

#4-18 Production of T2000 and Heavy Vehicles Parts

-No.4 HI: Machine Shop-

(1) Objectives and Outline of the Plan

At present light vehicle production is centered on the production of the B600 and X2000 models and local production has been implemented for these. Due to productive incapacity of the machine shop of No.4 HI the component parts to the T2000 and the Heavy Vehicle lines are largely imported .

The present plan aims at the increase in production of light vehicle related items and the implementation of the local production of the T2000 and Heavy Vehicle related parts currently imported, in order to realize a saving of foreign capital and improvement in technical expertise.

The parts related to the T2000 and Heavy Vehicles, excepting engine parts, which are scheduled for local production are as follows;

	T2000	Heavy Vehicles	X2000
1. rear axle shaft	1,560 items	3,950	2,080
2. front axle	780 items	1,910	
3. steering knuckle	1,560 items	3,950	
4. knuckle arm	780 items	1,910	
5. differential carrier	600 items		
6. differential case	1,200 items		

In order to realize the processing of the above parts a building area of some 2,000 square meters is needed for the installation of production equipment. The layout figure is the attached figure 1-1 and 1-2.

(2) Details of the Plan

1) Production line for the Rear Axle Shaft

Local production of the B600 rear axle shaft is currently cone but for

other vehicle models dependence is on imports and consequently installation of a specialist common processing line for both heavy and light vehicles is required.(vehicle models concerned ; T2000, X2000, BX402 and TE 21).

Casting blanks are supplied from the No.3 HI Foundry and processed finished parts are supplied in turn to the No.4 HI vehicle assembly shop, and No.1 HI axle and transmission assembly shop.

2) Front Axle production line

At present provision of the light and vehicle use completed parts is completely dependent on imports.

Installation of shared specialist processing lines for the heavy and light vehicle use is to be carried out(vehicle types concerned are the T 2000, BX 402 and the TE 21).

Casted blanks are to be supplied from the No. 3 HI Foundry and then processed finished parts in turn supplied to the No. 4 HI Light vehicle assembly shop and No. 1 HI axle and transmission assembly shop.

3) Production line for the Steering Knuckle

The B600 steering knuckle is currently locally produced but for other vehicle models dependence is on imports and consequently installation of a specialist common processing line for both heavy and light vehicles is required. The B600 is produced in this shop by the Job shop method. Installation of specialist lines for light and heavy vehicle with the aim also of expanding the productive capacity of this shop for the B600 line (vehicle types concerned ; B600, X2000 and BX 402).

Casting blanks are supplied from the No. 3 HI Foundry and processed finished parts are supplied in turn to the No. 4 HI light vehicle assembly shop, and No. 1 HI axle and transmission assembly shop.

4) Knuckle Arm production line

Local production of the B600 and X 2000 steering arm is currently done but for other vehicle models dependence is on imports and consequently installation of a specialist common processing line for both heavy and light vehicles is planned. Production of the locally produced B600 and X 2000 use items is done in this shop on the job shop method. Installation of specialist lines for light and heavy vehicle with the aim also of expanding the productive capacity of this shop is to be carried out (vehicle types concerned ; B600, X2000, T 2000 , BX 402 , and TE 21).

Casting blanks are supplied from the No. 3 HI Foundry and processed finished parts are supplied in turn to the No. 4 HI Light vehicle assembly shop, and No. 1 HI axle and transmission assembly shop.

5) Differential Carrier production line

Local production of the B600 and X 2000 differential carriers is currently done but for the T 2000 vehicle model dependence is on imports of completed assembly parts. The parts for B600 and for X2000 use are produced in this shop on the job shop method and installation of a specialist common processing line for all three types of light vehicles is to be carried out to include the expansion of this productive capacity.

Casting blanks are to be supplied from the No. 3 HI Foundry and processed finished parts are supplied in turn to the No. 4 HI vehicle assembly shop..

6) Differential Gear Case production line

Local production of the B600 and X 2000 differential gear cases is currently done but for the T 2000 vehicle model dependence is on imports of completed assembly parts. The parts for the use of the B600 and X2000 are produced using the job shop method in this shop and installation of a specialist common processing line for all three types of light vehicles is to be carried out to include the expansion of the productive capacity of this shop.

Casting blanks are to be supplied from the No. 3 HI Foundry and processed finished parts are supplied in turn to the No. 4 HI vehicle assembly shop.

A technical service ensuring the training for installation of equipment, trial testing, operational methods, verification of quality control and equipment maintenance etc. is required for realizing the above headings.

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Capital

A saving on foreign exchange from the production of T-2000 parts cannot be expected because production output is too low. (Assumed annual production: 20,280 pieces)

	Foreign Exchange Required at Implementation of Plan (yen per item)	Amount of Foreign Exchange Required at Present (yen per item)
Cost of parts	-	3,218
Raw Material Costs	2,574	-
Freight & Insurance	301	341
Sub-total	2,875	3,559
Working equipment costs	11,726	-
TOTAL	14,601	3,559

Note: The working equipment costs are only for the additional costs incurred by this plan. For details of the above items refer to the Attached Table 3-3. The product price is assumed at weighted average of the prices for the various parts of T2000 parts related to the present project. The price for blank materials represents 80% of the price of the finished product.

2) Reduction in Production Costs Achieved

A comparison of production costs for one item at present and after the implementation of the present plan is as follows:

	(Unit: yen per item)	
	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	2,574	3,218
Freight & insurance	301	341
Sub-total	2,875	3,559
Local CP/RM costs	-	-
Depreciation	9,275	-
Utility costs	473	-
Labor costs	79	-
Overheads	355	-
Admin. costs	222	-
Other costs	5,355	1,364
Sub-total	15,759	1,364
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	18,634	4,923

A reduction in production costs cannot be expected to result because of the low production output of the present plan.

