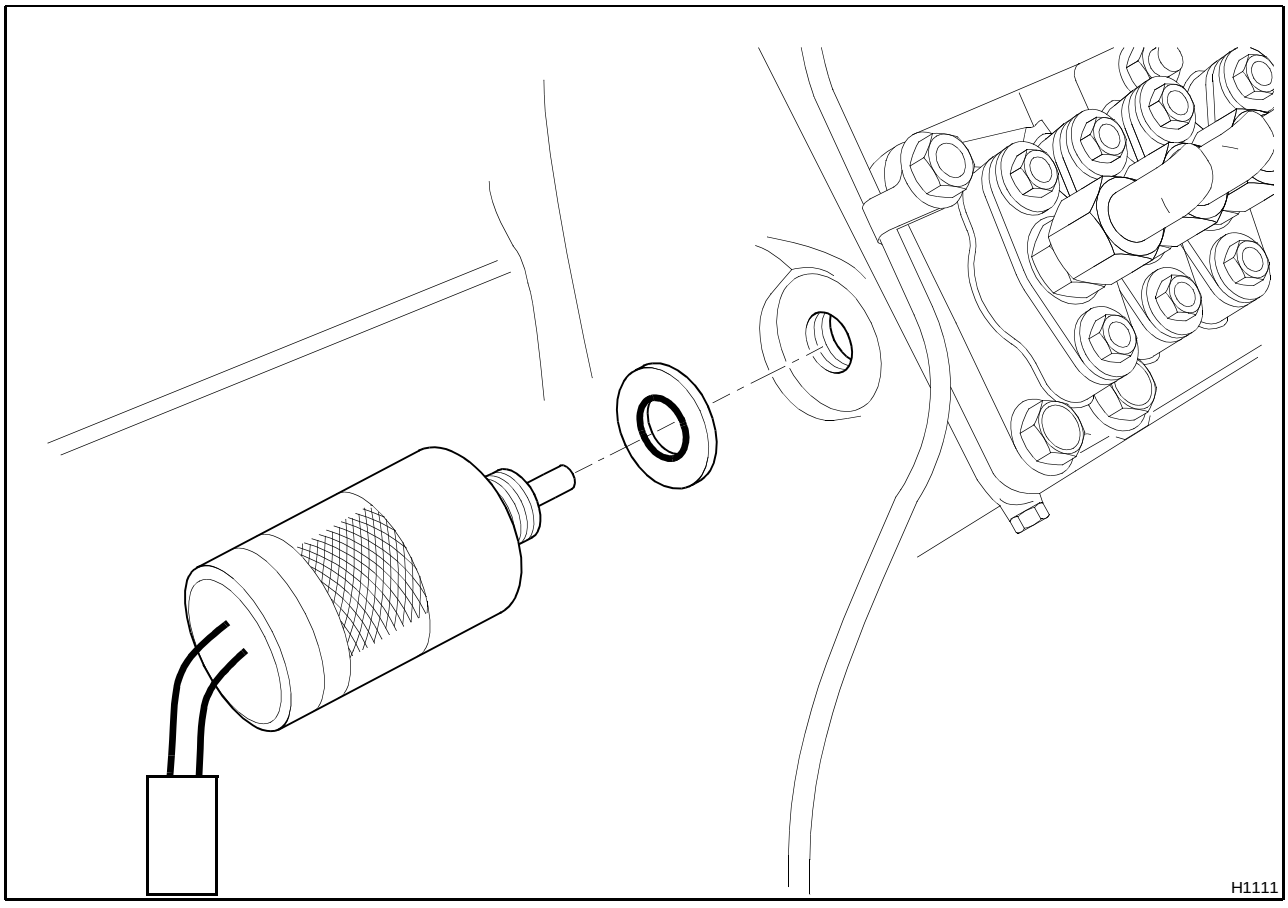
To remove and to fit **Operation 14-1**

Special requirements

Engine	Torque Nm (lbf ft) kgf m	
All models	Solenoid	17 (12) 1,7

Notes:

- The washer is fitted with an integral “O” ring.
- Always use a new washer on assembly.



Wiring diagram - automatic shutdown 40 amp alternator - 403C-11

Automatic shutdown operation symptoms

If the conditions below last for more than 10 seconds during the start operation, the engine will shut down.

If the conditions below last for more than 2 seconds while the engine is operated, the engine will shut down.

Warning! *There is no protection against low water levels.*

Conditions

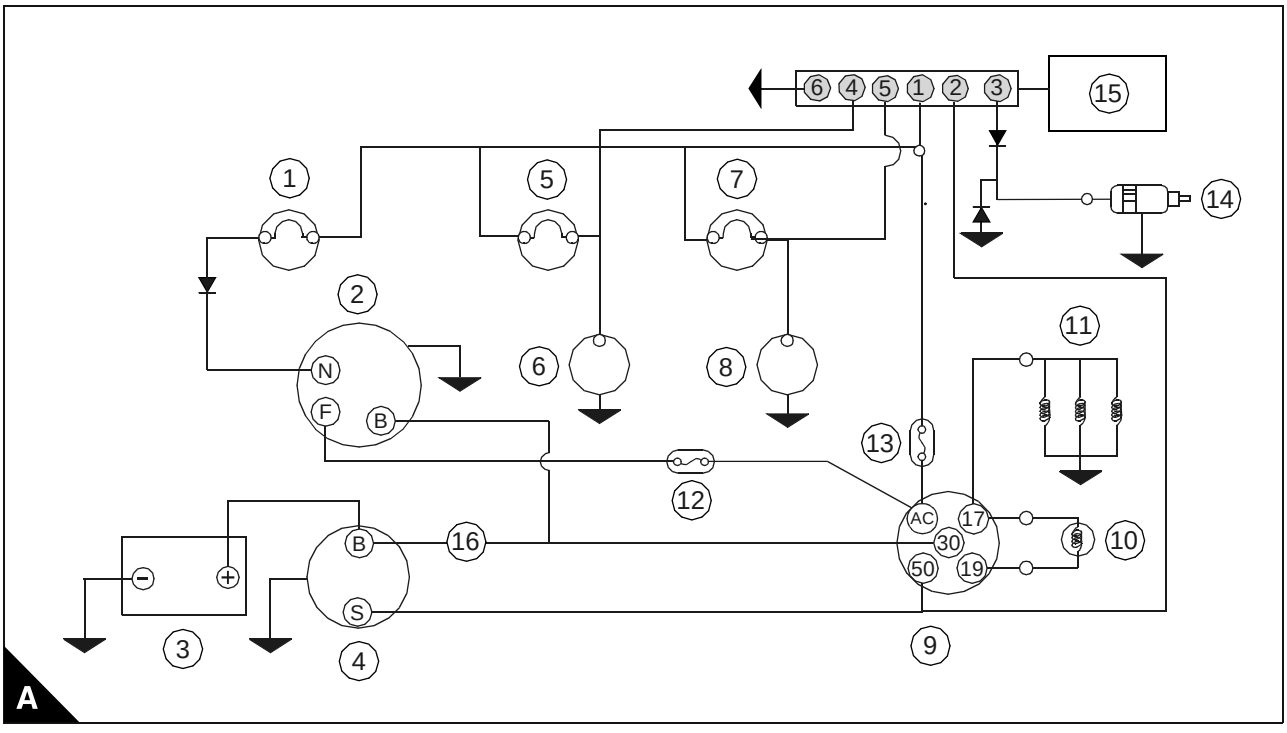
Water temperature switch: If the water temperature exceeds 105 °C ± 4 °C.

Oil Pressure Switch: If the oil pressure falls below 0,3 kgf/cm² (4.27 lbf/in²).

1 Alternator warning lamp
2 Alternator
3 Battery
4 Starter motor
5 Oil pressure warning lamp
6 Oil pressure switch **(1)**
7 Water temperature warning lamp
8 Thermostat switch
9 Key switch
10 Glow signal
11 Glow plugs
12 Fuse
13 Fuse
14 Solenoid switch
15 Automatic shutdown device
16 A delayed fuse can be fitted if desired

(1) Max current draw for standard oil pressure switch is 0.42 amps (5 Watt lamp max).

→|← = Diode. Capacity: Current 3 amp. Reverse Voltage: 600V. **(This is mandatory)**.

