



Small A series:

A53

A63

A73

Compact & Orchard Tractors

Service Manual

VALTRA

A53

A63

A73

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10 General



20 Engine



30 Electrical System



40 Power Transmission



50 Brake System



60 Front Axle & Steering



70 Frame & Wheels



80 Cab & Shields



90 Hydraulics



100 Tools

10. General

11. General
12. Layout
13. Repair
14. Maintenance

To the reader

The Service Manual for Valtra A53, A63, A73 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 Valtra 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 Valtra.

**Valtra Inc.
Tractor Service**

11. GENERAL	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 110	Page 1
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COMPACT & ORCHARD MODELS

MODEL	A53Compact	A63 Compact	A73 Compact	A53Orchard	A63 Orchard	A73 Orchard
Engine						
No. of cylinders / Capacity (l)	3 / 3.3	3 / 3.3	3 / 3.3	3 / 3.3	3 / 3.3	3 / 3.3
Max power, kW/hp/rpm*	37 / 50 / 2200	50 / 68 / 2200	56 / 78 / 2200	37 / 50/ 2200	50 / 68 / 2200	56 / 78 / 2200
Max torque Nm /rpm	196 /1400	285 /1400	310 /1400	196 /1400	285 /1400	310 /1400
Transmission	Gearbox 12 + 12R, synchro shuttle					
Differential Lock	Mechanical *	Electro-Hydraulic	Electro-Hydraulic	Mechanical *	Electro-Hydraulic	Electro-Hydraulic
4WD Engagement	Mechanical *	Electro-Hydraulic	Electro-Hydraulic	Mechanical *	Electro-Hydraulic	Electro-Hydraulic
Speeds; km/h @2200 rpm						
12+12R, 12.4-36 rear tyres	0.8-34			0.8-34		
Independent 2-speed PTO						
PTO Speed / rpm (engine)	540 / 1890			540 / 1890		
PTO Speed / rpm (engine)	540E / 1594			540E / 1594 or 1000 / 2074		
Hydraulics						
Max pump capacity (l/min) / max pressure (bar)	43 / 195	43 / 195	43 / 195	43 / 195	43 / 195	43 / 195
Auxiliary hydraulic valves	2	2	2	2	2	2
Max. lifting force (kN)	22	22	27	22	22	27
Dimensions and weights						
Wheelbase 2WD / 4WD, mm	1958/2010	1958/2010	1958/2010	1958/2010	1958/2010	1958/2010
Length mm (with front weight)	4100	4100	4100	4100	4100	4100
Width, mm **	1900	1900	1900	1700	1700	1700
Width (cab model), mm **	1940	1940	1940	-	-	-
Height, mm **	2400	2400	2400	2175	2175	2175
Height (cab model), mm **	2580	2580	2580	-	-	-
Weight (without additional weights) 2WD / 4WD, kg	2400/2610	2400/2610	2400/2610	2400/2610	2400/2610	2400/2610
Fuel tank l	60	60	60	60	60	60
Ground clearance, mm **	400	400	400	400	400	400
Tyres (2WD)	7.50-16 + 14.9R30			6.50-16 + 380/85R24		
Tyres (4WD)	300/70R20 + 14.9R30			280/70R16 + 380/85R24		

* Specifications may vary by market

** Overall dimensions are calculated according to the size of 14.9x28 tyres (open cab) or 14.9x30 tyres (cab -models). Minimum width 1625 mm

12. LAYOUT	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 120	Page 1
------------	----------------	---	--------------------	-------------	-----------

Contents

12. Layout:	
12.1 . . Layout of Service Manual	2
12.2 . . Code designations	3

12. LAYOUT	Issue No. 1	02.12.2013	Model A53/63/73	Code 120	Page 2
------------	----------------	------------	--------------------	-------------	-----------

