

580LE-SLE-LSP-LPS 590SLE-LSP LOADER BACKHOES

TABLE OF CONTENTS

DIVISION/SECTION	N° SECTION	REFERENCE N°
1 GENERAL INFORMATION		
Standard Torque Specifications and Loctite Product Chart.....	1001	7-79450GB
Fluids and Lubricants	1002	7-79461GB
2 ENGINE		
Removing and Installing the Engine and the Radiator	2000	7-79471GB
Stall Tests	2002	7-79482GB
Engine Specifications	2402 *	
Cylinder Head and Valves	2415 *	
Engine Cylinder Block	2425 *	
Lubrication System	2445 *	
Cooling System	2455 *	
Turbocharger	2465 *	
Turbocharger Failure Analysis	2565 *	
3 FUEL SYSTEM		
Fuel System and Filters	3410 *	
Fuel Injector	3413 *	
CAV Injection Pump	3414 *	
Bosch Injection Pump	3415 *	
4 ELECTRICAL SYSTEM		
Removal and Installation of Electrical Components	4000	7-79490GB
Electrical Schematics	4001	7-79503GB
580LSP-590LSP Electronic System and Troubleshooting	4002	7-83511GB
Battery	4003	7-79510GB
Starter Motor	4004	7-79520GB
Instrument Cluster	4005	7-79530GB
Alternator	4007	7-79540GB
5 STEERING		
Removing and Installing the Steering Components	5000	7-79551GB
Steering Specifications, Pressure Checks and Troubleshooting (580LE)	5001	7-79561GB
Steering Specifications, Pressure Checks and Troubleshooting (580SLE)	5001	7-79571GB
Steering Control Valve (Orbitrol), EATON Type	5002	7-79580GB
Rotary Control Valve (Orbitrol), DANFOSS Type	5002	7-27460GB
Steering Cylinders	5003	7-79590GB
Front Axle, Two Wheel Drive Machines	5005	7-79600GB
Front Axle, Four Wheel Drive Machines	5006	7-79611GB

*Refer to the Engine Service Manual

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6 TRANSMISSION

Removal and Installation of Transmission Components (CARRARO)	6000	7-27560GB
Removal and Installation of CLARK (Powershift) Transmission	6000	7-27570GB
Transmission Specifications, Pressure Checks and Troubleshooting (CARRARO)	6002	7-79631GB
Transmission Specifications, Pressure Checks and Troubleshooting (CLARK)	6002	7-84330GB
Wheels and Tires	6003	7-79640GB
Rear Axle and Planetaries	6004	7-79650R1GB
Rear Axle and Planetary (Standard)	6004	7-27300GB
Rear Axle and Planetary (Powershift)	6004	7-27310GB
Gearbox (CARRARO)	6007	7-79660GB
CLARK Powershift Transmission	6007	7-83631GB

7 BRAKES

Removing and Installing the Braking System Components	7000	7-79671GB
Master-Cylinder	7003	7-79680GB

8 HYDRAULIC SYSTEM

Removing and Installing the Components of the Hydraulic System	8001	7-79690GB
Hydraulic System Specifications, Troubleshooting and Pressure Checks (580LE)	8002	7-79701GB
Hydraulic System Specifications, Troubleshooting and Pressure Checks (580SLE)	8002	7-79711GB
Cleaning the Hydraulic System	8003	7-79720GB
Hydraulic Pump (580LE)	8004	7-79731GB
Hydraulic Pump (580SLE)	8004	7-79741GB
Loader Control Valve	8005	7-79751GB
Cylinders	8006	7-79760GB
Backhoe Attachment Control Valve Block (580LE)	8007	7-79771GB
Backhoe Attachment Control Valve Block (580SLE)	8007	7-79781GB
Auxiliary Control Valve	8008	7-79790GB
Accumulator for Machines Fitted with Ride Control System (Optional)	8009	7-83520GB
Solenoid Valves for Machines Equipped with Ride Control System (Optional)	8010	7-83530GB
Sideshift Carriage Locking Cylinder	8011	7-21090GB
Boom Safety Valve	8012	7-27290GB
Dipper Safety Valve	8013	7-27320GB
Loader Arm Safety Valve	8014	7-27330GB
Swing Sequence Valve	8020	7-21010GB

9 CHASSIS/ATTACHMENT

Pedals and Levers	9001	7-79801GB
Air Conditioning Troubleshooting for Systems with R-134a Refrigerant	9002	7-79810GB
Air Conditioning Pressure Gauges and Checks for Systems Using R-134a Refrigerant	9003	7-79820GB
Air Conditioning System Maintenance for Systems Using Refrigerant R-134a	9004	7-79830GB
Servicing Components of Air Conditioning System Using R-134a Refrigerant	9005	7-79840GB
Loader	9006	7-79850GB
Cab with ROPS and Safety Frame with ROPS	9007	7-27580GB
Backhoes Attachment	9008	7-79870GB
Seat and Safety Belt	9009	
Large Format Hydraulic and Electrical Schematics.....	Pocket	

Section to be distributed at a later date.

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Section

1001

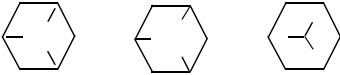
STANDARD TORQUE SPECIFICATIONS AND LOCTITE PRODUCT CHART

TABLE OF CONTENTS

TORQUE SPECIFICATIONS - DECIMAL HARDWARE	2
TORQUE SPECIFICATIONS - METRIC HARDWARE.....	3
TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS.....	4-5
LOCTITE PRODUCT CHART	6

TORQUES SPECIFICATIONS (DECIMAL HARDWARE)

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts and Studs		
		
Size	Pound-inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inchs	800 to 880	1085 to 1193
1-1/4 inchs	1120 to 1240	1519 to 1681
1-3/8 inchs	1460 to 1680	190 to 2278
1-1/2 inchs	1940 to 2200	2631 to 2983

Grade 8 Bolts, Nuts and Studs		
		
Size	Pound-inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inchs	1280 to 1440	1736 to 1953
1-1/4 inchs	1820 to 2000	2468 to 2712
1-3/8 inchs	2380 to 2720	3227 to 3688
1-1/2 inchs	3160 to 3560	4285 to 4827

NOTE : Use thick nuts with Grade 8 bolts.

TORQUE SPECIFICATIONS (METRIC HARDWARE)

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

Grade 8.8 Bolts, Nuts and Studs		
		
Size	Pound-inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

Grade 10.9 Bolts, Nuts and Studs		
		
Size	Pound-inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

Grade 12.9 Bolts, Nuts and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

Section

2000

REMOVING AND INSTALLING THE ENGINE AND THE RADIATOR

TABLE OF CONTENTS

SPECIFICATIONS..... 2

SPECIAL TORQUE SETTINGS 2

TOOLS REQUIRED 2

REMOVING THE RADIATOR 3

REMOVING THE ENGINE 6

RADIATOR INSTALLATION 15

RADIATOR SHROUD 16

FRONT ENGINE MOUNT INSTALLATION..... 17

INSTALLING THE ENGINE FRONT BRACKET 18



WARNING: *This symbol is used in this manual to show important safety messages. Whenever you see this symbol, carefully read the message which follows, since it shows there is a risk of serious injury.*

SPECIFICATIONS

Cooling system capacity :

 With heater..... 16.5 litres

 Without heater 15.8 litres

Thermostat opening

 Begins to open 83°C

 Fully open at..... 95°C

Radiator cap opening pressure1 bar

Coolant solution..... See Section 1002

SPECIAL TORQUE SETTINGS

Front engine bracket self-locking nuts..... 41 to 47 Nm

Torque converter retaining screws 52 to 57 Nm

Engine front bracket retaining screws 89 to 107 Nm



WARNING: *Boiling coolant solution may escape if the radiator cap is removed while the system is still hot. To remove the cap. First allow the system to cool, then turn the cap to the first notch and wait until there is no more pressure. Then remove the cap.*

TOOLS REQUIRED



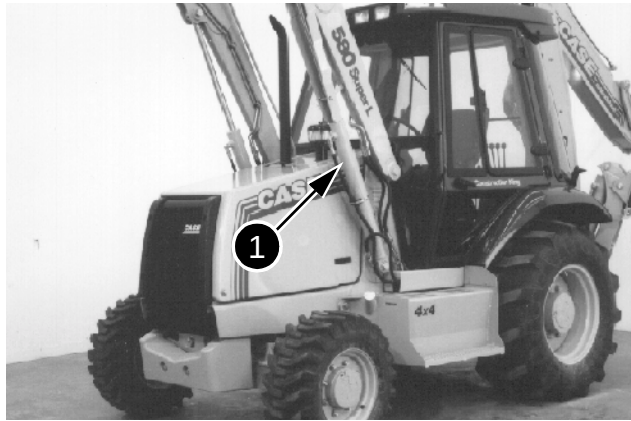
T91222

CAS 1690 Engine turn-over tool

REMOVING THE RADIATOR

Put identification tags on all disconnected hoses and wires. Close disconnected hoses and fittings with caps and plugs.

