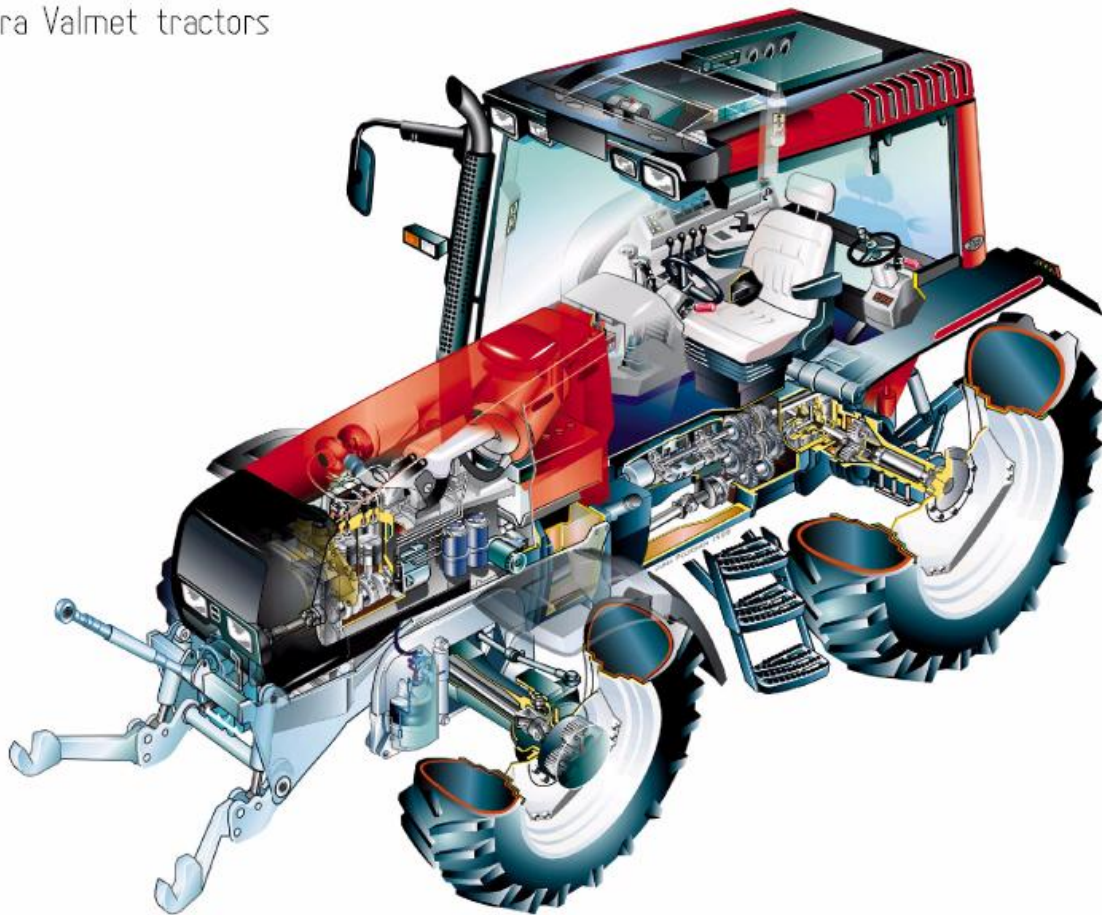


VALTRA – VALMET MEGA MEZZO HI-TEC

Valtra Valmet tractors



WORKSHOP MANUAL

Virtakonele Elykonele
Stromläraie Air lpu fram
K3 K4

10 General

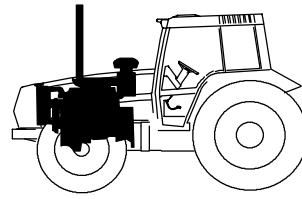
VALTRA

6000, 6100, 6200
6250, 6300, 6350
6400, 6550, 6600
6650, 6800, 6850
6900, 8000, 8100
8200, 8400, 8050
8150, 8450, 8550
8750, 8950
6600E – 8750E