(5) Recommendations on the Implementation of the Plan

The improvement of the shop/line systems of No.4 HI Machine Shop is a pre-requisite condition.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-18(1) Extension for parts production
No.4 HI: Machine shop

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg. (2,000m2)		
2	Imported M/E		
1	M/E for rear axle shaft production		
1 1	Centering M/C	Set	1
1 2	NC lathe	Set	1
1 3	Induction hardening/tempering M/C	Set	1
1 4	Copy grinder	Set	1
1 5	Vertical multi spindle drilling M/C	Set	1
1 6	Miscellaneous		
1 6 1	Screw cutting lathe	Set	1
1 6 2	Horizontal milling M/C	Set	1
1 6 3	Straightening M/C	Set	1
1 6 4	Magnetic-particle test	Set	1
1 6 5	Washing equipment	Set	1
2	ME: front axle production		
2 1	Single purpose facing M/C	Set	1
2 2	Single purpose boring M/C	Set	2
2 3	Single purpose boring and milling M/C	Set	1
2 4	Materials handling equipment/tools	Lot	1
3	Steering knuckle production		
3 1	Induction hardening/tempering M/C	Set	1
3 2	Magnaflux tester	Set	1
3 3	Copy lathe	Set	1
3 4	Copy grinder	Set	1
3 5	Miscellaneous		
3 5 1	Press M/C	Set	1
3 5 2	Lathe	Set	1
3 5 3	Radial drilling M/C	Set	2
3 5 4	Horizontal milling M/C	Set	2
3 5 5	Turret drilling M/C	Set	2
3 5 6	Multi-spindle drilling M/C	Set	2
3 5 7	Upright drilling M/C	Set	1
3 5 8	Spline milling M/C	Set	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-18(2) Extension for parts production
No.4 HI: Machine shop

No	Items	Unit	No.
4	Knuckle arm production		
4 1	Centering M/C	Set	1
4 2	Copy lathe	Set	1
4 3	Drilling M/C	Set	1
4 4	Milling M/C	Set	1
4 5	Tools	Lot	1
5	Differential carrier production		
5 1	NC lathe	Set	1
5 2	Single purpose boring/tapping M/C	Set	1
5 3	Single purpose internal rough boring M/C	Set	1
5 4	Single purpose internal fine boring M/C	Set	1
5 5	Miscellaneous		
5 5 1	Vertical milling M/C	Set	1
5 5 2	Turret drilling M/C	Set	2
5 5 3	Run out correcting M/C	Set	1
6	Differential gear case production		
6 1	NC lathe	Set	1
6 2	Single purpose boring/tapping M/C	Set	1
6 3	Single purpose spherical facing M/C	Set	1
6 4	Single purpose M/C	Set	1
6 5	Miscellaneous		
6 5 1	Vertical lathe	Set	1
6 5 2	Upright drilling M/C	Set	1
6 5 3	Washing equipment	Lot	1
7	T2000 engine parts production		
7 1	Cam grinder	Set	1
7 2	Single purpose oil hole boring M/C	Set	1
7 3	Tools	Lot	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-18)

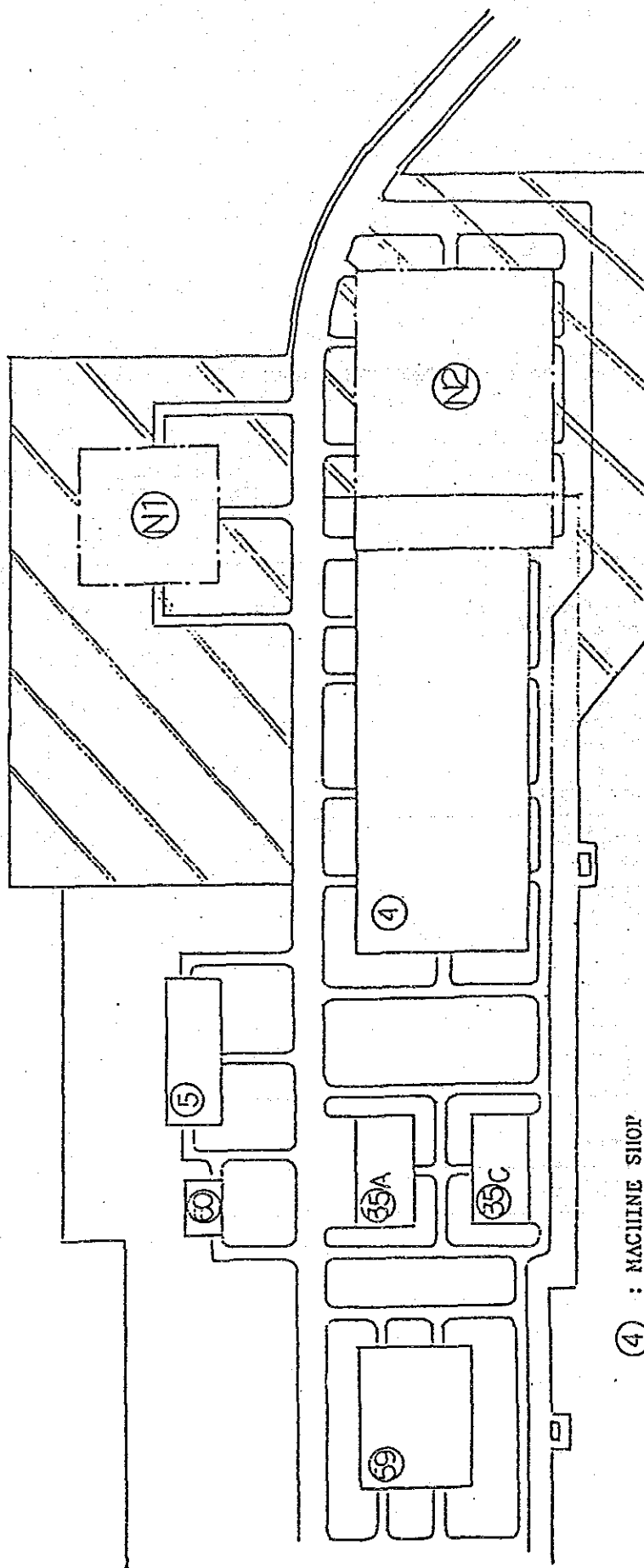
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	115.2	161.4	276.6
2 Freight & Insurance	13.5	-	13.5
Sub-total	128.7	161.4	290.1
3 Import Duty	-	19.3	19.3
4 Unloading	-	1.9	1.9
Building Total	128.7	182.6	311.3
Bldg & Land Total	128.7	182.6	311.3
2 1 Imported M/E (FOB)	2253.2	-	2253.2
2 Freight & Insurance	263.6	-	263.6
Sub-total	2516.8	-	2516.8
3 Import Duty	-	377.5	377.5
4 Unloading	-	37.8	37.8
5 Installation Cost	-	0.0	0.0
Imported M/E Total	2516.8	415.3	2932.1
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	169.2	-	169.2
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	169.2	-	169.2
Total Investment	2814.7	597.9	3412.6

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-18)