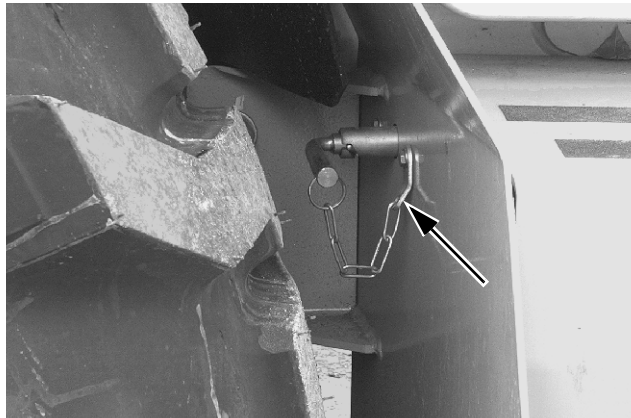
STEP 1



BP9502285

Park the machine on a level surface. Raise the loader attachment, shut down the engine, then install the locking bar (1) to maintain the loader attachment in position.

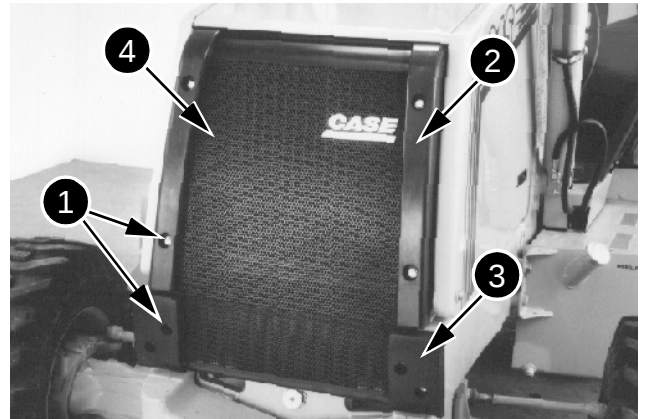
STEP 2



CD95K021

Place the battery master switch in the "Off" position (circuit isolated from battery).

STEP 3



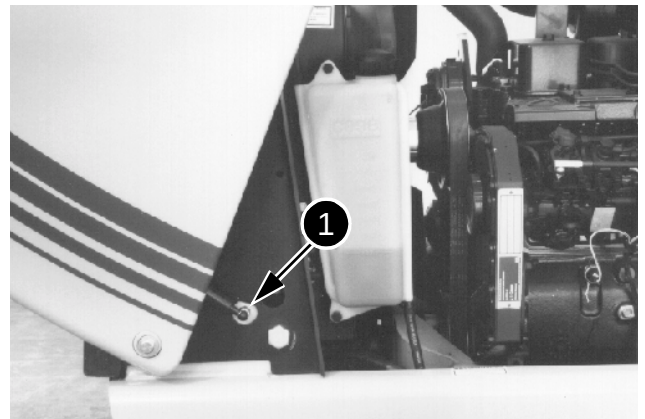
BP9502315

Remove the caps screws (1), upper (2) and lower bumpers (3), and the grille (4) from the front of the machine.

STEP 4

Remove the bolts, washers, and nuts from the pivot point on the hood.

STEP 5



BP9502286

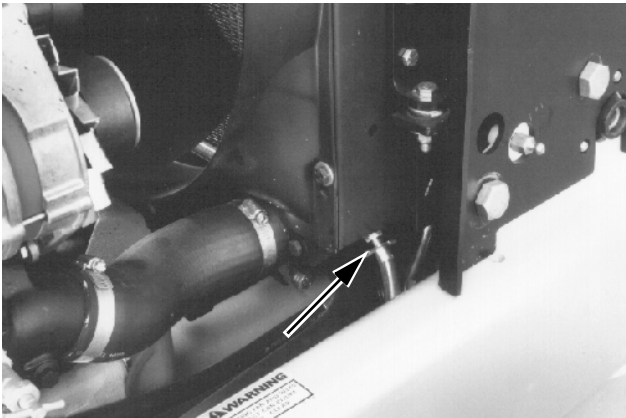
Have another person help with the following procedure:

- A. Open the hood.
- B. Remove the retainers from the hood struts (1) and disconnect the hood struts from the stud.
- C. Hold the hood in place and disconnect the hood cable from the radiator shroud on the other side of the machine.
- D. Carefully lower the hood back to the closed position.

STEP 6

BP9502288

Remove the hood retaining screws. Drive the pivot tubes out of the hood pivot point. Remove the hood from the machine.

STEP 7

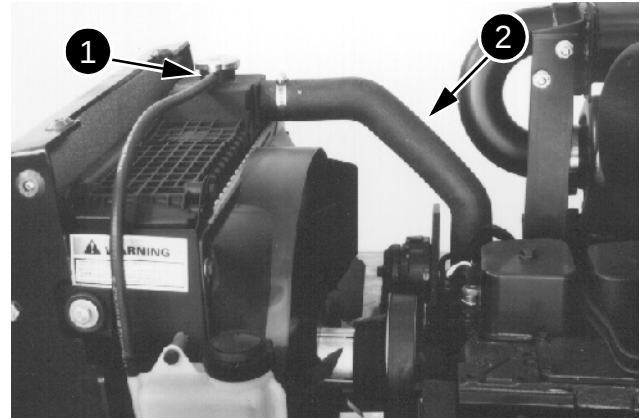
BP9502290

Slowly remove the radiator cap. Install a hose on the drain valve and drain the radiator into a clean container that holds approximately 17 litres. Once the radiator is completely drained, close the drain valve.



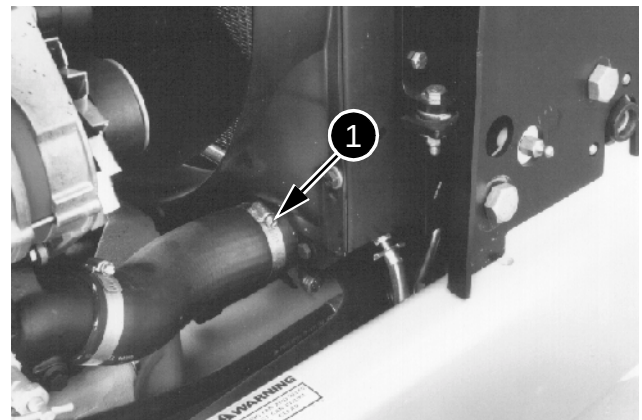
WARNING: Do not remove the cap when the engine is hot. The circuit is still under pressure and you could be scalded.

NOTE: During installation, fill the radiator and coolant reservoir completely. See Section 1002 for coolant solution specifications. Start and run the engine until the coolant is at operating temperature. Stop the engine and check for leakage. When the coolant is cold, check the coolant reservoir level. Add coolant as required. Never remove the radiator cap to check the coolant level in the radiator.

STEP 8

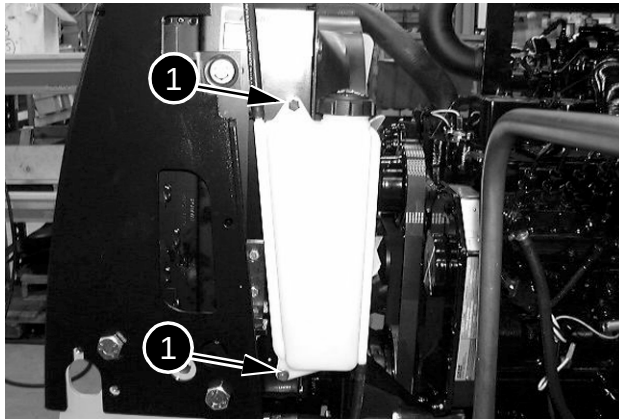
BP9502292

Disconnect the overflow hose (1) from the radiator neck. Loosen the clamp and disconnect the upper radiator hose (2).