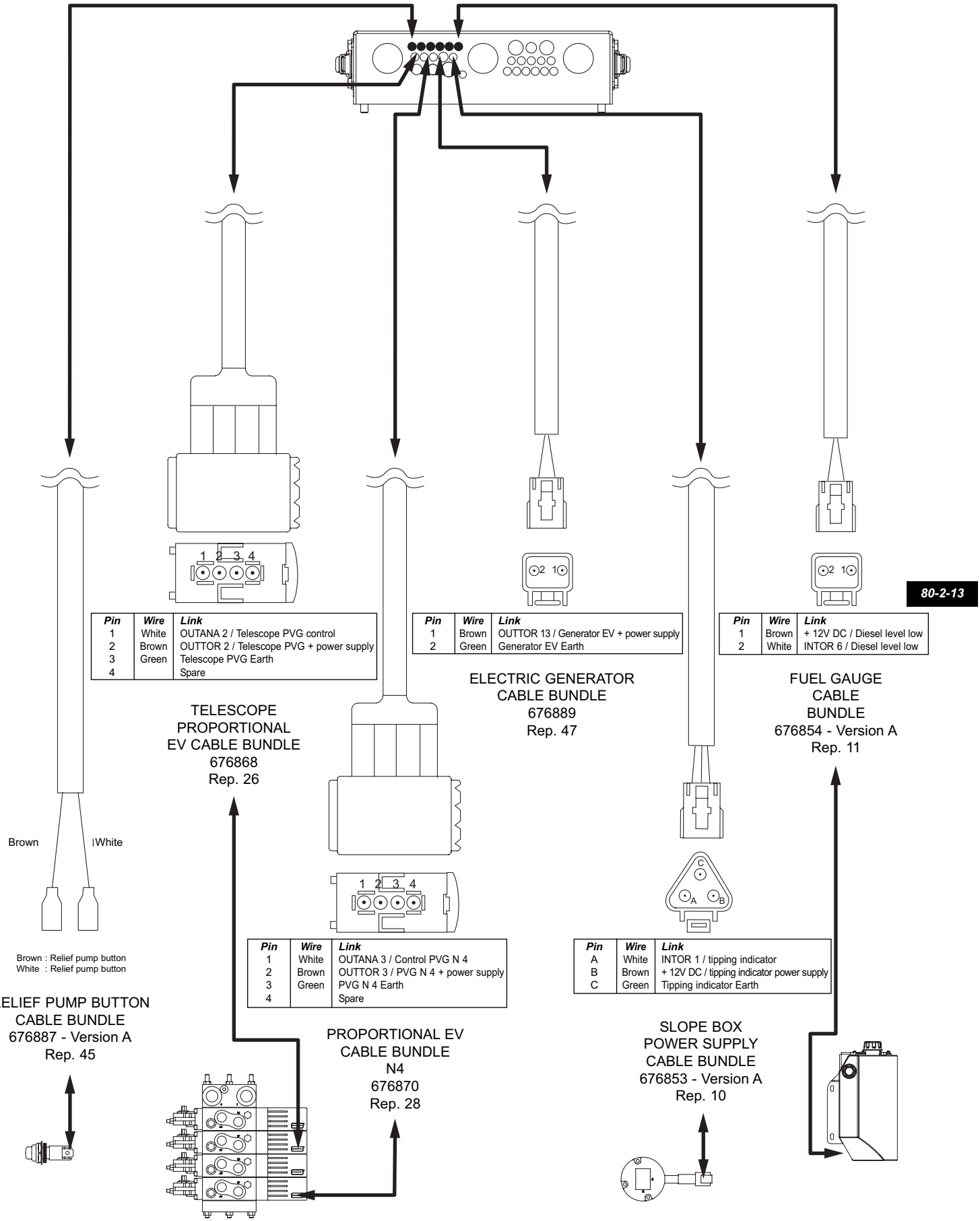


GROUPS 30

AXLE

A - MACHINES UP TO NO. 506427

A8 - MISCELLANEOUS CABLE LOOMS BRC 301 - REP. 10, 11, 26, 28, 45, 47



80-2-13

Pin	Wire	Link
1	White	OUTANA 2 / Telescope PVG control
2	Brown	OUTTOR 2 / Telescope PVG + power supply
3	Green	Telescope PVG Earth
4		Spare

TELESCOPE PROPORTIONAL EV CABLE BUNDLE
676868
Rep. 26

Pin	Wire	Link
1	Brown	OUTTOR 13 / Generator EV + power supply
2	Green	Generator EV Earth

ELECTRIC GENERATOR CABLE BUNDLE
676889
Rep. 47

Pin	Wire	Link
1	Brown	+ 12V DC / Diesel level low
2	White	INTOR 6 / Diesel level low

FUEL GAUGE CABLE BUNDLE
676854 - Version A
Rep. 11

Brown : Relief pump button
White : Relief pump button

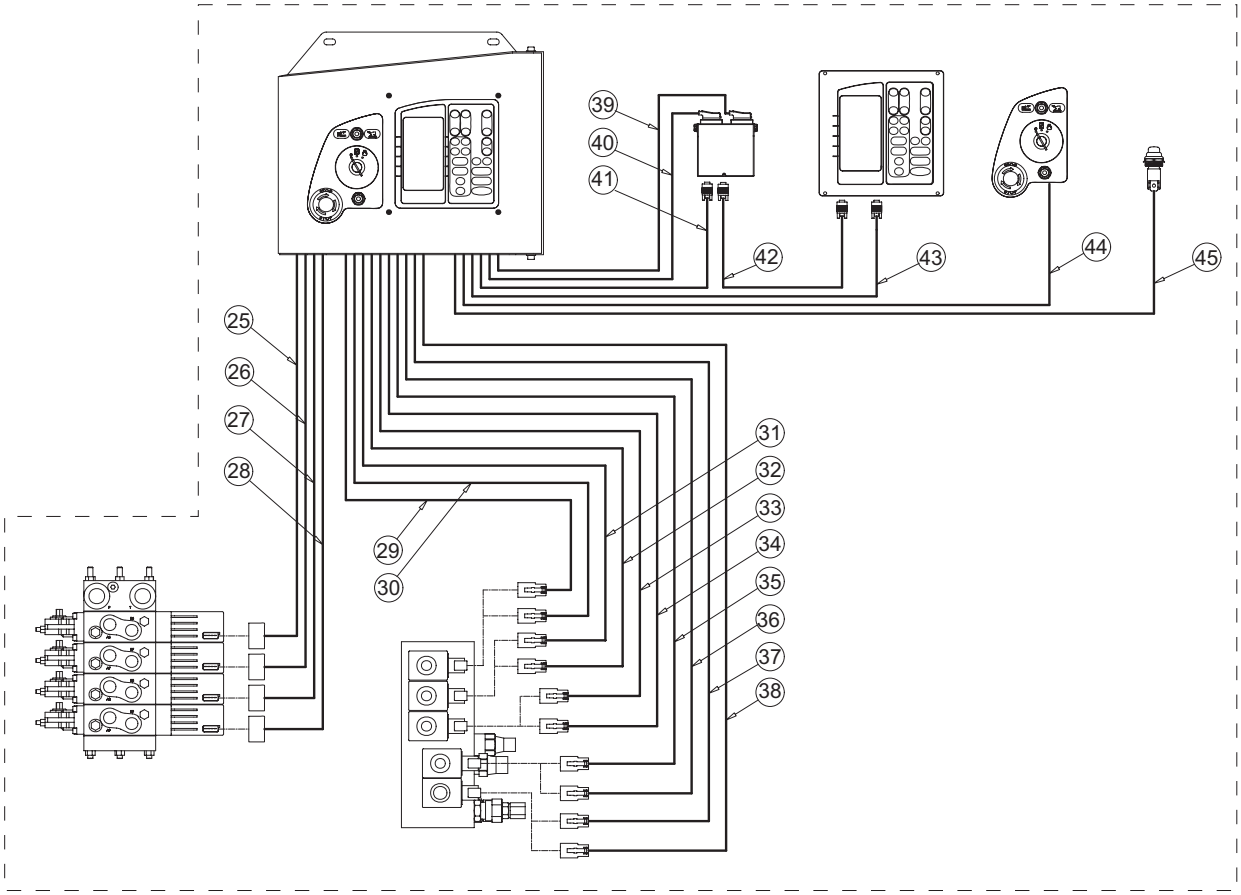
RELIEF PUMP BUTTON CABLE BUNDLE
676887 - Version A
Rep. 45

Pin	Wire	Link
1	White	OUTANA 3 / Control PVG N 4
2	Brown	OUTTOR 3 / PVG N 4 + power supply
3	Green	PVG N 4 Earth
4		Spare

PROPORTIONAL EV CABLE BUNDLE
N4
676870
Rep. 28

Pin	Wire	Link
A	White	INTOR 1 / tipping indicator
B	Brown	+ 12V DC / tipping indicator power supply
C	Green	Tipping indicator Earth

SLOPE BOX POWER SUPPLY CABLE BUNDLE
676853 - Version A
Rep. 10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D - MACHINES FROM NO. 508292

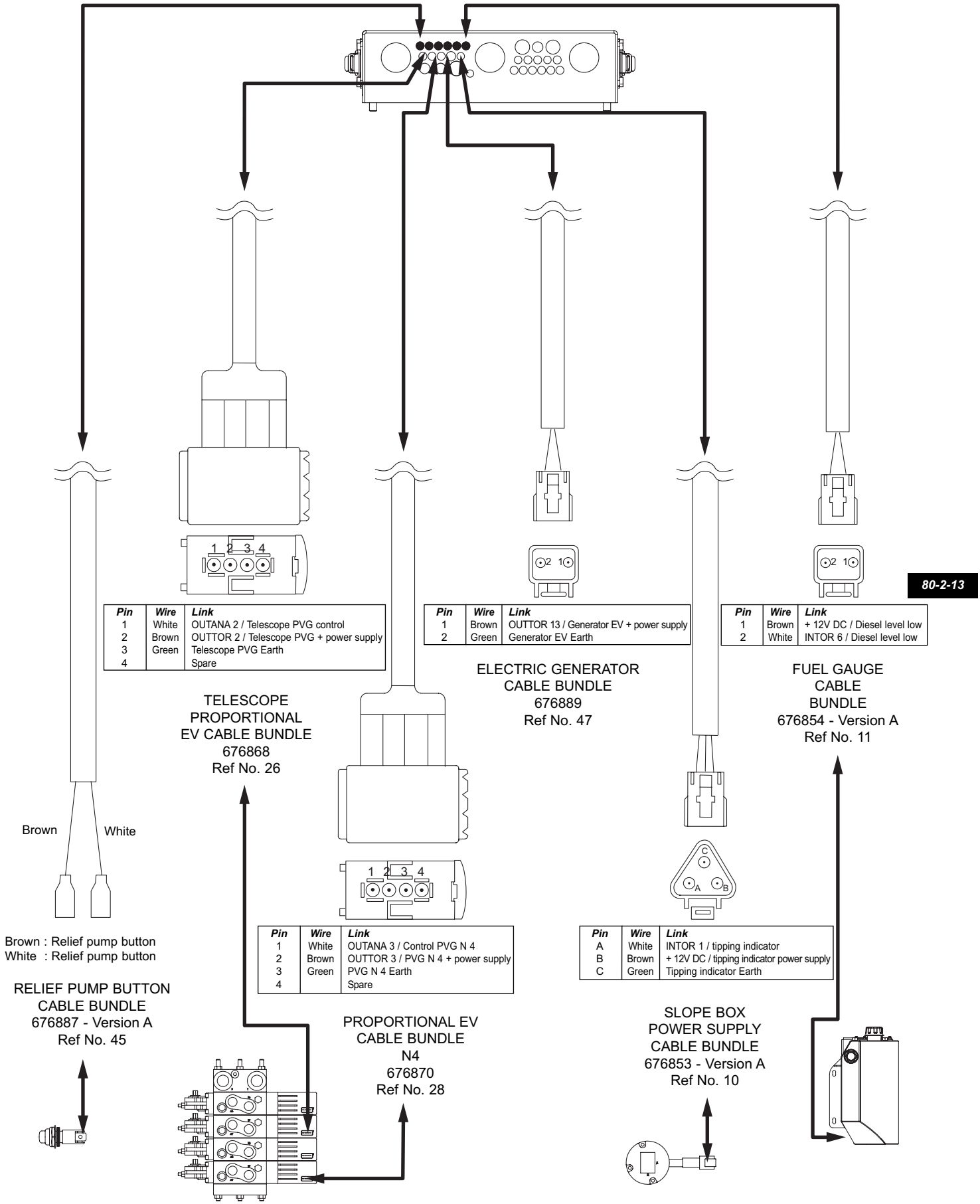
Only bundles which have been changed relative to the previous version appear in this chapter.