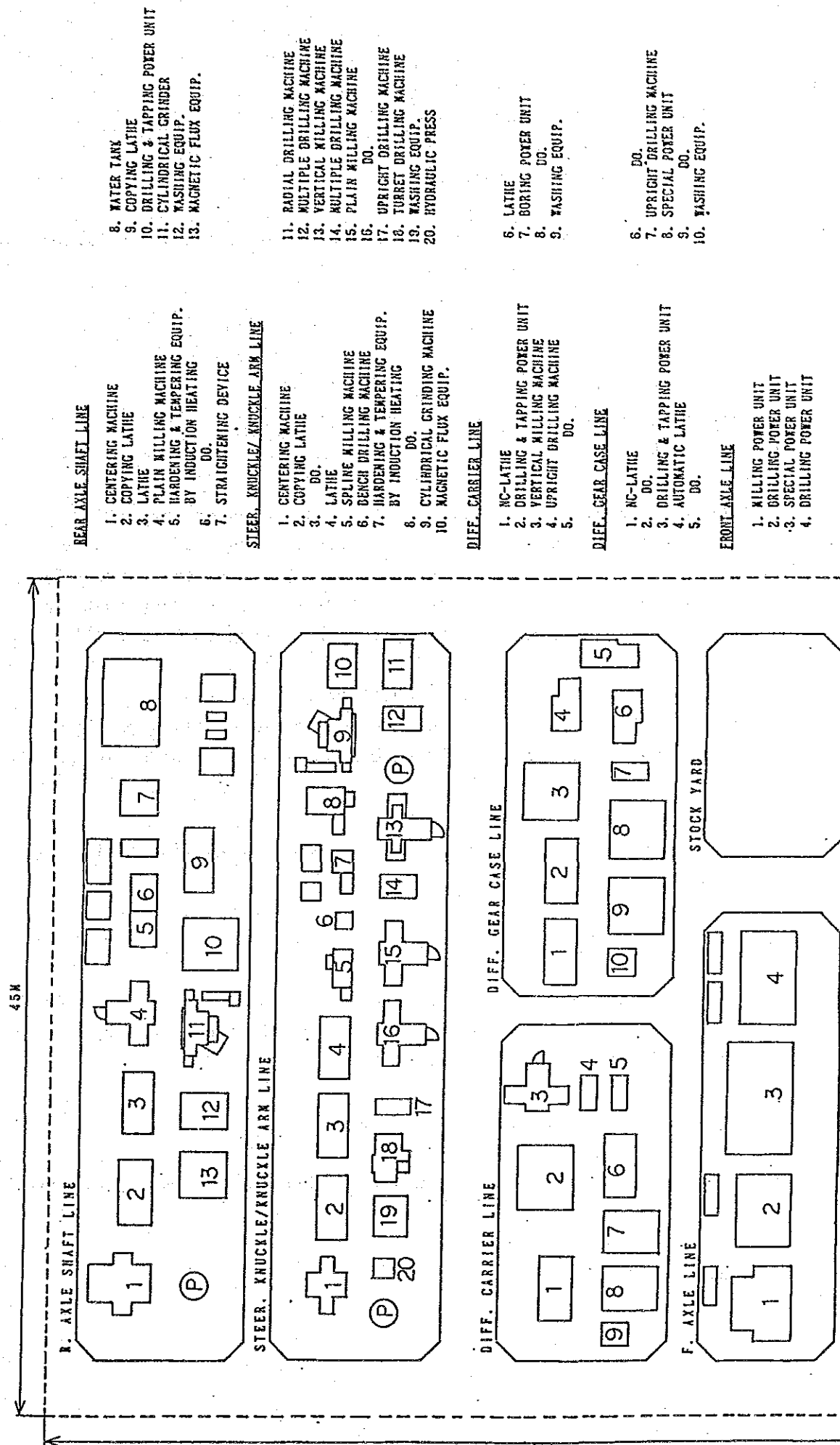
Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	52.2	-	52.2	14
Freight & Insurance	6.1	-	6.1	2
Import Duty	-	8.7	8.7	2
Unloading	-	0.9	0.9	0
Sub-total	58.3	9.6	67.9	18
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	58.3	9.6	67.9	18
2 Utilities	0.0	9.6	9.6	3
Variable Cost	58.3	19.2	77.5	21
3 Depreciation	156.1	32.0	188.1	50
4 Amortization	0.0	-	0.0	0
5 Maintenance	79.4	17.3	96.7	26
6 Design Fee	2.3	-	2.3	1
7 Labor	-	1.6	1.6	0
8 Overhead	-	7.2	7.2	2
9 Admin. Cost	-	4.5	4.5	1
Fixed Cost	237.8	62.6	300.4	79
Annual Cost	296.1	81.8	377.9	100
Unit P. Cost			18634.1	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			18634.1	

Attached Figure. 1-1 LAYOUT OF NEW SHOP (N1:DIFF AND AXLE MACHINING SHOP N2:ENGINE SHOP) - NO.4HI



- ④ : MACHINE SHOP
- ⑤ : HEAT TREATMENT SHOP
- 35A : WAREHOUSE
- 35C : WAREHOUSE
- 59 : PISTON AND PISTON RING MACHINING SHOP
- 60 : PLATING SHOP

Attached Figure 1-2 LAYOUT OF DIFF. AND AXLE MACHINING SHOP(1/200)' (N17



#4-19 DS Engine Parts Production
- No.4 HI: Diesel Engine Shop -

(1) Objectives and Outline of the Plan

At present, the following parts for the engine of the heavy vehicles lines are dependent on imports:

- engine gear
- pulley
- inlet manifold
- exhaust manifold
- water pump

The present plan aims to improve the level of technical expertise with the aim of saving foreign exchange assets used for imports by the local production of the above listed parts. The warehouse currently located to the south side of the No.4 HI Diesel Engine Shop is to be remodeled and production lines for parts processing to be installed.

In order to remedy the problems in product quality caused by the detrimental effect caused to machine precision by settling of floor and foundation the floor concrete thickness shall be made at least 250 mm.

Production capacity including the service parts production is to be 1,900 sets per annum.

(2) Details of the Plan

The processing equipment for manufacturing above-mentioned parts shall be installed in the remodelled warehouse divided into blocks by the products (refer to Attached Figure 1-1).

1) Engine Gear Production Line

The following parts are included under the heading of the engine gear:

- gear, crankshaft
- gear, idler

gear, camshaft
gear, injection pump drive

Forged blanks are supplied from the No.3 HI Forging Shop and the finished processed parts are supplied to the No.4 HI Diesel Engine Shop.

Soft nitriding treatment is to be carried out in order to increase the fatigue strength.

2) Pulley Production Line

The following parts are covered under the heading of the pulley:

pulley, crankshaft
pulley, crank drive

Cast blanks are supplied from the No.3 HI Foundry and finished processed parts are then supplied to the No.4 HI Diesel Engine Shop.

3) Inlet and Exhaust Manifold Production Line

The inlet manifold are supplied from the No.4 HI Light Alloy Shop and the exhaust manifold from the No.3 HI Foundry. The process finished parts are supplied to the No.4 HI Diesel Engine Shop.