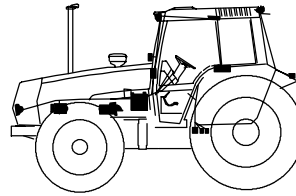
Service Manual Tractors

Groups 10–100

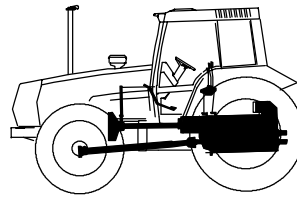
Valtra Inc.
44200 Suolahti, Finland



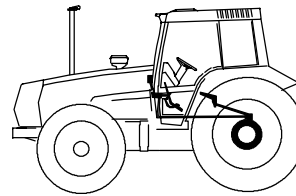
20 Engine



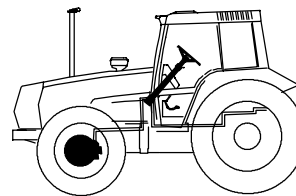
30 Electrical system



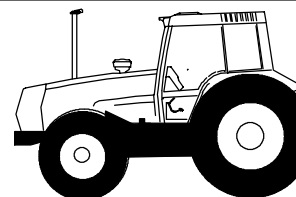
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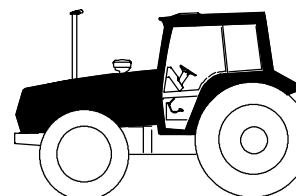
50 Brake system



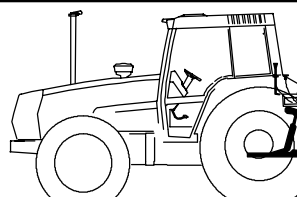
60 Steering system and Front axle



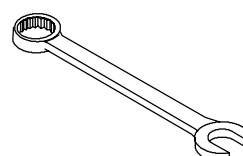
70 Frame and Wheels



80 Cab and Shields



90 Hydraulics



100 Tools

10. General

11. Layout

12. Repairs

13. Maintenance

To the reader

The Service Manual for the Valmet tractors is intended to be a practical reference source to be used in workshop. The repair instructions in the manual are based on methods which have been worked out in practice during normal workshop conditions and which are based on the use of special tools from the manufacturer when stated in the instructions. The manual also contains descriptions of the design and function of the components.

Detailed maintenance instructions can be found in Operator's Manual.

The Service Manual will be continually updated with new revised pages which should be inserted in the manual. Alterations and additions will first appear as service bulletins.

Only genuine Valmet spare parts should be used to ensure the best possible function of the machine. Certain operations should be carried out with the aid of special tools designed by Valmet.

**Valmet Tractors Inc.
Tractor Service**

11. General	1. 8. 2000	Model	Code	Page
	1. 9. 2002	6000–8950	110	0

The following supplements have been published for the Valmet 6000–8950 Service Manual:

Ordering number	Date	Notes
39 256 211	15. 6. 1992	
39 256 212	1. 9. 1992	
39 256 213	15. 5. 1993	
39 256 214	1. 1. 1994	
39 256 215	1. 1. 1995	
39 256 216	15. 4. 1995	
39 256 217	15. 5. 1996	
39 256 218	1. 4. 1997	
39 256 219	1. 8. 1998	
39 260 211	1. 11. 1998	
39 260 212	1. 6. 1999	
39 260 213	1. 10. 1999	
39 260 214	1. 8. 2000	
39 260 215	1. 9. 2002	

Supplement no. 39 256 211 (15. 6. 1992)

Includes:

- Autocontrol III
- air conditioning
- tractor 8000
- amendments

- Hi Shift
- amendments
- the latest fitting instructions of optional equipment

Supplement no. 39 256 212 (1. 9. 1992)

Includes:

- 20–series engines
- amendments

Supplement no. 39 256 219 (1. 8. 1998)

Includes:

- FieldMaster
- pressure air brakes for trailer (optional)
- latest fitting instructions for optional equipment
- amendments
- new folder, new index leaves (10–30 and 40–100) and new spine labels.

Supplement no. 39 256 213 (15. 5. 1993)

Includes:

- Delta Powershift
- tractor 8400
- amendments
- the latest fitting instructions of optional equipment

Supplement no. 39 260 211 (1. 11. 1998)

Includes:

- HiTech reverse shuttle
- Autocontrol V
- New 50–series models
- Front axle air suspension
- E–engines
- Amendments

Supplement no. 39 256 214 (1. 1. 1994)

Includes:

- tractors 6000 and 8200
- Autocontrol II
- Autocontrol IV
- Sige–axle differential lock
- industrial front axle
- latest air conditioning
- amendments

Supplement no. 39 260 212 (1. 6. 1999)

Includes:

- Autocontrol 2.2
- amendments (e.g. for AC V)
- fitting instructions for optional equipment

Supplement no. 39 256 215 (1. 1. 1995)

Includes:

- amendments
- the latest fitting instructions of optional equipment

Supplement no. 39 260 213 (1. 10. 1999)

Includes:

- Carraro 20.29 front axle
- amendments (e.g. version 42 of AC V)

Supplement no. 39 256 216 (15. 4. 1995)

Includes:

- engine intake air system and cooling system, modifications
- Autocontrol 2.1
- Agrodatta–instrument
- hydraulic type clutch release mechanism
- DPS, modifications

Supplement no. 39 260 214 (1. 8. 2000)

Includes:

- HiTech gen. 2, AC–5.2
- front PTO on 6250H–6850Hi tractors
- modified lubricating oil pump for 6–cyl. engines
- new rear axle housing for transmissions 650/550
- amendments
- updated fitting instructions for optional equipment

Supplement no. 39 256 217 (15. 5. 1996)

Includes:

- tractor 6800
- tractors 8050–8750
- amendments

Supplement no. 39 260 215 (1. 9. 2002)

Includes:

- transmission and final drives 700
- Agroline–instrument
- technical modifications

Supplement no. 39 256 218 (1. 4. 1997)

Includes:

- tractors 6200 and 8000R
- front PTO
- CareTel

11. Layout	X	Model	Code	Page
	8. 11. 1990	6000–8750	110	1

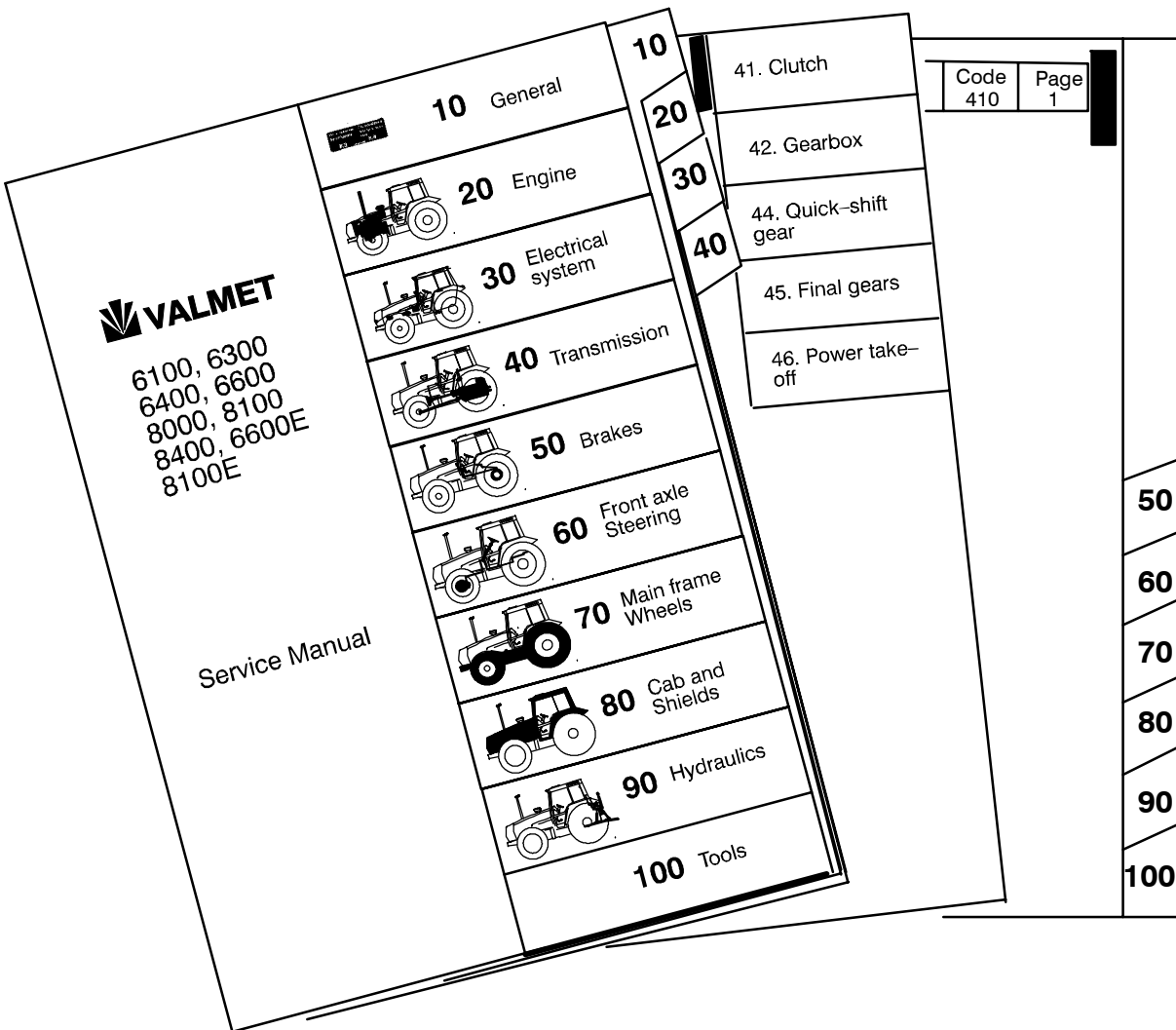
Layout of Service Manual

1. Division into groups

The manual is divided into groups (10– 100) which are based on the make – up of the tractor. The groups are listed on the first index leaf.

- Example. 10. General
 20. Engine, fuel and cooling systems
 30. Electrical system
 40. Power transmission
 a.s.o.

The number designation for each group is given in the top left box of the respective pages (and the first figure in the code designation)



2. Division into components or sub-groups

Each group is further divided into components or sub-groups. The number and the name of each component is given in the top left box on each page (and comprise the two first figures in the code designation).

- Example. 41. Clutch
 42. Gearbox
 44. Quick-shift gear
 45. Final drives etc.

11. Layout	8. 11. 1990	Model	Code	Page
	8. 11. 1990	6000–8750	110	2

3. Code designation


Three–digit code designations are used to distinguish the different document groups for the respective components. The same code is also used in the Time List as a reference to the text in this Manual. The code designation numbers appear both in the box at the top of the page and also in the headings.

Example: Code 410:

- Group: Power transmission (4)
- Component: Clutch (41)
- Document group: General (410)

4. Page numbers

The instructions for all components are numbered in consecutive order in the right–hand box at the top of the page. The page numbers begin with page 1 for each component.

				
