

1188 Hydraulic Wheeled and Crawler Excavators

Table of Contents

DIVISION/SECTION	SECTION N°	REFERENCE N°
1 GENERAL INFORMATION		
Safety, general information and torque specifications	1001	7-56942GB
Specifications (Crawler excavators)	1002	7-79021GB
Specifications (Wheeled excavators)	1002	7-79031GB
2 ENGINE		
Engine removal and installation	2002	7-79040GB
Engine specifications	2401	**
Cylinder head and valve assembly	2415	*
Engine block	2425	*
Lubrication system	2445	*
Cooling system	2455	*
Turbocharger	2465	*
Turbocharger failure analysis	2565	*
3 FUEL SYSTEM		
Fuel system and filter	3410	*
CAV injection pump	3411	*
BOSCH injection pump	3412	*
Fuel injector	3413	*
BOSCH ANEROID fuel injection pump	3416	*
4 ELECTRICAL SYSTEM		
Electrical schematic (Crawler excavators) - (before November 1999)	4001	*
Electrical schematics (Wheeled excavators)	4001	*
Electrical schematic (Crawler excavators) - (November 1999 and after)	4001	*
Electrical schematics (Wheeled excavators)	4001	*
Electronic system and troubleshooting (Crawler excavators)	4002	*
Electronic system and troubleshooting (Wheeled excavators)	4002	*
Starter motor	4003	7-58691GB
Alternator	4004	7-58701GB
Powersensor diagnostic tool	4010	7-79991GB
Anti - start device tool	4020	7-29370GB
5 UNDERCARRIAGE		
Track group (Crawler excavators)	5002	7-79070GB
6 DRIVE TRAIN		
Travel reduction gear and brake (Crawler excavators)	6002	7-79080GB
Swing reduction gear and brake	6003	7-79091GB
Front axle and service brake (Wheeled excavators)	6004	7-79100GB
Rear axle and service brake (Wheeled excavators)	6005	7-79110GB
Gearbox and parking brake (Wheeled excavators)	6008	7-80701GB
Twin wheels (Wheeled excavators)	6020	7-26170GB
7 UNDERCARRIAGE HYDRAULICS		
Hydraulic travel motor (Mono-speed crawler excavators)	7002	7-80711GB
Hydraulic travel motor (Two-speed crawler excavators)	7003	7-80721GB
Hydraulic travel motor (Wheeled excavators)	7003	7-80731GB
Travel control valve (Crawler excavators)	7030	7-80741GB
Travel, stabilizer and dozer blade control valve (wheeled excavators)	7031	7-79170GB
Steering, stabilizer, dozer blade and front axle locking cylinders (wheeled excavators)	7080	7-79180GB

* Consult the Schematic Set

** Consult the engine Service Manual.

DIVISION/SECTION	SECTION N°	REFERENCE N°
8 UPPERSTRUCTURE HYDRAULICS		
Hydraulic inspection, adjustment and schematics (Wheeled excavators).....	8001	*
Hydraulic inspection, adjustment and schematics (Crawler excavators)	8001	*
Hydraulic swivel (Crawler excavators)	8011	7-80791GB
Hydraulic swivel (Wheeled excavators)	8011	7-80801GB
High Pressure Hydraulic pumps	8020	7-58862GB
Swing Hydraulic pumps	8021	7-79220GB
Attachment control valve.....	8031	7-79230GB
Swing control valve	8033	7-79240GB
Rotary control valve (Orbitrol) (Wheeled excavators).....	8037	7-80841GB
Hydraulic swing motor and forced-feed safety block	8040	7-80851GB
Attachment and swing control block (Control lever).....	8050	7-80261GB
Travel and option control block (Foot pedal).....	8051	7-80270GB
Travel hand control block (Inching, wheeled excavators)	8052	7-80870GB
Direction of travel inverter control block (Inching, crawler excavators).....	8053	7-80290GB
Travel control block (wheeled excavators).....	8054	7-80301GB
Brake module	8060	7-80882GB
Parking brake electro-control valve.....	8061	7-80952GB
Electro-control valve block (Crawler excavators).....	8070	7-79331GB
Electro-control valve block (wheeled excavators).....	8071	7-79341GB
Attachment cylinders.....	8080	7-79351GB
9 UPPERSTRUCTURE		
Upperstructure and turntable bearing	9002	7-79361GB
Cab	9004	7-58191GB

** Consult the Schematic Set*

NOTE: CASE Company reserves the right to make changes in the specification and design of the machine without prior notice and without incurring any obligation to modify units previously sold.

The description of the models shown in this manual has been made in accordance with the technical specifications known as of the date of design of this document.

Section 1001

**SAFETY, GENERAL INFORMATION
AND TORQUE SPECIFICATIONS**

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>

SAFETY



WARNING: This symbol means **WARNING ! BE VIGILANT ! YOUR SAFETY IS AT RISK**. The message that follows the symbol contains important safety information. Read it carefully. Be sure you understand the possible risks of injury or even death.

To avoid all risks, always follow the safety notes contained in this section and throughout this manual.

Put the warning tag shown below on the key for the keyswitch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags, Part Number 321-4614, are available from your service parts supplier.



PDG0328



WARNING: Read the Operator's Manual carefully and make sure you understand how to operate the controls correctly.



WARNING: Never operate the machine and attachment controls unless you are seated in the operator's seat. If you are not in the operator's seat, you run the risk of serious injury.



WARNING: The machine is built to carry the operator only. Do not allow passengers to ride on the machine.



WARNING : Prior to starting up the engine read the safety messages contained in the operator's manual carefully. Read all safety stickers on the machine. Have people move back from the machine. Learn how to use the controls before starting up the machine. It is your responsibility to follow the manufacturer's instructions on how to operate and maintain the machine. It is your responsibility to follow applicable rules and regulations. Service and Operator's Manuals are available from your J.I. Case Dealer.



WARNING: If you wear loose clothing or if you omit to use safety equipment for your work, you risk injury. Always wear clothes that do not risk getting caught in the machine. Other safety equipment may be necessary, in particular : helmets, safety shoes, ear plugs, safety glasses, protection mask, thick gloves and reflecting clothes.



WARNING: When working close to the fan with the engine running, avoid wearing loose clothing and operate with extreme caution.



WARNING: When checking the hydraulic circuits, follow procedures to the letter. **DO NOT CHANGE** procedures.



WARNING: Prior to operating the hydraulic cylinders of this machine for setting or to bleed the circuit, have all people standing around the machine move away.



WARNING: Wear gloves or insulated mittens when working on hot parts.



WARNING: Lower all attachments to the ground or rest them on stands before carrying out maintenance jobs.



WARNING: Fine sprays of hydraulic oil under pressure can penetrate the skin and cause serious infection. If hydraulic oil under pressure penetrates the skin, see a doctor immediately. Maintain all hoses and pipes in good condition. Make sure that all connections are properly tightened. Change all hoses or pipes that have been damaged or that are suspect. **DO NOT CHECK** for leaks with bare hands. Use a piece of cardboard or wood.



WARNING: To remove a hardened pin such as a pivot pin, or a hardened shaft, use a soft head hammer (brass or bronze) or a brass or bronze strip and a steel head hammer.