12.1 Layout of Service Manual

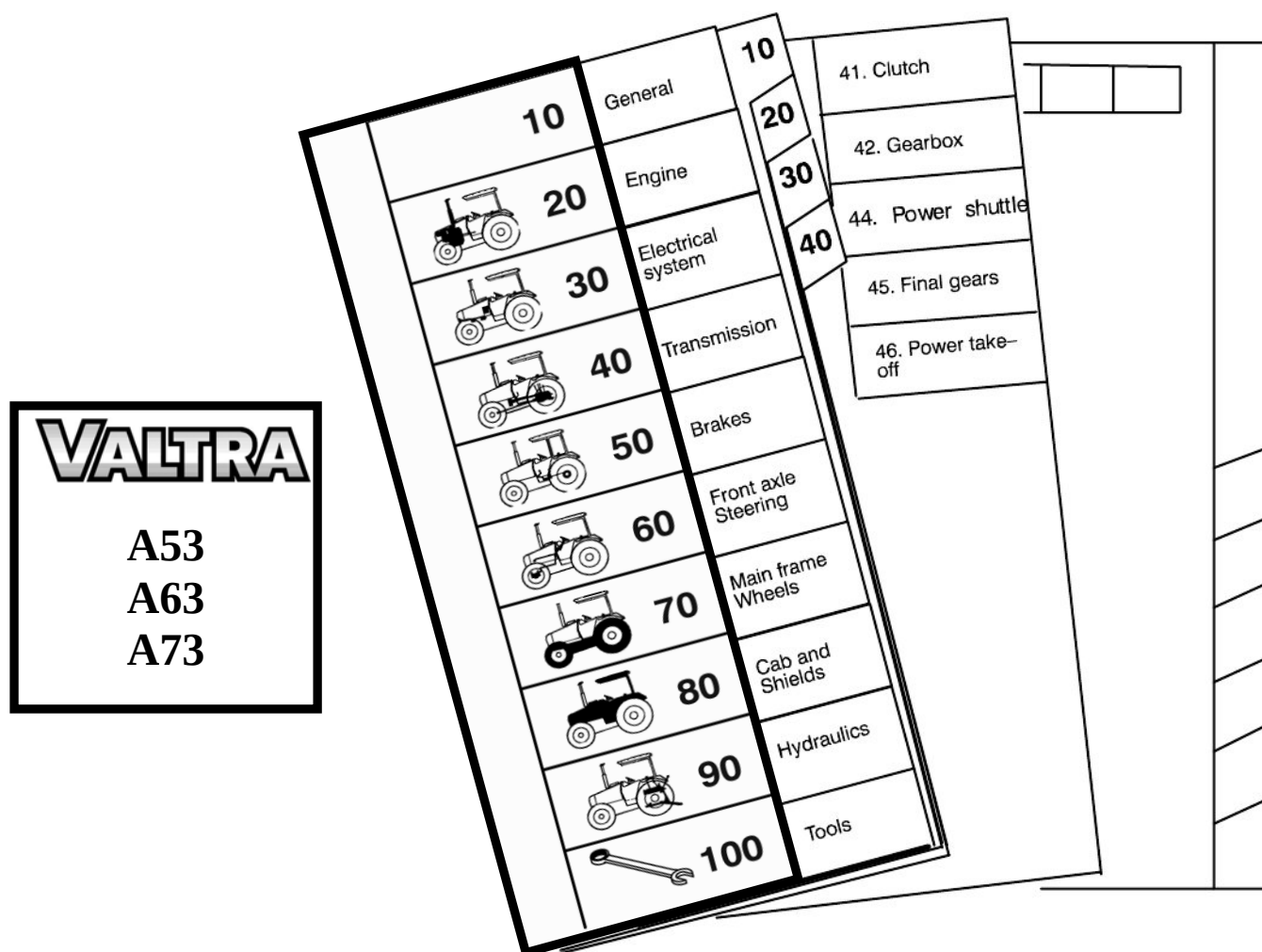
1. Division into groups

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, power shuttle, 4WD clutch
 - 45. Final drives etc.

12. LAYOUT	Issue No. 1	02.12.2013	Model A53/63/73	Code 120	Page 3
------------	----------------	------------	--------------------	-------------	-----------

3. Tractor model

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

4. Code designation

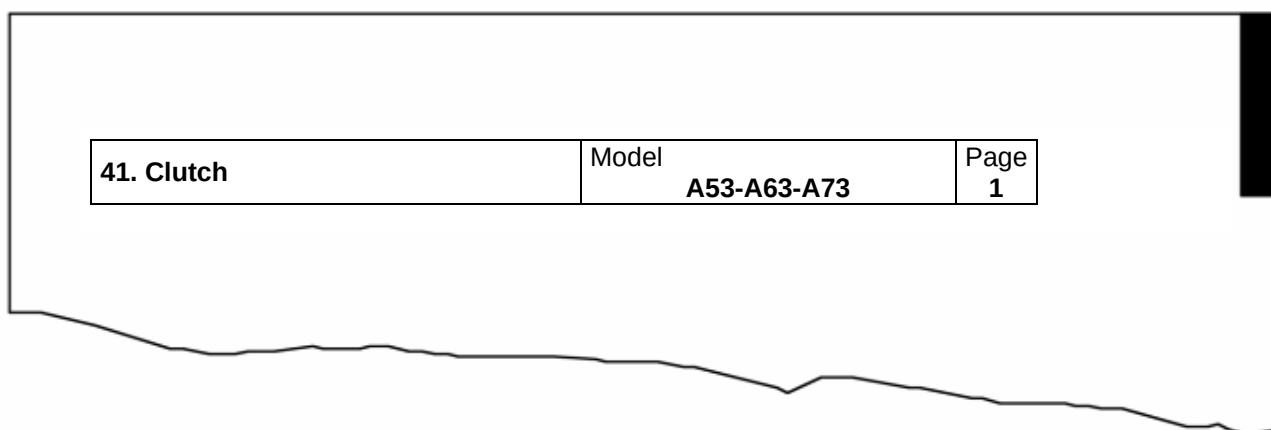
Three--digit code designations are used to separate the different document groups for the respective components. The same code is also used in the Time list as a reference to the text in this manual. The code designation numbers appear in the box at the top of the page and also in the headings.

Example: Code 410

- Group: power transmission (4)
- Component: clutch (41)
- Document group: general (410)

5. 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



6. Date

At the top of each page there are two boxes for dates. In a case of 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 proper date box.

7. Additions and amendments of the service manual

New and up--dated pages will be continuously 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) indicates 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, it is the page with the later date in the date box and the old date in the crossed--over box which is valid or which is the current page.

When an entirely new set of repair instructions is issued, it will be accompanied by instructions on where the pages should be inserted in the file.

If there is a big change or additional pages in service manual, the issue number will be changed also.