As the processing equipment for the aluminum alloy cast parts and the cast iron parts are mixed it is necessary to clean machinery and gather the cutting scraps after the processing of each lot.

4) Water Pump Production Line

The cast blanks for pump case and impeller are supplied from the No.3 HI Foundry and after machine processing is completed these are assembled with the imported parts at the water pump assembly area. The assembled parts are then supplied to the No.4 HI Diesel Engine Shop.

A technical service ensuring the training for installation of equipment, testing, operational methods, verification of quality control

and equipment maintenance, etc. is required for the realization of the above headings.

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Exchange

The changes in amounts of required foreign exchange for production of one DS Engine are as follows (however this is with an annual production of 13,310 items):

	Foreign Exchange Required at Implementation of Plan (yen per item)	Amount of Foreign Exchange Required at Present (yen per item)
Cost of parts	-	4,208
Raw Material Costs	3,366	-
Freight & Insurance	376	88
Sub-total	3,742	4,296
Working equipment costs	5,642	-
TOTAL	9,384	4,296

Note: The working equipment costs are only for the additional costs incurred by this plan. For details of the above items refer to the Attached Table 3-3.

Raw material price was assumed 80% of product price. The product price is the average price of DS Engine parts weighted by production quantity of various vehicles.

With Increased Production (items/year)	Foreign Exchange Req. at Implementation (yen/item)	Annual Foreign Exchange Req. (yen/item)
13,310	9,384	4,296
30,000	4,163	4,296
50,000	2,498	4,296

A saving on foreign exchange can be anticipated with an annual production output of 30,000 items.

2) Reduction in Production Costs Achieved

A comparison of production costs for one item at present and after the implementation of the present plan is as follows:

(Unit: yen per unit)		
	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	3,366	4,208
Freight & insurance	376	88
Sub-total	3,742	4,296
Local CP/RM costs	-	-
Depreciation	4,388	-
Utility costs	113	-
Labor costs	135	-
Overheads	150	-
Admin. costs	45	-
Other costs	2,817	859
Sub-total	7,648	859
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	11,390	5,155

Therefore, because of the low annual production output of the present plan a reduction in the production costs cannot be expected to result.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-19 Domestic Production of DS Engine Parts
- No.4 HI: Diesel Engine Shop -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	Gear for engine		
1 1	NC, horizontal lathe w/jig & tool	Set	1
1 2	NC, horizontal lathe w/jig & tool	Set	1
1 3	NC, vertical hobbing machine w/jig and tool	Set	1
1 4	Gear, chamfering machine w/jig and tool	Set	1
1 5	Vertical broaching machine w/jig and tool	Set	1
1 6	Gear, shaving machine w/jig and tool	Set	1
1 7	Stamping punch w/jig	Set	1
1 8	Upright drilling machine w/jig and tool	Set	1
1 9	NC, vertical drilling machine	Set	1
110	Gas softener equipment	Set	1
111	Hydraulic press	Set	1
112	Bench drilling machine	Set	1
113	Horizontal simple lathe	Set	1
114	Miscellaneous	Lot	1
2	Pulley		
2 1	NC horizontal lathe w/jig & tool	Set	1
2 2	NC horizontal lathe w/jig & tool	Set	1
2 3	NC vertical drilling machine w/jig and tool	Set	1
2 4	Vertical balancing machine w/jig and tool	Set	1
2 5	Vertical broaching machine w/jig and tool	Set	1
2 6	Stamping punch w/jig and tool	Set	1
2 7	Miscellaneous	Lot	1
3	Inlet and exhaust manifold		
3 1	Vertical machining center w/jig and tool	Set	1
3 2	Horizontal machining center w/jig and tool	Set	1
3 3	Horizontal CNC lathe w/jig and tool	Set	1
3 4	Upright drilling machine w/jig and tool	Set	1
3 5	Leakage tester w/tool	Set	1
3 6	Miscellaneous	Lot	1
4	Water pump		
4 1	Horizontal CNC lathe w/jig & tool	Set	1
4 2	Horizontal CNC lathe w/jig & tool	Set	1
4 3	Vertical machining center w/jig and tool	Set	1
4 4	Drilling and tapping special machine w/tool	Set	1
4 5	Leakage tester w/tool	Set	1
4 6	Miscellaneous	Lot	1
5	Piping and electric wiring materials	Lot	1

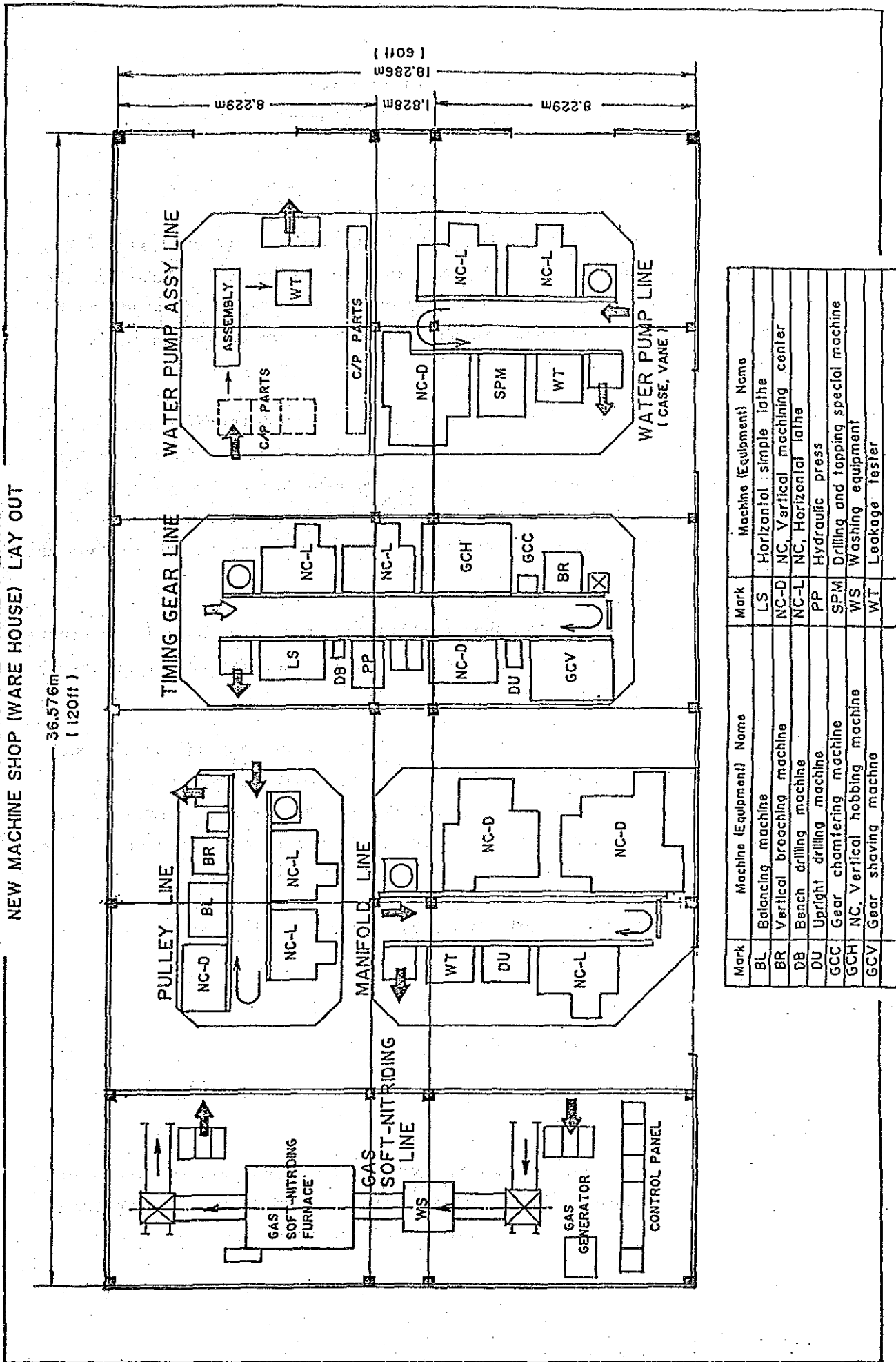
Attached Table 3-2: REQUIRED INVESTMENT (#4-19)