WARNING: When using a hammer to remove or reassemble pivot pins, or when using compressed air, or when using a grinder make sure to wear safety glasses that protect the eyes from all sides.



WARNING: Use proper lifting/hoisting equipment to lift wheels or tracks and always work on safe ground. Prevent the machine from moving using correct safety chocks.



WARNING: When performing maintenance or repair operations on the machine, make sure that the work shop floor, the cab and the steps of the excavator are free from oil, water, grease, tools etc. Use oil absorbing material or rags as necessary. Always think safety.



WARNING: Certain components of this machine are very heavy. Use hoisting tools or additional assistance as recommended in this manual.



WARNING: Exhaust fumes can cause death. If it is necessary to start up the engine in a closed building, evacuate exhaust fumes using an exhaust pipe extension. Open the doors and let fresh air into the building.



WARNING: When battery liquid is frozen, the battery can explode if : (1) you try to charge the battery or (2) you try to start the engine by connecting an auxiliary power source. To prevent battery electrolyte from freezing keep the battery fully charged. If you do not follow these instructions, you or others nearby may be injured.



WARNING: Batteries contain acid and explosive gases. A spark, a flame or an improper cable connection may cause an explosion. For proper connection of cables to the battery of this machine see the Operator's Manual. If you do not follow these instructions, you risk severe injury.

TWIN WHEELS

Safety rules



WARNING: *In all cases, before removing twin wheels, always deflate both tyres completely.*



WARNING: *If a tyre bursts it can cause serious injury. Check tyres regularly to see that they are in good condition and always be sure to inflate them to the correct pressure.*



WARNING: *Never face a tyre when checking pressure or adding air. Always stand in front of the tread. Use an inflation cage if the wheel has been removed from the machine. Make sure all people standing in the area move well away.*



WARNING: *Never weld near a tyre. If this can not be avoided, it is mandatory to remove the tyre before performing any welding operations.*



WARNING: *Make sure that all decals on the machine are perfectly legible, clean them regularly and replace any decals which are damaged, missing or painted over, with new ones.*

Safety instructions

- Use appropriate, good quality tools to disassemble the various wheel components. Never use a hammer. Use a rubber, plastic or copper-faced mallet.

IMPORTANT: *Never remove the inner tyre valve extension, as this will be necessary afterwards for inflating and deflating the tyre.*

IMPORTANT: *If the valve or the valve extension are no longer accessible, take the necessary precautions and then, imperatively, puncture the tyre.*

- Use suitable grease to facilitate the installation and removal of the tyre.
- Never re-inflate a tyre on the machine which has been used at a pressure lower than 5.6 bar.
- Check the various components: tyre, rim, shoulder, retaining ring and replace any defective items.
- Never reuse a retaining ring which is distorted or rusty.

GENERAL INFORMATION

CLEANING

Clean all metal parts except bearings with white spirit or steam. Do not use caustic soda when steam cleaning. After cleaning, dry and lubricate all parts. Clean hydraulic lines with compressed air. Clean bearings with kerosene, then dry them and lubricate them.

INSPECTION

Check all parts when disassembled. Change all parts showing wear or damage. Scratches that are not too deep can be removed by honing or with a rag dipped into buffing compound. A full visual inspection to detect wear and pitting and subsequent changing of parts will prevent premature failure.

BEARINGS

Check that bearings rotate freely. If their adjustment is too loose or if they do not run regularly, change them. Wash bearings with a good solvent or kerosene and let them dry. **DO NOT DRY BEARINGS WITH COMPRESSED AIR.**

NEEDLE BEARINGS

Before inserting needle bearings into a bore, remove all metal particles from the edge of the bore. Prior to mounting bearings with a press, coat the inside and the outside of the bearing with vaseline.

GEARS

Check all the gears for wear or damage. Change worn or damaged gears.

SEAL RINGS, O-RINGS, GASKETS

Always use new seal rings. O-rings and gaskets. Coat sealing rings and O-rings with vaseline.

SHAFTS

Check all shafts showing signs of wear or damage. Check that the surface of a shaft running in a bearing is not damaged.

SPARE PARTS

Always use original CASE spare parts. To order spare parts, see the Spare Parts Catalogue to indicate the proper reference of original CASE spare parts. Failures caused by the use of parts that are not original CASE spare parts are not covered by the warranty.

LUBRICATION

Use only oils and lubricants specified in the Operator's and Service Manuals. Failures due to the use of oils and lubricants not specified are not covered by the warranty.

Section

2002

2002

ENGINE REMOVAL AND INSTALLATION

Before performing any service work on a machine, the following steps must be carried out in the order shown:

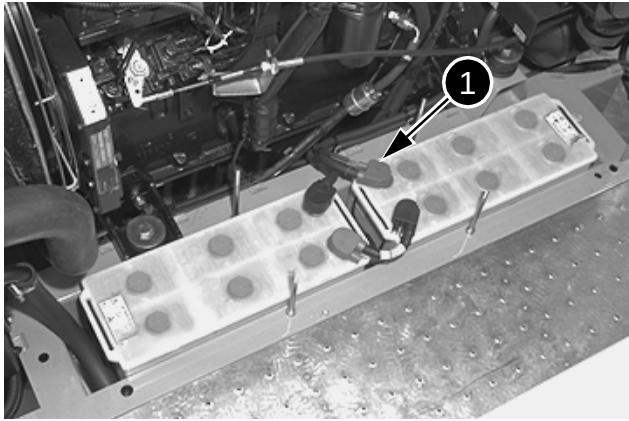
- Park the machine on hard, flat ground.
- Lower the attachment to the ground.
- Stop the engine and let it cool down.
- Turn the battery master switch to the "OFF" position and remove the key.



When the machine is running, the engine components and the hydraulic pump reach a high temperature. To avoid being burnt by hot metal or scalded by high temperature water or oil, let the machine cool down before beginning any operation.

Removal and installation

STEP 1



PG03613

Disconnect the negative cable (1) first and then the other cables.

STEP 2

Remove the access panels located under the engine.

STEP 3

Remove the exhaust silencer outlet tube.

NOTE : *When installing, make sure that the exhaust outlet is pointing towards the rear.*

STEP 4

Remove the upper hood using a suitable lifting device.

STEP 5

Remove the side panel on the walkway side.

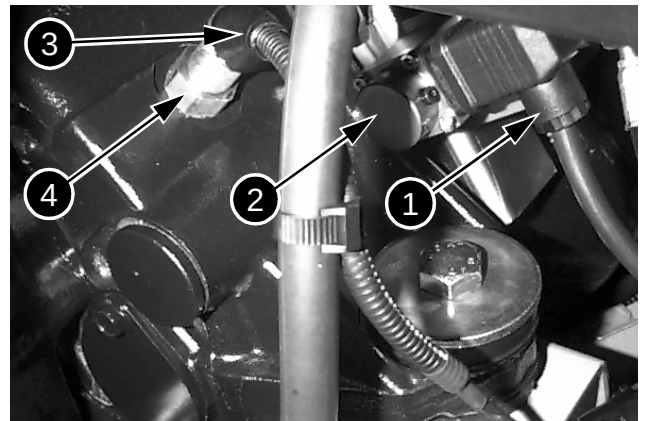
STEP 6

Remove the exhaust silencer and its bracket.

