FIATAGRI

PRINT No. 603.54.276.01

F 100 – F 110 – F 120 – F 130 Turbo model tractors
Workshop Manual – First updating edition

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FIATGEOTECH S.p.A. – Viale delle Nazioni, 55 – MODENA
AFTER SALES SERVICE – Technical Publications & Tools

Print No. **603.54.276.01** – 12 – 1992 – 800

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ATTENTION

Pages superseding and replacing the corresponding ones with same number in the Basic Manual – Print No. 603.54.276.00:

- Section 00 – pages 3-4-5-6-7-8-9-10-11-12
- Section 18 – pages 9-10-13 14
- Section 21 – pages 9-10-25-26-33-34-47-48
- Section 23 – pages 11-12-15 16
- Section 25 – pages 25-26
- Section 27 – pages 3-4-13-14-15-16
- Section 31 – pages 3-4-7-8
- Section 33 – pages 1-2-7-8-15-16
- Section 35 – pages 13-14-21-22-31-32
- Section 41 – pages 1-2-3-4-5-6-9-10
- Section 55 – pages 7-8

Newly issued – pages

- Section 00 – pages 13-14
- Section 10 – pages 1 to 90
- Section 21 – pages 51-52-53-54
- Section 23 – pages 17-18
- Section 27 – pages 37-38
- Section 31 – pages 15-16-17-18
- Section 35 – pages 33 to 68
- Section 41 – pages 11 to 30
- Section 55 – pages 9 to 50

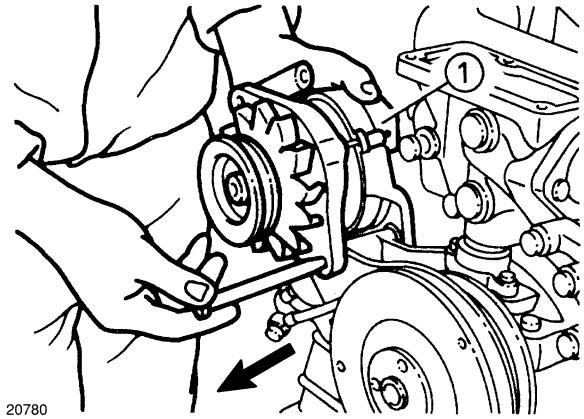
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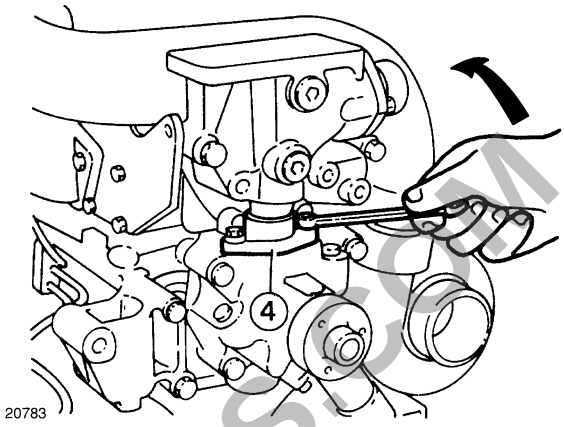
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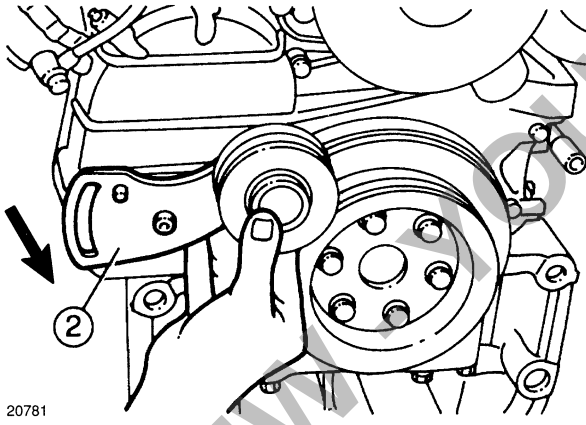
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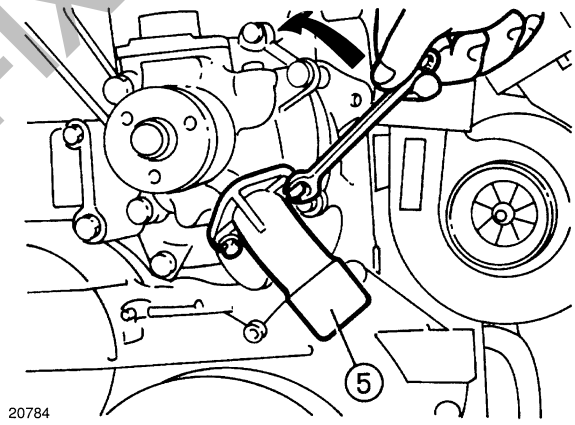
5. Back off the alternator mounting screws completely and then remove the alternator (1).



