



LT SERIES ROOTS BLOWER

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTION

ISSUE 09.04

LONGTECH MACHINERY INDUSTRY CO LTD
(An ISO 9001:2000 Certified Company)
Manufacturer of Quality Roots Blowers




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FOREWORD

Longtech roots blowers are the result of advanced engineering and skilled manufacturing. To be assured of receiving maximum service from this equipment the owner must exercise care in its operation and maintenance. This manual is written to give the operator and maintenance personnel essential information for day-to-day operation, maintenance and adjustment. Careful adherence to these instructions will result in economical operation and minimum downtime.

 DANGER	Danger is used to indicate the presence of a hazard which will cause severe personal injury, death, or substantial property damage if the warning is ignored.
 WARNING	Warning is used to indicate the presence of a hazard which can cause severe personal injury, death, or substantial property damage if the warning is ignored.
 CAUTION	Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the warning is ignored.
NOTICE	Notice is used to notify people of installation, operation or maintenance information which is important but not hazard-related.



SAFETY PRECAUTIONS

Safety is everybody's business and is based on your use of good common sense. All situations or circumstances cannot always be predicted and covered by established rules. Therefore, use your past experience, watch out for safety hazards and be cautious. Some general safety precautions are as follows:



Failure to observe these notices could result in injury to or death of personnel.

- **Keep fingers and clothing away from blower inlet and discharge ports, revolving belts, sheaves, pulleys, etc.**
- **Do not use the air discharge from this unit for breathing – not suitable for human consumption.**
- **Do not loosen or remove the oil filler plug, drain plugs, covers, or break any connection, etc., in the blower air or oil system until the unit is shut down and the air pressure has been relieved.**
- **Electrical shock can and may be fatal.**
- **Blower unit must be grounded in accordance with the Local Electrical Code. A ground jumper equal to the size of the equipment ground conductor must be used to connect the blower motor base to the unit base.**
- **Open main disconnect switch, tag and lockout before working on the control.**
- **Disconnect the blower unit from its power source, tag and lockout before working on the unit – the equipment may be automatically controlled and may start at any time.**






Failure to observe these notices could result in damage to equipment.

- **Stop the unit** if any repairs or adjustments on or around the blower are required.
- **Disconnect the blower unit from its power source, tag and lockout before working on the unit – the equipment may be automatically controlled and may start at any time.**
- **Do not exceed** the design speed.
- **Do not operate unit** if safety devices are not operating properly. Check periodically. Never bypass safety devices.



INSTALLATION

1. If possible, install the blower in a well-lit, clean, dry place with plenty of room for inspection and maintenance.
2. The temperature of blower room should be maintained at not higher than 40°C. In order to avoid premature failure to blower and motor a suitable ventilation fan should be installed at the room.
3. For permanent installations concrete foundations should be provided. The blower must be leveled.


 WARNING	Customers are cautioned to provide adequate protection, warning and safety equipment necessary to protect personnel against hazards involved in the installation and operation of this equipment in the systems or facility.
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NOTICE	If the unit is not flat, it will be necessary to shim the blower feet at installation.
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 WARNING	Over tightening of belt tension leads to heavy bearing loads and premature failure
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PIPING


1. Suction and discharge connections on all blowers should be large enough to handle maximum volume with minimum friction loss.
2. The material of piping and fittings should be of steel.
3. Excessive weight of piping and fittings will cause internal misalignment and premature wear. Never allow the blower to carry the weight of the pipe. If possible a flexible joint should be installed between the unit and the piping. Where a flexible joint is not practical, the weight of the rigid connection must be separately supported.
4. All system piping must be cleaned internally before connecting to the blower.
5. Install a check valve at the discharge of the blower.

 CAUTION	Do not operate the unit with discharge valve shut off.
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ELECTRICAL





1. Install electrical wiring of motor according to the local electrical authority's requirements and local electrical codes.
2. Motor should have an overload protection circuit.
3. Before starting, jog motor to determine correct rotation. Refer to directional arrow on blower (clockwise as viewed through pulley side).