(Unit: million yen)			
Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	749.1	-	749.1
2 Freight & Insurance	83.2	-	83.2
Sub-total	832.3	-	832.3
3 Import Duty	-	124.9	124.9
4 Unloading	-	11.7	11.7
5 Installation Cost	-	0.0	0.0
Imported M/E Total	832.3	136.6	968.9
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	66.6	-	66.6
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	66.6	-	66.6
Total Investment	898.9	136.6	1035.5

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-19)

Items	Annual Cost (million Yen)			Component (%)
	F/C	L/C	Total	
1 CP/RM				
A Imported CP/RM (FOB)	44.8	-	44.8	30
Freight & Insurance	5.0	-	5.0	3
Import Duty	-	7.5	7.5	5
Unloading	-	0.7	0.7	0
Sub-total	49.8	8.2	58.0	38
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	49.8	8.2	58.0	38
2 Utilities	0.0	1.5	1.5	1
Variable Cost	49.8	9.7	59.5	39
3 Depreciation	49.9	8.5	58.4	39
4 Amortization	0.0	-	0.0	0
5 Maintenance	25.0	4.1	29.1	19
6 Design Fee	0.2	-	0.2	0
7 Labor	-	1.8	1.8	1
8 Ovehead	-	2.0	2.0	1
9 Admin.Cost	-	0.6	0.6	0
Fixed Cost	75.1	17.0	92.1	61
Annual Cost	124.9	26.7	151.6	100
Unit P.Cost			11389.9	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact.Cost			11389.9	

NO.4 H I DIESEL ENGINE PLANT
NEW MACHINE SHOP (WARE HOUSE) LAY OUT



#4-20 Production of the Exhaust and Inlet Valve

- No.3 HI: #Exhaust and Inlet Valve Line -

(1) Objectives and Outline of the Plan

All of the inlet and exhaust valves for engines currently used for heavy and light vehicles imported as completed parts. Those for agricultural machinery engine use rely on the importation of crude casted materials which are then finished by machine processing in the No.3 HI.

The present plan is for the installation of an integrated production line from casting materials to completion of machine processing for the inlet and exhaust valves of all engines whether heavy or light vehicles or for agricultural machinery. The aim of the plan is to save foreign exchange currently expended on imports and to improve the level of technical expertise.

To this end expansion of shop building by an area of some 1,080 square meters and of a building area of some 120 square meters for accessory equipment use is planned.

An integrated line of processing equipment from casting, heat treatment, machine processing, finishing, down to inspection shall be installed at the extended area inside the shop, and a compressor and other auxiliary equipment be installed in the other extension area set aside for this purpose.

Production capacity, including servicing parts, is planned to reach the following levels;

Inlet valve	50,000 per annum
Exhaust valve	50,000 per annum

(2) Details of the Plan

Expansion of the area inside the No.3 HI by approximately 1,080 square meters, and installation of production lines for shared use in producing the inlet and exhaust valves of the heavy vehicles, light

vehicles and agricultural machinery engines is planned. Process flow chart is shown in Attached Figure 2-1, and the layout plan is in Attached Figure 2-2.

The planned production line shall include equipment for casting, heat treatment, and machine processing and installation of the various types of inspection device, measurement jigs, and measurement devices needed to check product quality is to be carried out.

Provision of the various metal molds, and jig tools need for processing production is to be made.

Shop auxiliary equipment such as transmitted electricity receiving equipment, compressors, water supply and drainage equipment, etc., are to be installed in a covered area of about 120 square meters constructed in the vicinity of the shop.

Processed finished goods are to be supplied to the No.4 HI Diesel Engine Shop in the case of heavy vehicle use products, to the No.4 HI Machine Shop in the case of light vehicle use products and to the No.3 HI in the case of agricultural machinery use products.

As precision processed parts are involved it is necessary that exclusive containers be available for transportation purposes.

A technical service ensuring the training for installation of equipment, trial testing, operational methods, verification of quality control and equipment maintenance etc. is required.

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Capital

In the event of the present plan being implemented a saving on the required amount of foreign exchange cannot be anticipated because of the low level of 100,000 pieces of planned annual production output.

	Foreign Exchange Required at Implementation of Plan (yen per item)	Amount of Foreign Exchange Required at Present (yen per item)
Cost of Parts	-	1,140
Raw Material Costs	570	-
Freight and Insurance	63	127
Sub-total	633	1,267
Working Equipment Costs	1,444	-
TOTAL	2,077	1,267

Note: For detail, see Attached Table 3-3. The price of casting material is assumed 50% of the product. The product price is the average price weighted by production quantity of various vehicles.