STEP 7

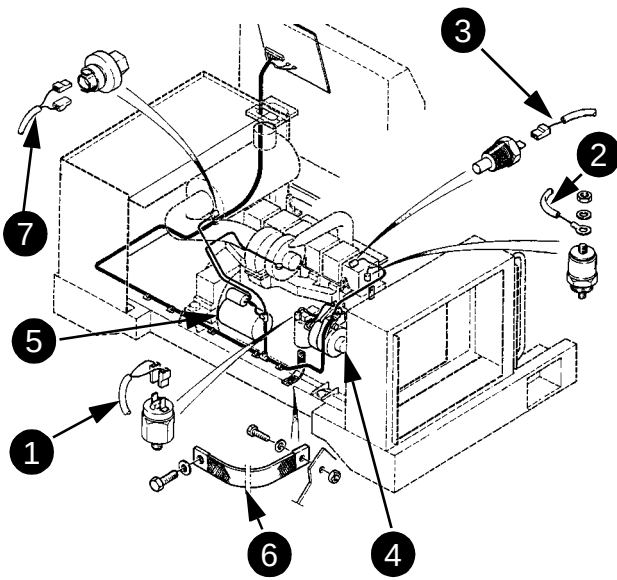
Remove the hose connecting the air filter to the turbo charger, disconnect the air filter restriction pressostat (see item (7) Step 9) and remove the air filter.

STEP 8



CD96A008

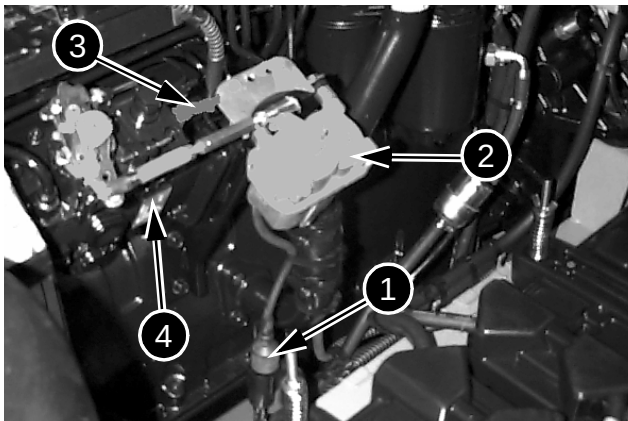
Disconnect the electrical supply (1) from the proportional pressure reduction valve DRE4 (2) and the connector (3) from the speed detector (4).

STEP 9

PDG0415

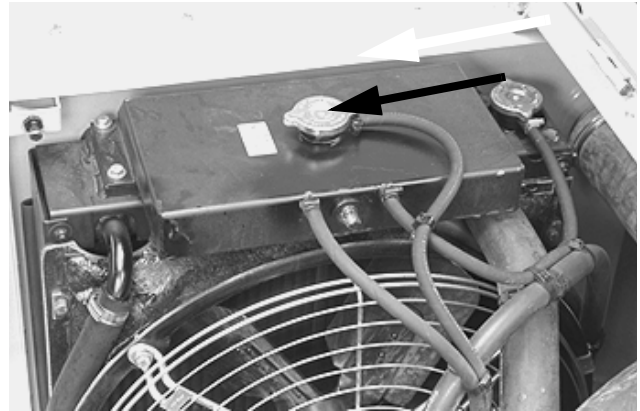
Disconnect the wires and electrical harnesses connected to the engine.

- 1 Engine oil pressure pressostat.
- 2 Engine coolant solution temperature sender.
- 3 Engine cut-out solenoid valve.
- 4 Alternator (see section 4003), for wiring identification.
- 5 Starter motor (see Section 4004), for wiring identification.
- 6 Earthing strap.
- 7 Air filter restriction pressostat.

STEP 10

CD96A009

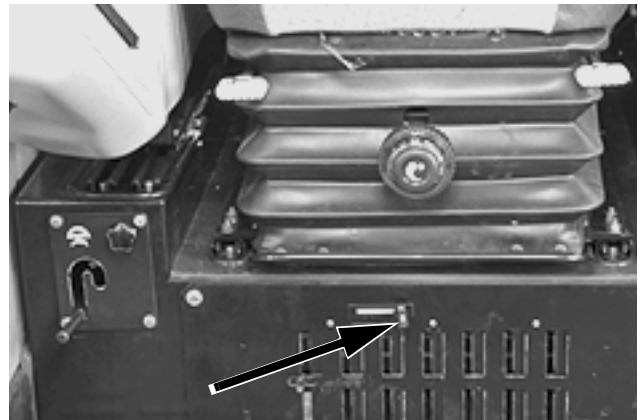
Disconnect the connector (1) from the servo-motor (2) and the connector (3) from the injection pump (4).

STEP 11

PG02824A

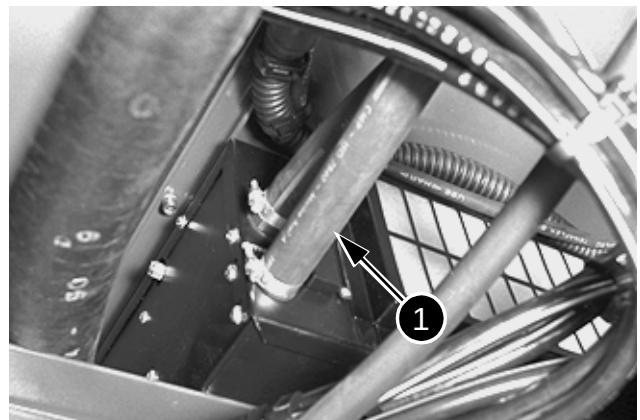
Remove the expansion reservoir cap.

NOTE : Do not remove the cap when the engine is hot. The system is still under pressure and you risk being scalded.

STEP 12

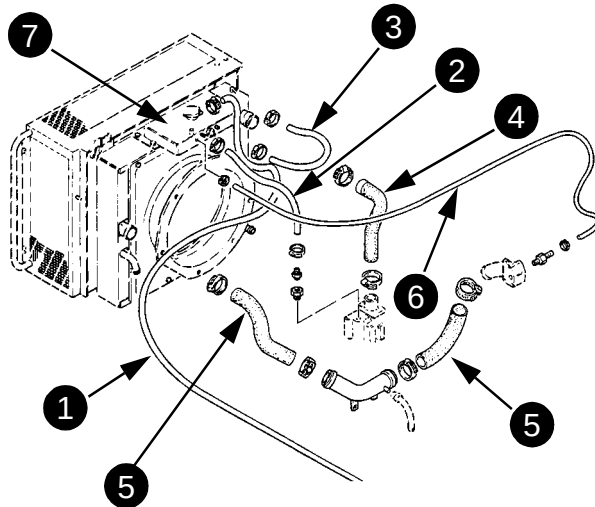
PG01706

Move the heating lever to the left.

STEP 13

PE07509

Remove the lower tray under the operator's compartment. Place a receptacle of about 30 litres underneath and then disconnect the hose (1) from the heating system and allow the coolant solution to flow out.