41. Clutch	8. 11. 1990	Model	Code	Page
	15. 5. 1993	6100–8400	410	1

5. Date

At the top of each page there are two boxes for dates. In the case of a revised issue, the date of the earlier issue is printed in the crossed–over box and the date of the current issue is printed in the "real" date box.

6. Model

At the top of each page the tractor model for which the page is valid is indicated.

7. Additions and amendments of the service manual

New and up–dated pages will be continually added to the service manual. The new pages should be inserted as indicated by the code: the first digit (also the first digit on the index leaf) indicated the group:

- the two first digits indicate the component or sub–group
- the third digit indicates the document group for the respective components
- the page number indicates the definite position of the page within the service manual

If there are two pages with the same code and page number the page with the later date in the date box (and the old date in the crossed–over box) is valid (or the current page).

N.B. Fitting instructions for extra equipment are inserted into the service manual at the end of group concerned (E.g. code 39 is inserted at the end of group 30).

11. Layout	8. 11. 1990	Model	Code	Page
	1. 4. 1997	6000–8750	110	3

Code designation in the Service Manual

10. General

- 110 Layout
- 120 Repairs
- 130 Maintenance

20 Engine

21. Engine

- 210 Technical data, tools, description
- 211 Cylinder block and flywheel housing
- 212 Cylinder head and valve mechanism
- 213 Crank mechanism
- 214 Timing gears
- 215 Lubrication system and oil sump
- 216 Induction and exhaust system, turbocharger
- 219 Removing and fitting engine

22. Fuel system

- 220 Technical data, tools, description
- 222 Fuel feed pump and fuel filters
- 223 Injection pump and injectors

23. Cooling system

- 230 Technical data, tools, description
- 231 Thermostat and coolant pump

30. Electrical system

- 310 Specifications, wiring diagrams
- 311 Autocontrol II
- 312 Autocontrol 2.1
- 313 Sigma–power
- 320 AC power lift
- 321 ACD power lift
- 330 Agrodata
- 331 AD–instrument
- 340 Autocontrol–III
- 350 Autocontrol IV
- 360 CareTel

40. Power transmission

41. Clutch

- 410 Technical data, tools, description
- 411 Clutch assembly and pedal rods
- 412 Hydraulic coupling

42. Gearbox

- 420 Technical data, tools, description
- 421 Selector forks
- 422 Gear shift levers
- 423 Shafts and gear wheels
- 424 Differential