 DANGER	Blower unit must be grounded in accordance with the Local Electrical Code. Electrical shock can and may be fatal.
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STARTUP CHECKLIST

1. Before starting under power, the blower should be turned over by hand to make certain there is no binding or internal contact.
2. Check the unit and all piping for foreign material and clean if required.
3. All connections are properly fastened.
4. All valves are fully opened.
5. Electrical wiring is properly connected.
6. Belt drives must be carefully aligned. Motor and blower pulleys must be parallel to each other and in the same plane.
7. Belt tension should be carefully adjusted and belts tightened only enough to prevent slippage.
8. After the running-in period of about a week, the belt tension should be checked and re-adjusted if required.
9. Ensure the direction of rotation is correct.
10. Safety valve should be tested at the initial startup to be sure it is adjusted to relieve at the maximum pressure differential rating of the blower by 1.1~1.5 times the normally operating pressure.
11. Check the unit for proper lubrication. Ensure proper oil level of both oil gauges i.e. at the centreline of the oil gauge while the blower is not in operation. Shell OMA LA 150~220 or equivalent grade of lubricating oil is recommended. The lubricating oil should be changed after the running-in period of one month. Thereafter, the oil should be changed every three months' interval.



 WARNING	<p>Do not overfill with gear oil as this will tend to cause excessive heating of the gears and bearings and may damage the unit. Ensure proper oil level should be at the centreline of oil gauges when the blower is not in operation.</p>
 WARNING	<p>Rotating components will cause severe injury in case of personal contact. Keep hands away from blower inlet and discharge ports.</p>
 CAUTION	<p>Ensure that the direction of rotation is correct.</p>
 CAUTION	<p>Ensure proper grade of gear oil is used.</p>
NOTICE	<p>Safety valves should be placed as close as possible to the blower discharge. It should be tested and adjusted at the initial startup and adjusted thereafter.</p>



MAINTENANCE

DAILY MAINTENANCE CHECKLIST

1. Valve condition.
2. Lubricating oil level.
3. Discharge pressure.
4. Motor current.
5. Abnormal noise.
6. Abnormal vibration.

3 MONTHS' INTERVAL MAINTENANCE CHECKLIST

1. Safety valve operation.
2. All connections are properly fastened.
3. V-belt tension and condition.
4. Gears and bearing are running smoothly.
5. Change lubricating oil.
6. Check valve operation.