F - MACHINES ACCORDING TO DT 3173

Only bundles which have been changed relative to the previous version appear in this chapter.

A - MACHINES UP TO NO. 506427 :
CABLING AS PER SCHEMATIC DIAGRAM 676593 - VERSION A

A8 - MISCELLANEOUS CABLE LOOMS BRC 301 - REP. 10, 11, 26, 28, 45, 47



80-2-13

Pin	Wire	Link
1	White	OUTANA 2 / Telescope PVG control
2	Brown	OUTTOR 2 / Telescope PVG + power supply
3	Green	Telescope PVG Earth
4		Spare

Pin	Wire	Link
1	Brown	OUTTOR 13 / Generator EV + power supply
2	Green	Generator EV Earth

Pin	Wire	Link
1	Brown	+ 12V DC / Diesel level low
2	White	INTOR 6 / Diesel level low

TELESCOPE PROPORTIONAL EV CABLE BUNDLE 676868 Ref No. 26

ELECTRIC GENERATOR CABLE BUNDLE 676889 Ref No. 47

FUEL GAUGE CABLE BUNDLE 676854 - Version A Ref No. 11

Brown : Relief pump button
White : Relief pump button

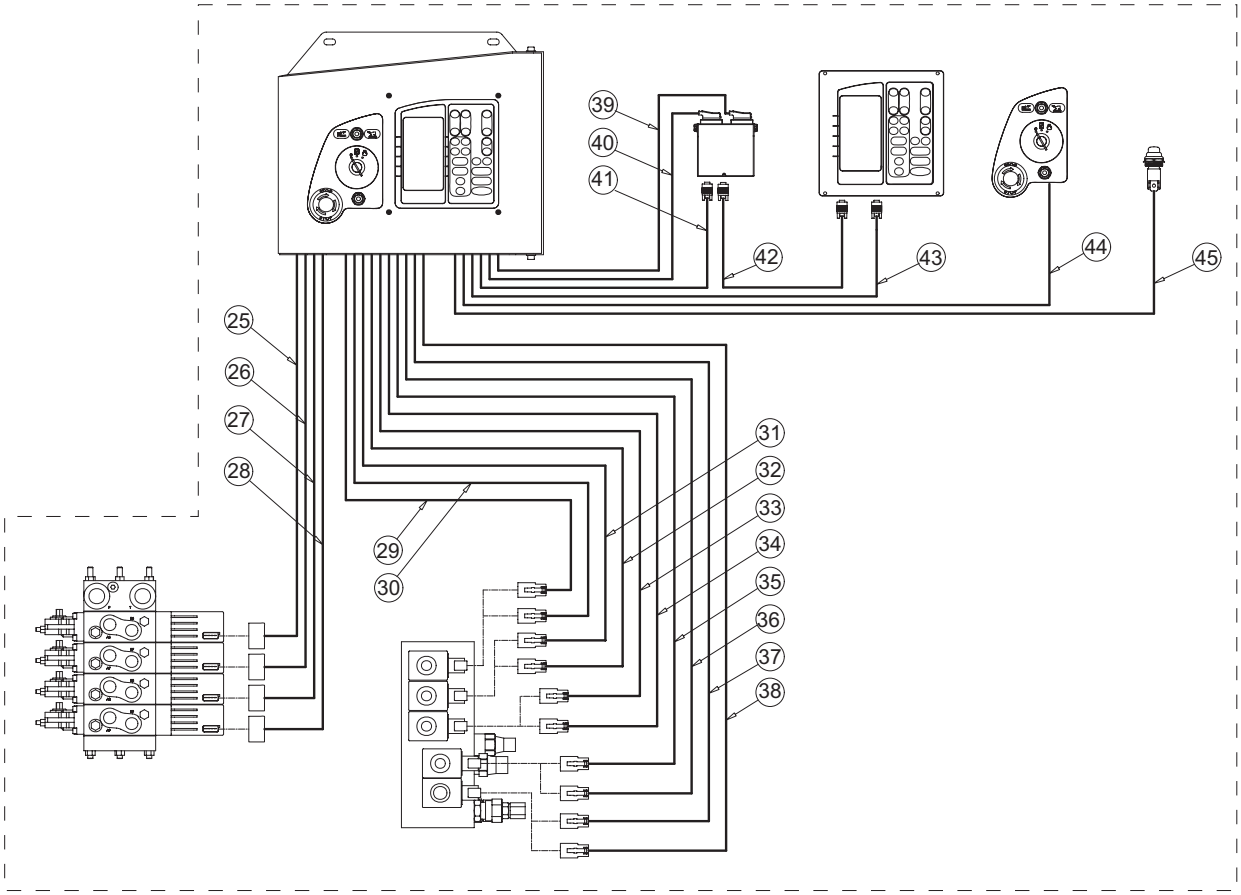
RELIEF PUMP BUTTON CABLE BUNDLE 676887 - Version A Ref No. 45

Pin	Wire	Link
1	White	OUTANA 3 / Control PVG N 4
2	Brown	OUTTOR 3 / PVG N 4 + power supply
3	Green	PVG N 4 Earth
4		Spare

PROPORTIONAL EV CABLE BUNDLE N4 676870 Ref No. 28

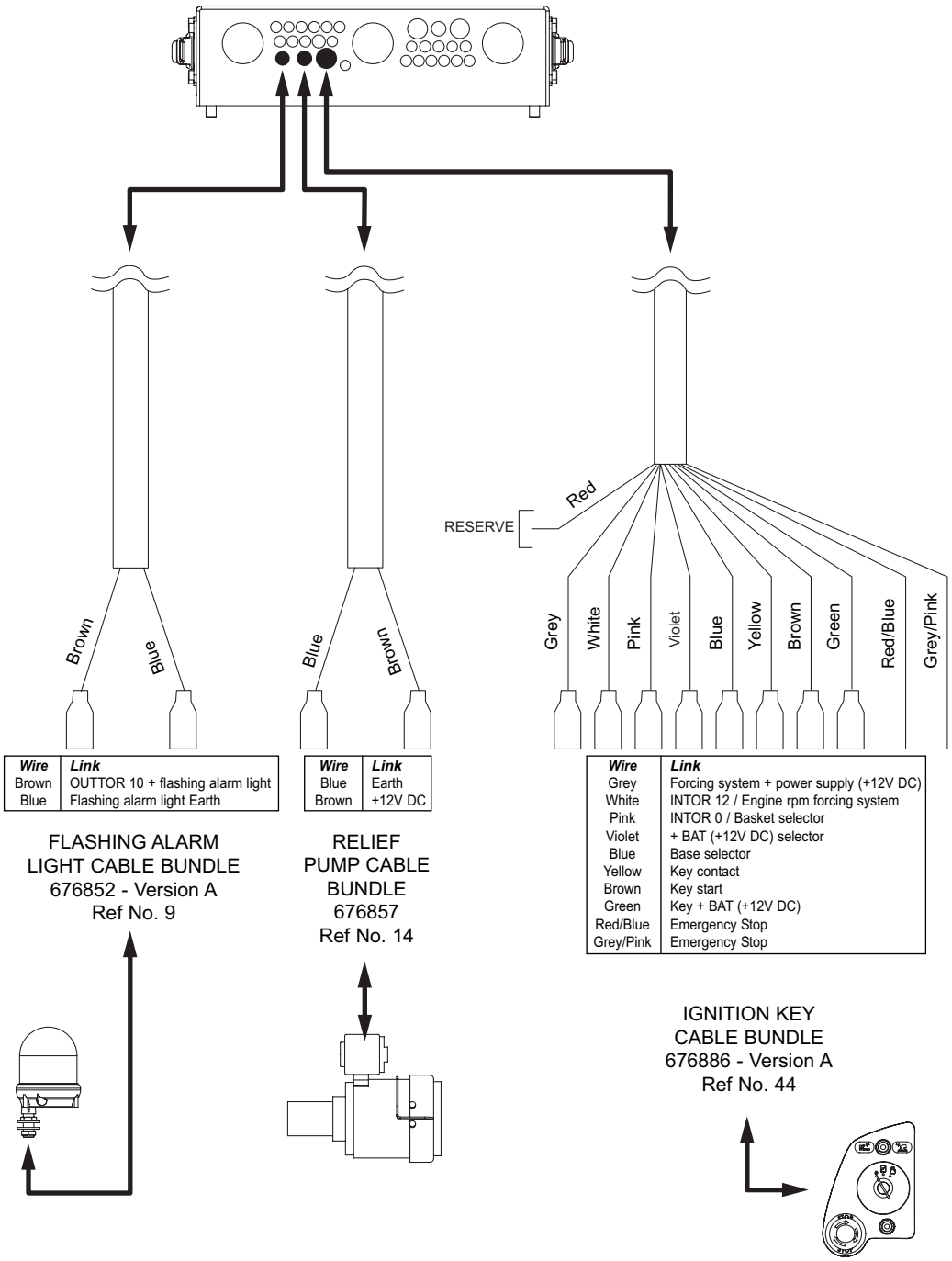
Pin	Wire	Link
A	White	INTOR 1 / tipping indicator
B	Brown	+ 12V DC / tipping indicator power supply
C	Green	Tipping indicator Earth