STEP 9

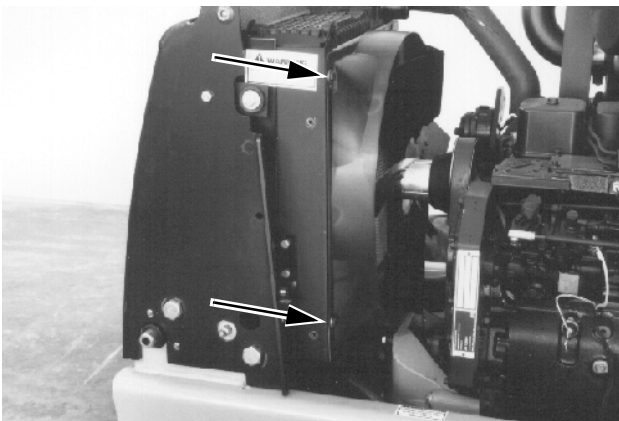
BP9502290

Loosen the clamp (1) and disconnect the lower radiator hose.

STEP 10

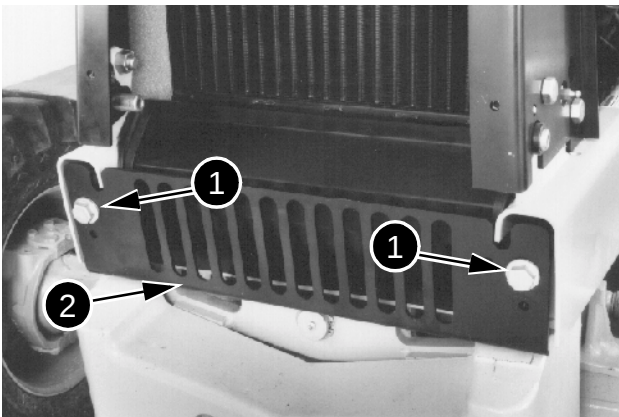
CD00C003

Remove the screws (1), spacers and washers from the coolant solution reservoir, then remove it from the machine.

STEP 11

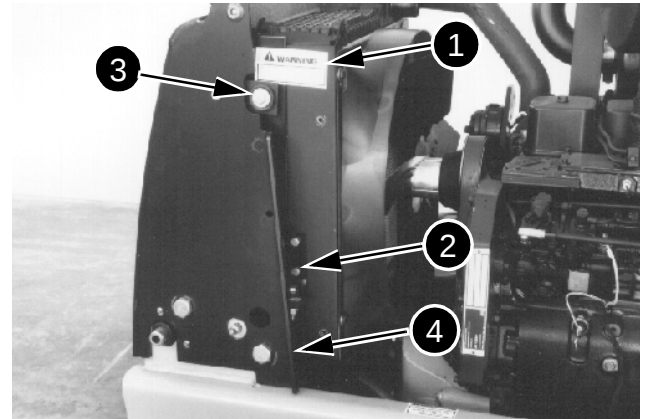
BP9502293

Remove the hardware from the fan shroud. Move the fan shroud away from the radiator.

STEP 12

BP9502314

Remove the cap screws (1) and pump guard (2) from the machine.

STEP 13

BP9502293

Remove the cap screws that fasten the lower brackets (2) to the radiator. Remove the hardware and the lower brackets (2) from the radiator shroud (1). Remove the cap screws and flat washers that fasten the upper brackets (3) to the radiator. Remove the cap screws and flat washers (4) that fastens the condenser if equipped and oil cooler to the radiator. Lift the radiator straight up and remove the radiator from the machine.

NOTE: Installation of the radiator is the reverse of removal.

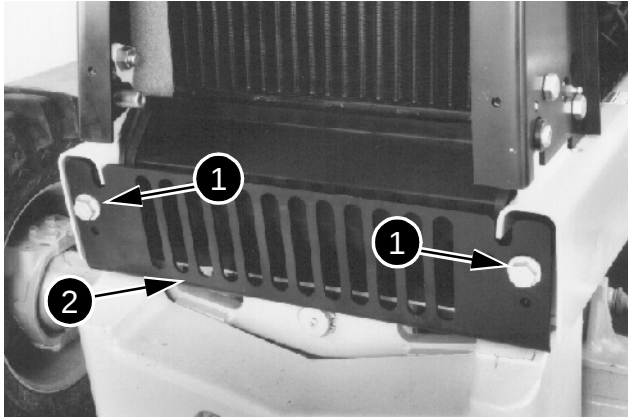
REMOVING THE ENGINE

Put identification tags on all disconnected hoses and wires. Close disconnected hoses and fittings with caps and plugs.

STEP 1

Carry out Steps 1 to 11 "Radiator Removal".

STEP 2



BP9502314

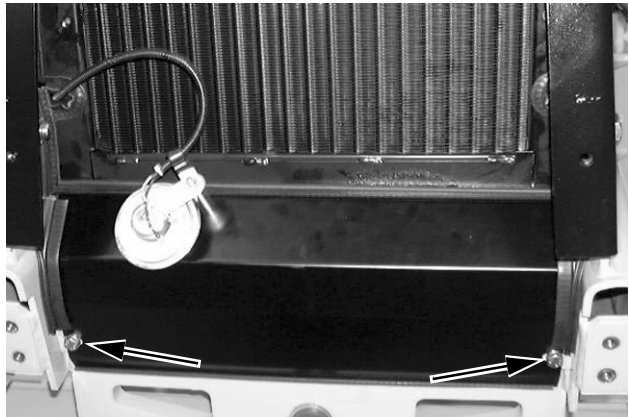
Remove the cap screws (1) and pump guard (2) from the machine.

STEP 3

If a horn is fitted to the machine's deflector, disconnect the cable from the horn.

NOTE: If the machine is equipped with air conditioning and with a baffle plate with a notch provided for the dryer hose, pass on to Step 12. If the machine is equipped with air conditioning and with a baffle plate in which no notch is provided for the dryer hose, carry out Steps 9 to 11 to avoid having to discharge the air conditioning system. For machines without air conditioning, carry out Steps 4 to 8.

STEP 4



CD00C004

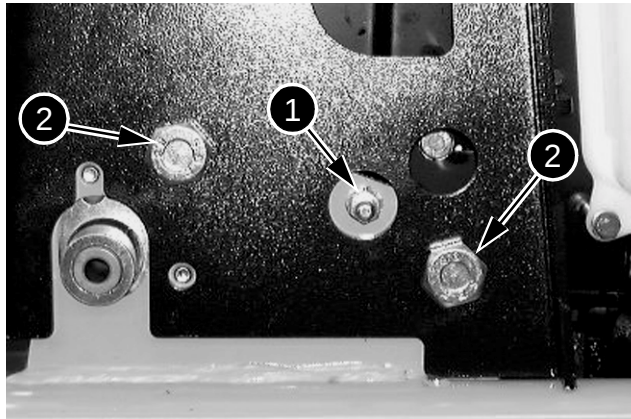
Loosen and remove the cap screws, flat washers, and if equipped, lock washers that fasten the baffle plate to the front of the machine.

STEP 5



CD00C005

Disconnect the hoses from the oil cooler. Plug the hoses.

STEP 6

CD00C006

Remove the studs (1). Remove the bolts (2) and nuts that fasten the radiator shroud to the frame.

STEP 7

Remove the radiator shroud, radiator, and oil cooler as an assembly.

STEP 8

Go to Step 23.

NOTE: Do steps 9 to 11 for machine with air conditioning and a baffle plate without a slot.

STEP 9

Remove all straps that hold the hose for the air conditioning system drier from the front of the machine back to the cab. It is important to have as much hose as possible at the front of the machine to do the next step.

STEP 10

Loosen and remove the cap screws, flat washers, and if equipped, lock washers that fasten the baffle plate to the front of the machine.

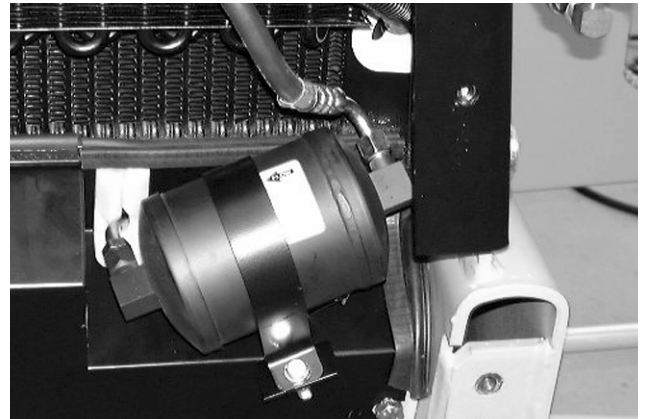
STEP 11

Move the baffle plate and drier for access to the hoses on the left side of the oil cooler.