2) Reduction in Production Costs Achieved

A comparison of production costs for one items at present and after the implementation of the present plan is as follows:

(unit: yen per item)

	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	570	1,140
Freight & insurance	63	127
Sub-total	633	1,267
Local CP/RM costs	-	-
Depreciation	936	-
Utility costs	359	-
Labor costs	22	-
Overheads	37	-
Admin. costs	11	-
Other costs	813	190
Sub-total	2,178	190
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	2,811	1,457

(5) Recommendations of Implementation of the Plan

At the present level of planned production, both foreign exchange saving and production cost reduction cannot be expected. Therefore, it is recommended to watch the market trend and implement the project in accordance with the extent of market maturity.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-20 Exhaust & Inlet Valve Production
 - No.3 HI: #Exhaust & Inlet Valve Line -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	Forging facility	Set	1
2	Heat treatment facility	Set	1
3	Machining and finishing facility	Set	1
4	Inspection facility	Set	1
5	Facility for molds, jigs and tools	Set	1
6	Auxiliary facility	Set	1
7	Spare parts	Lot	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-20)

(Unit: million yen)

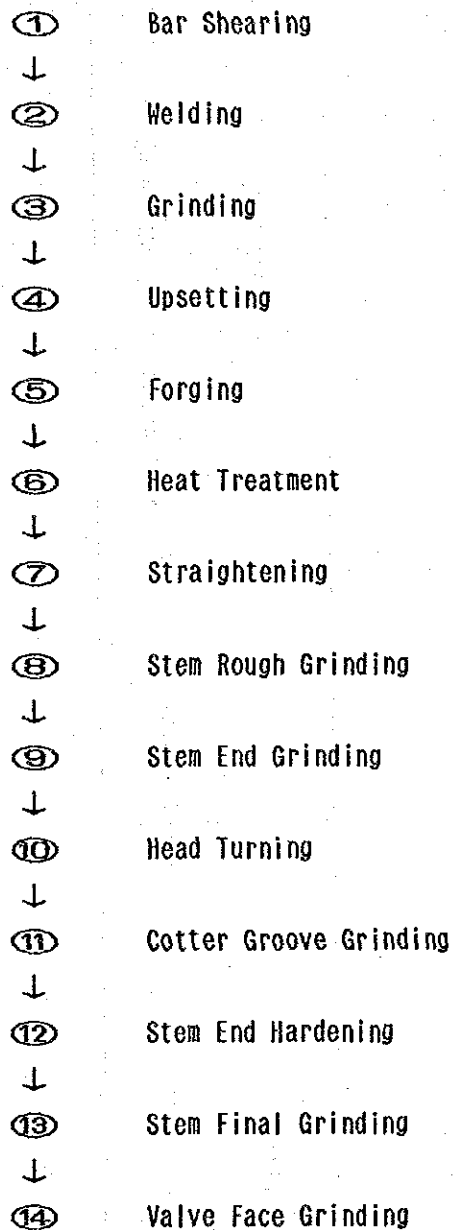
Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	1203.6	-	1203.6
2 Freight & Insurance	133.6	-	133.6
Sub-total	1337.2	-	1337.2
3 Import Duty	-	200.6	200.6
4 Unloading	-	18.8	18.8
5 Installation Cost	-	5.1	5.1
Imported M/E Total	1337.2	224.5	1561.7
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	58.8	-	58.8
C Software	60.0	-	60.0
D Interest	0.0	-	0.0
Other Costs Total	118.8	-	118.8
Total Investment	1456.0	224.5	1680.5

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-20)

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	57.0	-	57.0	20
Freight & Insurance	6.3	-	6.3	2
Import Duty	-	9.5	9.5	3
Unloading	-	0.9	0.9	0
Sub-total	63.3	10.4	73.7	26
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	63.3	10.4	73.7	26
2 Utilities	0.0	35.9	35.9	13
Variable Cost	63.3	46.3	109.6	39
3 Depreciation	80.2	13.4	93.6	33
4 Amortization	23.8	-	23.8	8
5 Maintenance	40.1	6.7	46.8	17
6 Design Fee	0.3	-	0.3	0
7 Labor	-	2.2	2.2	1
8 Overhead	-	3.7	3.7	1
9 Admin. Cost	-	1.1	1.1	0
Fixed Cost	144.4	27.1	171.5	61
Annual Cost	207.7	73.4	281.1	100
Unit P. Cost			2811.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			2811.0	

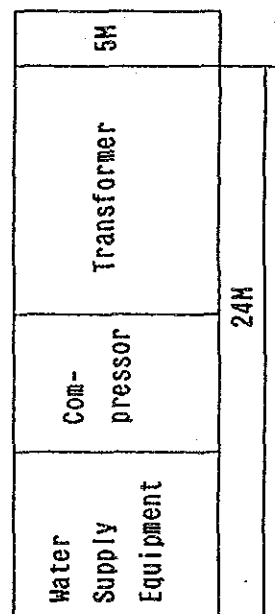
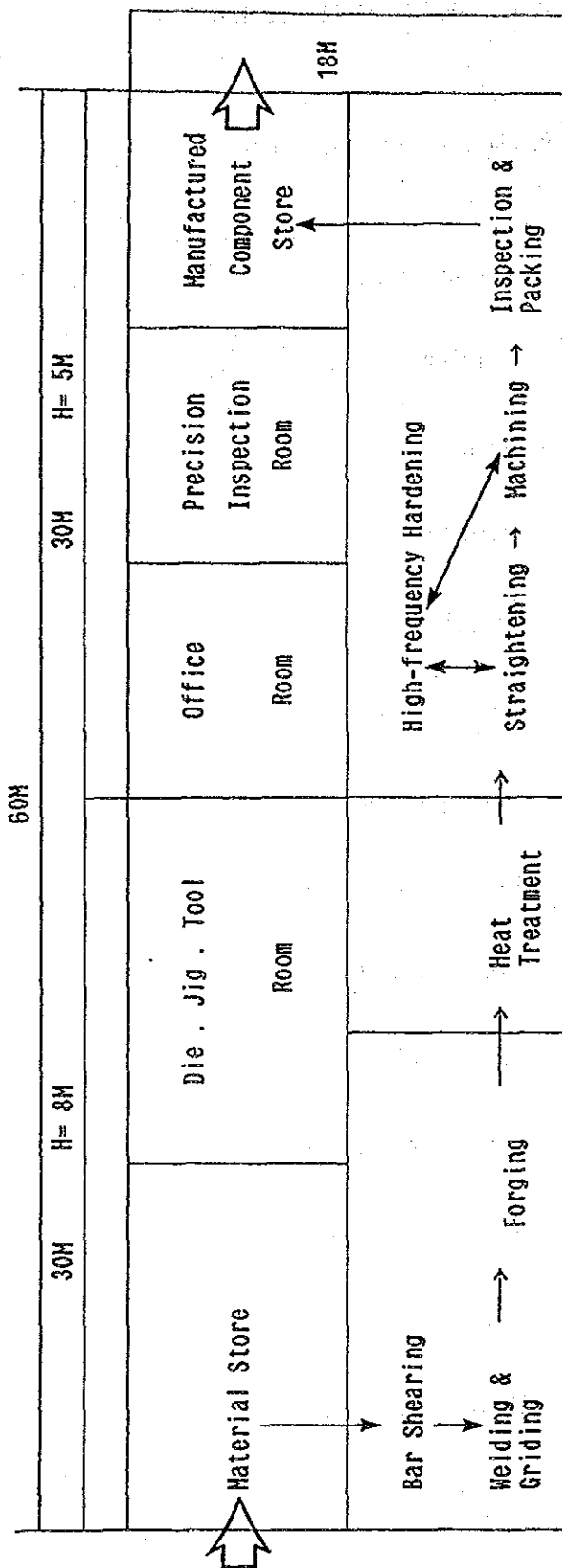
Attached Figure 2-1 VALVE MANUFACTURING SHOP