SLOPE BOX POWER SUPPLY CABLE BUNDLE 676853 - Version A Ref No. 10



80-2-13

B10 - MISCELLANEOUS CABLE LOOMS BRC 301 - REP. 9, 14, 44



Wire	*Link*
Brown	OUTTOR 10 + flashing alarm light
Blue	Flashing alarm light Earth

FLASHING ALARM
LIGHT CABLE BUNDLE
676852 - Version A
Ref No. 9

Wire	*Link*
Blue	Earth
Brown	+12V DC

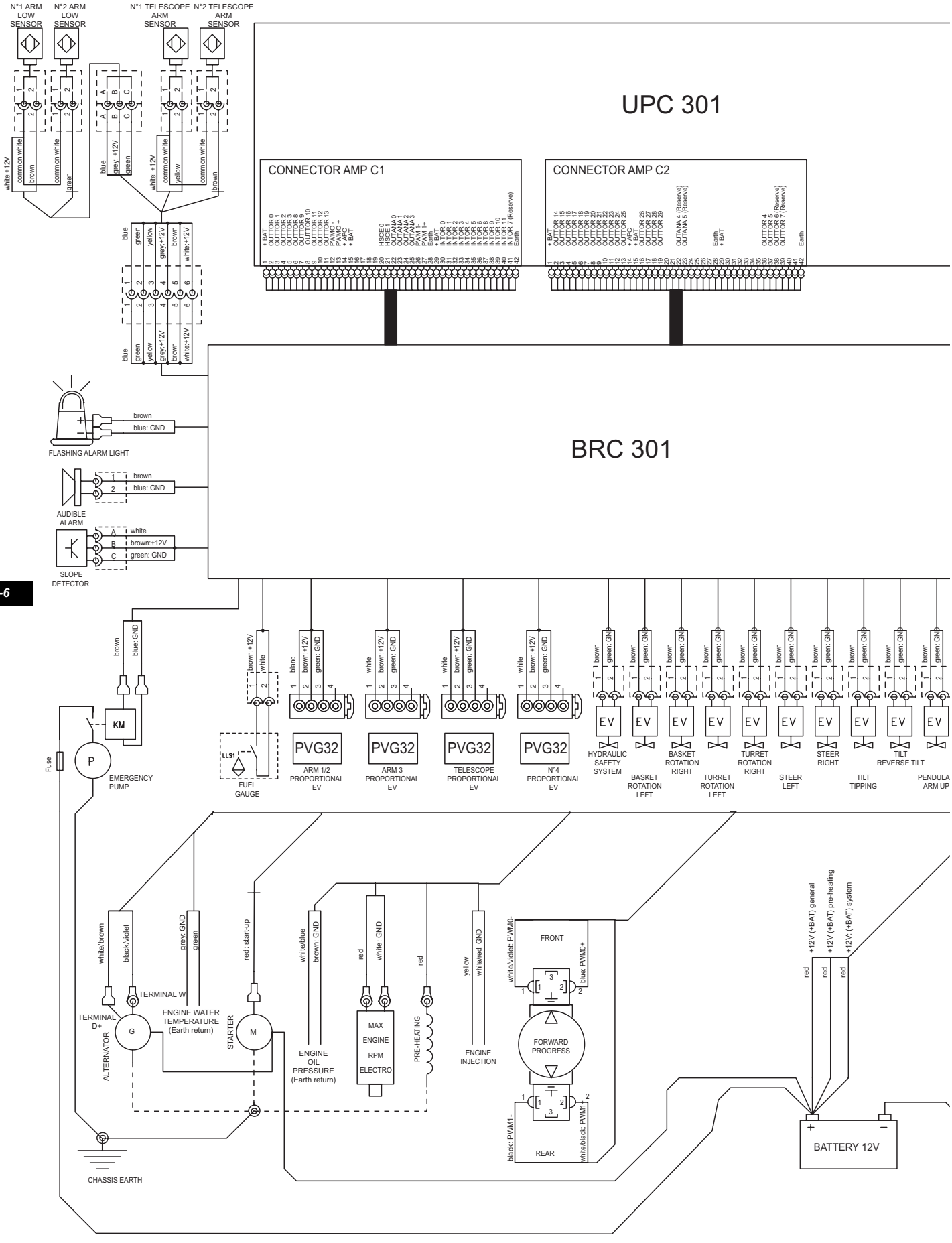
RELIEF
PUMP CABLE
BUNDLE
676857
Ref No. 14

Wire	*Link*
Grey	Forcing system + power supply (+12V DC)
White	INTOR 12 / Engine rpm forcing system
Pink	INTOR 0 / Basket selector
Violet	+ BAT (+12V DC) selector
Blue	Base selector
Yellow	Key contact
Brown	Key start
Green	Key + BAT (+12V DC)
Red/Blue	Emergency Stop
Grey/Pink	Emergency Stop