12. LAYOUT	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 120	Page 4
------------	----------------	--	--------------------	-------------	-----------

12.2 Code designations in the Service Manual

10. General

- 110 General, lay out
- 120 Maintenance

20 Engine

21. Engine

- 210 Technical data, description, tools
- 211 Cylinder block and flywheel housing
- 212 Cylinder head and valve mechanism
- 213 Crank mechanism
- 214 Auxiliary drive gears (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, description, tools
- 222 Fuel feed pump and fuel filters
- 223 Injection pump and injectors

23. Cooling system

- 230 Technical data, description, tools
- 231 Cooling system

30 Electrical system

- 310 Tractor electrical system, wiring diagrams

40 Power transmission

41. Clutch

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

42. Gearbox

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

43.

44. Low gear

- 440 Technical data, description, tools
- 441 Low gear

45 Final drives

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

46. Power take off

- 460 Technical data, description, tools
- 462 Power take off

50 Brake system

- 510 Technical data, description, tools
- 511 Service brakes
- 512 Parking brake

60. Front axle and steering system

61. Steering system

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

62. Powered front axle

- 620 Technical data, description, tools
- 621 Housing and central pivot bearings
- 622 Drive shafts
- 623 Hubs
- 624 Differential
- 625 Adjustments

70 Frame and wheels

- 710 Frame
- 720 Wheels

80 Cab and shields

- 810 Cab
- 820 Shields
- 830 Air conditioner

90 Working hydraulics, power lift

91 Working hydraulics and mechanical power lift

- 910 Technical data, description, tools
- 911 Pump and pipe system
- 912 Hydraulic power lift
- 913 Adjustments

100 Special tools

- 101 Special tools ETV
- 102 Locally prepared tools ET

13. REPAIR	Issue No. 1	02.12.2013	Model A53/63/73	Code 130	Page 1
------------	----------------	------------	--------------------	-------------	-----------

Contents:

13. Repair	
13.1 . . . General instruction for repair	1
13.2 . . . Tightening torques	5

13. REPAIR	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 130	Page 2
------------	----------------	---	--------------------	-------------	-----------

13.1 . . 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

13. REPAIR	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 130	Page 3
------------	----------------	--	--------------------	-------------	-----------

13. REPAIR

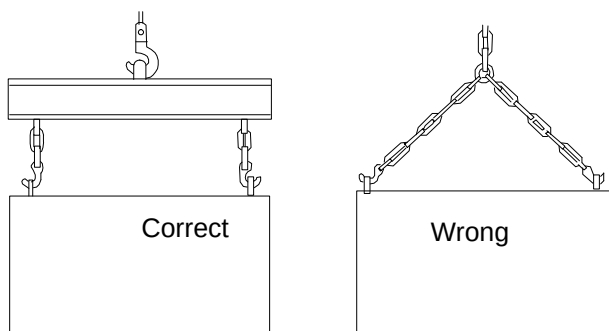
Cleanliness

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

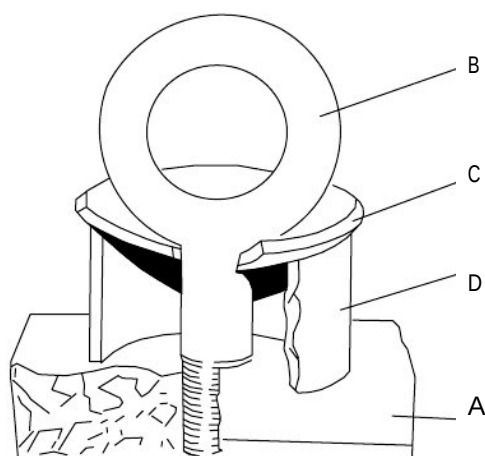
When shims are removed, tie them together and identify their location. Keep shims clean and take care not to bend them before refitting them.

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.

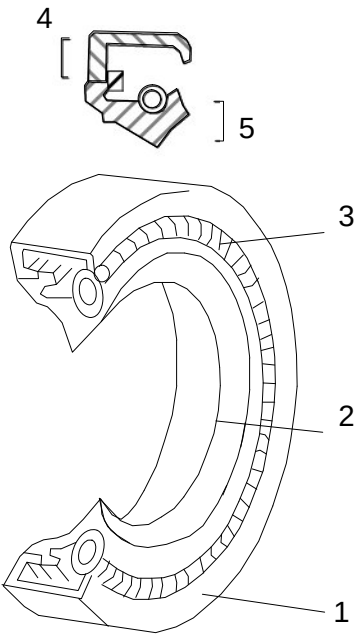


Forged eyebolt support

- 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.



The main parts of lip-type seal:

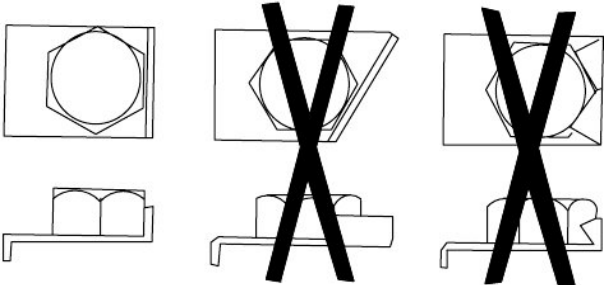
1. Case
2. Sealing element
3. Ring spring

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.