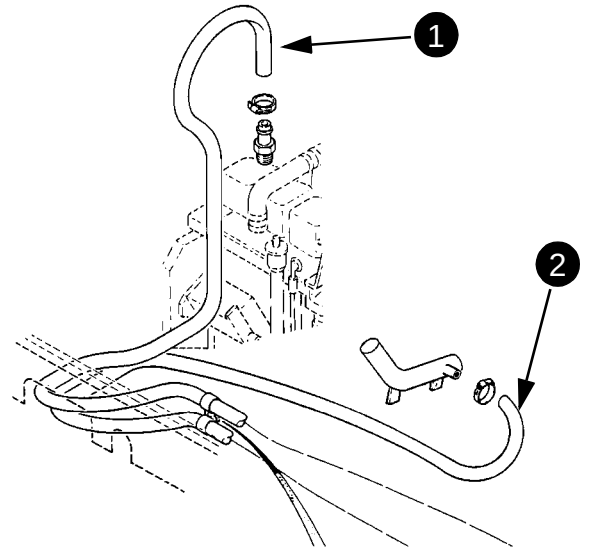
STEP 14

PDG0407

Disconnect, label and remove the cooling system hoses from the engine in numerical order.

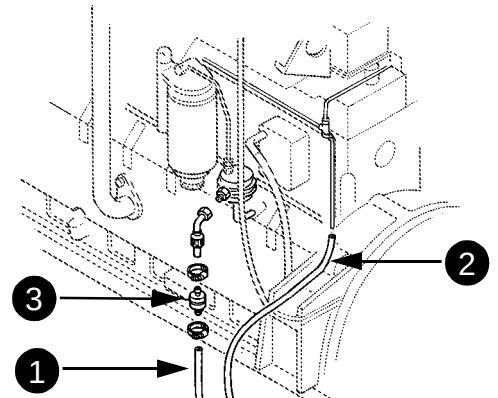
NOTE : When installing, make sure that the system hoses are clean.

- 1 Overflow hose
- 2 Engine gas evacuation hose
- 3 Radiator gas evacuation hose
- 4 Engine/radiator return hose
- 5 Pump/radiator inlet hose
- 6 Coolant solution supply hose
- 7 Expansion reservoir

STEP 15

PDG0411

Disconnect heating system hoses (1) and (2) from the engine.

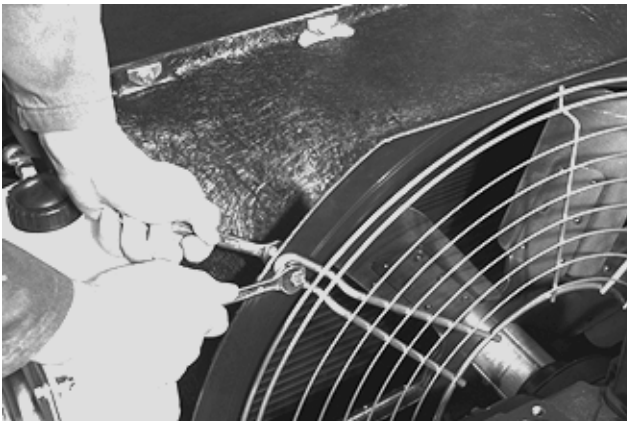
STEP 16

PDG0409

Disconnect the fuel supply pipe (1) and plug it. Disconnect the fuel return pipe (2) and plug it.

NOTE : When installing, change the filter (3).

STEP 17



PE06825

Remove the fan guard fastening hardware and remove the guard.

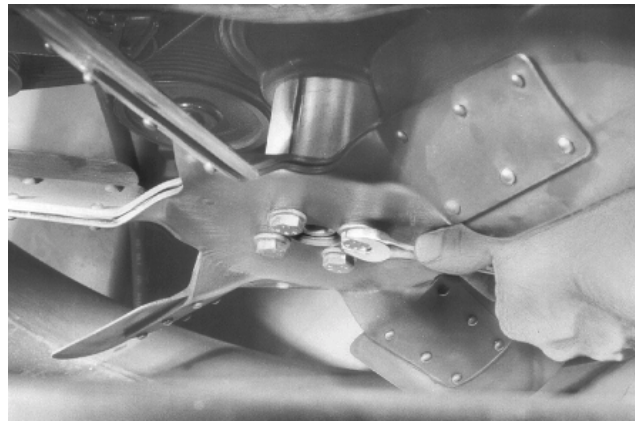
STEP 18



PE10104

Remove the shroud fastening hardware and move the shroud towards the engine to gain access to the fan retaining screws.

STEP 19

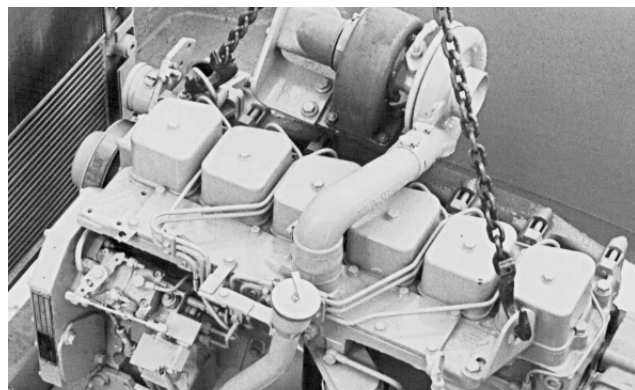


PE10105

Remove the four fan retaining screws and remove the fan and spacer. Remove the fan shroud.

NOTE : *When installing, the fan shroud should be installed resting on the engine. Install spacer and the fan and then tighten the screws to a torque of 44 Nm.*

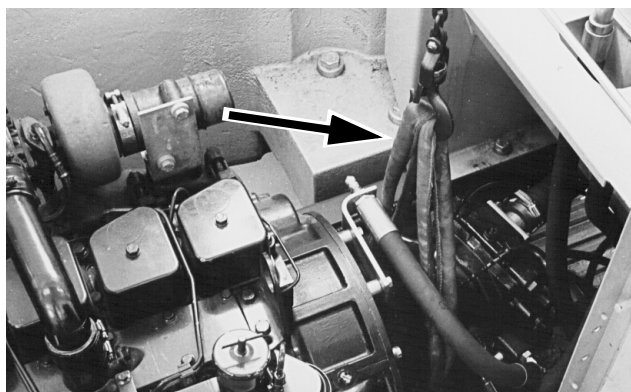
STEP 20



B20308

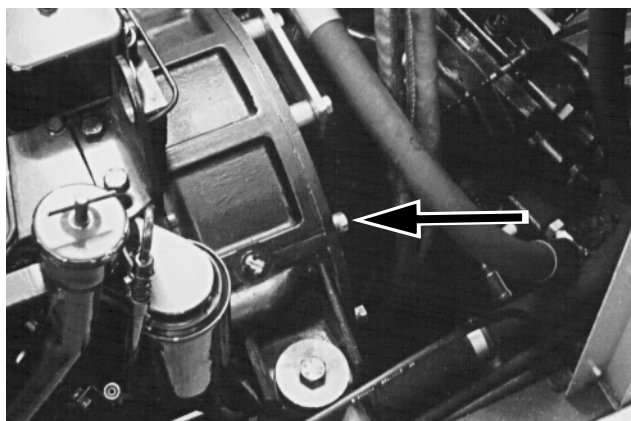
Attach a suitable lifting device to the engine lifting eyes.