44. Quick–shift gear, DPS, reverse shuttle, 4WD clutch

- 440A Quick–shift gear, technical data, tools, description
- 440B Reverse shuttle, technical data, tools, description
- 440C 4WD clutch, technical data, tools, description
- 441 Quick–shift gear, repair instructions
- 442 Reverse shuttle, repair instructions
- 443 4WD clutch, repair instructions
- 444 DPS, repair instructions

45. Final drives

- 450 Technical data, tools, description
- 451 Final drives, repair instructions

46 Power take–off

- 460 Technical data, tools, description
- 461 Power take–off, repair instructions
- 463 Front PTO, repair instructions

11. Layout	8. 11. 1990	Model	Code	Page
	1. 4. 1997	6000–8750	110	4

50. Brakes

- 510 Technical data, description
- 511. Service brakes
- 520 Parking brake

60. Steering system and front axle**61. Steering system**

- 610 Technical data, tools, description
- 611 Steering valve
- 612 Priority valve
- 613 Steering cylinder
- 614 Adjustment

64. Powered front axle

- 640 Technical data, tools, description
- 641 Front axle housing and front axle suspension
- 643 Hubs
- 644 Differential
- 645 Industrial front axle

70 Frame and wheels

- 710 Tractor frame
- 720 Tyres and wheel discs

80 Cab and shields

- 810 Cab
- 820 Shields
- 830 Air conditioner

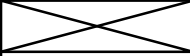
90 Hydraulics

- 910 Technical data, tools, description
- 911 Pump and pipes
- 912 Working hydraulics
- 913 Three–point linkage, towing hook
- 920 AC power lift

100. Special tools

- 101 Special tools (ETV)
- 102 Locally manufactured tools

Note! Separate fitting instructions for the optional equipments are inserted into the Service Manual. These instructions are positioned to the end of each main group. E.g. code 39 are placed to the end of group 30.

12. Repairs		Model	Code	Page
	8. 11. 1990	6000–8750	120	1

General instructions for repairs

Outer oil seals

The Service Manual contains instructions for changing all outer oil seals, (e.g. oil seals on the PTO shaft end, on the output shaft to the front wheel drive and on the pinion shaft on the powered front axle, and so on).

Sealing compound and glue

If sealing compounds or glue are required for the repair work, the instructions will specify a sealing compound or glue which is readily available through specialist dealers. Some seals should be greased before fitting and the space between the lips of the seal should be filled with universal grease. If the seal is to be pushed over splines or sharp edges the seal should be protected with for example a thin plastic foil.

Tightening torques and setting values

All necessary tightening torques and setting values for each repair operation are given at the beginning of each repair section under the heading Technical Data. The most important values can also be found in the repair instructions.

Table 1 later gives the tightening torques in order of dimension, quality and surface treatment. The values given in the table should be used if the tightening torque is not given in the repair instructions.

Safety

Always bear safety in mind when repairing or servicing the tractor. Use tools and lifting devices in the correct way. When you are removing tractor components or splitting the tractor, every tractor part must be supported in such a way, that no risk of accident exists. Avoid working under the supported tractor part if it is not absolutely necessary. When supporting the tractor the centre of gravity of the frame part must always be checked. For instance the wedges must always be fitted between front axle and engine to prevent axle oscillation when splitting the front frame of the tractor.

Trouble–shooting

The following procedure, combined with the information contained in the workshop manual will be helpful in tracing faults accurately. It consists of following a number of logical steps to locate and correct the problem:

- a) Determine the problem
- b) List possible causes
- c) Differentiate the causes
- d) Conduct checks in logical order to determine the exact cause
- e) Consider approximate remaining service life against cost of parts and labour.
- f) Make any necessary repairs.
- g) Recheck the parts and functions for correct operation