STEP 12

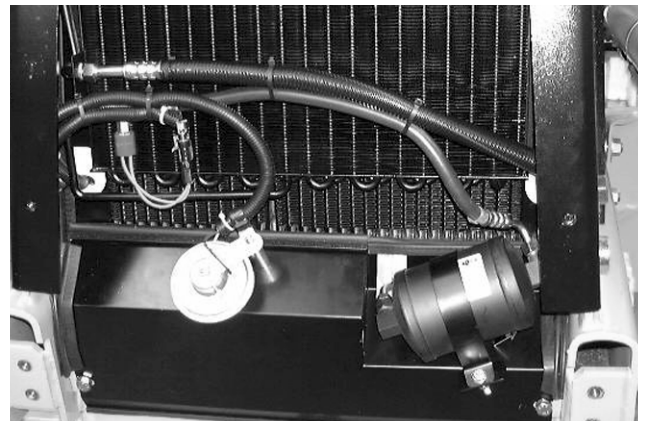
Go to Step 15.

NOTE: Do steps 13 and 14 for machines with air conditioning and a baffle plate with a slot.

STEP 13

CD00C007

Remove the self-locking nut and the clamp from the dryer.

STEP 14

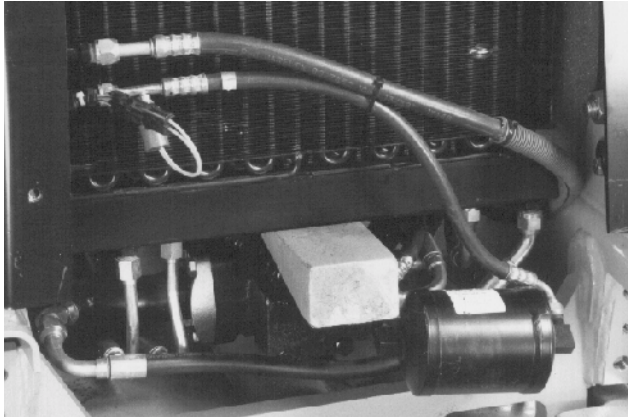
CD00C008

Remove the cap screws, flat washers, and if equipped, lock washers that fasten the baffle plate to the front of the machine. Remove the baffle plate from the dryer and from the machine.

NOTE: Do the remaining steps for all machines.

NOTE: The photo shown below does not correspond to this model of machine, but the procedure is the same.

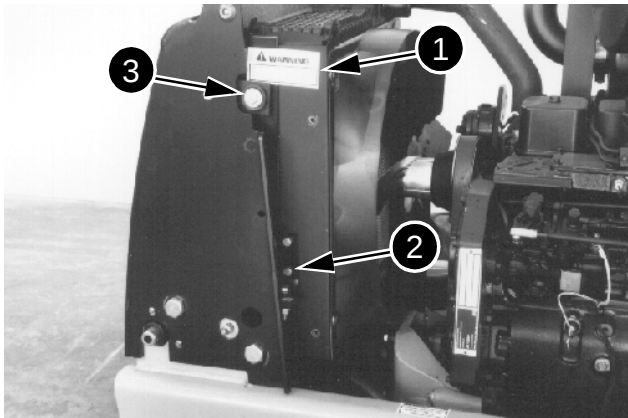
STEP 15



BP9503106

Put a block under the oil cooler to hold the radiator, oil cooler, and condenser in place when the radiator shroud is removed.

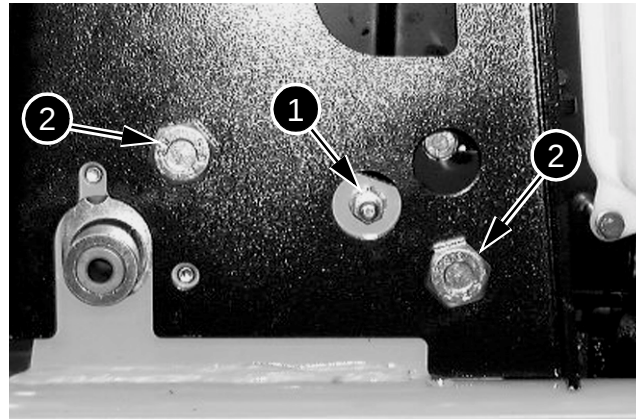
STEP 16



BP9502293

Remove the cap screws that fasten the lower brackets (2) to the radiator (1). Remove the hardware and the lower brackets (2) from the radiator shroud. Remove the cap screws and flat washers that fasten the upper brackets (3) to the radiator.

STEP 17



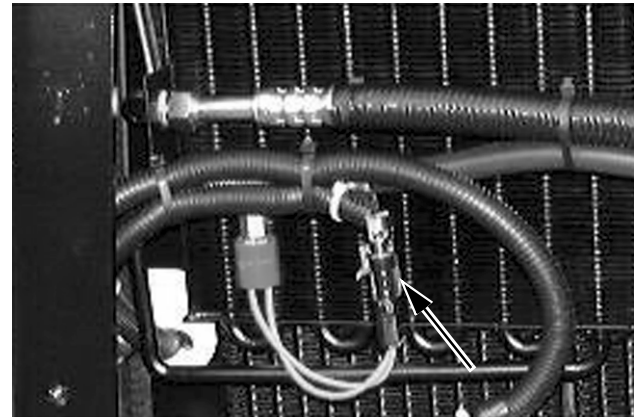
CD00C006

Remove the studs (1) from the frame. Remove the bolts and nuts (2) that fasten the radiator shroud to the frame.

STEP 18

Remove the radiator shroud from the radiator, oil cooler, and condenser.

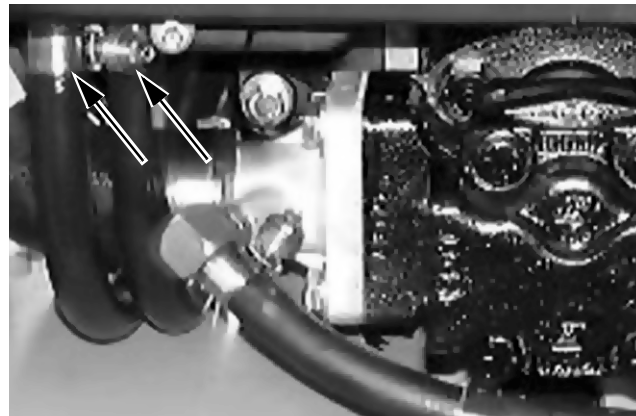
STEP 19



CD00C009

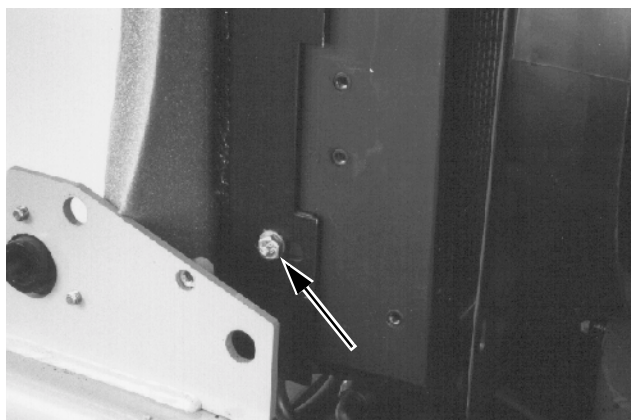
Disconnect the electrical connector for the drier.

STEP 20



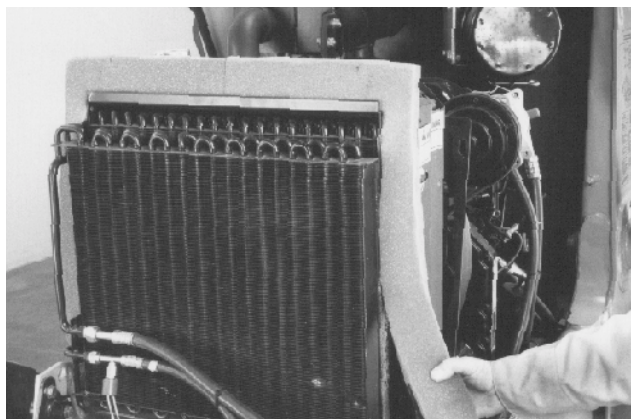
CD00C010

Disconnect the hoses on either side of the oil cooler. Plug the hoses.

STEP 21

BP9503107

Remove the cap screws and flat washers that fasten the condenser and oil cooler to the radiator.

STEP 22

BP9503110

Pull the foam baffle away from the condenser.

