

# **DIESEL ENGINE AND PUMP REPAIRING**

## **1. INTRODUCTION:**

Diesel engines, generator, Electric motors and pump-sets etc. equipment are the nucleus of modern rural and urban centers. The demand for repairing and servicing of these items are steadily growing, and therefore there is a bright scope in this field.

## **2. PRODUCT & ITS APPLICATION:**

Diesel engines and coupled generators and motor are essential for all sectors due to power and water needs in urban and rural area population, agriculture activities and industries.

Engines and pumps motors etc. like all machines, need repair and servicing due to normal wear and tear in operation. There are also several faults that occur due to damage to worn components, overloading, corrosion, overheating, etc. Most of them pertain to bearing, bushes, shaft and impeller wear out or the electrical motor winding failures.

This equipment require experienced repair shops that can repair, rebuild and replace components as also carry out normal servicing of these equipment by cleaning and preventive maintenance for smooth operations.

## **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

An ITI / Diploma / Graduate with relevant experience

## **4. INDUSTRY OUTLOOK/TREND**

The repairing and servicing of diesel engines and pumps are the dire needs of rural sector as these are widely used for irrigation and harvesting purposes. The

repairing and servicing of diesel engines and pumps are the dire needs of rural sector as these are widely used for irrigation and harvesting purposes. The users sometimes are not well verse in proper use and maintenance of these equipment. Therefore there is good scope for a service center in such areas that lack the facility.

## **5. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:**

With growing population and also due to industrialization of our country there is wide use of standby power generating diesel engine generators, while pumps are widely used for water supply in commercial, residential and other buildings as well as for irrigation purposes in rural/ semi urban areas.

Electric motor/pump also has an extensive use in regular supply of water in almost every household and as well as industrial units, institutions, hotels and markets. All these equipment need local repair and servicing and therefore, it can be taken up by experienced person in various rural, semi urban and urban centers.

## **6. RAW MATERIAL REQUIREMENTS:**

Mostly equipment specific spare components are needed as per repair job requirement. The service unit may also need welding etc. consumables for the purpose.

## **7. MANUFACTURING PROCESS:**

The repairing and servicing process is equipment specific. It involves steps like dismantling machines, inspection of components for wear tear and damage. The worn or damaged parts may be replaced with new or cleaned, repaired, or rebuilt as per the need and then assembled. The repaired equipment is then inspected for proper functioning and performance.

## **8. MANPOWER REQUIREMENT:**

The unit shall require highly skilled service persons. The unit can start from 8 employees initially and increase to 23 or more depending on business volume.

Sr No	Type of Employees	Monthly Salary	No of Employees				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Skilled Operators	16000	1	1	2	2	3
2	Semi-Skilled/ Helpers	7000	2	2	2	2	3
3	Supervisor/ Manager	25000	0	0	0	1	1
4	Accounts/ Marketing	16000	0	0	0	1	1
5	Other Staff	7000	0	0	0	1	1
	TOTAL		3	3	4	7	9

## 9. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 3 months from the serious initiation of project work.

Sr No	Activities	Time Required in Months
1	Acquisition of Premises	-
2	Construction (if Applicable)	-
3	Procurement and Installation of Plant and Machinery	2
4	Arrangement of Finance	2
5	Manpower Recruitment and start up	1
	Total Time Required (Some Activities run concurrently)	3

## 10. COST OF PROJECT:

The unit will require total project cost of Rs 6.42 lakhs as shown below:

Sr No	Particulars	In Lakhs
1	Land	0.00
2	Building	0.00
3	Plant and Machinery	4.33
4	Fixtures and Electrical Installation	0.56
5	Other Assets/ Preliminary and Preoperative Expenses	0.30
6	Margin for working Capital	1.23

<b>TOTAL PROJECT COST</b>	<b>6.42</b>
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### 11. MEANS OF FINANCE:

The project will require promoter to invest about Rs 2.53 lakhs and seek bank loans of Rs 3.89 lakhs based on 70% loan on fixed assets.

Sr No	Particulars	In Lakhs
1	Promoters Contribution	2.53
2	Loan Finance	3.89
	<b>TOTAL:</b>	<b>6.42</b>

### 12. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr No	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	0.23	40	0.09	0.14
2	Receivables	0.38	50	0.19	0.19
3	Overheads	0.90	100	0.90	0.00
4	Creditors	0.12	40	0.05	0.07
	TOTAL	1.62		1.23	0.40