Main Production Process Chart



Attached Figure 2-2

$$18H \times 60H = 1080H^2$$



#4-21 T-2000 Engine Production and LV Engine and Transmission Production Increase

- No.4 HI: Machine Shop -

(1) Objectives and Outline of the Plan

Currently local production of light vehicles is centered on that of the B-600 and X-2000 models.

Many of the parts for the T-2000 engine are the same as those for the X2000 engine and dependence on imports is due to the insufficiency of productive capacity of the No.4 HI machine shop.

The present plan proposes measures for increased production of the 2000 cc engine and transmission together with implementation of the local production of the T-2000 engine with the aim of saving on foreign capital currently spent on imports and improving technical expertise.

Current productive capacity for the year of 1986 was as follows:

B-600 433 vehicles

X-2000 236 vehicles

T-2000 (340 vehicles) (engine and transmission are imported as completed parts)

The main hindering factor to productive capacity is insufficient capacity of the No.4 HI machine shop. Even with repairs and replacement of damaged and worn-out machinery, and provision for a improvement of the production system the best productive capacity which can be anticipated is as follows:

B-600 800 vehicles per annum

X-2000 500 vehicles per annum

For this end expansion of the facility area of the Machine shop should be made by an area of some 5,670 square meters on the north side of the shop. Here production lines for the main parts on a production flow system should be set up and layout be changed to allow for a job shop method of production of the remaining other parts. This would allow for an expansion of productive capacity to reach the aim of some 1,000 vehicles per annum set for the X-2000 model.

Adoption of overtime and/or two shift working will enable to achieve the planned targets of 1,000 vehicles per year for the B-600, and 1,600 for the X-2000 with the above improvement.

As a large number of the engine parts for the T-2000 and X-2000 are shared in common it is possible to meet the problem by increasing the productive capacity of the No.4 HI Machine shop, and chiefly by supplementing a section of the general purpose equipment. However, only a few sets of machines exclusive for T-2000 engine production is necessary to be added.

As conversion of the X-2000 use VA engine to the FE engine is planned for the future, it is also probable to convert the T-2000 use engine to the FE engine. Therefore, it is necessary to consider the appropriate time for the changeover to local production of the T-2000 use engine to avoid useless investment.

(2) Details of the Plan

1) Introduction of Production Line for Engine Parts of T-2000

Most of engine parts of T-2000 and X-2000 are commonly used each other and exclusive parts are as follows:

- exhaust and inlet manifolds
- timing gear
- cam gear
- dynamo drive pulley
- water pump body
- crankshaft
- cam shaft

The above parts production can be achieved by supplementing the general purpose equipment of No.4 HI Machine shop with additional two specialist machines, namely, a cam grinding machine and oil hole drilling machine for crankshaft use.

2) Expansion of Building Facilities and Provision for a Improvement of Line System

An area of some 5,670 square meters on the north side of the machine shop of No.4 HI will be extended (see Attached Figure 2-1). Flow production line type processing production lines for the 5 main parts, that is the cylinder head, cylinder block, crankshaft, cam shaft, and con rod will be set up in the expanded area (see Attached Figure 2-2).

For other parts processing should be carried out by general purpose equipment using the job shop system and in order to increase productivity some 113 additional pieces of general purpose equipment installed.

As the production is carried with the job shop system it is necessary to integrate processes efficiently on the basis of available processes and required processing time. Further, provision of exclusive containers for each of the different parts is necessary to avoid mixing or hindrance to product quality in the processes.

(3) Estimated Required Capital

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Capital

With the assumption of an annual production of 1,000 units, the foreign exchange requirement at present and after implementing the project are shown in the followings.

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	-	226,694
Raw Material Costs	181,400	-
Freight & Insurance	21,200	22,667
Sub-total	202,600	249,361
Working Equipment Costs	650,700	-
TOTAL	853,300	249,361

Note: The working equipment costs are only for the additional costs incurred by this plan. Detail is shown in Attached Table 3-3. The price of blank materials is assumed 80% of the price of the completed product price.

The above calculation is based on the production increase (1000 units) between 2,300 units of planned production in 1998 and 1,300 units of production capacity available after implementation of rehabilitation and shop/line improvement project of Machine Shop, No.4 HI (#4-7). The production facilities introduced by the present project will have 3,600 units of annual production capacity with overtime and/or 2 shift working system. Thus, if the production assumed to be carried out at the capacity level, the increased production is 2,300 units a year. The followings show the relationship between annual production quantity and required foreign exchange. If the production increase exceeds 3,000 units a year, then the foreign exchange saving may be expected. (However, it should be kept in mind that the production capacity set is 2,300 units a year.)

In Event of Increased Production (unit per year)	Required Amount of Foreign Capital with Implementation of Plan (yen per unit)	Amount of foreign Exchange Saved (yen per unit)
1,000	853,300	249,361
2,300	485,500	249,361

2) Reduction in Production Costs Achieved

A comparison of production costs for one item at present and after the implementation of the present plan is as follows:

	(unit: yen per unit)	
	Production Costs After Implementation of the plan	Present Production Costs
Imported CP/RM costs		
FOB price	181,400	226,694
Freight & insurance	21,200	22,667
Sub-total	202,600	249,361
Local CP/RM costs	34,236	34,236
Depreciation	533,100	233,364
Utility costs	15,300	19,704
Labor costs	36,071	36,071
Overheads	20,600	34,324
Admin. costs	13,000	10,146
Other costs	227,793	103,512
Sub-total	880,100	471,357
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	1,082,700	720,718