12. Repairs

8. 11. 1990

Model

6000–8750

Code

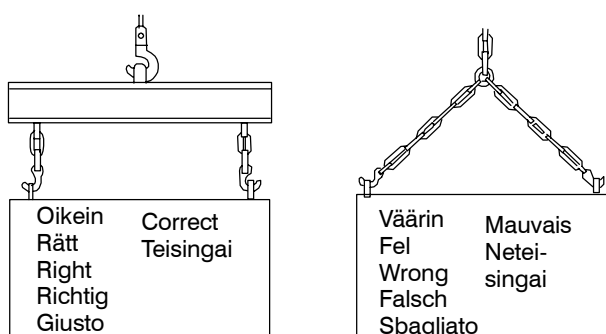
120

Page

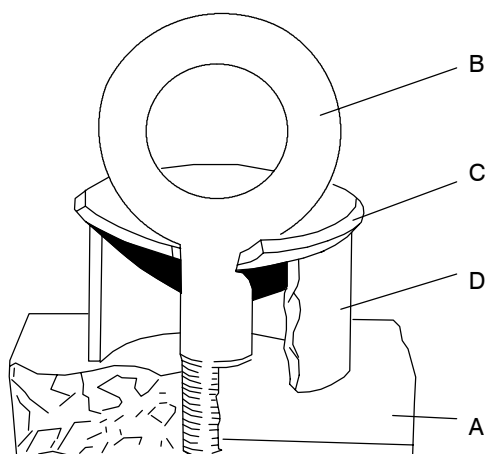
2

Handling of heavy components

Unless otherwise specified, all removals should be accomplished using adjustable lifting equipment. All supporting slings must be parallel to each other and as near vertical as possible in relation to the object being lifted. However, where slings are of a far greater capacity than the weight of the load to be fitted, a triangular lifting arrangement may be used.



When removing a component at an angle, remember that the capacity of an eyebolt is reduced when the angle between the supporting members and the object becomes less than 90°.



Forged eyebolt support

- A. Load
- B. Lifting shackle
- C. Shackle retaining plate (3 mm thick)
- D. Sleeve

When necessary the forged eyebolt can be supported in the way shown in figure above. Sleeve D may or may not be welded to plate.

Warning! If a part resists removal, check that all nuts and bolts have been removed and that there is no interference from adjacent parts.

Cleanliness

To ensure long life of a machine, it is important to keep dirt and foreign material out of its vital working components. Precautions must be taken to safeguard against this. Enclosed compartments, seals and filters have been provided to keep the supply of air, fuel and lubricant clean. These protective devices must not be removed.

Whenever hydraulic, fuel, lubricating oil or lines are disconnected, clean the point of disconnection and the surrounding area. As soon as a line has been disconnected, cap, plug or tape the line or opening to prevent the ingress of foreign material.

The same cleaning and covering precautions should be taken when access covers or inspection plates are removed.

Clean and inspect all parts. Make sure that all passages and holes are clear. Cover all parts to keep them clean. Make sure parts are clean when they are reassembled. Leave new parts in their wrapping until they are actually needed for reassembly.

Assembly

When reassembling a machine, complete each step in sequence. never partially assemble one part then start to assemble another. Make all recommended adjustments. Always check the job on completion to ensure that nothing has been overlooked. Recheck the various adjustments before putting the machine back into service.

Note! Before fitting new parts, remove rust preventative compound from all machined surfaces (usually "peel-off substances").

Lubrication

Where applicable, fill the compartments of repaired or renewed components with the quantity, type and grade of clean lubricant recommended in the routine maintenance section of the Operator's Manual.

Shims

When shims are removed, tie them together and identify their location. Keep shims clean and take care not to bend them before refitting them.

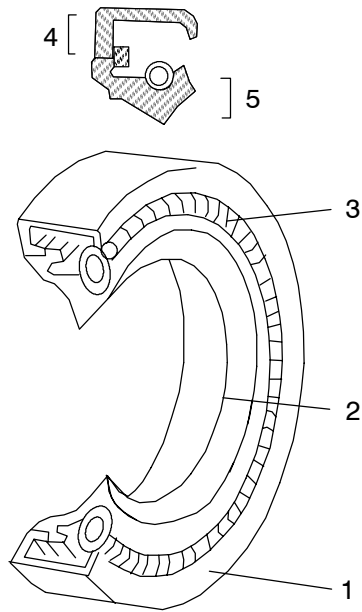
Gaskets

Make sure that the holes in gaskets line up with lubricating oil passages in the mating parts. If gaskets have to be made, use material of the correct type and thickness. Make sure that holes are punched in the right places. Incorrectly punched gaskets can cause serious damage.

Lip type rubber seals

Lubricate the lips of lip-type rubber seals with oil before fitment. Do not use grease on seals, except for grease seals.

12. Repairs	8. 11. 1990	Model 6000–8750	Code 120	Page 3
	8. 11. 1990			



The main parts of lip–type seal:

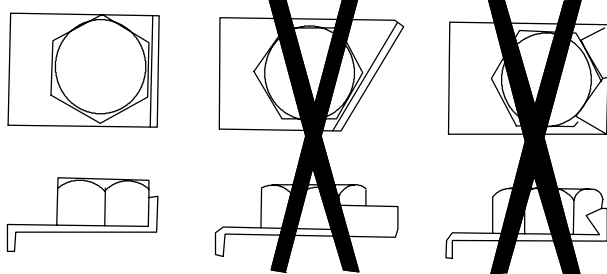
1. Case
2. Sealing element
3. Ring spring

The figure above shows the construction of a simple lip–type seal. The cross section shows the heel (4) and the toe (5), used to identify the sides of a single element seal. With a few exceptions, the toe of a single–lip is located on the lubricant side. Some seals have a second auxiliary lip which has no spring.