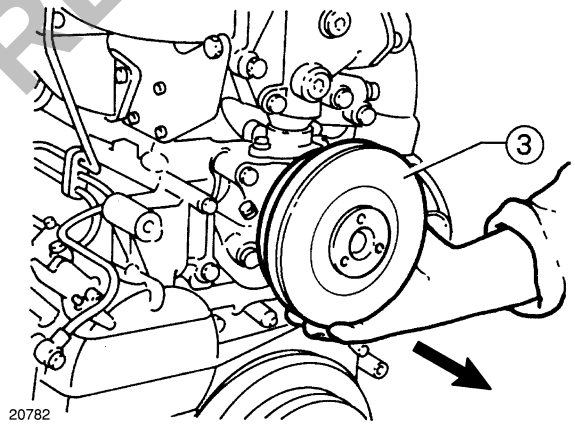
8. Unscrew the screws securing sleeve (4) connecting pump to thermostat.



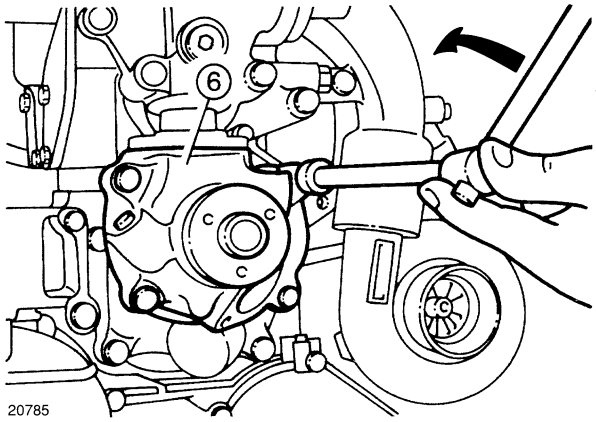
6. Back off the securing screws completely and then retrieve the belt stretcher (2).



9. Remove securing screws and then the connection (5).



7. Withdraw the fan pulley (3).



10. Remove the screws securing the water pump (6) and then the latter; should the pump be sticked use a plastic hammer to detach it.

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ENGINE CRANKSHAFT AND BEARING MAIN DATA

(cont.)

	F 100	F 110 F 120 F 130
Maximum permissible ovalization or taper on main and connecting rod bearing journals after grinding	0.01 mm (.0004 in)	
Maximum permissible ovalization or taper on main and connecting rod bearing journals consequent to wear	0.05 mm (.0020 in)	
Maximum permissible tolerance on alignment of main bearing journals and crankshaft with the latter supported on the two outer journals	0.10 mm (.0040 in)	
Maximum permissible tolerance on alignment of each pair of connecting rod pins with main bearing journals (in both directions)	0.25 mm (.0100 in)	
Tolleranza massima sulla distanza fra superficie esterna perni di biella ed asse albero motore	± 0.10 mm (.0040 in)	
Maximum permissible tolerance on perpendicularity of the flywheel mating flange plane with respect to the engine crankshaft longitudinal axis (measured with a comparator gauge applied frontally, A page 10–64, on a circumference with diameter 2 mm (.08 in) smaller than that of the flange); total comparator reading	0.025 mm (.0010 in)	
Maximum permissible tolerance on the co–axiality of the flywheel mounting seat (B, page 10–64) with respect to the crankshaft main bearing journals; total comparator reading	0.04 mm (.0016 in)	

CONNECTING ROD MAIN DATA

	F 100	F 110 F 120 F 130
Diameter, bearing seat on connecting rod small end	41.846 to 41.884 mm (1.6475 to 1.6490 in)	
Outside diameter, connecting rod small end bearing	41.979 to 42.017 mm (.6527 to 1.6542 in)	
Interference fit, bearing and connecting rod small end	0.095 to 0.171 mm (.0037 to .0067 in)	
Inside diameter, connecting rod small end bearing (after force fitting)	38.004 to 38.014 mm (1.4962 to 1.4966 in)	
Diameter, connecting rod half–bearing housing	67.407 to 67.422 mm (2.6538 to 2.6544 in)	
Tolerance on parallelism between the connecting rod big and small end center lines, checked at 125 mm (4.92 in)	± 0.07 mm (.003 in)	
Maximum permissible weight difference among connecting rods on same engine	25 g (.88 oz) 0.082 to 0.334 mm	

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	Page	Date
Windshield washer jet spray nozzle – Replacement	2	01–92
Rear window glass wiper motor – Removal – Installation	3	01–92
Rear window glass fluid line connecting check valve and jet spray – Replacement	3–4–5–6	01–92
Rear window glass jet spray nozzle – Replacement	7	01–92
Marelli starting motor – Main data	8–9	12–92
BOSCH starting motor – Main data	10–11	12–92
Battery charging system – Battery –Lighting – Signals – Accessories	12	12–92
Standard instrument panel	13	12–92
Instrument and check panel	14	12–92
Optoelectronic instrument panel	15	12–92
Control board	16	12–92
Fuses – Relays	17	12–92
Wiring diagram (standard version)	18–19	12–92
Wiring diagram (version w/ check panel)	20–21	12–92
Wiring diagram (version w/optoelectronics)	22–23	12–92
Wiring diagram (from connectors 21–23 to cab)	24	12–92
Wiring diagram (from connector 24 to front)	25	12–92
Wiring diagram (from connector 22 to centre/rear)	26	12–92
Wiring diagram (transmission w/HI–LO)	27–28	12–92
Wiring diagram (rear PTO w/ brake)	29–30–31	12–92
Wiring diagram (ground–speed PTO)	32–33	12–92
Wiring diagram (differential lock/4WD)	34–35–36–37–38	12–92
Wiring diagram (optional w/ trailer brake valve)	39–40–41	12–92
Wiring diagram (optoelectronic circuits)	42	12–92
Instrument panel rear view – Optoelectronic instrument calibration	43	12–92
Wiring diagram (electronic lift circuit)	44	12–92
HI–LO safety switch Replacement	45–46	12–92
Windshield wiper contact adjustment (on cab w/opening windshield)	46	12–92
Electrical system wiring harness and connectior chart	47	12–92
Check board wiring harness and connector chart	49	12–92