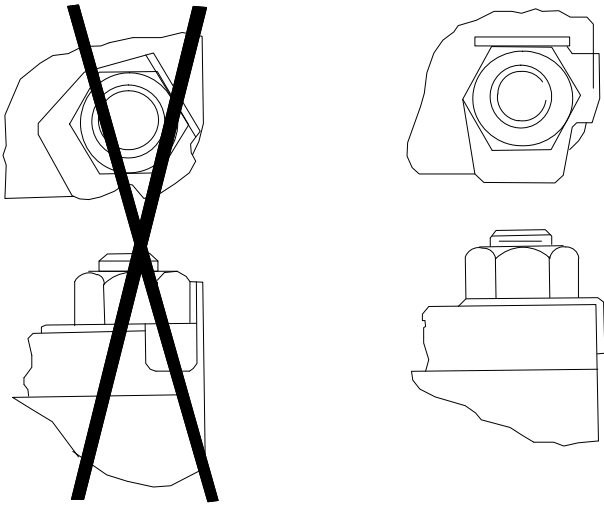
Cables and wires

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.

13. REPAIR	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 130	Page 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 m 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. REPAIR	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 130	Page 6
------------	----------------	---	--------------------	-------------	-----------

Common tightening torques

If in the repairing instructions have not been given specified tightening torque to screw or nut, use tightening torque which are mentioned in table below.

Tightening torques, metric standard thread (ISO)

Tightening torques Nm¹⁾

Quality, surface treatment, material and so on

Dim.	8.8		8.8		8.8		10.9		12.9	
	lubr.	tol. ±	Zne ²⁾	tol ±	Znk ³⁾	tol. ±	lubr.	tol. ±	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.

14.MAINTENANCE	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 140	Page 1
----------------	----------------	---	--------------------	-------------	-----------

Contents:

14.1 . . . Valtra service	1
14.2 . . . Filling table	2
14.3 . . . Oil recommendations and fuel requirements	4
14.4 . . . Grease	5
14.3 . . . Maintenance Schedule	6

14.MAINTENANCE	Issue No. 1	02.12.2013	Model A53/63/73	Code 140	Page 2
----------------	----------------	------------	--------------------	-------------	-----------

14.1 Valtra service

Maintenance

Correct maintenance at the right time is a basic condition for reliable operation of the tractor. Maintenance 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.

Carrying out the maintenance

- Always stop the engine before doing any servicing work.
- Apply the parking brake to ensure the tractor cannot move. If the ground is uneven the wheels should be blocked.

Always observe the utmost cleanliness in all maintenance work. NOTE: Do not let the water get to the electrical equipment when washing the machine.

- 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 before driving 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.

Avoid touching the exhaust manifold, turbocharger and other hot parts of the engine.

- Keep the engine surfaces clean in order to avoid the risk of fire.

The fuel, lubricating oil and coolant cause irritation to skin if in contact for long periods.

- After completion of any service work replace all safety covers etc.

Waste oil, liquid waste, oil filters and batteries should be handled carefully and disposed of properly.

Greasing lubricating points fitted with grease nipples

- Always clean the grease nipples before applying the grease gun.
- Pump in grease to the nipples until clean grease is squeezed out (unless otherwise instructed).
- Wipe off all surplus grease which has been squeezed out at the lubricating points.
- Preferably carry out lubrication with bearing points and joints unloaded and with the bearings in different positions (e.g. lubricate the steering knuckle bearing on the steering axle with the wheels at both full left and right lock and with the front axle lifted up).

Scheduled maintenance

NOTE: All intervals are counted from zero hours on the hour recorder. For example, the 500 hours service is carried out after 500, 1000 hours etc. even if the measures have been carried out at the guarantee service (=100 hours service).

Example: The 1000 hour service contains all items mentioned under the 10 hr/daily and the 50 hr/weekly checks as well as the 500 hr service.

Service inspection (after 100 hours)

Service inspection after 100 hours running to all new tractors.

The following steps should be taken:

20 Engine

- Change engine oil and filter
- Change prefilter of fuel system
- Change fuel filter

40 Power transmission

- Change filter

60 Steering system and front axle

- Change oil in differential
- Change oil in planetary gears

90 Hydraulic system

- Change pressure filter and clean hydraulic pump suction strainer

General

- Road test tractor. During the road test check all the functions of all the controls and instruments. After the road test, check for oil leaks, check the coolant and fuel system.

14.MAINTENANCE	Issue No. 1	02.12.2013	Model A53/63/73	Code 140	Page 3
----------------	----------------	------------	--------------------	-------------	-----------

All volumes are with filters.