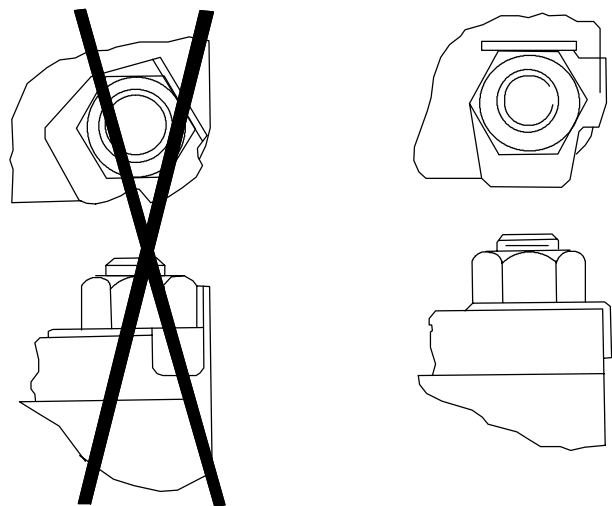
Cables and wires

When removing or disconnecting a group of cables or wires, label each one to ensure correct refitment.

Locking devices



Correct and incorrect use of retainers



Correct and incorrect method of fitting and bending locking tabs.

Slackening of nuts and bolts is prevented by mechanical means such as lockwashers, tab washers and cotter pins, or by Loctite–type locking agents.

Flat retainers must be installed properly to be effective. Bend one end of the retainer against the edge of the part. Bend the other end against one of the nut or bolt head. Always fit new retainers in compartments which house moving parts. When fitting lockwashers on aluminium housings, place a flat washer between the lockwasher and the housing.

Note!

1) Never fit a lockwasher (Grower, fan, spring, etc.) under a nut or bolt to which a specified torque has to be applied.

2) Always thoroughly degrease components before applying Loctite type locking agents.

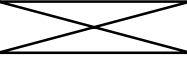
Bushes and press fits

Do not fit bushes with a hammer alone. Use a suitable fitting tool and a hammer or, better still, a press if possible..

When using a press, ensure that pressure is applied directly in line with the bore. If the ring has an oil hole, take care to align it with the oil hole in the mating part. When press fitting a part into another part, lubricate the mating surfaces. Tapered parts should be assembled dry. Before assembly, check that the tapers are dry and free from burrs.

Fitting bolts in blind holes

Use bolts of the correct length. A bolt which is too long may "bottom" before the head comes into contact with the part it is to hold: this will cause damage to the threads. If a bolt is too short, there may not be enough threads engaged to hold the part securely.

12. Repairs		Model	Code	Page
	8. 11. 1990	6000–8750	120	4

Table

Table 1. Tightening torques, metric standard thread (ISO)

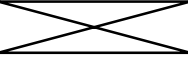
Dim.	Tightening torques Nm ¹⁾									
	Quality, surface treatment, material and so on									
	8.8 lubr.	tol. ±	8.8 Zne ²⁾	tol ±	8.8 Znk ³⁾	tol. ±	10.9 lubr.	tol. ±	12.9 lubr	tol. ±
M4	–		–		–		–		–	
M5	6,4	0,6	5,7	0,5	–		9	1	11	1
M6	11	1	10	1	12	1,2	15	1,5	18	2
M8	25	2	23	2	30	3	35	4	45	5
M10	50	5	45	5	60	5	70	7	90	10
M12	90	10	80	8	100	10	125	10	151	15
M14	140	15	125	10	160	15	200	20	240	20
M16	220	20	195	20	250	25	300	30	370	40
M18	300	30	270	30	350	35	430	40	510	50
M20	430	40	380	40	480	50	600	60	720	70
M22	570	60	500	50	650	65	800	80	970	100
M24	740	70	660	70	830	80	1030	100	1250	120
M27	1100	100	950	100	1200	120	1500	150	1800	180
M30	1500	150	1300	130	1600	160	2040	200	2500	250

¹⁾ 1 Nm=0,102 kpm

²⁾ Zne=zinc electroplating

³⁾ Znk=hot galvanized

If the bolts differs from the standard range the values in the table must not be used.