YEARLY MAINTENANCE CHECKLIST

1. Change V-belts.
2. Clean inside of suction and discharge silencers.

2 YEARS' INTERVAL MAINTENANCE CHECKLIST

1. Change bearings and oil seals.
2. Clean inside of casing.

4 YEARS' INTERVAL MAINTENANCE CHECKLIST

1. Change timing gears.

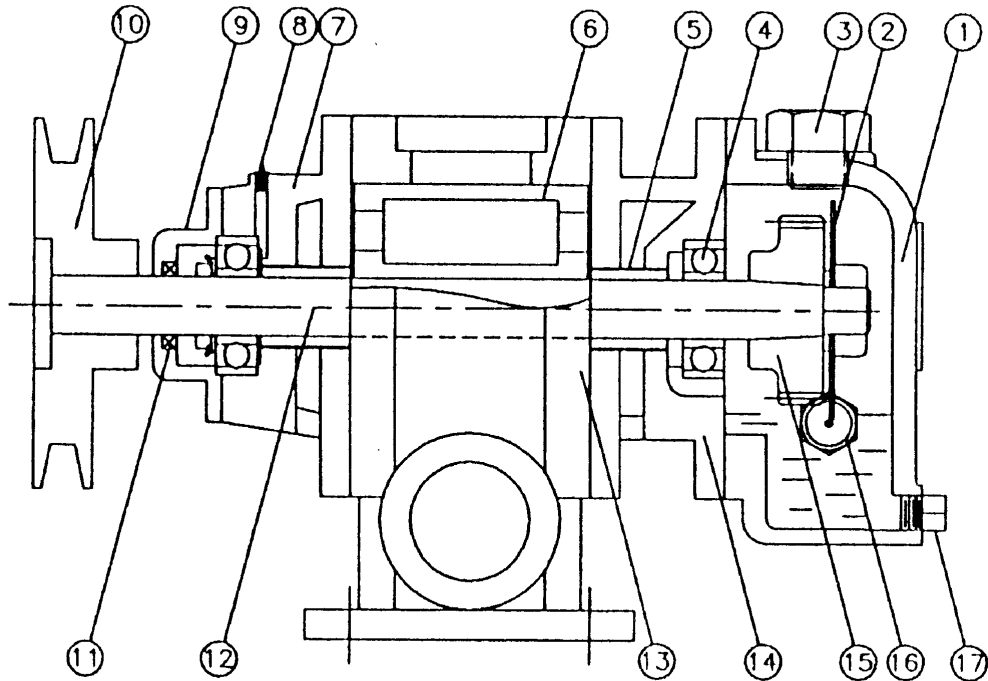


TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	SOLUTION
Blower not rotating	Rotors rusty or foreign materials within the unit.	Clean rotors or unit.
	Belt slipping or snapped.	Re-adjust belt tension or change belts.
	Motor faulty.	Check motor and power source.
Lack of air volume	Leakage from piping.	Tighten connections.
	Leakage from safety valve.	Re-adjust safety valve.
	Slipping of belts.	Tighten belts.
	Worn clearance.	Re-establish proper clearances.
Abnormal noise or vibration	Slipping of belts.	Tighten belts.
	Insufficient lubricating oil.	Top up oil.
	Foreign material within the unit.	Clean the unit.
	Knocking.	Retime rotors.
	Worn gears.	Replace timing gears.
	Worn bearings.	Replace bearings.
	Safety valve operation.	Re-adjust safety valve.
Oil leakage	Too much oil in oil case.	Reduce oil level.
	Oil case, packing or oil seal is damaged.	Replace the said parts.
	Drain plug or oil gauge is not properly tightened.	Tighten up.



Sectional & Construction Drawing Model LT-40

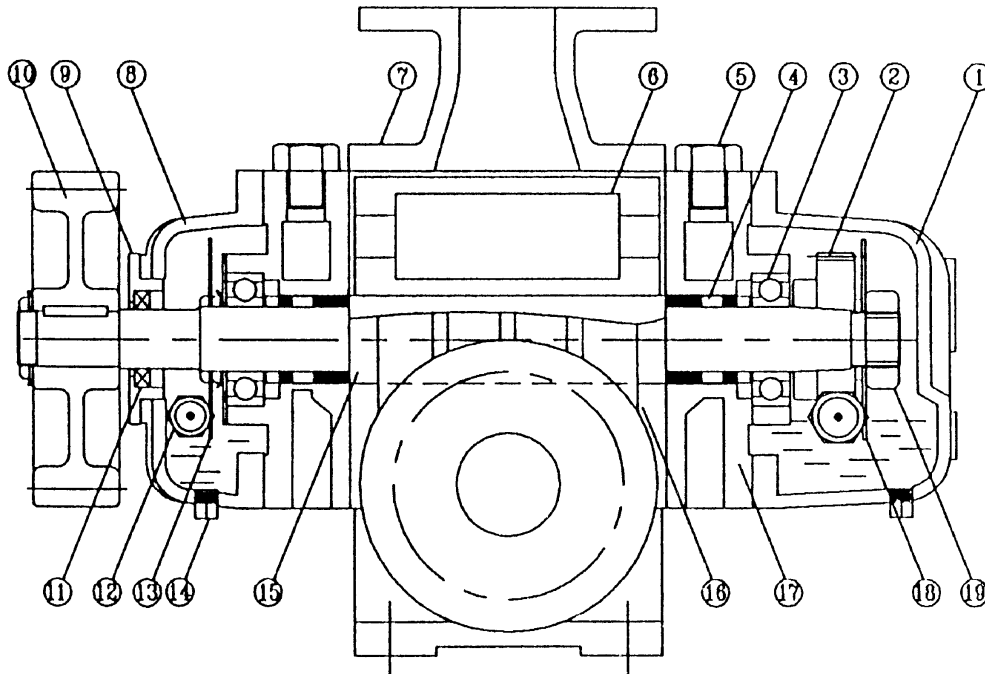


No.	Description	Material	No.	Description	Material
1	Gear case	FC25	11	Oil seal	NBR
2	Oil splash	SS41	12	Shaft	SCM440
3	Oil plug	S45C	13	Cylinder	FC25
4	Bearing	SUJ2	14	Side cover	FC25
5	Labyrinth seal	S45C	15	Timing gear	SNCM21
6	Rotor	FC25	16	Oil gauge	Glass
7	Side Cover	FC25	17	Drain plug	S45C
8	Grease plug	S45C	18		
9	Bearing cover	FC25	19		
10	Pulley	FC25	20		