Weight of engine : 443 kg

STEP 21

C24000

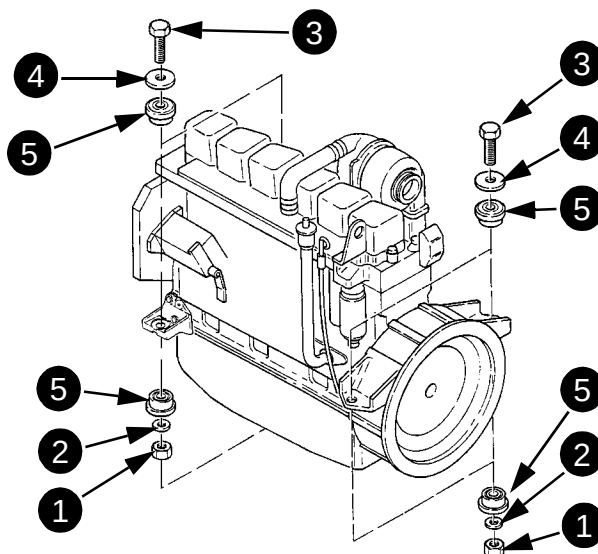
Using a suitable sling, support the hydraulic pump so as to keep it in place during the removal of the engine.

STEP 22

C24000A

Remove the hydraulic pump fastening hardware.

NOTE : When installing, tighten the hydraulic pump retaining screws to a torque of 44 Nm.

STEP 23

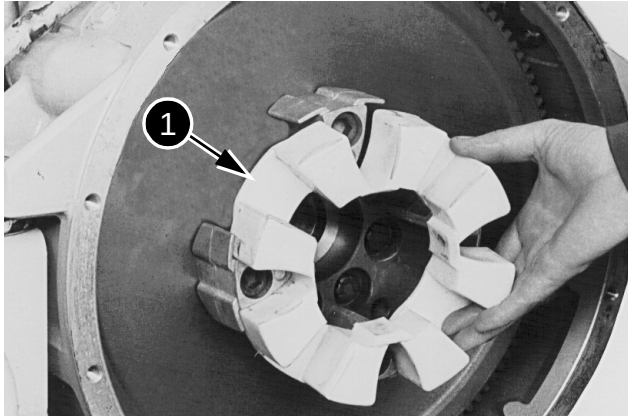
PDG0414

Remove the nuts (1), the washers (2) and remove the screws (3) and the thrust washers (4).

NOTE : When installing, make a visual check of the condition of the rubber spacers (5). Replace them with new spacers if necessary. Tighten the engine bearer retaining screws to a torque of 217 to 271 Nm.

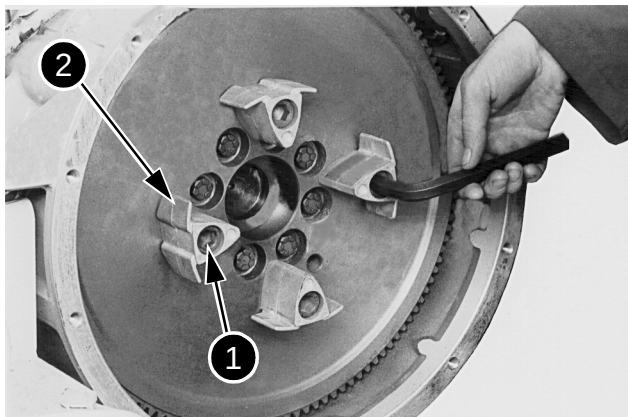
STEP 24

Carefully lift the engine. Move it towards the radiator until it is disengaged from the pump coupling. When there is nothing to prevent the removal of the engine, install it on a suitable repair bench.

STEP 25

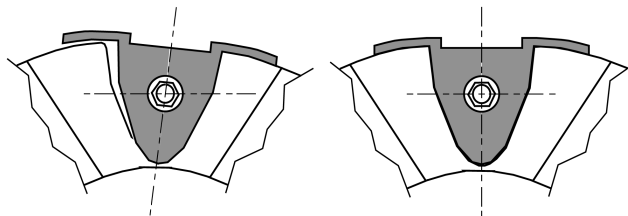
B20402

Remove the flexible coupling (1). Check the wear and general condition of the coupling and replace it by a new coupling if necessary.

STEP 26

B20404

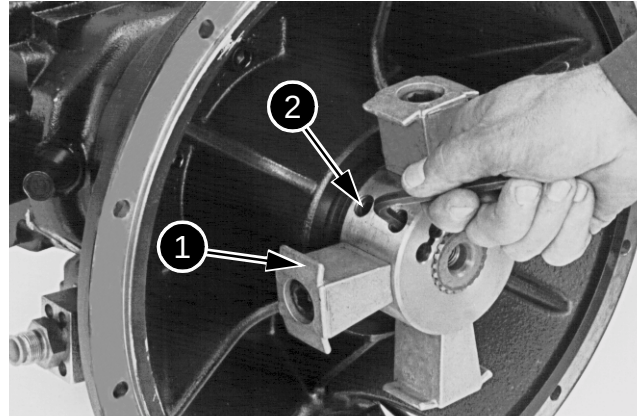
Remove the screws (1) and remove the centering lugs (2). Make a visual check of the wear and general condition of the centering lugs and replace them if necessary.

NOTE :**INCORRECT****CORRECT**

PDG0419

When installing, apply Loctite 638 on the screws, position the centering lugs correctly, and tighten the screws to a torque of 220 Nm.

NOTE : If it is necessary due to wear to replace the flexible coupling and the centering lugs, the splined sleeve should also be replaced.



C18226

Remove the splined sleeve (1) from the hydraulic pump. Replace it if necessary.

NOTE : When installing the splined sleeve (1), install the splined sleeve on the pump shaft. The splined sleeve should be pushed fully home against the pump shaft shoulder. Tighten the retaining screws (2) to a torque of 100 Nm.

NOTE : When installing the engine, proceed in the reverse order to that used for the removal.

Before using the machine, perform all the following operations:

- Turn the battery master switch to the "ON" position.
- Bleed and prime the fuel circuit (see Operators Manual).
- Check that the engine oil pressure warning lamp goes out when the engine is running.
- Adjust the engine speed detector if it has been removed. See Section 4002.
- Calibrate the servo-motor if it has been removed. See Section 4002.
- Bleed the cooling system (see Operator's Manual).
- Check the hydraulic system, fuel system and cooling system for leaks.
- Stop the engine and check all levels. Top up if necessary.