STEP 23

BP9503111

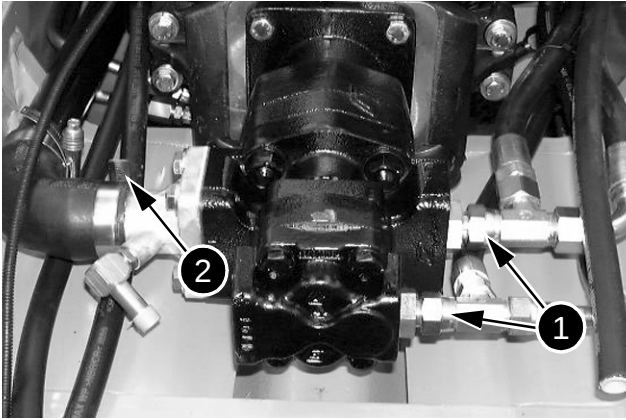
For machines with a slot in the baffle plate, move the condenser and drier assembly out of the way as shown. For machines without a slot in the baffle plate, have another person help to move the condenser, baffle plate, and drier assembly away from the radiator and oil cooler assembly. Fasten the assembly in position to the side.

STEP 24

BP9503112

Remove the radiator and oil cooler. Remove the fan shroud (1) from the fan.

STEP 25



CD00C011

Disconnect the hoses (1) from the LH side of the pump. Loosen the clamp (2) and disconnect the hose from the RH side of the pump.

NOTE: The photo shown below does not correspond to this model of machine, but the procedure is the same.

STEP 26

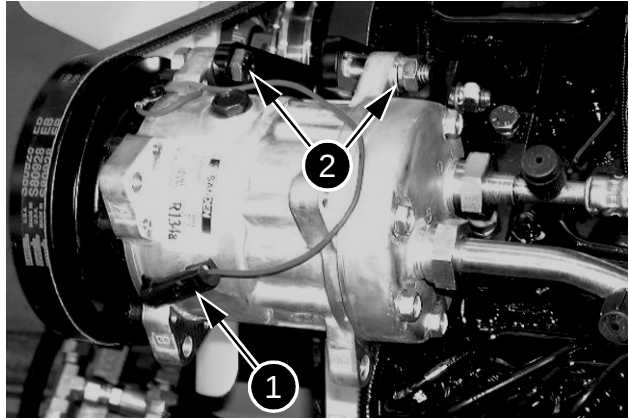


BP9502311

Loosen and remove the cap screws that fasten the pump to the pump mounting bracket.

NOTE: Do Steps 27 to 29 for machines with air conditioning.

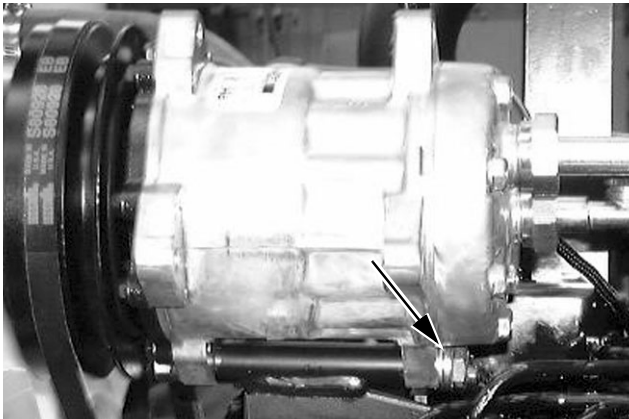
STEP 27



CD00C012

Disconnect the electrical connector (1). Remove the hardware (2) from the adjusting straps.

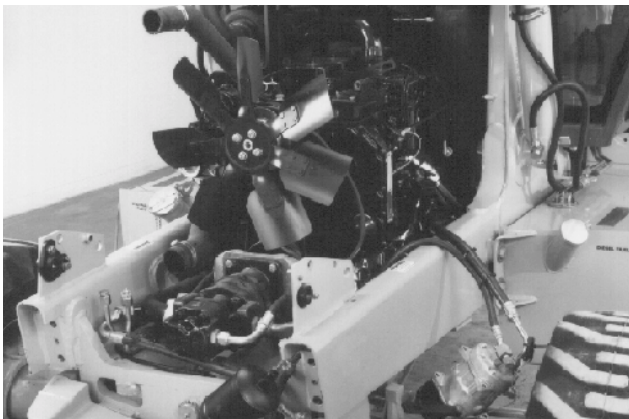
STEP 28



CD00C013

Remove the hardware that fastens the compressor to the bracket.

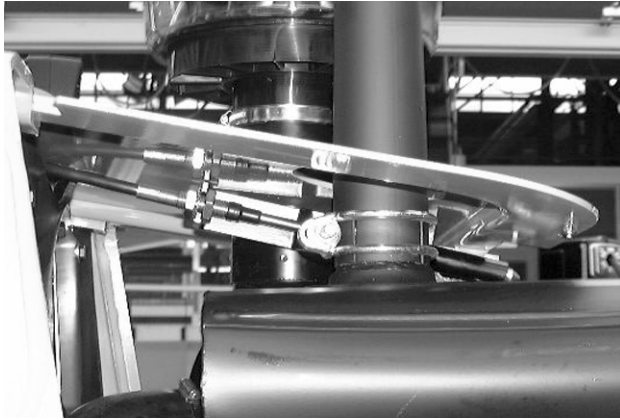
STEP 29



BP9503120

Remove the belt and place the compressor in the position shown in the photograph.

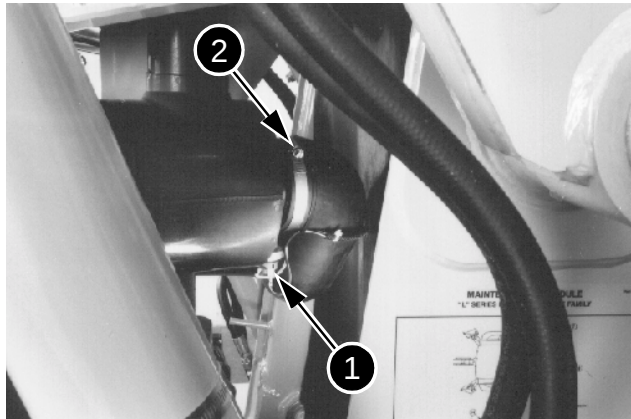
NOTE: During installation, adjust the drive belt according the instructions in Section 9003.

STEP 30

CD00C014

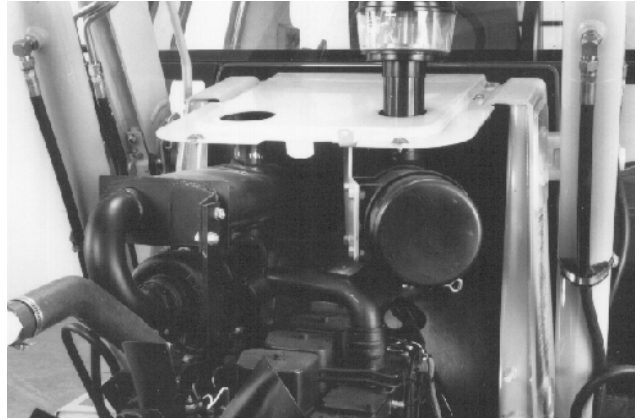
Loosen the clamp for the exhaust pipe at the muffler. Remove the exhaust pipe from the muffler.

NOTE: When installing, tighten the clamp to a torque of between 53 and 61 Nm.

STEP 31

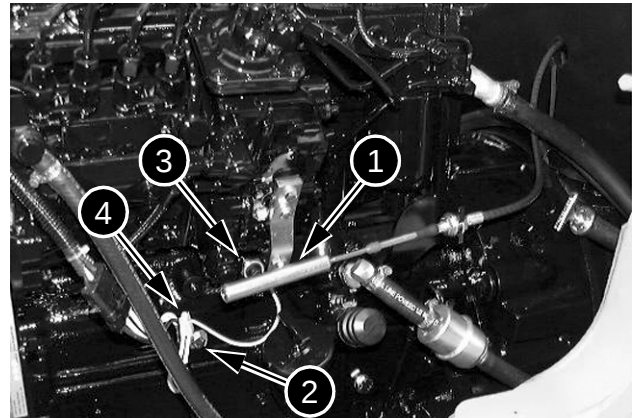
BP9502308

Remove the electrical connectors (1) from the air filter restriction warning lamp. Loosen the air filter hose clamp (2). Disconnect the air filter hose.