### 13. LIST OF MACHINERY REQUIRED:

Sr No	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Electrical Test meters	Nos	1	60000	60000
2	Tool Boxes, Torque Wrenches etc.	Nos	1	80000	80000
3	Lathe	Nos	1	70000	70000
4	Drill machine	Nos	1	30000	30000
5	Motor/alternator Rewinding tools	Nos	1	20000	20000
6	Bench Grinder and Misc. tools	Nos	1	70000	70000
7	Welding Sets	Nos	1	30000	30000
8	Hand Tools for Bolting/ Drilling/ Threading/ slotting	Nos	1	50000	50000
9	Electrical Meters viz Megger etc.	Nos	1	10000	10000
Sr No	Particulars	UOM	Quantity	Rate	Total Value

	subtotal:				420000
	Tools and Ancillaries				
1	Misc. equipment Jack etc.	LS	1	3000	3000
2	Tools and gauges	LS	1	10000	10000
	subtotal:				13000
	Fixtures and Elect Installation				
	Storage and transport bins and trolleys	LS	1	3000	3000
	Office Furniture	LS	1	3000	3000
	Telephones/ Computer	LS	1	20000	20000
	Electrical Installation	LS	1	30000	30000
	subtotal:				56000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	30000	30000
	TOTAL PLANT MACHINERY COST				519000

All the equipments and tooling are available from local manufacturers. The entrepreneur needs to ensure proper selection of equipments and tooling to have modern and flexible servicing. It may be worthwhile to look at reconditioned /used equipments and toolings. Some of the machinery and dies and toolings suppliers are listed here below:

1. Machineries and Spares  
Ranjit Chawla (Director)201, Karmastambh, LBS Marg, Vikhroli West  
Mumbai - 400083, Maharashtra, India
2. Pacific Engineering Corporation  
A-297, MIDC-Mahape, Near Mahape Bus Depot,  
Anthony Garage, Thane-Belapur Road, Mahape Midc,  
Navi Mumbai-400710, Maharashtra, India

#### 14. PROFITABILITY CALCULATIONS:

Sr No	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Capacity Utilization	%	40	50	60	70	70
2	Sales	Rs Lakhs	9.00	11.25	13.50	15.75	15.75
3	Raw Materials & Other	Rs Lakhs	2.77	3.46	4.15	4.84	4.84

	Direct Inputs						
4	Gross Margin	Rs Lakhs	6.23	7.79	9.35	10.91	10.91
5	Overheads Except Interest	Rs Lakhs	4.88	4.88	4.88	4.88	4.88
6	Interest	Rs Lakhs	0.54	0.54	0.54	0.54	0.54
7	Depreciation	Rs Lakhs	0.52	0.52	0.52	0.52	0.52
8	Net Profit Before Tax	Rs Lakhs	0.29	1.85	3.41	4.97	4.97

The basis of profitability calculation:

Unit will have capacity of servicing 1000 nos repair and servicing work including modification/major repair works. The repairing involves replacing parts at cost, however there is a margin of approx 10% or more on these components for servicing unit. The average billing of service and repair varies from 300 to 1000 or more per equipment.

The material requirements are almost nil as parts replaced and consumables like fasteners, clips, oil and grease, for which the cost is always charged. The repair also generates old worn parts wastage/ scrap to be sold at @ Rs 20 ~ 50 per Kg depending on type. The income of same is added. Consumables costs also considered based on prevailing rate.

Energy Costs are considered at Rs 7 per Kwh. The depreciation of plant is taken at 10 % and Interest costs are taken at 14 -15 % depending on type of industry.

## 15. BREAK EVEN ANALYSIS

The project is can reach break-even capacity at 42.02 % of the installed capacity as depicted here below:

Sr No	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	22.50
2	Variable Costs	Rs Lakhs	6.92
3	Fixed Cost incl. Interest	Rs Lakhs	5.94
4	Break Even Capacity	% of Inst Capacity	38.13

## **16. STATUTORY/ GOVERNMENT APPROVALS**

The unit may obtain industry unit registration from District Industry center. Shops in city areas shall need to get shop and establishment registration from local municipality etc. no other procedures are involved. Before starting the unit unit will also need GST registration for procurement of spares etc materials as also for sale of goods and services. As such there is no pollution control registration requirements, however the unit will have to ensure safe environment and Solid waste disposal shall have to meet the required norms.

## **17. BACKWARD AND FORWARD INTEGRATION**

The machines and equipment offer scope for diversification in to servicing other consumer and industries. As such there is not much scope for organic backward or forward integration. The service and repair business needs building up reputation, ensuring reliability and quality of services rendered. Also personal rapport of leading persons can generate good business volumes. The location with good catchment area ensures good market potential to new business units.

## **18. TRAINING CENTERS/COURSES**

There are no specific training centers for the servicing technology. Most of the training is given by manufacturers upon getting authorized service station or through apprentice ship with experienced vehicle repair shops.

Udyamimitra portal (link: [www.udyamimitra.in](http://www.udyamimitra.in)) can also be accessed for hand-holding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc. Entrepreneurship program helps to run business successfully is also available.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

### **Disclaimer:**

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of

knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Source:- Udyami Mitra/Sidbi