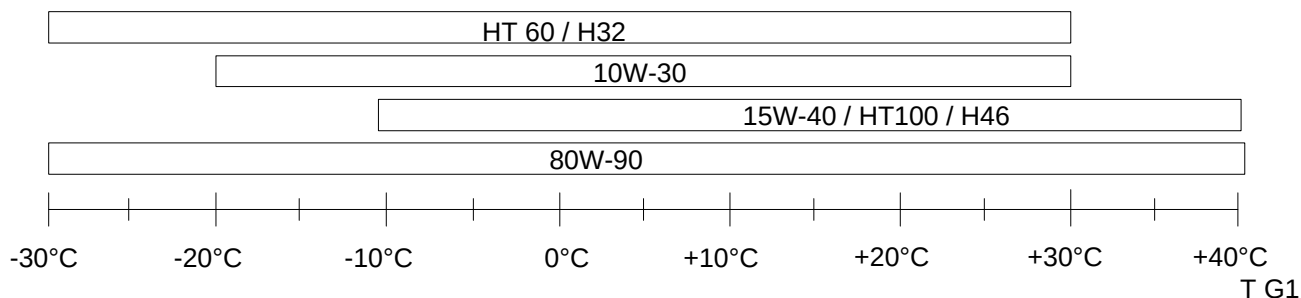
Part of machine	Valtra-grade	SAE-grade	API-grade	Volume, when changing (liter)
Engine A53	Valtra Engine E	10W-30: -20°C...+30°C 15W-40: -10°C...+40°C	CG-4 CH-4	7
A63				9
A73				
Hydraulic system	Valtra Transmission Valtra Hyrdraulic	HT 60: -30°C...+30°C HT 100: -10°C...+40°C 32: -30°C...+30°C 46: -10°C...+40°C	ISO VG 32 ISO VG 46	35 (upper mark) 25 (lower mark)
Power transmission	Valtra Transmission	HT 60: -30°C...+30°C HT 100: -10°C...+40°C	GL-4 (G2-98)	32
Powered front axle (4-wd) differential hubs	Valtra Axle	80W-90	GL-5 (LS)	6,5
				2 x 0,8
Front PTO	Valtra Engine	10W/30	CE CF/CF	1,4
			GL 5/4 CCMC D4	
Fuel tank	The fuel (diesel) must conform to the EN 590 standard.			70
- with extra fuel tank				95
Cooling system	Anti-freeze agent + water(standard ASTM D3306-86a or BS 6580:1985)			13,5
A53				15,5
A63				
A73				
Brake fluid reservoir	Brake fluid SAE J1703			0,3
Windscreen washer	Washer fluid			

Bio oil is also possible on hydraulic/transmission.
For more information contact your nearest dealer

14.MAINTENANCE	Issue No. 1	02.12.2013	Model A53/63/73	Code 140	Page 4
----------------	----------------	------------	--------------------	-------------	-----------

Oil recommendations according to outdoor temperature

When starting the tractor in a warm garage, oil meant for warmer areas may be used.



Quality requirements of engine fuel

Property	Requirement	Test standard
Specific weight +15°C, ISO 12185	0,82...0,86 kg/litre	ASTM D 4052, EN
Viscosity +40°C, 445, ISO 31041	12...45 mm ² /s	ASTM D
Sulphur content	max. 0,2 p-%	ASTM D 4294, ISO 8754
Cetane number 4737	min. 51	ASTM D
Water content	max. 200 mg/kg	ASTM D 1744

The fuel must conform to the EN 590 standard.

Fuel

- The properties of light fuel oil that is only intended for warming use do not meet the requirements of modern diesel engines and cannot be used as fuel.
- In particular, distributor-type injector pumps require the fuel to have sufficient lubricity, because they do not have oil lubrication in the same way as typical multi-element pumps. Adding oil to diesel fuel is not recommended, because it causes carbon build-up, and if oil is mixed with even a small amount of water it will clog the filter.
- Additionally, various fuel quality requirements imposed by taxation and seasonal changes have to be taken into consideration.

Fuel storage

- Storing and distributing fuel must be arranged in conditions where no water or impurities can enter the storage tanks. The storage tanks must be installed in a slanted position, so that water and impurities are collected at the opposite end from the suction pipe of the pump. The suction pipe of the pump should not reach the bottom of the tank.
- Water must be periodically drained from the tank in order to prevent problems. Refueling at the same time the tank is being refilled must be avoided without exception.
- When the tank is filled with winter-quality fuel in good time, the engine is guaranteed to run flawlessly during the cold season.

Filter system

- The engine's standard filter system gives sufficient protection for the injection system from impurities that can be present in well-tended distribution systems.
- The control of distributor-type injection pumps is based on internal pressure, which will drop if the fuel system is clogged. If the pilot pressure drops too low, engine power is reduced, smoke increased and starting becomes more difficult. Additionally, water in the injection system will destroy it in a very short time. For this reason, the water trap and the filters must always be serviced according to the specified amount of running hours.
- It is also important always to use original Valtra (or Perkins) fuel filters. They guarantee sufficient filtration, preventing impurities from damaging the fuel system. There are many cheap filter kits (so-called pirates) on the market, with lower quality and performance in order to minimise the cost. Among other things, the quality and amount of filter paper are often insufficient. There are also often dangerous defects in the basic structure that may cause expensive damage even in a short period of time.

14.MAINTENANCE	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 140	Page 5
----------------	----------------	---	--------------------	-------------	-----------

Grease

Always use the following greases in Valtra tractors. Each point requires its own type of grease.

Valtra Grease, Universal Grease Lithium-based universal grease.

Is suitable for greasing all heavy machines.

-30° ... +130°C

Universal grease of high quality, lithium based grease for vehicle use.

It is recommended for greasing wheel bearings, chassis water pumps, caterpillar rollers etc.

The grease is adhesive, protects against corrosion and resists water and varying temperatures. Temperature range is -30° ... +130°C.

Valtra Calcium LF, Calcium Grease LF

Is suitable for greasing all heavy machines. Long fibre grease. Colour red.

-20° ... +60°C

Calcium LF is of long fibre, high quality and calcium based universal grease for vehicle use.