STEP 32

BP9502306

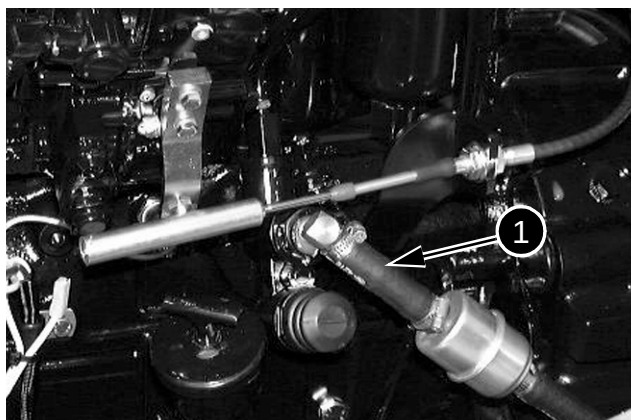
Remove the cap screws and flat washers that fasten the cover to uprights. Remove the cover and air cleaner as an assembly.

STEP 33

CD00C015

Remove the tie straps (1). Disconnect the wiring harness clamp (2). Disconnect the cable from the oil pressure sender (3). Disconnect the fuel stop cable (4).

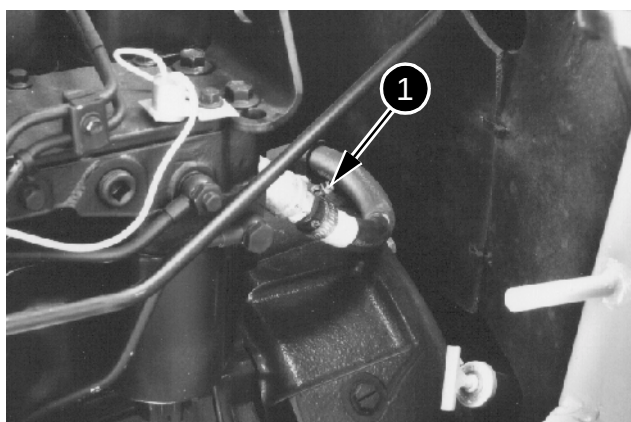
STEP 34



CD00C016

Disconnect the fuel pipe (1) and plug it.

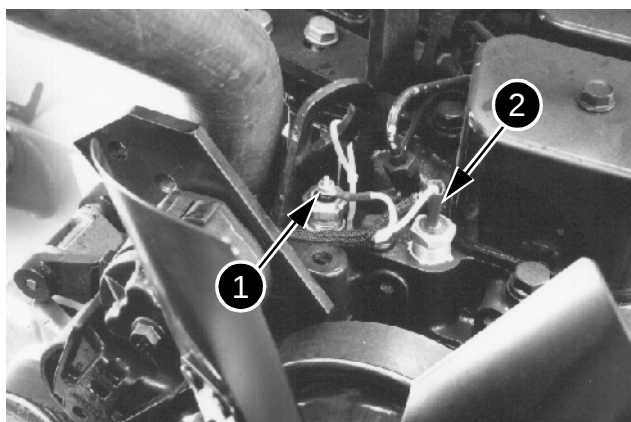
STEP 35



BP9502301

Disconnect and cap the heater hose (1).

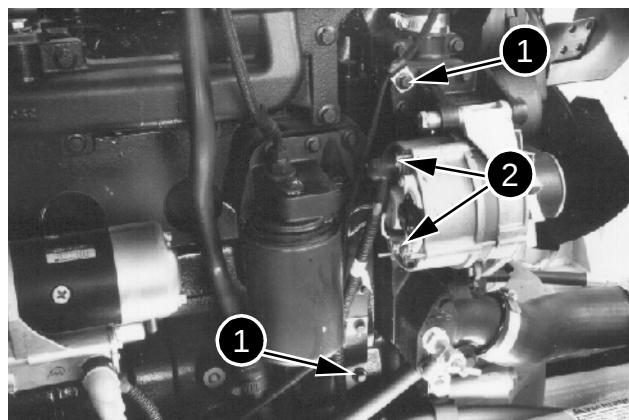
STEP 36



BP9502298

Disconnect the coolant temperature sender (1) and coolant temperature switch (2).

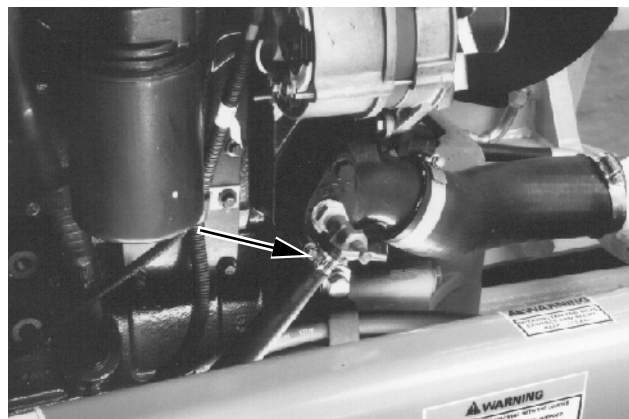
STEP 37



BP9502296

Remove the harness clamps (1). Disconnect the cables (2) from the alternator.

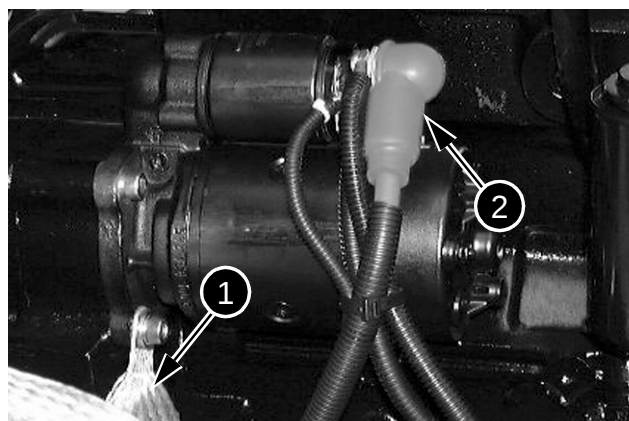
STEP 38



BP9502297

Loosen the clamp. Disconnect and plug the heater hose.

STEP 39

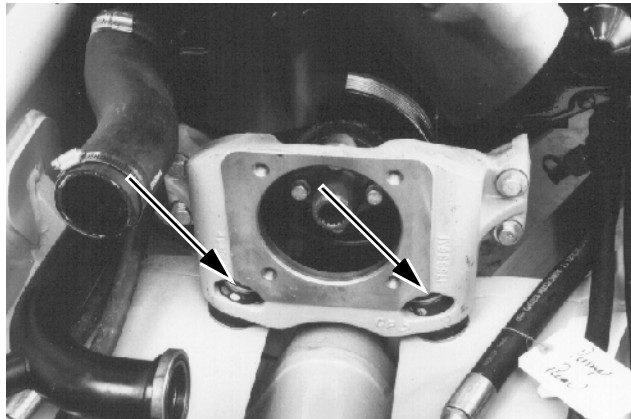


CD00C017

Disconnect the earth strap (1). Put identification tags on the starter cables (2). Disconnect the cables (2).

NOTE: The photo below does not correspond to this model of machine but the procedure is the same.

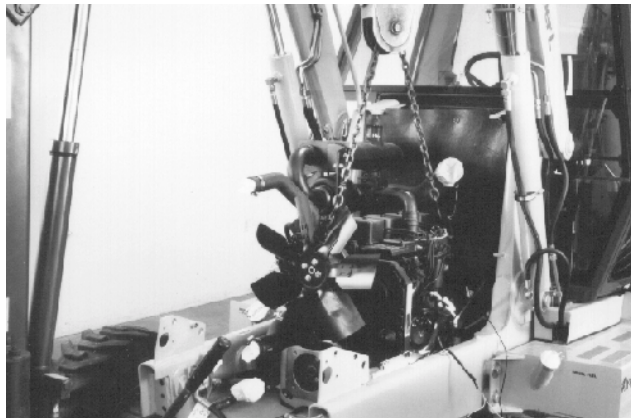
STEP 40



Remove the bolts, flat washers, and nuts from the front engine mount.

NOTE: When installing, tighten the self-locking nuts to a torque of between 41 and 47 Nm.

STEP 41



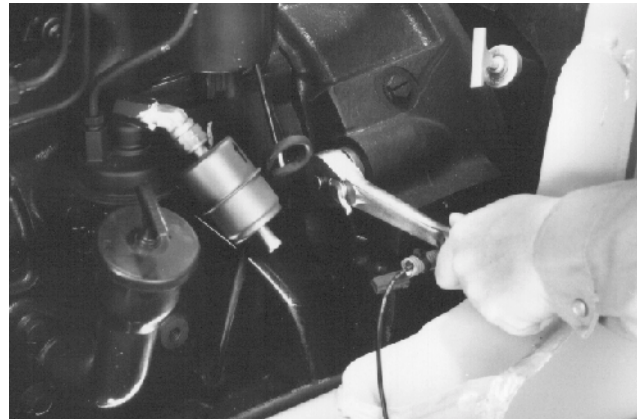
Connect lifting equipment to the lifting eyes on the engine to hold the engine in place.