IGNITION KEY
CABLE BUNDLE
676886 - Version A
Ref No. 44

80-2-13

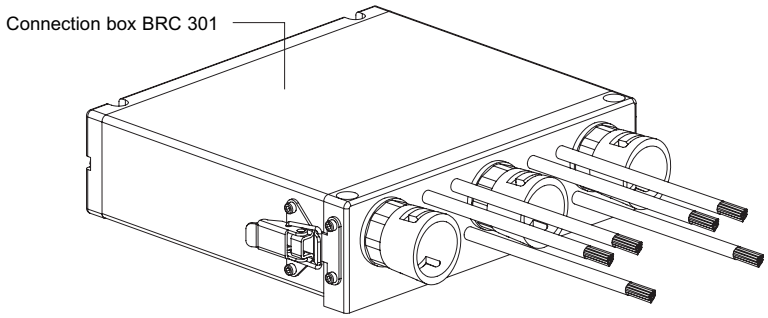
B1 - CHASSIS/TURRET SECTION



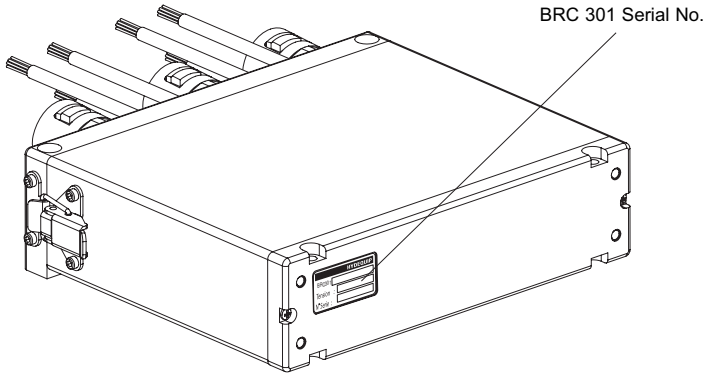
80-6

3 - BRC 301 Box

Front face

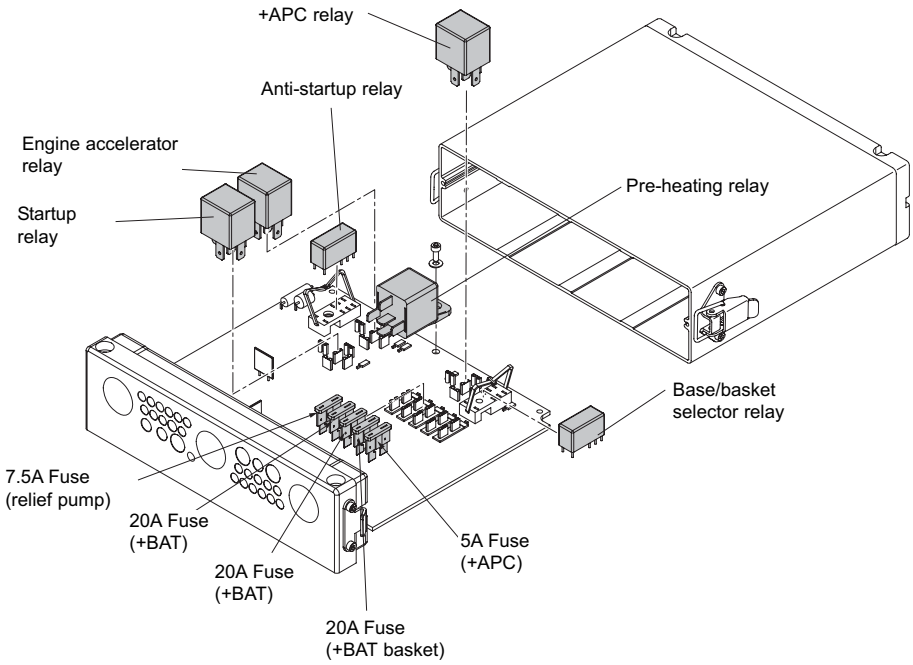


Rear face

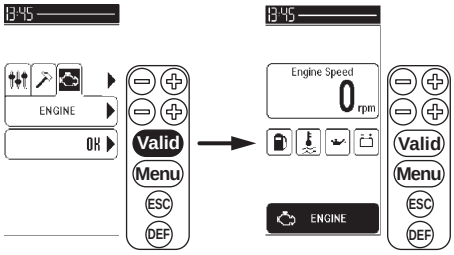


80-8-7

Exploded view



7 - ENGINE MENU



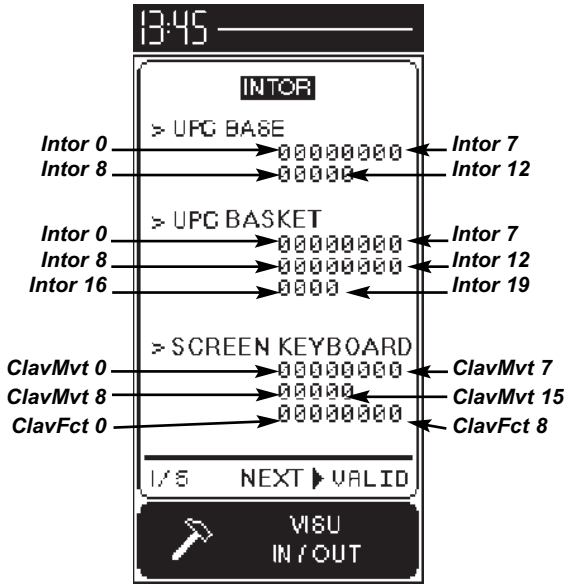
ENGINE Menu

- Validate the selection :
VALID

LEVELS 2, 3 AND 4

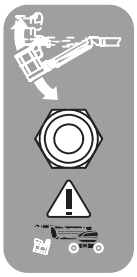
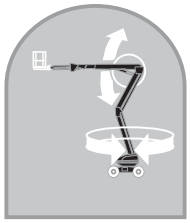
8 - INPUTS/OUTPUTS SUB-MENU

8 - 1 - Page 1/5 - INTOR



80-8-7

BASE UPC			
Bit	Description	Status 0	Status 1
Intor0	Base/basket selector	Base Pos.	Basket pos
Intor1	Slope sensor	In slope	Outside slope
Intor2	Arm low sensor 1	Working pos	Transport pos
Intor3	Telescope retracted sensor 1	Extended	Retracted
Intor4	Arm low sensor 2	Working pos	Transport pos
Intor5	Battery charge return	Normal	Low
Intor6	Diesel level low	Low	Normal
Intor7	Telescope retracted sensor 2	Extended	Retracted
Intor8	Engine water temperature high	Abnormal	Normal
Intor9	Engine oil pressure low	Abnormal	Normal
Intor10	Front axle assembly detector	Misaligned	Aligned
Intor11	Rear axle assembly detector	Misaligned	Aligned
Intor12	NOT AFFECTED	/	/

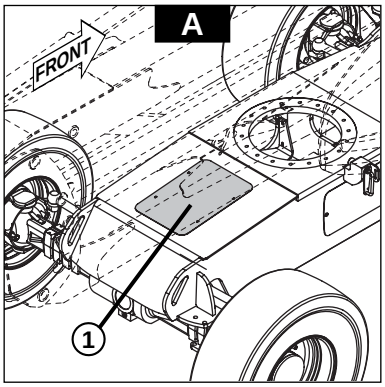
SUB-GROUP	NUMBER	DESCRIPTION	VALEUR
	7	Tilt Down Max Speed S3	**15**
	8	Tilt Down Accel Time	**10**
	9	Tilt Down Decel Time	**4**
PENDULAR ARM CONTROL 	0	Pendulum Up Max Speed S1	**50**
	1	Pendulum Up Max Speed S2	**55**
	2	Pendulum Up Max Speed S3	**60**
	3	Pendulum Up Accel Time	**12**
	4	Pendulum Up Decel Time	**6**
	5	Pendulum Down Max Speed S1	**13**
	6	Pendulum Down Max Speed S2	**15**
	7	Pendulum Down Max Speed S3	**17**
	8	Pendulum Down Accel Time	**8**
	9	Pendulum Down Decel Time	**22**
BASKET ROTATION CONTROL 	0	Basket Rot Right Max Speed S1	**8**
	1	Basket Rot Right Max Speed S2	**8**
	2	Basket Rot Right Max Speed S3	**8**
	3	Basket Rot Right Accel Time	**0**
	4	Basket Rot Right Decel Time	**0**
	5	Basket Rot Left Max Speed S1	**8**
	6	Basket Rot Left Max Speed S2	**8**
	7	Basket Rot Left Max Speed S3	**8**
	8	Basket Rot Left Accel Time	**0**
	9	Basket Rot Left Decel Time	**0**
TURRET ROTATION CONTROL 	0	Turret Rot Right Max Speed S1	**17**
	1	Turret Rot Right Max Speed S2	**17**
	2	Turret Rot Right Max Speed S3	**18**
	3	Turret Rot Right Accel Time	**80**
	4	Turret Rot Right Decel Time	**4**
	5	Turret Rot Left Max Speed S1	**17**
	6	Turret Rot Left Max Speed S2	**17**
	7	Turret Rot Left Max Speed S3	**18**
	8	Turret Rot Left Accel Time	**80**
	9	Turret Rot Left Decel Time	**4**
MOTOR CONTROL 	0	Engine Max Speed Stop Timer	**1**
	1	Engine Max Speed Start Timer	**4**
	2	Engine Started Timer	**20**
	3	Bypass Eng Speed Inhibit Mvts	**1**
	4	Engine Started Threshold	**600**
	5	Forced Engine Valid Timer	**1**
	6	Forced Engine Unvalid Timer	**0**
FLASHING LIGHT	0	Flashing Light Stop Timer	**10**
GENERATOR CONTROL	0	Generator Start Timer	**40**
PRE-HEATING	0	PreHeating Timer	**60**
DEFAULTS	0	CAN Network Default Timer	**15**
	1	Defaults Calcul Start Timer	**40**
	2	Engine Water Default Timer	**100**
	3	Engine Oil Default Timer	**40**
	4	Battery Charge Default Timer	**200**
	5	Low Diesel Oil Default Timer	**150**
	6	OverLoad Default Timer	**20**
	7	OverSlope Default Timer	**20**

REMOVAL OF THE HYDROSTATIC MOTOR

- Set the platform in transport position on a horizontal surface.

- Switch off the IC engine and use the battery cut-out to switch off the platform *(pre-production)*.

- Remove the cover plate ***(A-1)***.



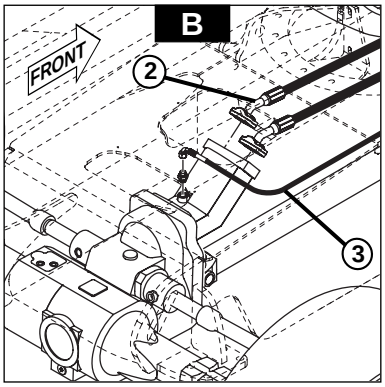
- Mark the location of the engine's supply hoses and remove and seal them :

    - Place a receptacle under the engine a receptacle under the engine.

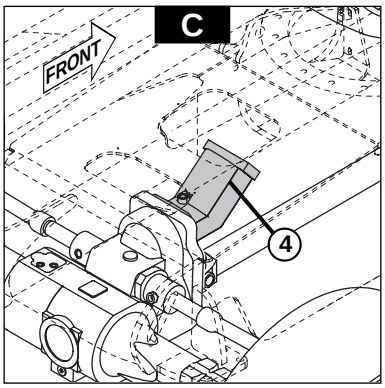
    - Loosen the fixing screws for the hoses ***(B-2)*** slowly, a quarter of a turn at a time, to release the residual pressure.

    - When the pressure has reduced, remove the hoses fully and seal them with cloths.

    - Remove the drain hose ***(B-3)*** and seal it with a male 8S plug.



- Remove the motor ***(C-4)*** : *WARNING, the motor weighs at least* ***20kg***.

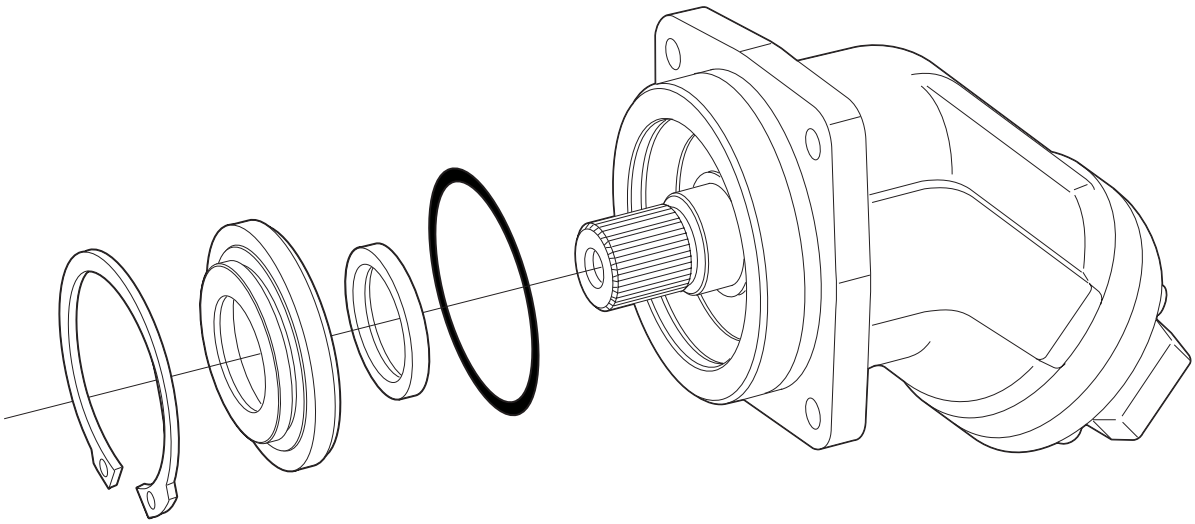


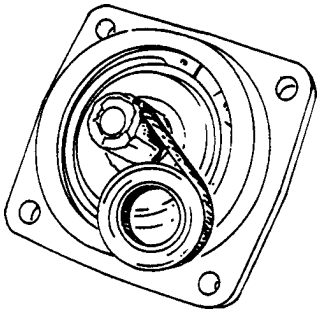
RE-INSTALLATION

- Carry out the removal operations in reverse order.