90 – BODY AND OPERATOR'S CAB

Paints	1	01–92
Cab windshield glass – Replacement	2–3–4	01–92
Cab door, RH or LH side – Removal – Installation	4–5	01–92
Door handle and lock, RH or LH side – Replacement	5	01–92
Cab door glass – Replacement with door removed	6	01–92
Cab door weatherstrip, RH or LH side – Replacement	7	01–92
Cab door alignment and closing – Adjustment	8	01–92
Cab rear side window glasses Replacement	9	01–92
Cab rear window glass – Replacement and adjustment	10–11–12	01–92
Rear window glass seal – Replacement	13	01–92
Lower rear window glass	13	01–92
Cab roof safety hatch – Removal – Installation	14	01–92
Side pillar trim – Replacement	15	01–92
Rear cab headliner – Replacement	16	01–92
Cab front left–hand side headliner Disassembly – Assembly	17–18–19	01–92
Cab front right–hand side headliner Disassembly – Assembly	19	01–92
Cab central headliner Disassembly – Assembly	20–21	01–92

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MODEL F130 Turbo – CALIBRATION DATA – BOSCH PUMP TYPE VE 6/11 F 1150 R 394 – 98405596

ASSEMBLY DATA

Pump timing: commencement of delivery 8° ± 1° before T.D.C. in cylinder no. 1 on compression stroke.
Pre–lifting of pumping element for timing the pump on engine: 1 mm (.039 in) from B.D.C. (w/ special tools **291754** – **291755**).
Pump delivery connection to cylinder No. 1: marked with letter A.

ASSEMBLY DIMENSIONS

SYMBOLS	K	KF	MS
mm (in)	3.30 (.130)	5.30 (.209)	1.10 (.043)

TEST CONDITIONS

Test machine complying with ISO 4008/1.../2 standards.
Injectors complying with ISO 7440–A61 standards – (1688901020 w/button 1680103096).
Injector pressure setting: 172 to 175 bar (175 to 178 kg/cm^2 – 2483 to 2492 psi).
Feed pressure: 0.35 bar (Kg/cm^2 – 5.0 psi).
Fuel lines: (ISO 4093.2): (1680750017) 6x2x840 mm
Graduated glass drain time: 30 sec.
Test fluid: ISO 4113 at 40° ± 2°C.

1. COMMENCEMENT OF DELIVERY

Pre–lifting of pumping element from B.D.C.: 0 ± 0.02 mm (.0008 in)	Pump rotation (drive end): clockwise	Firing order: 1–5–3–6–2–4

2. ADVANCE DEVICE STROKE

Rpm: 700	LDA pressure: 100 kPa	Advance stroke: 1.7 to 2.1 mm (.067 to .082 in)

3. FEED PUMP PRESSURE

Rpm: 700	LDA pressure: 100 kPa	Inside feed pressure: 4.0 to 4.6 bar

4. FULL–LOAD DELIVERY

Rpm: 1000	LDA pressure: 100 kPa	Delivery/1000 shots: 83.5 to 84.5 cm^3	Spread: cm^3 ≤ 3.0

5. FULL–LOAD DELIVERY

Rpm: 500	LDA pressure: 0 kPa	Delivery/1000 shots: 74.5 to 75.5 cm^3	Spread: – cm^3

6. GOVERNOR SPREAD CURVE AT IDLING

Rpm: 325	LDA pressure: kPa	Delivery/1000 shots: 16 to 20 cm^3	Spread: cm^3 ≤ 3.0

7. GOVERNOR SPREAD CURVE AT MAX SPEED

Rpm: 1260	LDA pressure: 100 kPa	Delivery/1000 shots: 37 to 43 cm^3	Spread: – cm^3

8. DELIVERY AT IDLING SPEED

Rpm: 100	Delivery/1000 shots: 90 to 120

9. TRANSFER PRESSURE

LDA pressure	kPa	100		
Rpm		700	550	1000
Inside feed pressure	bar	4.0 to 4.6	3.2 to 3.8	5.2 to 5.8

10. ADVANCE

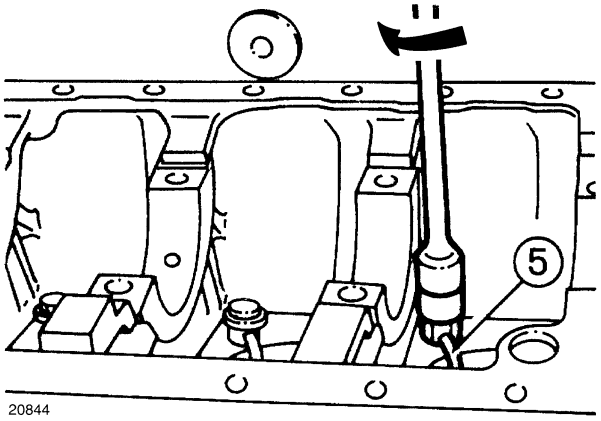
LDA pressure	kPa	100		
Rpm		700	550	1000
Advance stroke	mm	1.7 to 2.1	0.8 to 1.6	2.9 to 3.7