It is recommended for greasing chassis, water pumps, pins etc.

The grease is adhesive, protects against corrosion and resists water and varying temperatures.

Temperature range is -20° ... +60°C.

Valtra Grease Moly

Is suitable for greasing all heavy machines. Lithium-based universal grease.

-30° ... +130°C

Universal grease of high quality, lithium based grease for vehicle use.

It is recommended for greasing wheel bearings, chassis water pumps, caterpillar rollers etc.

The grease is adhesive, protects against corrosion and resists water and varying temperatures. Temperature range is -30° ... +130°C.

Avoid repeating skin contact.

Protect nature and take care of empty packages.

14.MAINTENANCE	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 140	Page 6
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Daily/every 10 hours

1. Check engine oil level
2. Check coolant level and radiator fins and front grilles of the engine cover

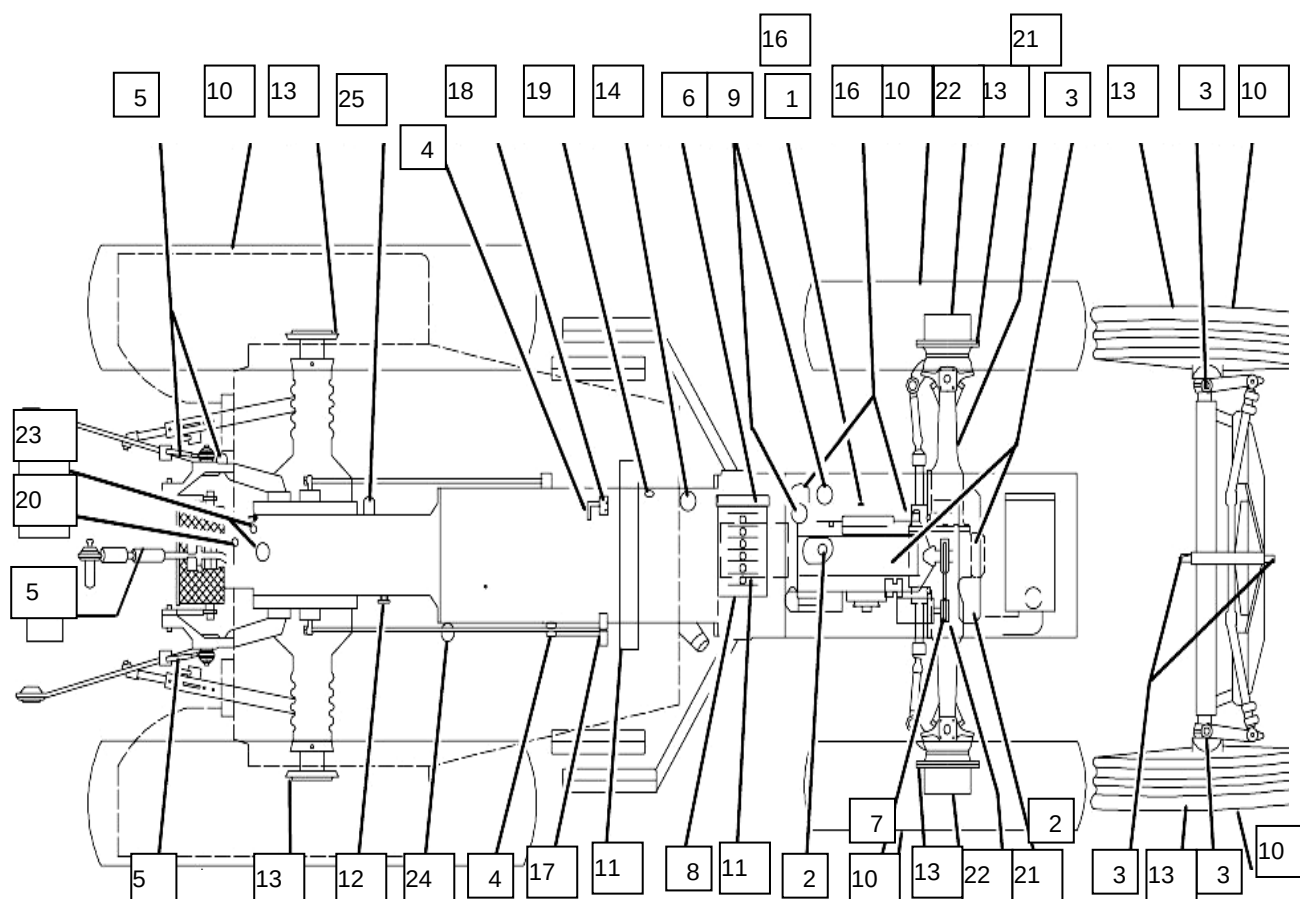
Weekly/every 50 hours

3. Lubricate front axle and steering nipples
 - 2-wheel drive
 - front axle mountings (2 nipples)
 - steering knuckles (2 nipples)
 - 4-wheel drive
 - front axle mountings (2 nipples)
4. Lubricate brake and clutch pedals (3 nipples)
5. Lubricate top link and lifting links
6. Check fluid level in windscreen washer
7. Check belts tightness
8. Check electrolyte level in battery
9. Check prefilter and fuel filter of fuel system
10. Check tyre/tire pressures

Every 500 hours

11. Clean cab air filter and also upper filter (extra equipment)
12. Lubricate gear lever joints
13. Check wheel nuts tightness
14. Check brake fluid level
15. Grease door hinges
16. Change engine oil and filter (or yearly), in extremely dusty conditions at 250-hour.
17. Check brake pedal free travel
18. Check clutch pedal free travel
19. Check PTO lever free travel
20. Check oil filter in power/ transmission
21. Check oil lever in differential, 4-wheel drive
22. Check oil lever in hub reduction gears, 4-wheel drive
23. Check oil lever in hydraulic system
24. Change pressure filter in hydraulic system
25. Change oil filter transmission

NOTE: When carrying out servicing you must follow the service intervals, i.e., you must also do all previously mentioned items. For example, when doing 500 hours service you must also do the servicing required weekly and daily.