Section

4003

STARTER MOTOR

4003

TABLE OF CONTENTS

SPECIFICATIONS.....	2
SPECIAL TORQUES.....	2
SHOP EQUIPMENT TOOLS	2
STARTER MOTOR	
Removal and Installation.....	3
No-Load test procedure	4
Understanding No-Load test results.....	5
Disassembly and Assembly	6
Inspection.....	7

SPECIFICATIONS

Manufacturer	Bosch
Weight	25.5 kg
No-Load test at 27°C	
Volts	24 V
Current draw	85 amps maximum
Brush length.....	8.5 mm minimum
Commutator diameter.....	42.5 mm minimum
Armature shaft end play	0.05 to 0.5 mm
Armature shaft run-out.....	0.03 mm maximum
Lubricant for thrust bearing and splines on armature shaft.....	GE silicone grease G321 Versilube

SPECIAL TORQUES

Drive housing screws	4.5 to 6 Nm
Starter motor mounting bolts.....	43 Nm

WORKSHOP TOOLS

- 1 Sun electric VAT-33
- 2 Hand-held tachometer CAS 10756
- 3 Multimeter CAS 1559
- 4 Dial indicator CAS 10066-1A
- 5 Magnetic base for dial indicator OEM 1030
- 6 Torque wrench OEM 6479

STARTER MOTOR

Removal and Installation

STEP 1

Park the machine on hard level ground and stop the engine.

STEP 2

Turn the master disconnect switch to the OFF position and remove the key.

STEP 3

Fasten identification tags to and disconnect the cables and wires from the starter motor and solenoid. Remove the three mounting bolts and washers and remove the starter motor.

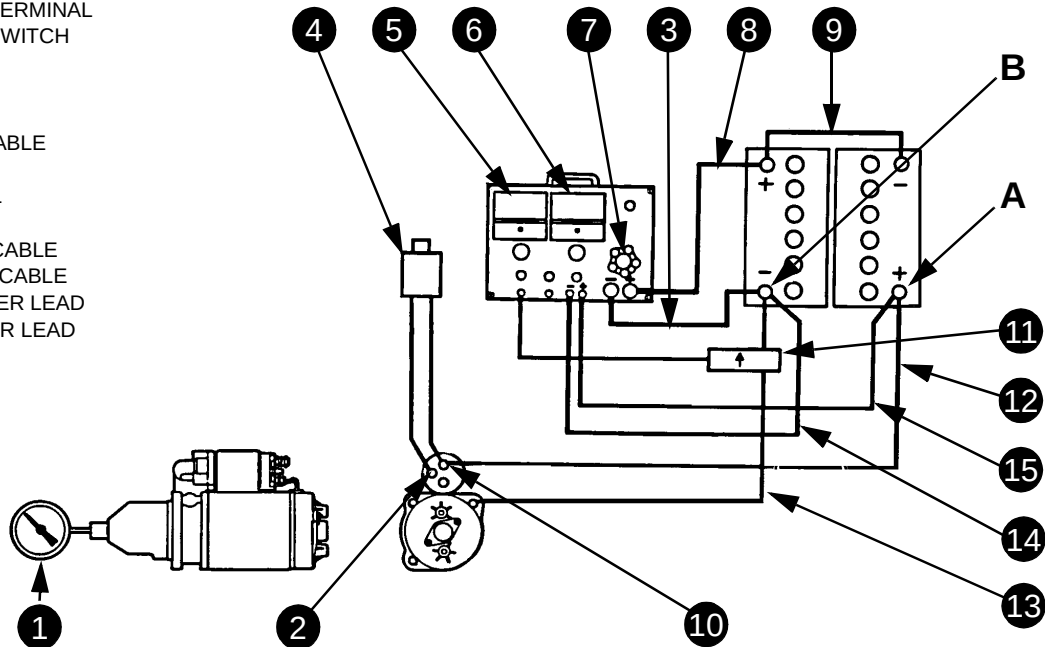
NOTE : *For installation, follow the same procedure in reverse order and tighten the starter motor mounting bolts to a torque of 43 Nm.*

No-Load test procedure

The No-Load test is carried out with the starter motor removed from the machine. Check to make sure the drive clutch slides freely on the armature shaft and the armature rotates freely.

The No-Load test can be carried out using a Sun Electric VAT-33 tester or an equivalent tester. A hand held tachometer is required to measure the speed of the armature shaft. A remote starter switch is required to actuate the starter motor and two fully charged 12 volt batteries to supply the electricity to turn the starter motor.

- 1 HAND TACHOMETER
- 2 STARTING TERMINAL
- 3 NEGATIVE CHARGE TERMINAL
- 4 REMOTE STARTING SWITCH
- 5 AMMETER
- 6 VOLTMETER
- 7 LOAD CONTROL
- 8 POSITIVE CHARGE CABLE
- 9 JUMPER LEAD
- 10 STARTING TERMINAL
- 11 AMMETER CLAMP
- 12 POSITIVE BATTERY CABLE
- 13 NEGATIVE BATTERY CABLE
- 14 NEGATIVE VOLTMETER LEAD
- 15 POSITIVE VOLTMETER LEAD



A87754

STEP 4

Fasten the starter motor in a soft jawed vise. Connect the positive battery cable to the positive post (A) and to the battery terminal on the starter solenoid. Connect the negative battery cable to the negative post (B) and to the mounting flange on the starter.

STEP 5

Adjust the controls for the Sun Electric VAT-33 tester as follows :

- 1 Move the load control to the OFF position.
- 2 Move the volt range control to the 10 to 30 volt range.
- 3 Move the amp. range control to the 0 to 1000 amperes range.
- 4 Move the volt lead switch to the EXT. position.

STEP 6

Connect the positive voltmeter lead of the tester to post (A).
Connect the negative voltmeter lead of the tester to post (B).

STEP 7

Connect the load leads of the tester as shown.

STEP 8

Fasten the ammeter clamp around the negative battery cable. The point of the arrow on the ammeter clamp must be toward the battery.

STEP 9

Connect the leads of the remote starter switch to the battery terminal and the switch terminal on the starter motor solenoid.

NOTE : *Steps 10 to 13 must be done rapidly. DO NOT apply a load to the battery for more than 15 seconds at one time. After 15 seconds turn the load control to the off position for 60 seconds to allow the tester to cool.*

STEP 10

Actuate the remote starter switch and turn the load control until the voltmeter indicates 23 volts.

STEP 11

Make a note of the reading on the ammeter.

STEP 12

Use the hand-held tachometer to check the armature shaft speed. Make a note of the armature shaft speed.

STEP 13

Release the remote starter switch and turn the load control to the OFF position.

STEP 14

Disconnect the negative battery cable from the starter. Disconnect the remainder of the test connections.

NOTE : *Refer to Specifications, on page 2, to check the readings obtained in Steps 11 and 12.*

Understanding No-Load test results

STEP 15

Low armature shaft speed and high current draw are indications of too much friction. Possible causes of too much friction are :

- 1 Tight, dirty or worn bearings.
- 2 A bent armature shaft.
- 3 Loose pole shoes (pole shoes make contact with the armature).
- 4 A short circuit in the armature winding. Disassemble the starter motor. Use an armature tester to test the armature.
- 5 Damaged field coil, refer to the test on page 8.

STEP 16

If the armature does not rotate and the current draw is high, possible causes are :

- 1 Field terminal making contact with the field frame. Inspect the insulators for the field terminal.
- 2 Damaged field coil, refer to the test on page 8.
- 3 Damaged bearings.

STEP 17

If the armature does not rotate and the current draw is zero, possible causes are :

- 1 An open field circuit, disassemble the starter motor and inspect the field coil connections.
- 2 An open armature coil, disassemble the starter motor and check for burned commutator segments. Use an armature tester to test the armature.
- 3 Brushes not making good contact with the commutator segments. Check for high insulation between the commutator segments, broken brush springs or worn brushes.