11. EXCESS FUEL BACK FLOW

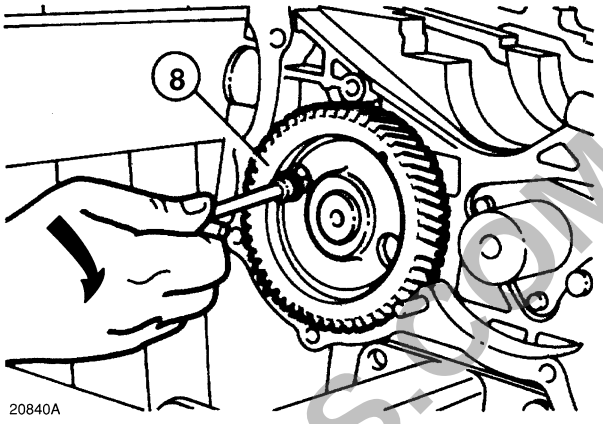
Rpm		500	1150
LDA pressure	kPa	0	100
Back leakage	cm^3	41 to 83 (26 to 98)	55 to 138 (40 to 153)

(follows)

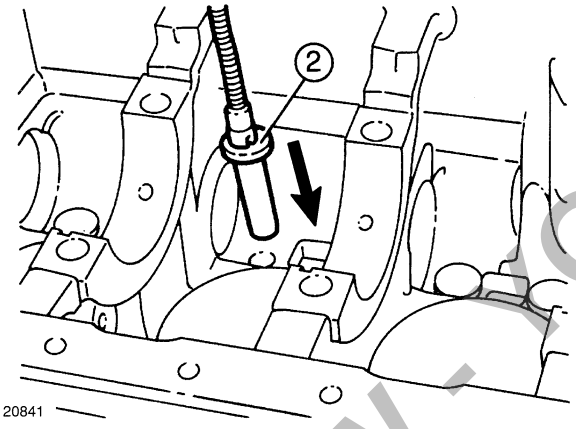
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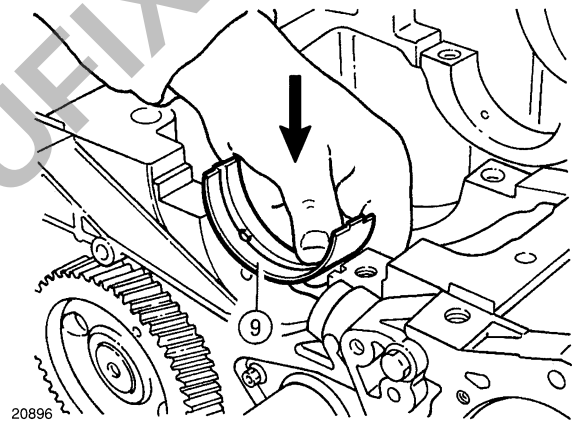
71. Fit the piston lube nozzle (5), torque tighten it to specifications (see on page 10–27) and finally bend the safety tab.



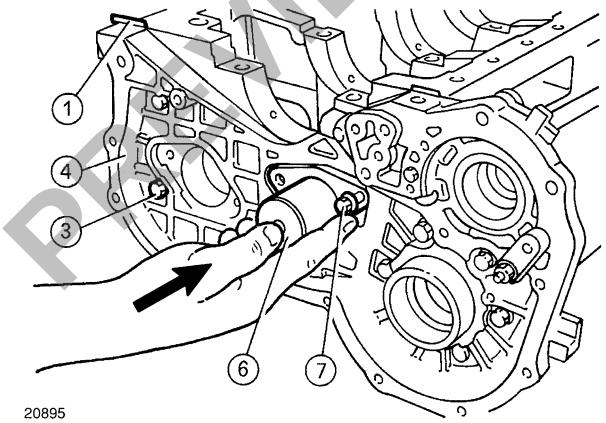
74. Lubricate and then introduce the valve timing gear camshaft and finally torque tighten its securing screws (8) to specifications (data on page 10–27).



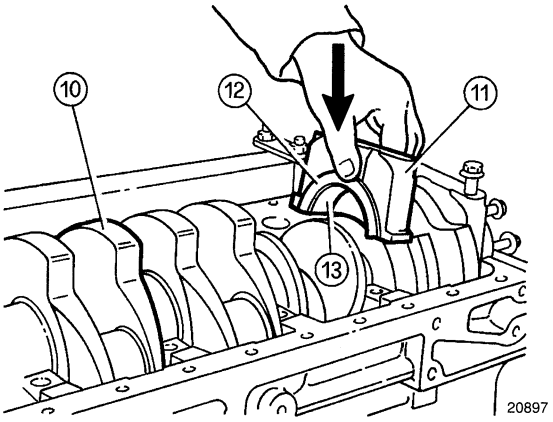
72. Lubricate valve tappets (2) using engine oil and then introduce them in their respective crankcase seats.