12. Repairs		Model	Code	Page
	8. 11. 1990	6000–8750	120	5

Conversion table for common units

Quantities and units	Conversion factors
Overall and detail dimensions millimetres (mm)	100 mm=3,94 inches 1 inch=25,4 mm
Short distances e.g. turning circles metres (m)	1 m=3,28 ft 1 ft=0,305 m
Travel distances kilometres	1 km=0,62 mile 1 mile=1,61 km
Tractor weights, axle loadings kilograms (kg)	1 kg=2,2 lbs 1 lb=0,454 kg
Travel speed kilometres per h (km/h)	1 km/h=0,62 mph 1 mph=1,61 km/h
Drawbar pull kilonewtons (kN)	1 kN=224,8 lbs 1 lb=4,448 N
Power (identified by such terms as crankshaft power, pto power, belt power, drawbar power, indicating the point at which the measurement was taken) kilowatts (kW)	1 kW=1,34 hp 1 hp=0,746 kW
Engine torque newton metres (Nm)	1 Nm=0,74 ft lb 1 ft lb= 1,356 Nm
Fuel consumption by weight (kilograms per hr, kg/h) (by volume) litres per hr (l/h)	1 kg/h=2,2 lb/hr 1 lb=0,454 kg 1 l/h=0,22 gal/hr 1 gal=4,54 l
Fuel economy (specific fuel consumption) grams per kilowatt hr (g/kWh)	304 g/kWh=0,5 lb/hp hr
Engine displacement litres (l)	1 l=61,02 cu in 100 cu in=1,639 l
Hydraulic pump pressure – mecapascal (MPa) delivery – millimetres per sec (ml/s)	1 MPa=145 psi 1000 psi=6,9 MPa 100 ml/s= 1,32 gpm 1 gpm=75,77 ml/s
Tyre pressure – kilopascal (kPa)	100 kPa= 14,5 psi 1 psi=6,9 kPa
Area acres – hectare	To convert multiply by 0,404686
Volume bushel – litre	To convert multiply by 39,3687
Quantity pound per acre – kilogram per hectare	Multiply by 1,12085
Volume superficial foot – cubic metre	Multiply by 0,002360

13. Maintenance	1. 1. 1994	Model	Code	Page
	15. 5. 1996	6000–8750	130	1

Maintenance Valmet 6000–8750

N.B. Detailed maintenance instructions, see Operator's Manual.

General

Correct maintenance at the right time is a basic condition for reliable operation of the tractor. Maintenance costs are small compared with any repair costs resulting from lack of maintenance. The most important measures are those which you carry out yourself and which include lubrication and various checks and adjustments.

The service intervals shown apply for normal operating conditions but in more severe conditions servicing should be carried out more frequently.

General instructions concerning oil checks and oil filling

- Always stop the engine before starting work
- Apply the parking brake to ensure the tractor cannot move. If the ground is uneven the wheels should be scotched
- Wash down the tractor first so that the work can be done more easily and quickly.
- Always observe the utmost cleanliness in all maintenance work. Thoroughly wipe off filler caps and plugs as well as surrounding parts of the tractor before filling up with fuel or oil.
- Inspect the oil and filters when changing. Large amounts of dirt (e.g. heavily clogged filters) can point to a fault which could cause extensive and costly repairs if not corrected in time.
- When carrying out checks the tractor should stand on level ground.
- Levels should be checked in the morning when the oil is cold and has had time to run down to the bottom of the unit concerned.
- When changing the oil, bear in mind that the oil can be very hot when it drains from the tractor. Waste oil and oil filters should be handled carefully and disposed of properly
- After completion of the service work always replace all safety covers etc.

Greasing lubricating points fitted with grease nipples

- Always clean the grease nipples before applying the grease gun.
- Apply grease through the nipples until clean grease oozes out (unless otherwise instructed).
- Wipe away superfluous grease which has been pressed out at the lubricating point.
- Preferably carry out lubrication with bearing points and joints unloaded and with the bearings in different positions.

Lubrication and maintenance schedule

All intervals are counted from zero hours on the hour recorder. For example, 1000 hours service is carried out every 1000 (yearly), 2000 hours (every other year) etc. even if the guarantee service has been carried out.

Example: The 1000 hour service contains all items mentioned under 10 h/Daily, 50 h/once a week, 250 h, 500 h and 1000 h.