Sectional & Construction Drawing

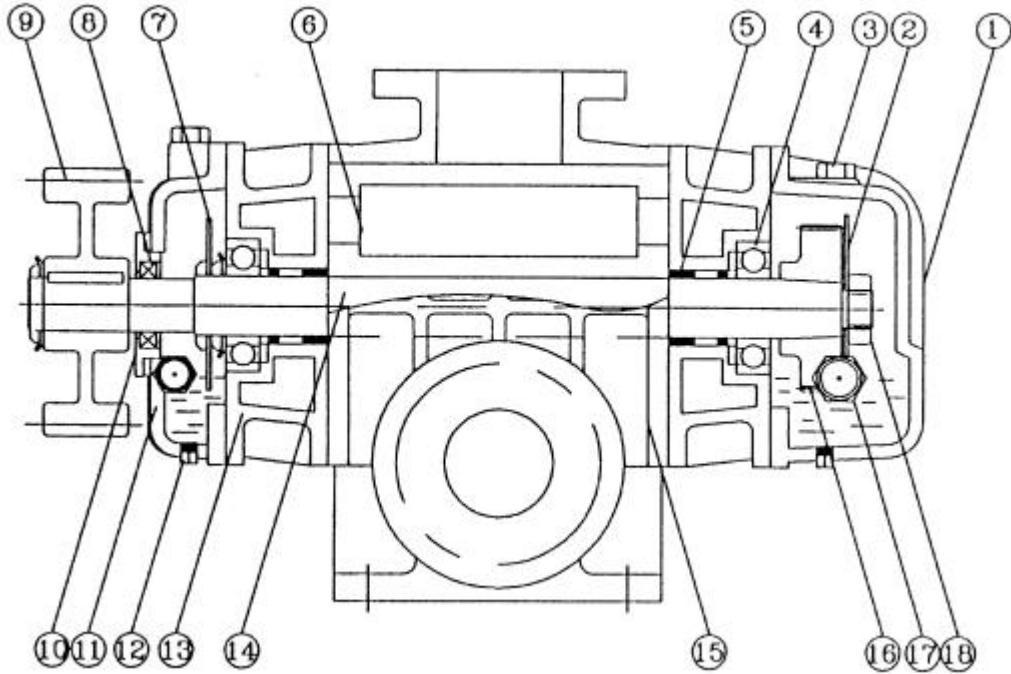
Model LT-50 ~ 65



No.	Description	Material	No.	Description	Material
1	Gear case	FC25	11	Oil gauge	Glass
2	Timing gear	S45C	12	Oil seal	NBR
3	Bearing	SUJ2	13	Oil splasher	SS41
4	Labyrinth seal	S45C	14	Drain plug	S45C
5	Oil plug	S45C	15	Shaft	SCM440
6	Rotor	FC25	16	Cylinder	FC25
7	Inlet flange	FC25	17	Side cover	FC25
8	Front oil cover	FC25	18	Oil splasher	SS41
9	Seal case	FC25	19	Nut	S45C
10	Pulley	FC25	20		



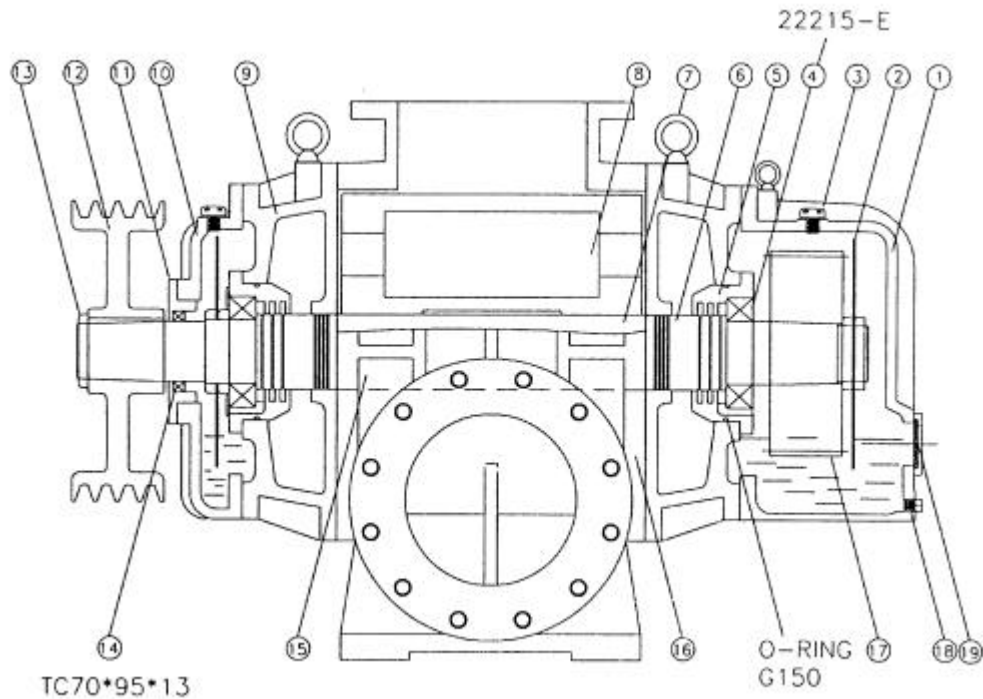
Sectional & Construction Drawing Model LT-80 ~ 150