75. Place and position bearing shells (9) on crankcase.



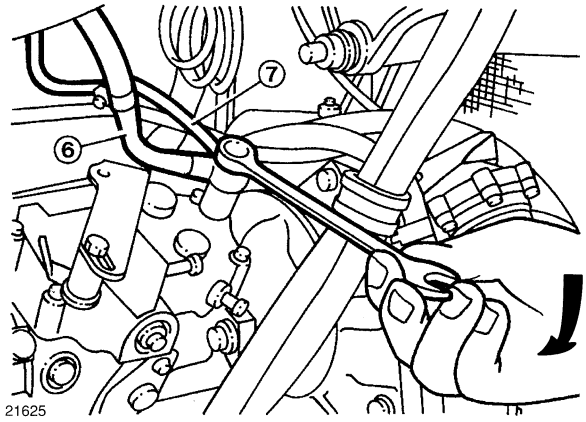
73. Place gasket (1) in contact with the crankcase mating surface, install the timing gear case (4), torque tighten the associated screws (3) to torque specifications (see data on page 10–27), introduce the intermediate pin (6) and finally tighten bolts to torque specifications also.



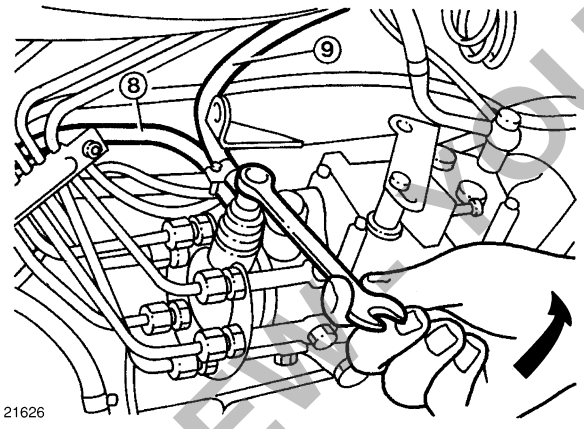
76. Install the engine crankshaft (10) complete with thrust half–rings, place main bearing caps (1) together with associated bearing shells (13) keeping in mind that thrust rings (12) are associated with and fitted on the sixth main bearing cap.

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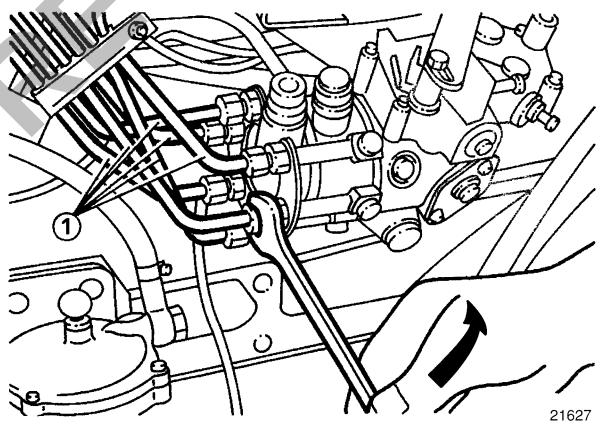
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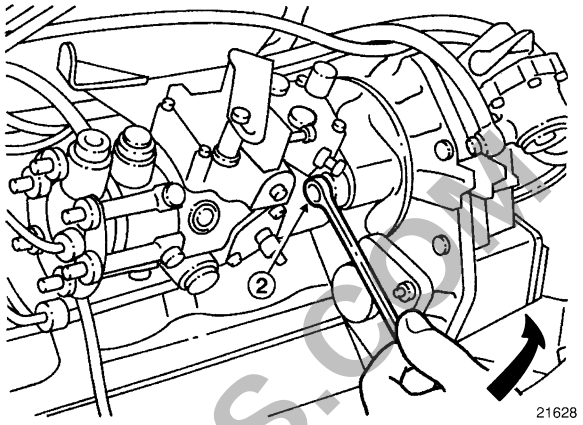
5. Remove the fuel return line (6) together with injector excess fuel recovery line (7).



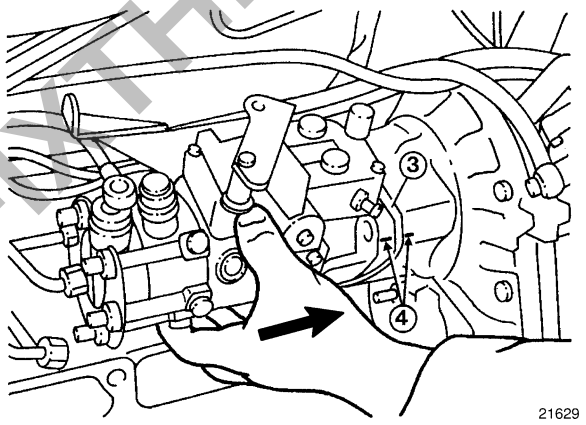
6. Remove fuel injection pump feed line (8) and thermostart feed line (9).