- Use the battery cut-out to switch off the machine *(pre-production),* start the IC engine and test front and then rear translation.

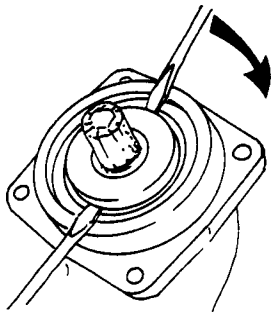
- Switch off the IC engine, check the hydraulic oil level in the reservoir and top up if necessary.





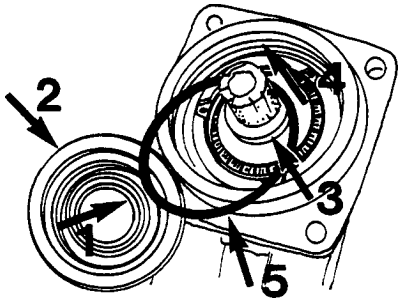
Bei nicht verzahnten Triebwellen: Paßfeder abnehmen. Triebwelle abkleben,

For non-splined shafts: remove key.
Protect the drive shaft (e.g. tape).



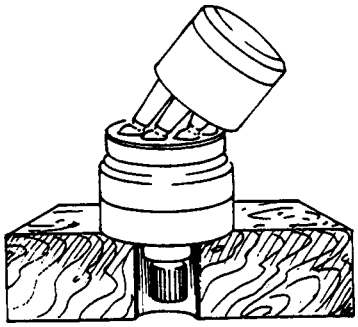
Sicherungsring ausbauen, Verschlußring abdrücken

Remove circlip, prise off cover.



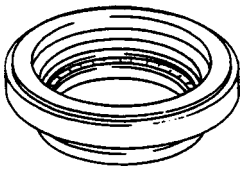
Sichtkontrolle
Wellendichtring (1), Verschlußring (2), Triebwelle (3), Gehäuse (4), O-Ring (5).

Visual check
Shaft seal (1), cover (2), drive shaft (3), housing (4), O-ring (5).



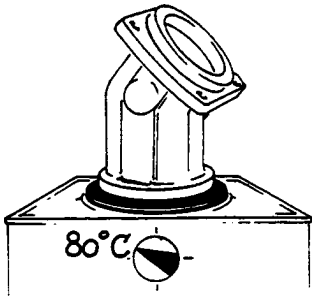
Triebwerk max. ausschwenken.

Swivel the rotary group to max.



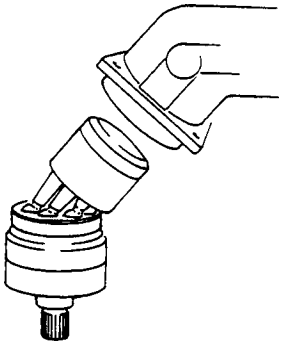
Neuer Radialwellendichtring montiert?

Is the new shaft seal fitted?



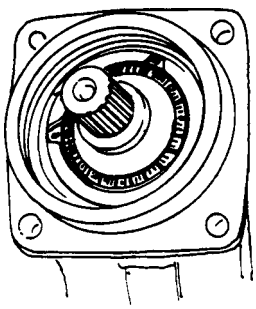
Gehäuse auf ca. 80° C erwärmen.

Heat the housing to approx. 80° C.



Heißes Gehäuse bis zum Anschlag aufsetzen.

Push on the hot housing until the stop is reached.



Neue Montagestellung.

New assembly position.

HINWEIS

Bezeichnungen, Beschreibungen und Darstellungen entsprechen dem Informationsstand zum Zeitpunkt der Drucklegung dieser Unterlage.

Änderungen können den Service am Produkt beeinflussen, Verpflichtungen entstehen uns daraus nicht. Methoden und Vorrichtungen sind Empfehlungen, für deren Resultat wir keine Haftung übernehmen können. BRUENINGHAUS HYDROMATIK- Baugruppen, mit Angabe der Fabrik-Nr. bestellt, sind die Basis guter Reparaturen.

Einstell- und Prüfarbeiten sind bei Betriebstemperatur auf dem Teststand vorzunehmen.

Schutz von Personen und Eigentum ist durch Vorkehrungen sicherzustellen.

Sachkenntnis, die Voraussetzung für jede Service-arbeit, vermitteln wir in unseren Schulungskursen.

NOTICE

Specifications, descriptions and illustrative material shown herein were as accurate as known at the time this publication was approved for printing.

BRUENINGHAUS HYDROMATIK reserves the right to discontinue models or options at any time or to change speci-fications, materials, or design without notice and with-out incurring obligation.

Optional equipment and accessories may add cost to the basic unit, and some options are available only in combination with certain models or other options.

For the available combinations refer to the relevant data sheet for the basic unit and the desired option.

Adjustment and tests have to be carried out on the test bench under operating temperatures.

Protection of personnel and property has to be guaranteed by appropriate measures.

Expert knowledge, the precondition of any service work, can be obtained in our training courses.

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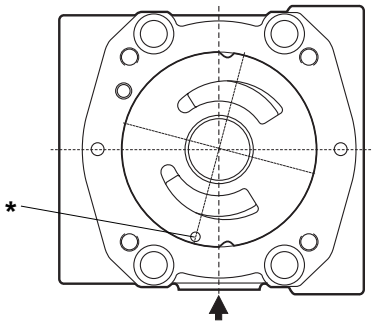
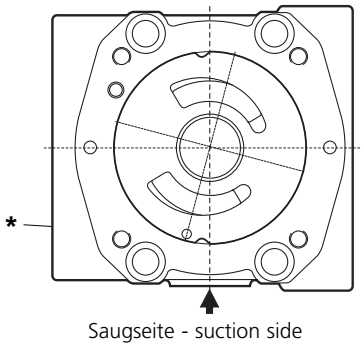


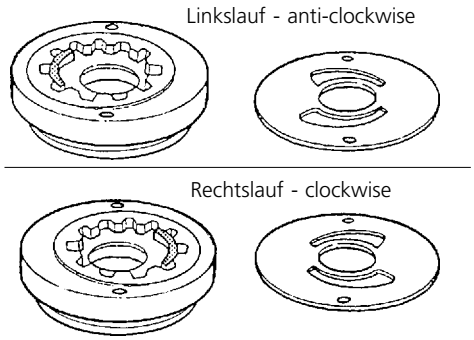
Verschleißplatte einsetzen.
Drehrichtung "Rechts" bei Blick auf die Triebwelle.
Achtung! Fixierstift

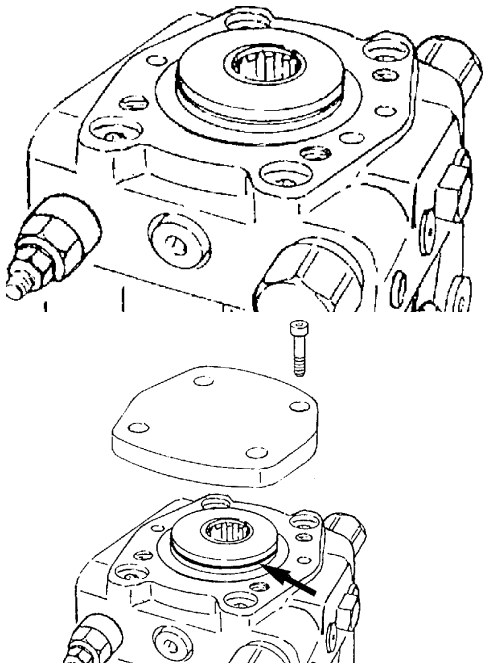
Fit wear plate.
Direction of rotation "clockwise" looking on the drive shaft.
Attention! Locating pin



Verschleißplatte einsetzen.
Drehrichtung "Links" bei Blick auf die Triebwelle.
Achtung! Fixierstift

Fit wear plate.
Direction of rotation "anti-clockwise" looking on the drive shaft.
Attention! Locating pin



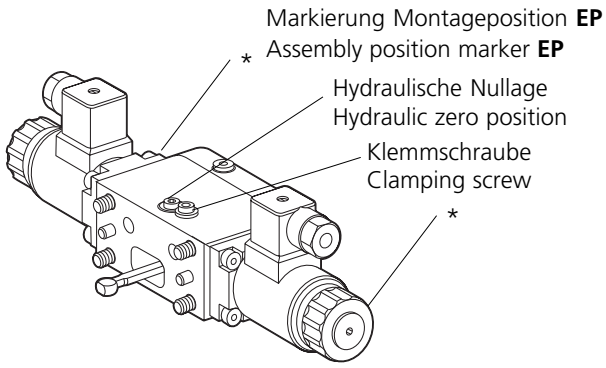


Hilfspumpe montieren.

Fit boost pump

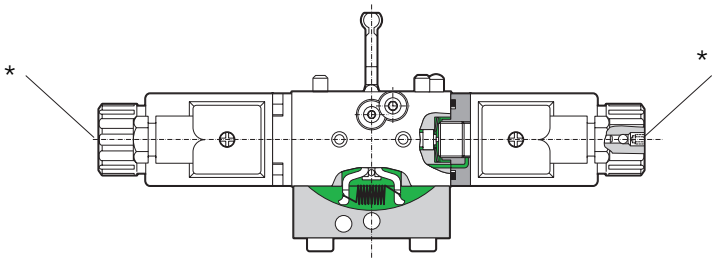
O-Ring und Deckel montieren.