STEP 18

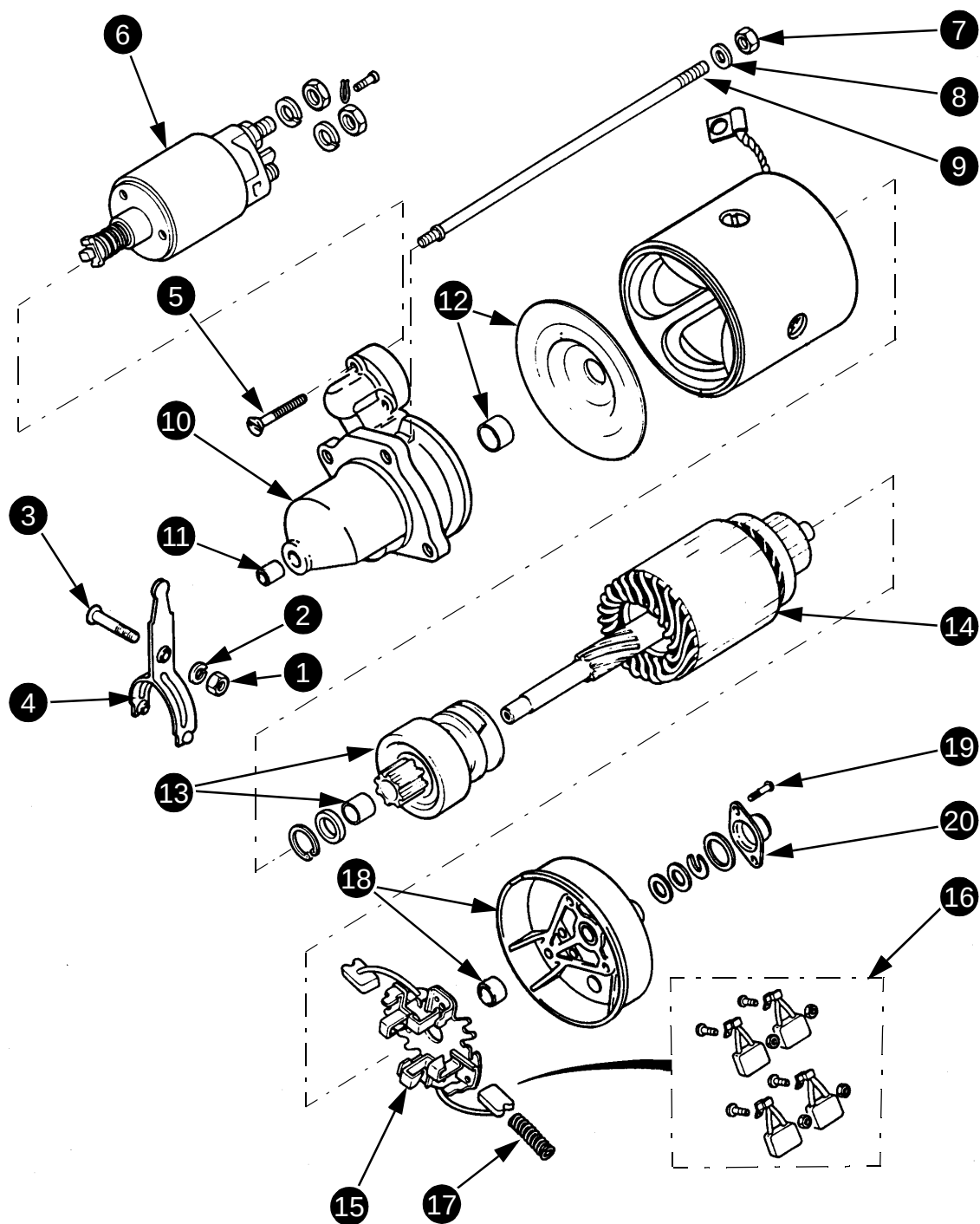
Low armature shaft speed and low current draw are indications of :

- 1 Dirt or corrosion on connections.
- 2 Damaged wiring.
- 3 Dirty commutator segments.
- 4 All causes in Step 17.

STEP 19

High armature shaft speed and high current draw are indications of a short circuit in the field coil. Replace the field coil by a new field coil. Repeat the No-Load test, on page 4, and check the operation of the starter motor.

Disassembly and Assembly



- 1 NUT
- 2 WASHER
- 3 SCREW
- 4 ENGAGING FORK
- 5 SCREW
- 6 SWITCH
- 7 NUT
- 8 WASHER

- 9 TIE-ROD
- 10 HOUSING
- 11 BEARING
- 12 CYLINDER GLAND
- 13 OVERRUNNING CLUTCH AND DRIVE PINION
- 14 ARMATURE
- 15 BRUSH HOLDER

- 16 BRUSH
- 17 SPRING
- 18 COVER
- 19 SCREW
- 20 CAP

DPH0205

Inspection

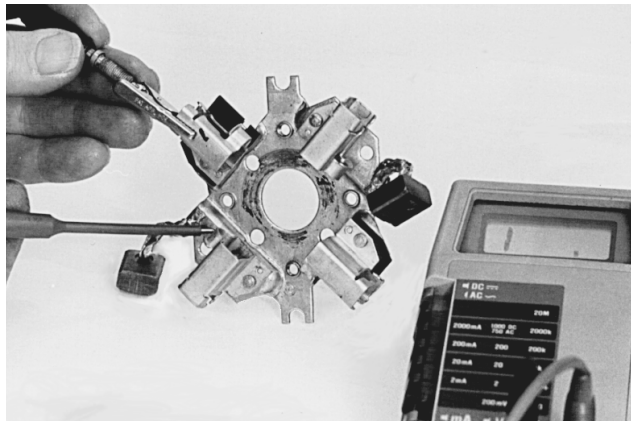
STEP 20

Use a clean dry cloth to clean the drive clutch, armature, field frame and starter solenoid. Use cleaning solvent to clean the remaining parts.

STEP 21

Measure the length of the brushes connected to the brush holder. If the length of any brush is less than 8.5 mm both brushes must be replaced. Measure the length of the brushes connected to the field coil. If the length of any brush is less than 8.5 mm both brushes must be replaced.

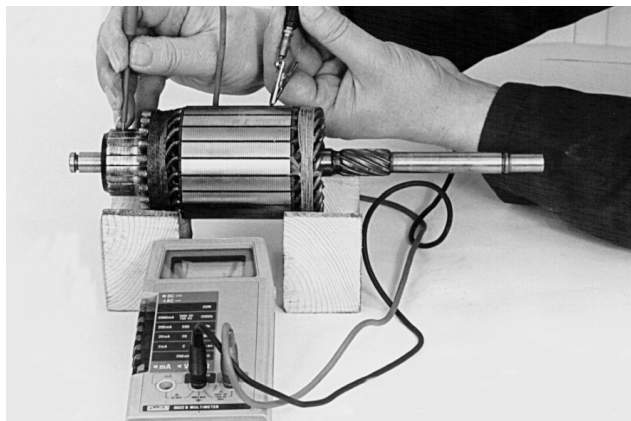
STEP 22



A06513

Connect one probe of the multimeter to the brush holder frame and the other probe to each insulated brush holder in turn. There must be no continuity. Replace the assembly if continuity exists.