No.	Description	Material	No.	Description	Material
1	Gear case	FC25	11	Front oil cover	FC25
2	Oil splasher	SS41	12	Drain plug	S45C
3	Oil plug	S45C	13	Side cover	FC25
4	Bearing	SUJ2	14	Shaft	SCM440
5	Labyrinth seal	S45C	15	Cylinder	FC25
6	Rotor	FC25	16	Timing gear	SNCM21
7	Oil splasher	SS41	17	Oil gauge	Glass
8	Oil seal	NBR	18	Nut	S45C
9	Pulley	FC25	19		
10	Seal case	FC25	20		



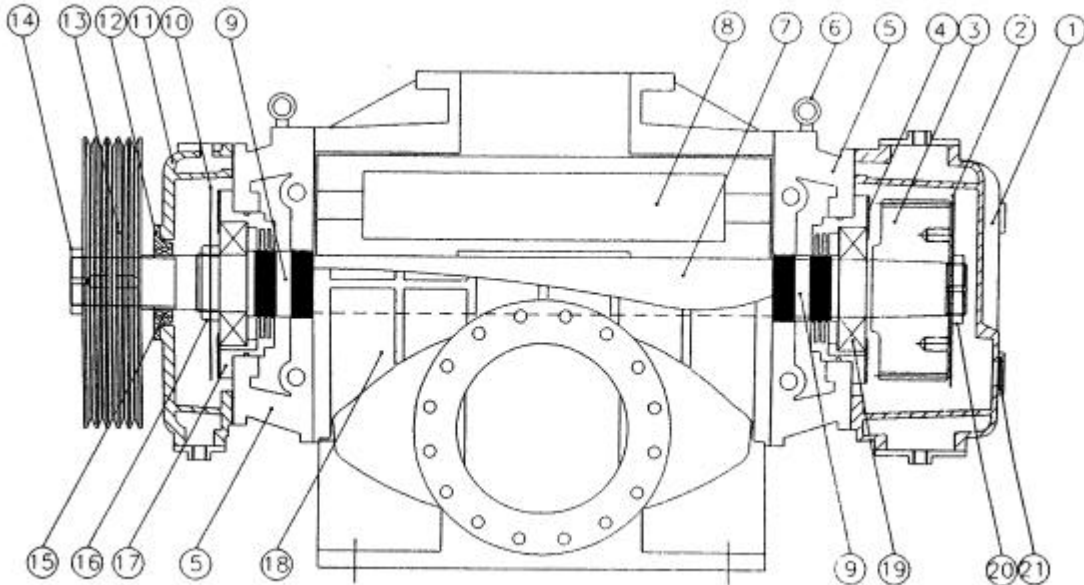
Sectional & Construction Drawing Model LT-200 ~ 250



No.	Description	Material	No.	Description	Material
1	Gear case	FC25	11	Seal case	FC25
2	Oil splasher	SS41	12	Pulley	FC25
3	Oil plug	S45C	13	Shaft nut	S45C
4	Bearing	SUJ2	14	Oil seal	Viton
5	Bearing case	FC25	15	Shaft	SCM440
6	Labyrinth seal	S45C	16	Cylinder	FC25
7	Eye bolt	S45C	17	Timing gear	SNCM21
8	Rotor	FC25	18	Drain plug	S45C
9	Side cover	FC25	19	Oil gauge	Glass
10	Oil cover	FC25	20		



Sectional & Construction Drawing Model LT-300 ~ 350



No.	Description	Material	No.	Description	Material
1	Gear case	FC25	12	Oil seal case	FC25
2	Oil splasher	SS41	13	Pulley	FC25
3	Gear	SCM420	14	Shaft nut	S45C
4	Plate	SS41	15	Oil seal	NBR
5	Side cover	FC25	16	Shaft nut	S45C
6	Eye bolt	S45C	17	Bearing case	FC25
7	Shaft	SCM440	18	Cylinder	FC25
8	Rotor	FC25	19	Bearing	SUJ2
9	Labyrinth seal	S45C	20	Shaft nut	S45C
10	Oil splasher	SS41	21	Oil gauge	GLASS
11	Front cover	FC25			