NOTE: There are six cap screws with lock washers that fasten the torque converter to the flywheel. Rotate the engine to align each cap screw with the access hole in the flywheel housing at the left side of the engine.

STEP 42

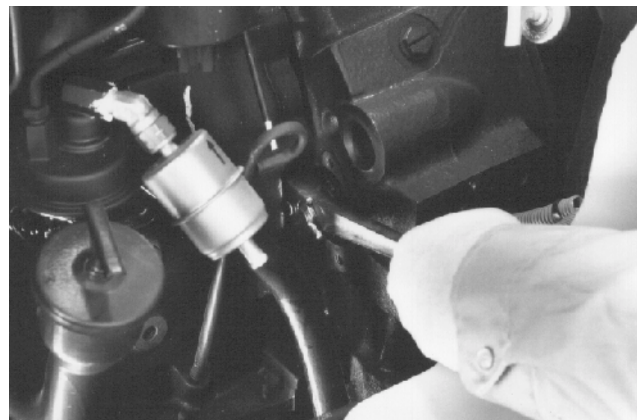
Remove the plastic plug from the flywheel housing. Remove the hose from the bracket and remove the cover and gasket from the access hole for the cap screws.

STEP 43



Install the CAS 1690 tool to turn the flywheel.

STEP 44



Loosen and remove all six cap screws and washers that fasten the torque converter to the flywheel.

NOTE: Be careful during installation when installing the cap screws and lock washers that fasten the torque converter to the flywheel. Tighten the screws to a torque of between 52 and 57 Nm.

STEP 45

Loosen and remove the 12 cap screws and flat washers that fasten the transmission to the engine. Move the heater hose and clamps out of the way.

STEP 46

Move the engine forward and raise the engine.
Remove the engine from the machine.

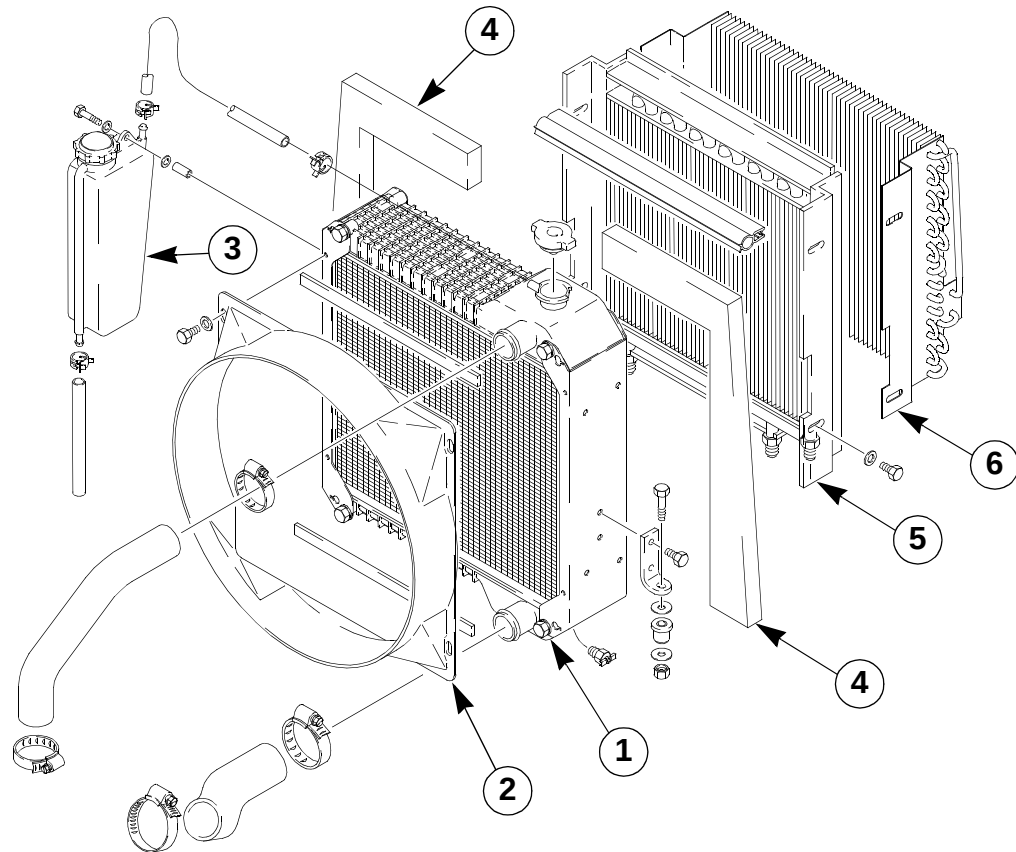
NOTE: *Installation of the engine is the reverse of removal. Before starting the engine, do the following:*

1. Fill the turbocharger with oil. Disconnect the fuel shut-off solenoid cable. Operate the starter motor for 1à to 20 seconds to fill the turbo-charger with oil. Connect the wire to the fuel shut-off solenoid.
2. It is essential that the hydraulic pump is filled with oil. Carry out the following procedure to fill the hydraulic pump with oil:
 - A. Make sure that the oil level in the reservoir is correct.
 - B. Remove the cap from the hydraulic reservoir.
 - C. Use a compressed air nozzle to pressurize the hydraulic reservoir. Wrap a cloth around the end of the hose at the nozzle.

NOTE: *34.5 kPa to 69.0 kPa is all that is required to move the oil. Pressure above 69.0 kPa can damage the hydraulic reservoir.*

- D. Have another person start and run the engine at low idle while the hydraulic reservoir is being pressurised.