7. Remove hi–pressure lines (1) from pump and injectors.



8. Loosen attaching screws and withdraw pump.



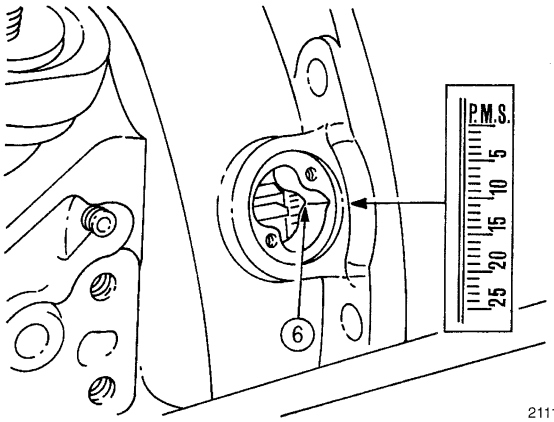
9. At pump re–installation, complete with gasket (3), proceed to align reference marks (4) and tighten attaching screws to torque specifications of page 10–27.

10. To install loose parts:

a. proceed reversing the removal sequence of operations, starting from no. 7 back to no. 2;

b. torque tighten to values specified on page 10–27.

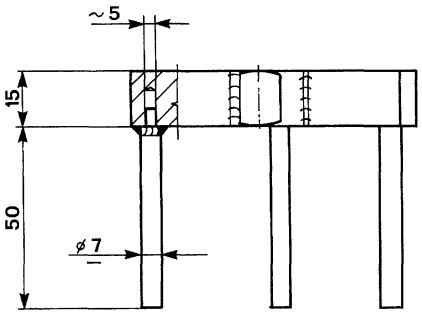
Lacking the reference marks, or should doubts arise as to their exactness, time the pump on the engine as follows:

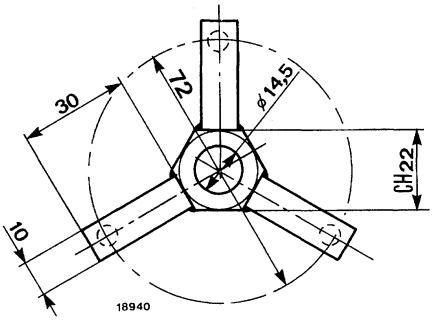


11. Turn flywheel to T.D.C. with valves on first cylinder closed.

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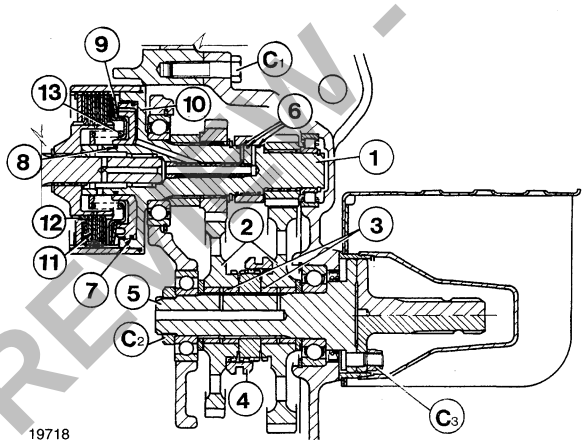
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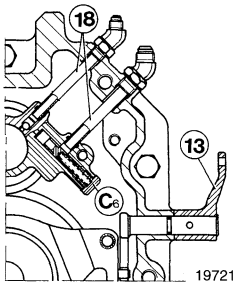


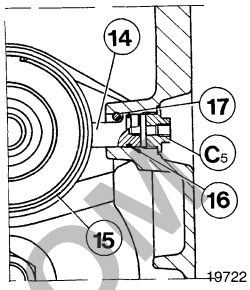
Special tool for the PTO clutch spring cup (stamp on tool the reference no. 50063)(Metric dimensions)

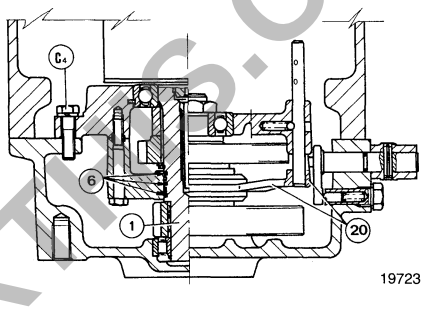
Material specification: Fe42C.