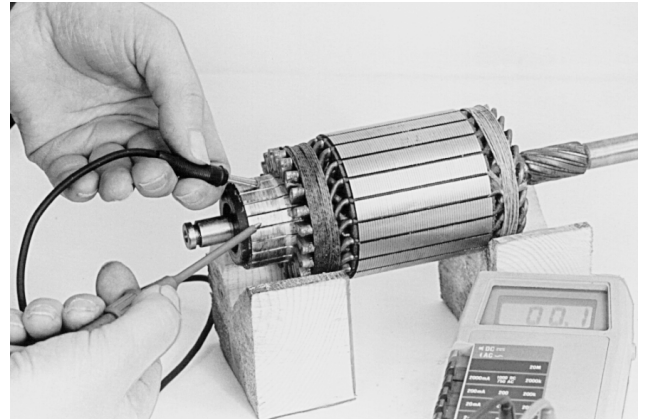
STEP 23



A06523

Place one probe of the multimeter to a commutator segment and the other probe to the armature core. There must be no continuity. If there is continuity the armature has an earth and must be replaced.

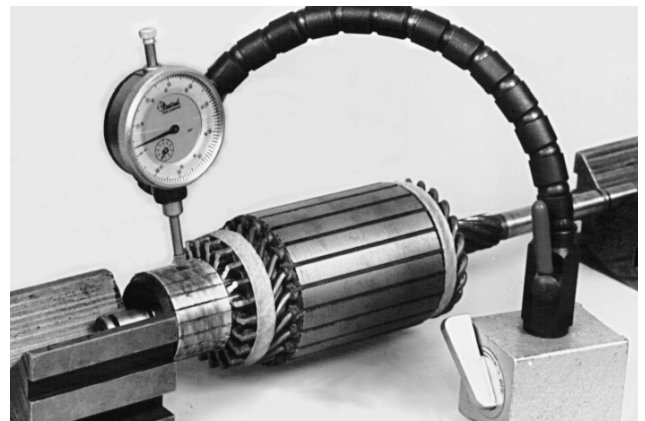
STEP 24



A05527

Place the probes of the multimeter to two segments of the commutator. If there is no continuity the winding has an open circuit and the armature must be replaced.

STEP 25



675970

Put the armature on vee-blocks and check the run out of the armature with a dial indicator. The run out must not be more than 0.03 mm. If necessary, put the armature in a lathe and remove enough material to make the run out less than 0.03 mm.

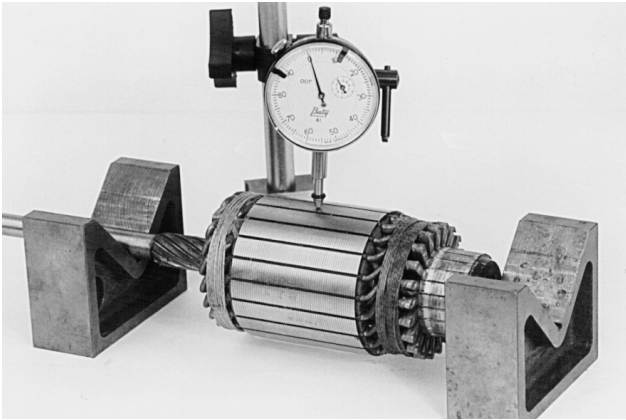


Suggest:

If the above button click is invalid.

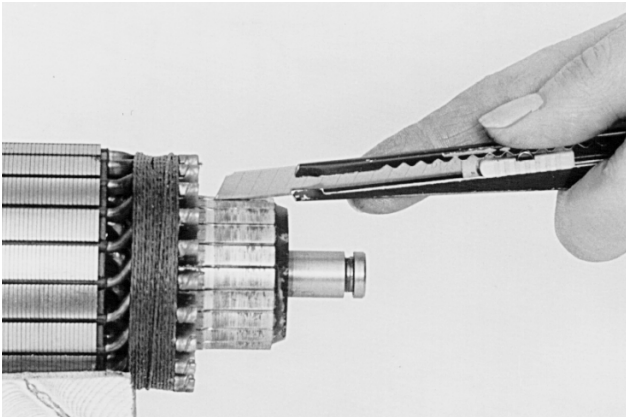
**Please download this document
first, and then click the above link
to download the complete manual.**

Thank you so much for reading

STEP 26

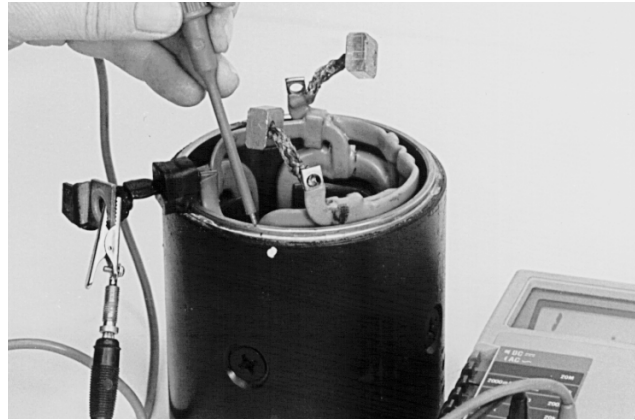
A05521

Place the armature on vee-blocks and check for distortion. If the armature is distorted it must be replaced.

STEP 27

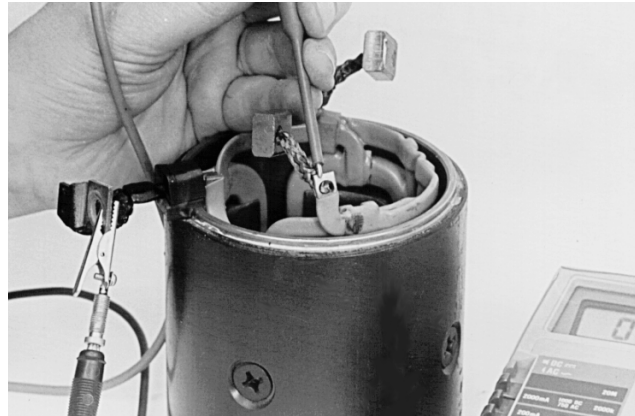
A05533

If the depth of the groove between the commutator segments is less than 0.2 mm, cut the insulation between the commutator segments to a depth of 0.5 mm. Use sandpaper to remove the rough edges from the commutator segments. Do not use emery cloth.

STEP 28

A05537

Place one probe of the multimeter on the field coil terminal and the other probe on an unpainted area on the surface of the frame. If there is continuity the field winding is earthed and must be replaced.

STEP 29

A06506

Place one probe of the multimeter on the field coil terminal and the other probe on the brush connection. If there is no continuity the field winding has an open circuit and must be replaced.

STEP 30

Check the splines and teeth of the overrunning clutch for wear and damage. Make sure the drive clutch moves freely on the armature shaft.

STEP 31

Check the bushings in the drive clutch, drive housing and end cover, replace if worn or damaged.

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>