RADIATOR INSTALLATION

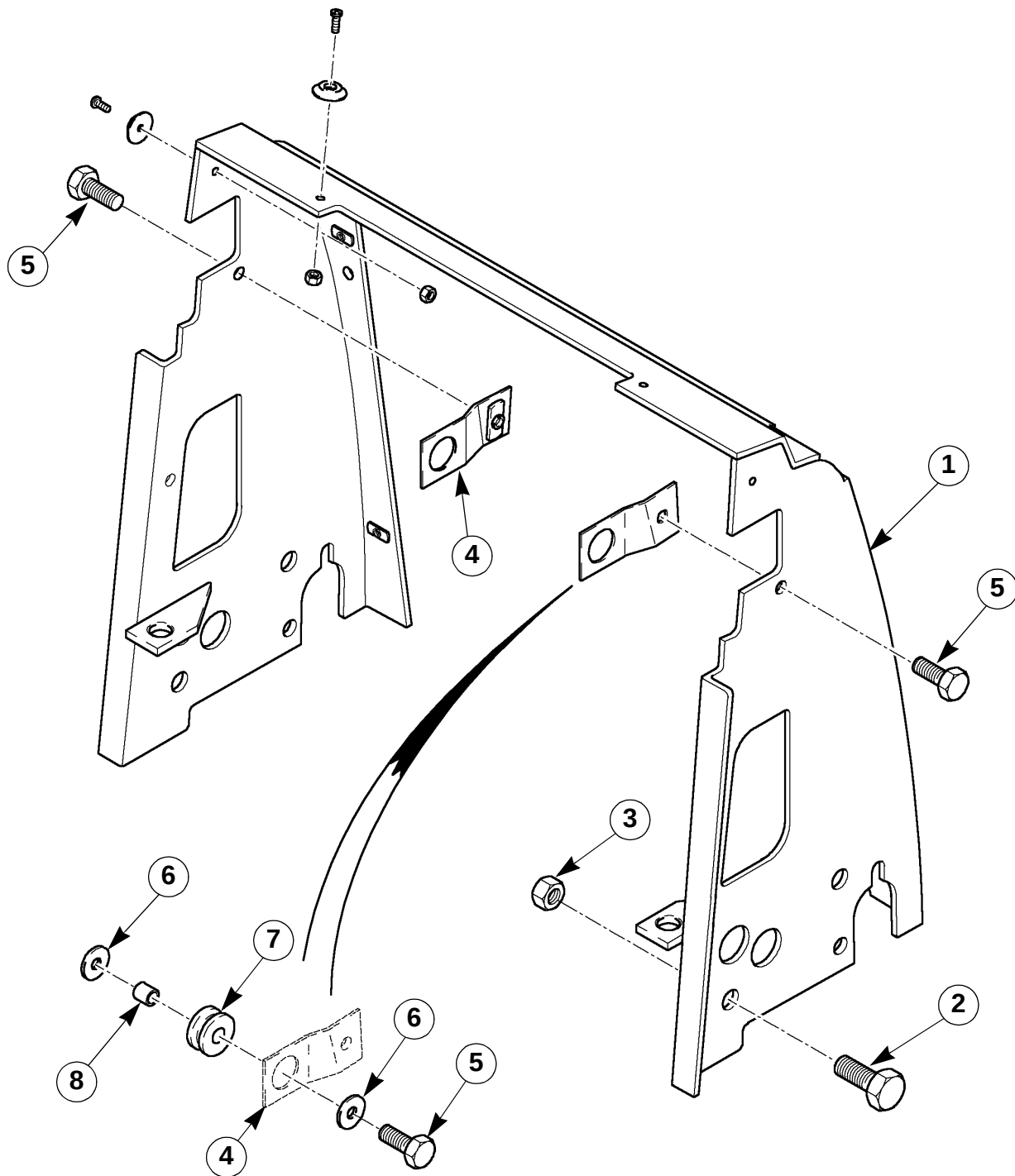


- 1 RADIATOR
- 2 FAN SHROUD
- 3 COOLANT RECOVERY RESERVOIR

- 4 SCREEN
- 5 OIL COOLER
- 6 AIR CONDITIONING CONDENSER

B9503081T

RADIATOR SHROUD

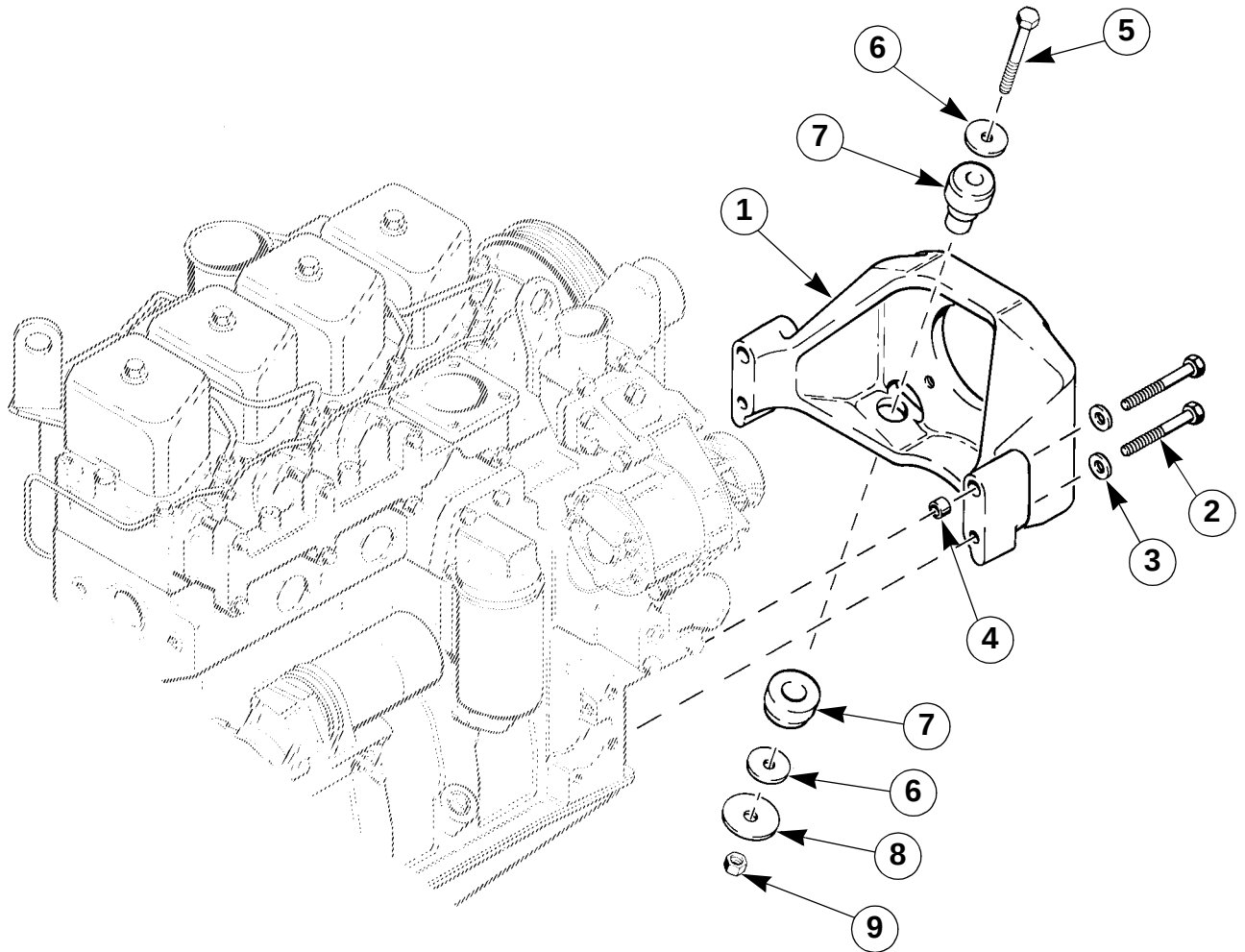


- 1 RADIATOR SHROUD
- 2 SCREWS RETAINING RADIATOR ON MACHINE UNDERCARRIAGE
- 3 NUT
- 4 BRACKET, RADIATOR SHROUD TO RADIATOR

- 5 SCREW
- 6 FLAT WASHER, SPECIAL
- 7 SHOCK ABSORBER
- 8 SPACER

C100C508

FRONT ENGINE MOUNT INSTALLATION



- 1 ENGINE MOUNT
- 2 CAP SCREW
- 3 HARDENED WASHER
- 4 SPACER
- 5 SCREW

- 6 HARDENED WASHER
- 7 GROMMET
- 8 HARDENED WASHER
- 9 SELF-LOCKING NUT

B9503083



Suggest:

If the above button click is invalid.

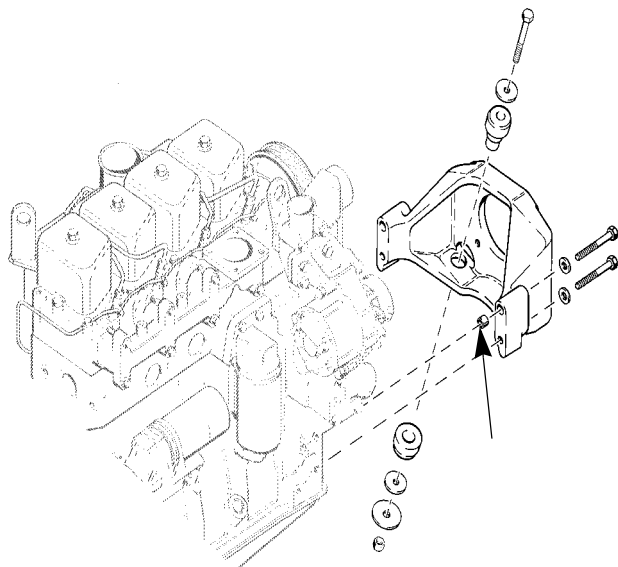
Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

INSTALLING THE ENGINE FRONT BRACKET

NOTE: If the front engine support was removed for any reason, the front engine support must be aligned with the crankshaft of the engine. If the front engine support is not aligned with the crankshaft of the engine, the pump can be damaged.

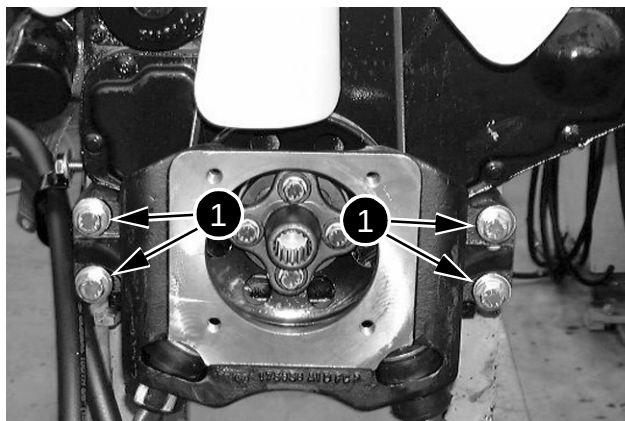
STEP 1



Install a spacer in each top hole in the front engine support. Install the front engine support with the hardware shown.

B9503083

STEP 2



CD00C018

When the front engine support is centred, tighten the screws (1) to a torque of between 89 and 107 Nm.

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