14.MAINTENANCE	Issue No. 1	https://truckmanualshub.com/ 02.12.2013	Model A53/63/73	Code 140	Page 7
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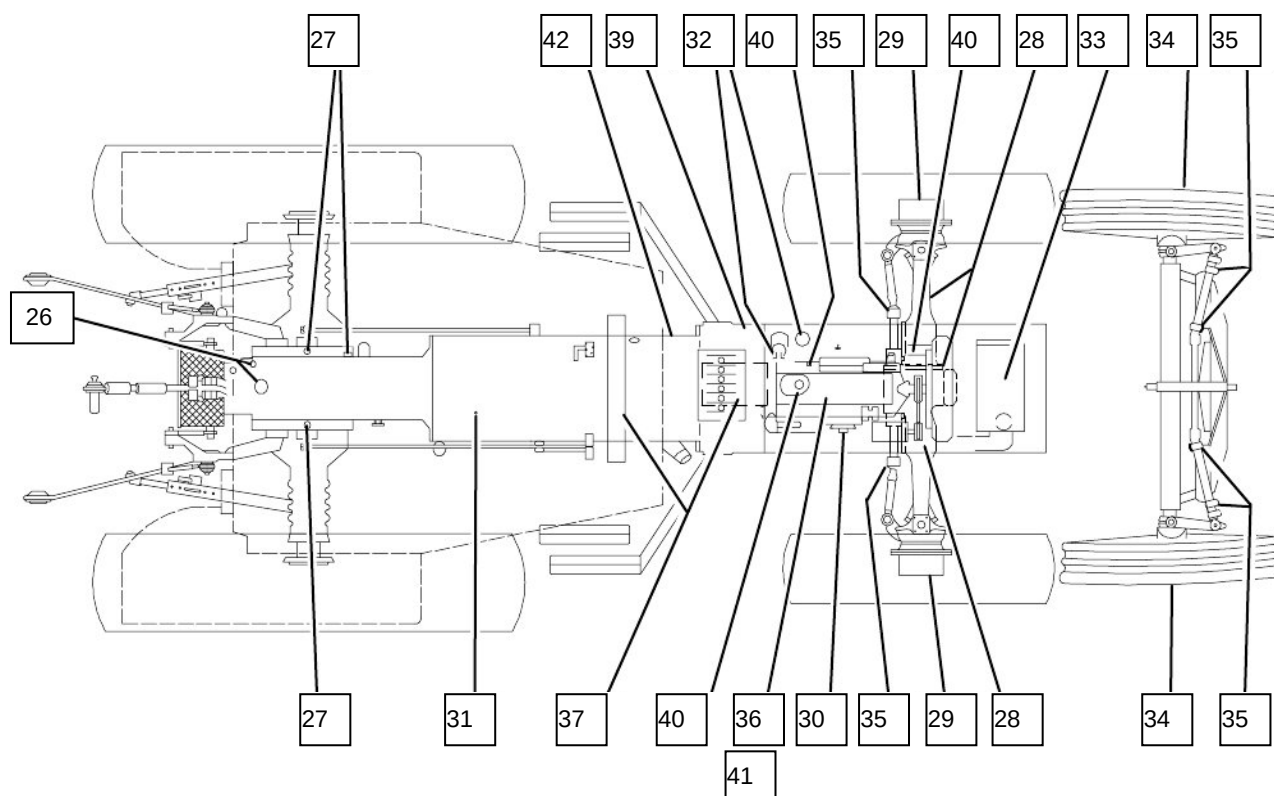
Every 1000 hours/yearly

- 26. Change oil and oil breather filter of the hydraulic system
 - 27. Change oil in power transmission
 - 28. Change oil in differential, 4-wheel drive
 - 29. Change oil in hub reduction gears, 4-wheel drive
 - 30. Clean hydraulic pump suction strainer
 - 31. Clean fuel tank
 - 32. Change prefilter and fuel filter of fuel system
 - 33. Change air filter and safety filter
 - 34. Lubricate front wheel bearings, 2-wheel drive
 - 35. Check and adjust toe-in front wheels
 - 36. Adjust valves
 - 37. Change cab air filter and upper filter (extra equipment)
 - 38. Tighten bolts and nuts of frame
 - 39. Grease flywheel ring gear
- When using biodiesel check and clean injectors, see the point 41.

Every 2000 hours/every other year

- 40. Clean coolant system
- 41. Check and clean injectors
- 42. Change brake fluid

NOTE: When carrying out servicing you must follow the service intervals, i.e., you must also do all previously mentioned items. For example, when doing 2000 hours service you must also do the servicing required at 1000, 500, weekly and daily.