Fit O-ring andcover plate.

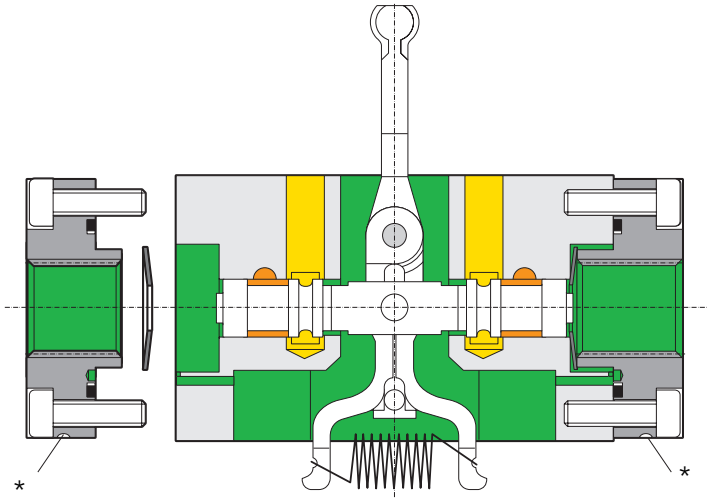


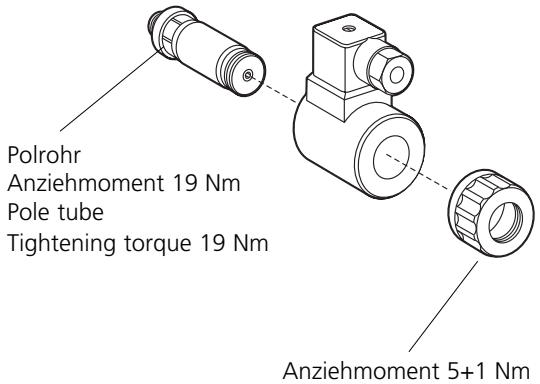
Die neuen Proportionalmagnete müssen bei der Inbetriebnahme entlüftet werden. Wird die Luft nicht aus dem Ankerraum entfernt, kann es zum Schwingen der Ansteuerung kommen.
Zum Entlüften ist am Ende des Magneten, im Messingteil, ein kleiner Gewindestift M4, SW 2 vorhanden. Dieser Gewindestift ist max. 2 Umdrehungen herauszudrehen und nach dem Entlüften mit 1 Nm wieder festzuziehen.
Bei der Ausführung mit Nothand mit Federrückzug muß zum Entlüften die Kunststoffmutter mit Gummibalg entfernt und nach dem Entlüften mit 5+1 Nm wieder angeschraubt werden.

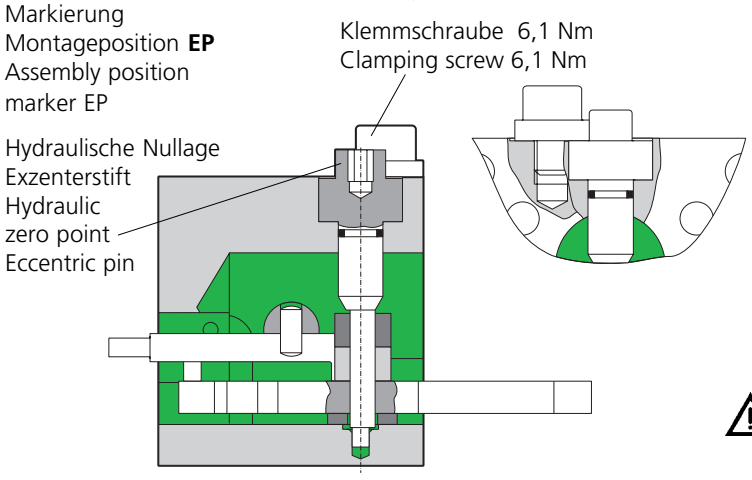
Entlüftungsschraube * max. 2 Umdrehungen herausdrehen.
Bleed screw *. Unscrew by a max. of 2 turns



The new proportional solenoids must be bled during commissioning. If the air is not removed from the armature chamber oscillations at the control can occur.
For bleeding purposes there is, on the end of the solenoid, in the brass component a small set screw M4, 2A/F. This can be unscrewed by a maximum of 2 turns and then after completion of the bleeding tightened to a maximum of 2 Nm.
For the version with hand override and spring return the plastic nut with rubber coating has to be removed for bleeding. After bleeding it has to be replaced and tightened with 5+1 Nm.

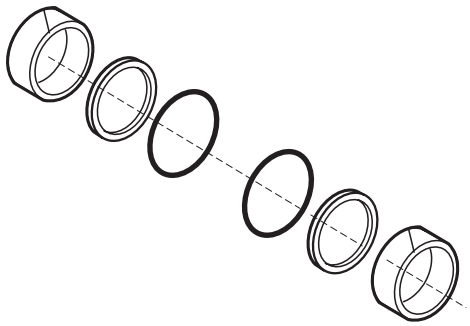


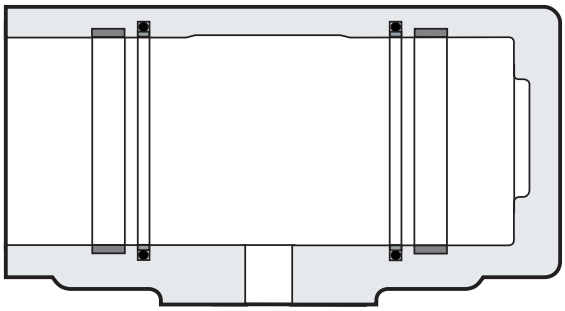


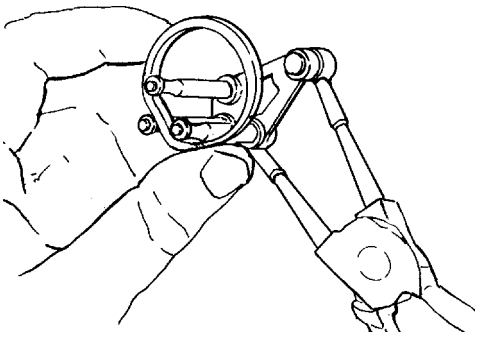


⚠ Beim Lösen der Klemmschraube
Exzenterstift - Hydraulische Nullage festhalten.

⚠ When loosening the clamping screw
Hold the eccentric pin - hydraulic zero point

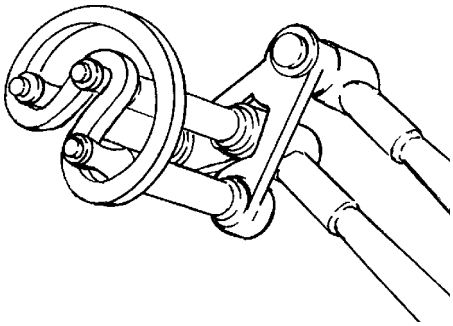






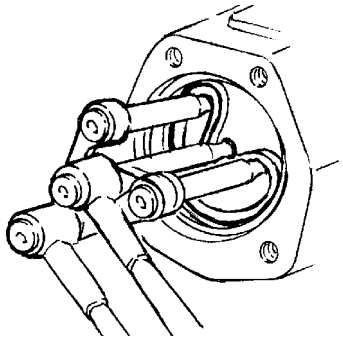
Dichtring in die Montagezange einlegen.

Fit the seal ring into the assembly tool.



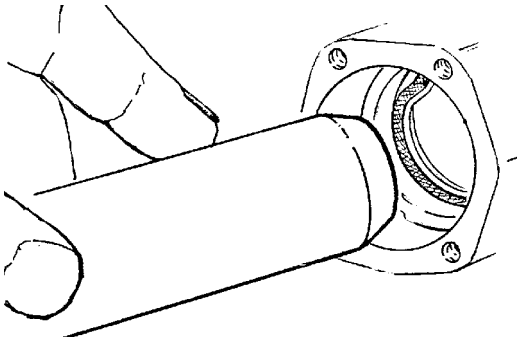
Dichtring mit Zangenschenkel nierenförmig zusammendrücken. Die Verformung von Turcon-Dichtungen ist sorgfältig vorzunehmen, damit die Dichtkanten nicht beschädigt werden.

Press the seal ring into the kidney shape using the assembly tool. The deformation of the Turcon seal has to be done with care so as not to damage the sealing edges.



O-Ring in Nut einlegen.
Dichtring ins Gehäuse einführen und in der Aufnahmenut plazieren. Dann Spannung lösen und Montagezange heraus ziehen. Lage des Dichtringes prüfen - eventuell mit dem Finger egalisieren.

Position the seal ring into the groove.
Position the seal ring into the housing and place it into the groove. Release the tension and withdraw the assembly tool.
Check the position of the seal ring if necessary straighten using a finger.

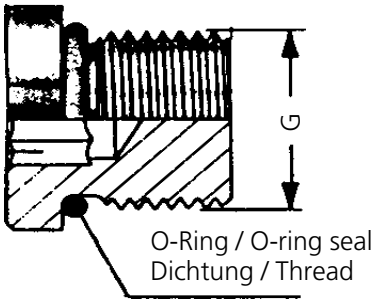


Kalibrieren des Dichtringes mit einem Kalibrierdorn (Stellkolben) - mit langer Schräge 10° bis 15°.

Calibrate the seal ring using a cylindrical plug gauge (positioning piston) at an angle of 10° to 15°.