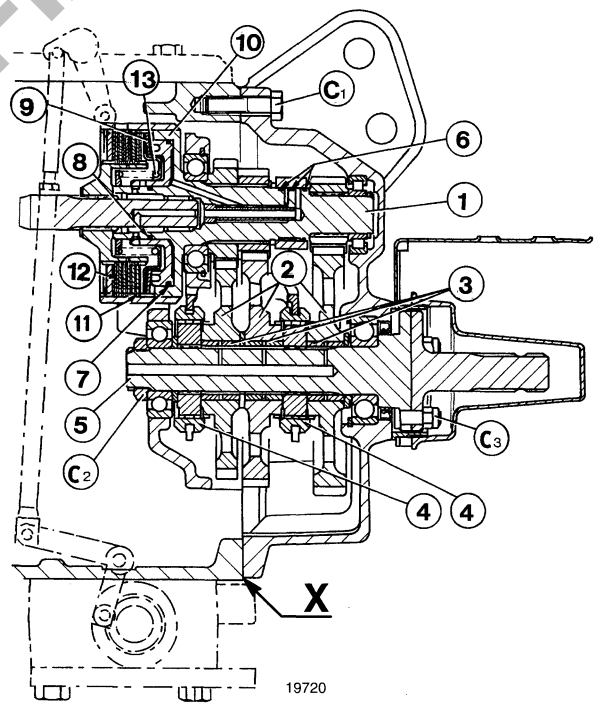


a









b

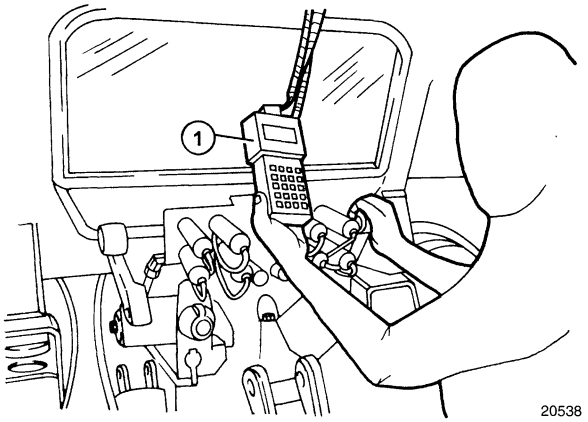
Sectional views of power take–off

a. Section through dual speed PTO (540–1000 rpm) – b. Section through 3–speed PTO (540–750–1000 rpm) – C_1. Capscrews, PTO case – C_2. Nut, PTO shaft – C_3. Self–locking nut, PTO splined extension shaft – C_4. Screws, bearing housing – C_5. Plug, PTO braking device connection – C_6. Cap, spring retainer – 1. Driving shaft – 2. Driven gears – 3. Driven gear bush bearings – 4. Engagement sleeves – 5. Driven shaft – 6. Permanent metal seals – 7 and 8. Oil seals – 9. Clutch engagement spring – 10. Actuating plunger – 11. Driven discs – 12. Driving discs – 13. Return spring – 14. Braking device – 15. Clutch case – 16. Oil seal – 17. Retaining split–pin – 18. Clutch control lines – 19. PTO speed selection control lever – 20. Speed selection control fork.

Note – At assembly apply sealing compound over surfaces **X** as reported on page 00–9.

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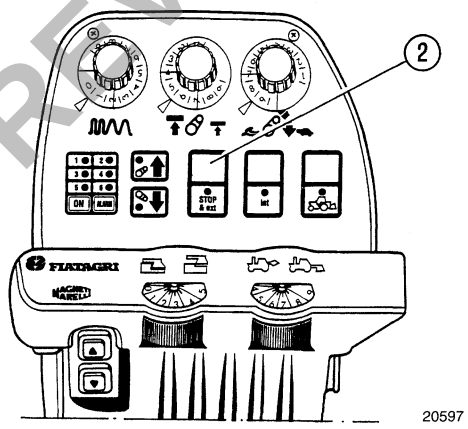


60. Manually, screw on **very slowly** the position sensor until on the display of the FIATGEOTECH TESTER **294009** (1) the reading associated with the delivery valve changes from OFF to ON. Unscrew the sensor still **very slowly** until the same ON reading on the display will change again back to OFF.

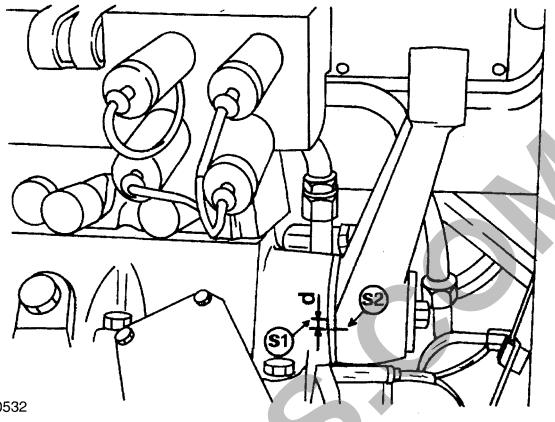
61. Using special wrench **50070** (see page 35–39), torque tighten the position sensor ring nut at about 20 Nm (2 kgm – 14.5 ft.lb).

62. Move lift arms up to stop and immediately after lower them down to stop making sure that none of the electronic control unit warning indicators is lighted.

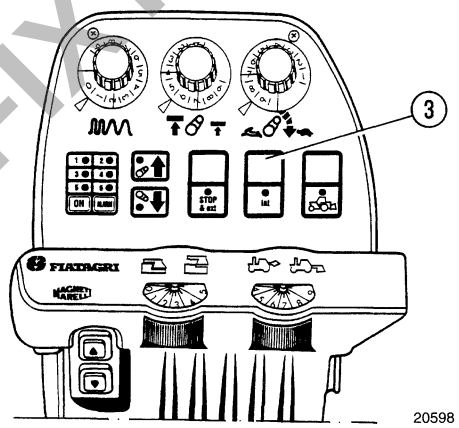
Checking functionality of the lifting arm upper stroke stop.



63. Once adjusted the upper stroke stop setting for the lift arms, press on push–button control (2) to activate external controls.