20. Engine

21.Layout

20. ENGINE	Issue No. 1	02.12.2013	Model A53/63/73	Code 210	Page 1
------------	----------------	------------	--------------------	-------------	-----------

Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

Some hazards are identified by the 'Safety Alert Symbol' and followed by a "Signal Word" such as 'DANGER', 'WARNING' or 'CAUTION'. The Safety Alert "WARNING" label is shown below.



The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

Operations that may cause product damage are identified by 'NOTICE' labels on the product and in this publication.

Perkins cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by Perkins is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Perkins dealers or Perkins distributors have the most current information available.



When replacement parts are required for this product Perkins recommends using Perkins replacement parts.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

20. ENGINE	Issue No. 1	02.12.2013	Model A53/63/73	Code 210	Page 2
------------	----------------	------------	--------------------	-------------	-----------

Table of Contents

Specifications Section

Engine Design	4
Fuel Injection Lines	5
Fuel Injection Pump (Bosch) (4 Cylinder Only)	5
Fuel Injection Pump (Delphi) (4 and 3 Cylinder Engines)	6
Fuel Injectors	7
Fuel Transfer Pump	7
Lifter Group	8
Rocker Shaft	8
Valve Mechanism Cover	9
Cylinder Head Valves	9
Cylinder Head	11
Turbocharger	12
Exhaust Manifold	13
Camshaft	14
Camshaft Bearings	15
Engine Oil Filter	15
Engine Oil Pump	16
Engine Oil Pressure	18
Engine Oil Bypass Valve	18
Engine Oil Pan	19
Crankcase Breather	21
Water Temperature Regulator and Housing	21
Water Pump	22
Cylinder Block	23
Crankshaft	25
Crankshaft Seals	29
Connecting Rod Bearing Journal	30
Main Bearing Journal	30
Connecting Rod	31
Piston and Rings	32
Piston Cooling Jet	33
Front Housing and Covers	34
Gear Group (Front)	35
Flywheel	37
Flywheel Housing	37
Crankshaft Pulley	37
Fan Drive	38
Engine Lifting Bracket	38
Alternator	38
Starter Motor	39
Glow Plugs	40

20. ENGINE	Issue No. 1	02.12.2013	Model A53/63/73	Code 210	Page 3
------------	----------------	------------	--------------------	-------------	-----------

Specifications Section

Engine Design

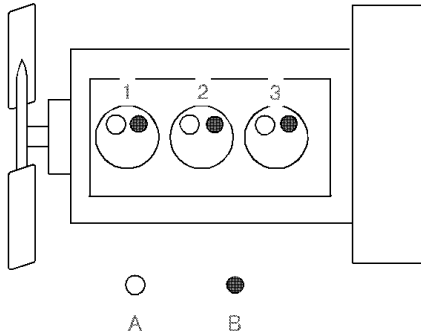


Illustration 1
Cylinder and valve location
(A) Inlet valve
(B) Exhaust valve

Bore	105 mm (4.133 inch)
Stroke	127 mm (5.000 inch)
Displacement	3.3 L (201 in3)
Cylinder arrangement	In-line
Type of combustion	Direct injection
Compression ratio	
Naturally aspirated engines	19.3:1
Turbocharged engines	18.2:1
Number of cylinders	3
Valves per cylinder	2
Valve lash	
Inlet valve	0.20 mm (0.008 inch)
Exhaust valve	0.45 mm (0.018 inch)
Firing order	1, 2, 3

When the crankshaft is viewed from the front of the engine, the crankshaft rotates in the following direction: Clockwise

When the camshaft is viewed from the front of the engine, the camshaft rotates in the following direction: Clockwise

The front of the engine is opposite the flywheel end. The left side and the right side of the engine are viewed from the flywheel end. The No. 1 cylinder is the front cylinder.

Fuel Injection Lines

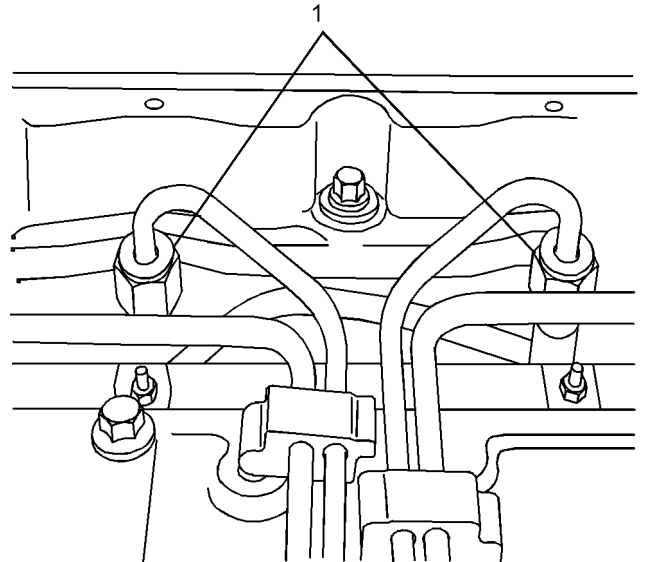


Illustration 2
Typical example

(1) Tighten the union nuts for the fuel injector nozzles to the following torque. 27 N·m (20 lb ft)

Tighten the union nuts for the fuel injection pump (not shown) to the following torque. 27 N·m (20 lb ft)

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