

How To Start Manufacturing Industries

TRUCK BRAKE RELINING PLANT

Truck brake relining is a simple type of automotive rebuilding that involves the cleaning and stripping of worn brake shoes and the installation of new brake linings using a riveting machine. While it is possible to reline truck brakes using hand tools, there are specialized machines which permit this type of automotive repair work to be done on a more efficient production rebuilding basis. A garage or service station will not usually have the volume of relining work necessary to justify the purchase of relining machinery, thus, a specialized truck brake relining operation becomes possible.

Quality control is critical in this type of automotive rebuild operation because the product can affect vehicle safety. If a truck brake relining operation is properly set up with the necessary machinery and equipment, then the quality of the relined brake shoe should be just as good as a new shoe. The rebuilt product can be guaranteed and sold at about 35 to 50 percent of the cost of a new unit because the most expensive parts of brake units, the cast metal shoes, can be salvaged.

The appropriate scale of a truck brake relining operation depends on the vehicle population in the market area being considered. A small but economical operation would have the capacity to reline approximately 150,000 brake shoes per year. A market area with about 200,000 to 300,000 trucks should be able to support this production capacity.

To initiate this type of rebuild operation, a stock of worn brake shoes is required. Such a stock called 'cores', must match the components used on the popular models of trucks in the market area to be served by the rebuilder. The initial stock of used cores can either be purchased from dealers who supply established rebuild operations in a number of countries, or it can be accumulated from the local market area at service stations and scrap yards. Once operations begin, then

the initial stock is replaced by cores taken in trade for rebuilt parts delivered to the garages and service stations in the area.

Process Description

1. Identification and storage. When brake shoes are received at the plant, each part is identified and stored according to model type.
2. Degreasing. Degreasing is the beginning of the production run. Shoes are placed in a tumbler degreaser which leaves the shoes wet, reducing flying asbestos dust when the worn brake linings are stripped from the shoes. A batch of at least 80 to 100 shoes of the same type is processed at one time to reduce machinery adjustments (however, smaller runs of less popular models may also be accommodated).
3. Brake stripping. Brake shoes are then placed on a heavy duty brake stripping machine which is designed to strip rivets and bolts from truck brake shoes. The brake shoe is placed on a mandrel, then a hydraulic cylinder coupled to a rack and pinion moves the shoe past a shearing blade. After the lining has been stripped, some of the remaining rivets may need to be manually knocked out of the shoe using an electric hand tool.
4. Sandblasting. Stripped brake shoes are placed in a sandblaster to remove any paint scale or rust.
5. Inspection. Fully cleaned brake shoes are inspected to see if they have maintained their original shape. Special instruments are used to test concavity, radius, and surface warpage. If the shoe is damaged, it is discarded. This inspection operation is critical to the quality and safety of the rebuilt product.
6. Paint dipping. Shoes are then painted in an automatic dip tank before new linings are riveted in place.

7. Brake relining. Special riveting machines are used to attach new brake linings to the brake shoes.
8. Packaging and storage. All relined brake shoes are packaged in die-cut foldable cardboard boxes, labelled, and stored ready for delivery.

Outline Of The Plant Operation

For a production operation capable of rebuilding 150,000 units per year, the following plant facility, machinery and equipment, labour, and materials are required.

1. Plant facility. A 600m² plant facility will be required. Included will be offices requiring about 80m² and inventory space requiring about 200m². Production operations will occupy the remaining 320m². A typical plant layout is illustrated in Figure 1.
2. Machinery and equipment. Initial capital investment in machinery and equipment will be approximately \$93,000 U.S. The types of machinery required are listed in Table 1.
3. Labour. The plant operation requires a staff of only 12 employees to operate on a 1-shift per day basis. Staffing requirements include 1 production manager/purchasing agent, 1 sales manager, 2 clerical staff, and 8 semi-skilled production workers. Staffing requirements are listed in Table 2.
4. Materials. The operation will require 3 types of materials. First, an inventory of 12,000 cores (approximately a 1-month supply) must be maintained. Secondly, an inventory of new brake linings will be required. Finally, a variety of operating supplies will also be needed, including rivets, paint, cleaning materials, etc.

Figure 1

Typical Plant Layout

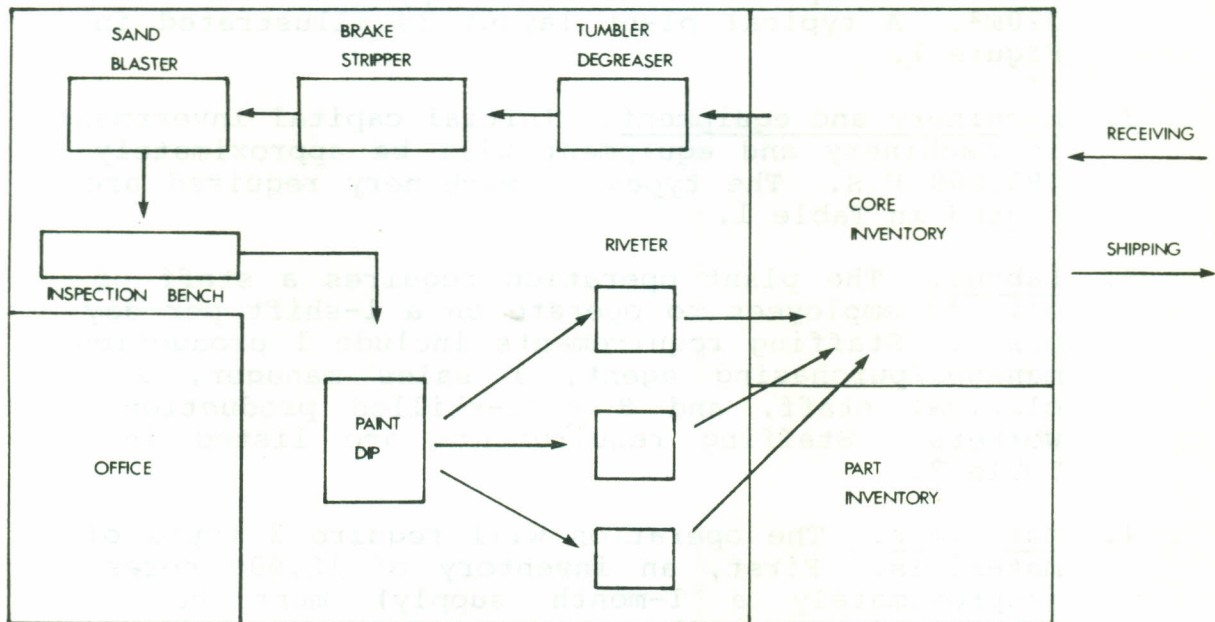


TABLE 1

MACHINERY AND EQUIPMENT

	<u>COST</u> (U.S.)
Inventory shelving and bins	\$ 5,000
Tumbler degreasing unit	7,000
Brake stripper	9,000
Hand tools	1,000
Sand blaster and dust collector	8,000
Testing equipment and bench	1,000
Paint dip tank	800
3 Riveting machines	15,000
Air ventilation equipment	25,000
6 light-duty hand trucks	1,200
1 light-duty delivery truck	10,000
Miscellaneous machinery and equipment	<u>10,000</u>
	\$93,000

TABLE 2

STAFFING REQUIREMENTS

	<u>NUMBER</u>
Production Manager/Purchasing Agent	1
Sales Manager	1
Office operations	2
Cleaning and stripping	2
Inspection and paint dip	2
Riveting	3
Packaging and shipping/receiving	<u>1</u>
TOTAL	12