5. Verschlußschrauben mit Innensechskant, O-Ring und UNF-, UN-Gewinde nach SAE J 514 (nach N 02.106)

5. Plugs with internal hexagon, O-ring and UNF-, UN- threads to SAE J 514 (nach N 02.106)

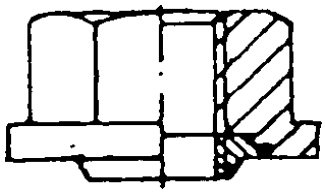


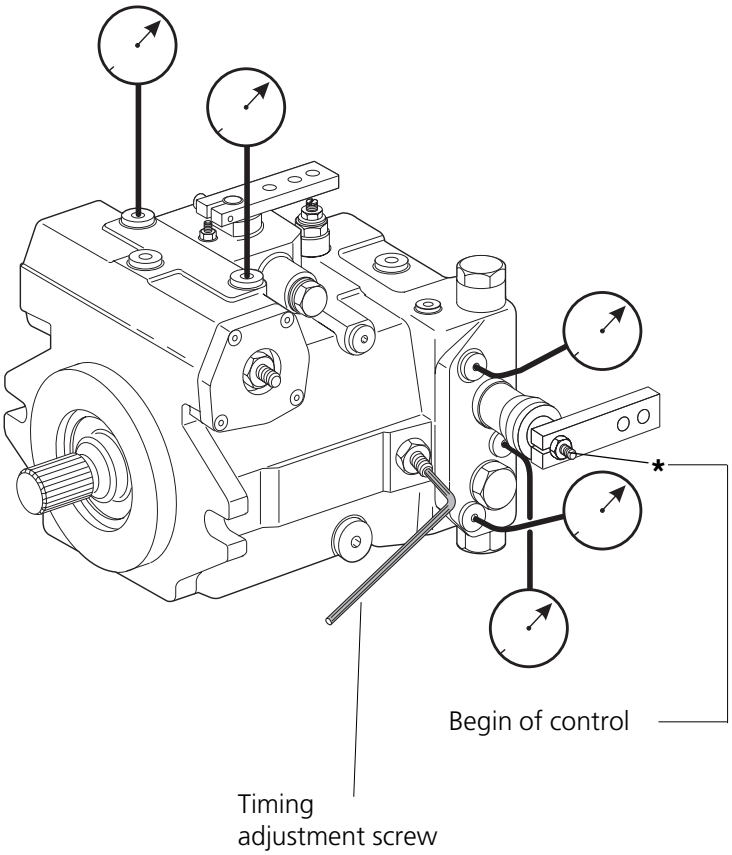
Gewinde / Thread	Anziehdrehmoment M_A in Nm Tightening torque M_A in Nm	Gewinde / Thread	Anziehdrehmoment M_A in Nm Tightening torque M_A in Nm
7/16 - 20 UNF	15	M12 x 1,5	20
1/2 - 20 UNF	20	M14 x 1,5	30
9/16 - 18 UNF	25	M27 x 1,5	90
3/4 - 16 UNF	72		
7/8 - 14 UN	127		
1 1/16 - 12 UN	147		
1 3/16 - 12 UN	173		
1 5/16 - 12 UN	198		
1 5/8 - 12 UN	320		
1 7/8 - 12 UN	390		

6. SEAL-LOCK-Dichtmuttern (nach N 02.100)

6. SEAL-LOCK - sealing nuts (to N 02.100)

Gewinde / Thread	Anziehdrehmoment M_A in Nm Tightening torque M_A in Nm
M6	10
M6 x 0,5	11
M8	22
M8 x 1	24
M10	40
M10 x 1	44
M12	69
M12 x 1,5	72
M14	110
M14 x 1,5	120
M16	170
M16 x 1,5	180





Attention!
Observe safety regulations!

Check setting data.
Operating temperature should be generally kept constant during the checking procedure.
Start prime mover, idle speed.

Block position
Drive direction switch - **"0"**.
Slowly increase motor speed up to the max. motor speed and observe measuring instruments.

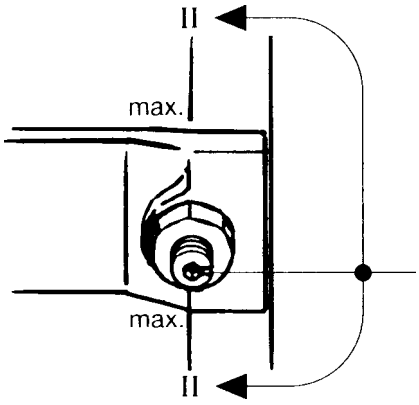
Boost pressure:
Idle speed of prime mover
Psp = approx. 15 - 20 bar
max. motor speed
Psp = ... bar*

Block position
Drive direction switch - **forwards**
(Road gear and fully applied brake)

Check setting data pump A4VIDA

*** Start of control:**
HD 40 - 50 bar
Motor speed . . . . . rpm* Psp . . . . . bar*
HD . . . . . bar*
Readjustment of start of control screw

End of control
HD . . . . . bar
Motor speed . . . . . rpm* Psp . . . . . bar*
Readjustment of the indexing screw



Note:
Eccentric adjusting - observe direction of rotation.

Note: * Setting data is in accordance to the order work!

Brueninghaus Hydromatik GmbH, Werk Elchingen, Glockeraustraße 2, D-89275 Elchingen, Tel. (07308) 820, Fax (07308) 7274, E-Mail: service.elchingen@bru-hyd.com

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FREE-WHEELING

The platform may only be towed a short distance. A tow bar must be used and the towing machine must have significant braking power in order to hold the platform.

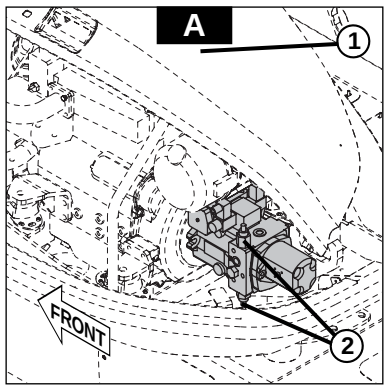
35-8-21

- To prevent the platform from moving when set for freewheeling, place chocks under the wheels (front or rear).

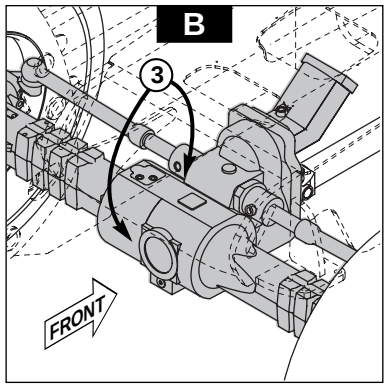
- Open the left-hand turret cowl ***(A-1)***.

- Mark the location of the HP hydraulic pump restrictors ***(A-2)*** and draw the alignment marks with a marker pen on all the pressure setting components.

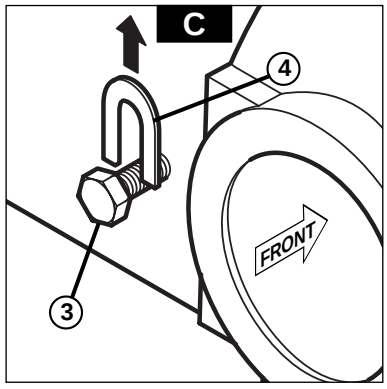
- Screw the restrictors up to the hard spot + **1 and a half turns** : *Warning, note the number of turns for the restrictors because this information will be useful later.*



- Locate the two screws ***(B and C-3)*** on the left-hand side at the front and rear of the rear axle assembly.



- Loosen them sufficiently to be able to remove the cleats ***(C-4)*** and then screw them in again : the platform is not completely unbraked.



RESETTING THE BRAKES

- Perform the removal operations in reverse order.

- Adjust the two restrictors ***(A-2)*** by turning them the number of turns in the first stage to make the markings coincide.

- Test translation on a flat surface and then on an inclined surface. Check that the platform is immobilised as soon as you stop operating the forward motion control.

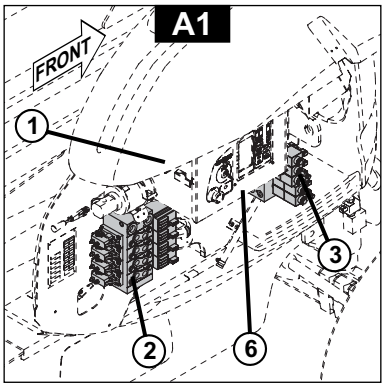
Before proceding to set the pressures described in this section, you must equip yourself with two hydraulic manometers :
- 1 manometer 0 - 200 bars.
- 1 manometer 0 - 100 bars.

- Open the right-hand turret cowl ***(A1-1)*** and fir the stay.

- Locate the proportional distributor ***(A1-2)*** and the distributor block ***(A1-3)***.

- Use the battery cut-out to switch the platform on *(pre-production)*.

- Start the IC engine.



A - SETTING THE PRESSURE ON THE PROPORTIONAL DISTRIBUTOR

1 - SETTING THE PRESSURE ON THE INLET PLATE'S PRESSURE RESTRICTOR

- Connect the manometer to the pressure port ***(A2-4)*** marked M on the upper block ***(A2-5)***.

- From the base console ***(A1-6)***, instruct the telescope to retract, continuing the instruction until it is at the end stop, and check that the manometer shows a pressure of 200 bars.

- If the value displayed is different, remove the protective ***(A2-7)*** on the telescope retraction valve on the third block from the top.

- Alter this valve's pressure setting by tightening it half a turn.

- Remove the protective plug ***(A2-8)*** for the pressure restrictor on the upper block ***(A2-5)***.

- From the base console ***(A1-6)***, instruct the telescope to retract (maintain the command) and set the pressure for the pressure reducer as follows :

    - Set the reducer's pressure to 220 bars.

    - Reduce the pressure setting down to 200 bars.

- Re-insert the plug.

- Set the pressure on the telescope retraction valve : refer to Paragraph *A3 - SETTING THE PRESSURE ON THE TELESCOPE CYLINDER BLOCK VALVES.*