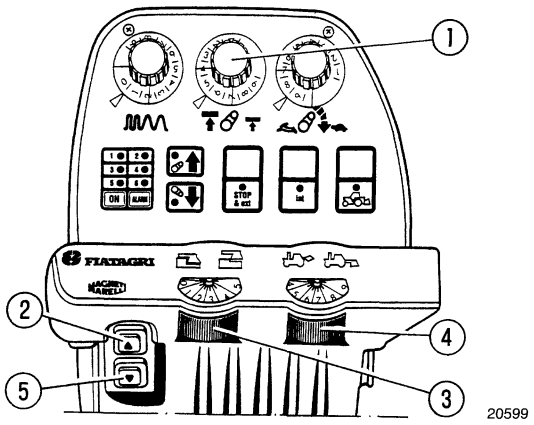


64. Raise lift arms up until the distance (d) between reference marks (S_1 and S_2) = 1 mm (.04 in).



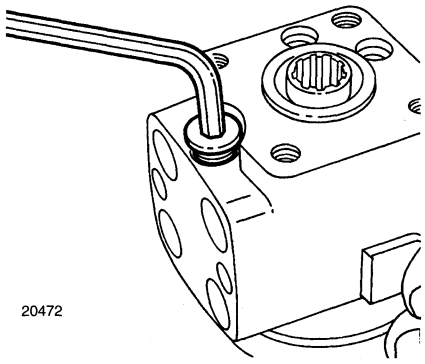
65. Verify if the control unit has again selected internal controls, in the positive case the indicator (3) lights up.

Checks with engine started

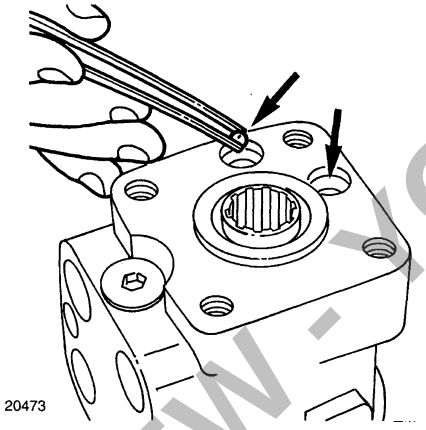


66. Turn the upper arm stop control knob (1) on 0, press the arms raising push–button control (2) and verify that arms raising travel occurs regularly and over the full length of stroke.

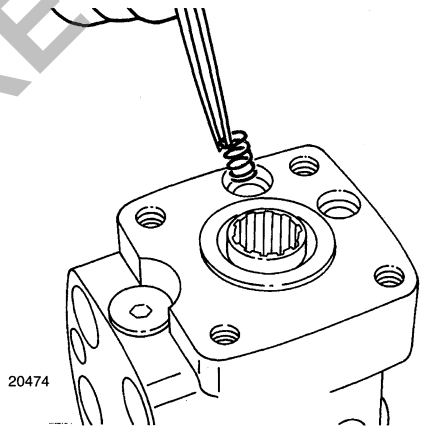
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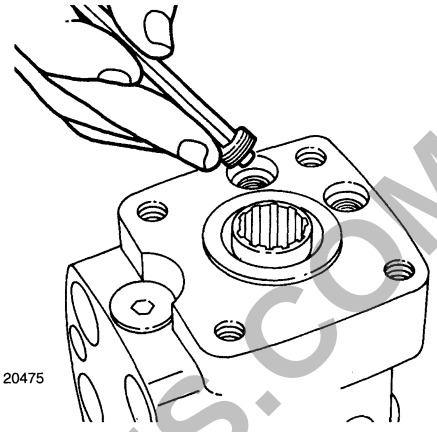
59. Screw on the plug complete with associated seal using a 8 mm Allen wrench and, after pressure setting on bench or on tractor, torque tighten at 40 to 60 Nm (4.1 to 6.1 Kgm or 30 to 44 ft.lb)



60. Introduce the two balls inside their cylinder safety valve seats shown by the arrows (see parts detail on page 13).

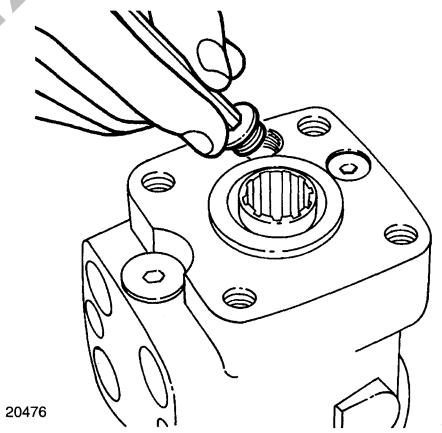


61. Introduce spring guides and springs into their cylinder safety valve seats.

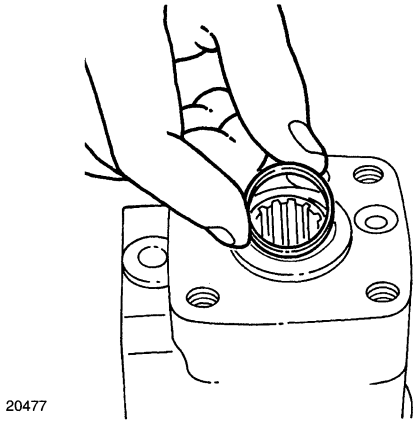


62. Screw on the two cylinder safety valve pressure setting screws using a 6 mm Allen wrench.

Note: pressure setting will be subsequently carried on bench or on tractor in accordance with the values given in the data chart of page 41–1.



63. Screw on the two plugs and associated oil seals using a 6 mm Allen wrench, perform pressure setting, torque tighten at 30 Nm (3 Kgm or 21 ft.lb).



64. After completion of assembly, fit the dust shield ring on control valve body.

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