Therefore a reduction in the production costs cannot be expected since the planned production increase is small, and therefore, burden of facilities cost per unit product is large. If the production increase is equivalent to 1,770 units of designed production capacity of the facility, then unit production cost will be as low as 721,000 yen and significant production cost reduction can be expected.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-21(1) 2000cc Engines Production & LV Engine Prod'n Incr.
- No.4 HI: Machine shop -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Expansion of Building (5,670m2)		
2	Imported M/E		
1	Reorganization of machining shop		
1 1	Electron beam welder	Set	1
1 2	Molybdenum thermal spray M/C	Set	1
1 3	Gear shaper	Set	1
1 4	Single purpose cam hole boring M/C	Set	1
1 5	Honing M/C for crank shaft & cylinder holes	Set	1
1 6	Miscellaneous		
1 6 1	Turret lathe	Set	8
1 6 2	Vertical lathe	Set	1
1 6 3	Pin lathe	Set	1
1 6 4	NC lathe	Set	2
1 6 5	Drilling M/C	Set	4
1 6 6	Multi spindle drilling M/C	Set	13
1 6 7	Radial drilling M/C	Set	4
1 6 8	Turret drilling M/C	Set	4
1 6 9	Machining center	Set	3
1 610	Horizontal milling M/C	Set	10
1 611	Vertical milling M/C	Set	8
1 612	Dual head milling M/C	Set	5
1 613	Internal grinding M/C	Set	1
1 614	Surface grinding M/C	Set	1
1 615	Cam grinding M/C	Set	1
1 616	Profiling grinding M/C	Set	7
1 617	Pin grinding M/C	Set	1
1 618	Roll forming M/C	Set	1
1 619	Centering M/C	Set	2
1 620	Balancing M/C	Set	1
1 621	Gear hobbing M/C	Set	2
1 622	Gear shaving M/C	Set	2
1 623	V chamfering M/C	Set	1
1 624	R chamfering M/C	Set	1
1 625	Gear chamfering M/C	Set	2

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-21(2) 2000cc Engines Production & LV Engine Prod. Incr.
- No.4 HI: Machine shop -

No	Items	Unit	No.
1	626 Press M/C	Set	3
1	627 Washing equipment	Set	6
1	628 Fine boring M/C	Set	2
1	629 Special purpose M/C	Set	30
1	630 Super finishing M/C	Set	2
1	631 Leak tester	Set	4
1	632 Shot peening M/C	Set	1
1	633 Heating furnace	Set	2
1	634 Magnetic particle test	Set	1
1	635 Assembling equipment	Set	1
2	Addition of shell machine		
2	1 Shell machine (VF-C type)	Set	2
3	Addition of mold		
3	1 Addition of mold	Set	1
4	Mold for new parts		
4	1 Forging mold for new parts for engine & transmission	Set	1
5	Addition of mold for new parts		
5	1 Mold for light alloy parts	Set	1
6	T2000 engine parts production		
6	1 Cam grinder	Set	1
6	2 Single purpose oil hole boring M/C	Set	1
6	3 Tools	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-21)

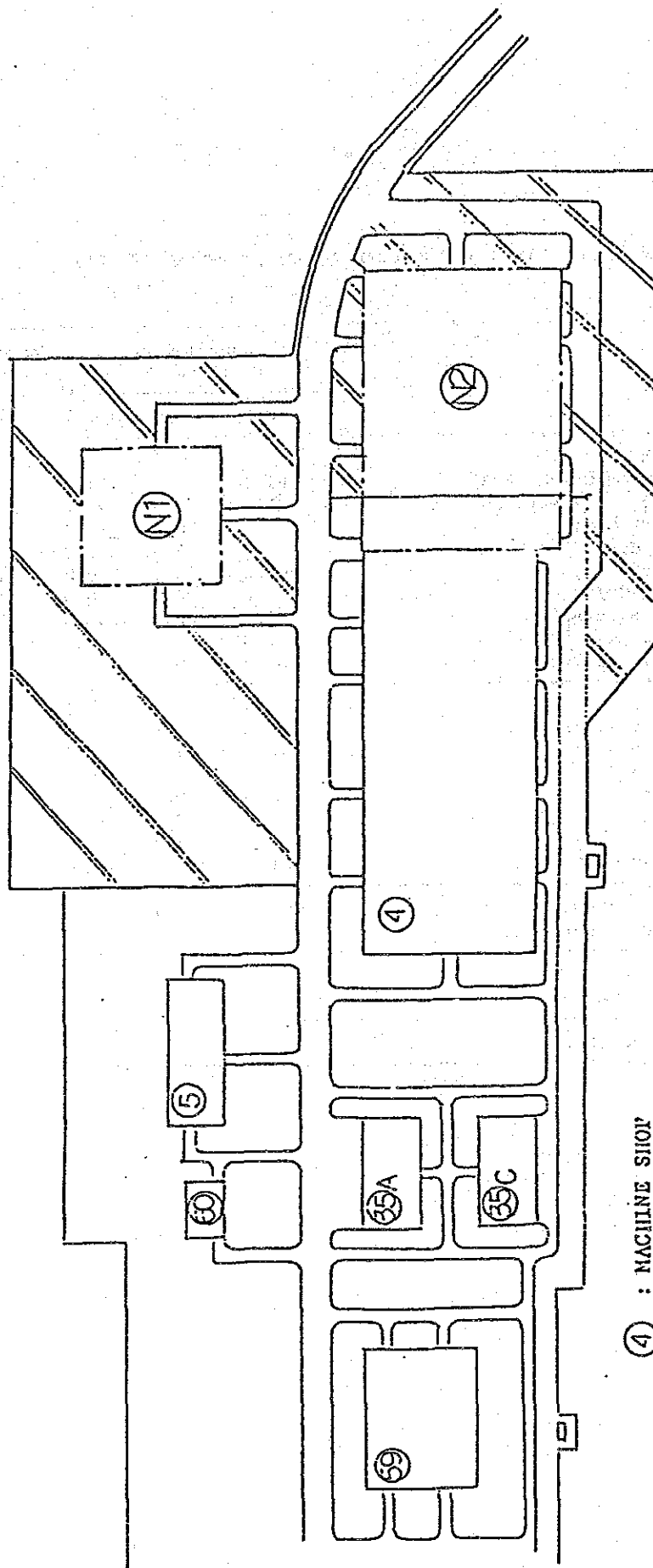
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	326.6	457.7	784.3
2 Freight & Insurance	38.2	-	38.2
Sub-total	364.8	457.7	822.5
3 Import Duty	-	54.7	54.7
4 Unloading	-	5.5	5.5
Building Total	364.8	517.9	882.7
Bldg & Land Total	364.8	517.9	882.7
2 1 Imported M/E (FOB)	5955.0	-	5955.0
2 Freight & Insurance	696.8	-	696.8
Sub-total	6651.8	-	6651.8
3 Import Duty	-	997.8	997.8
4 Unloading	-	99.8	99.8
5 Installation Cost	-	34.2	34.2
Imported M/E Total	6651.8	1131.8	7783.6
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	261.0	-	261.0
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	261.0	-	261.0
Total Investment	7277.6	1649.7	8927.3

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-21)

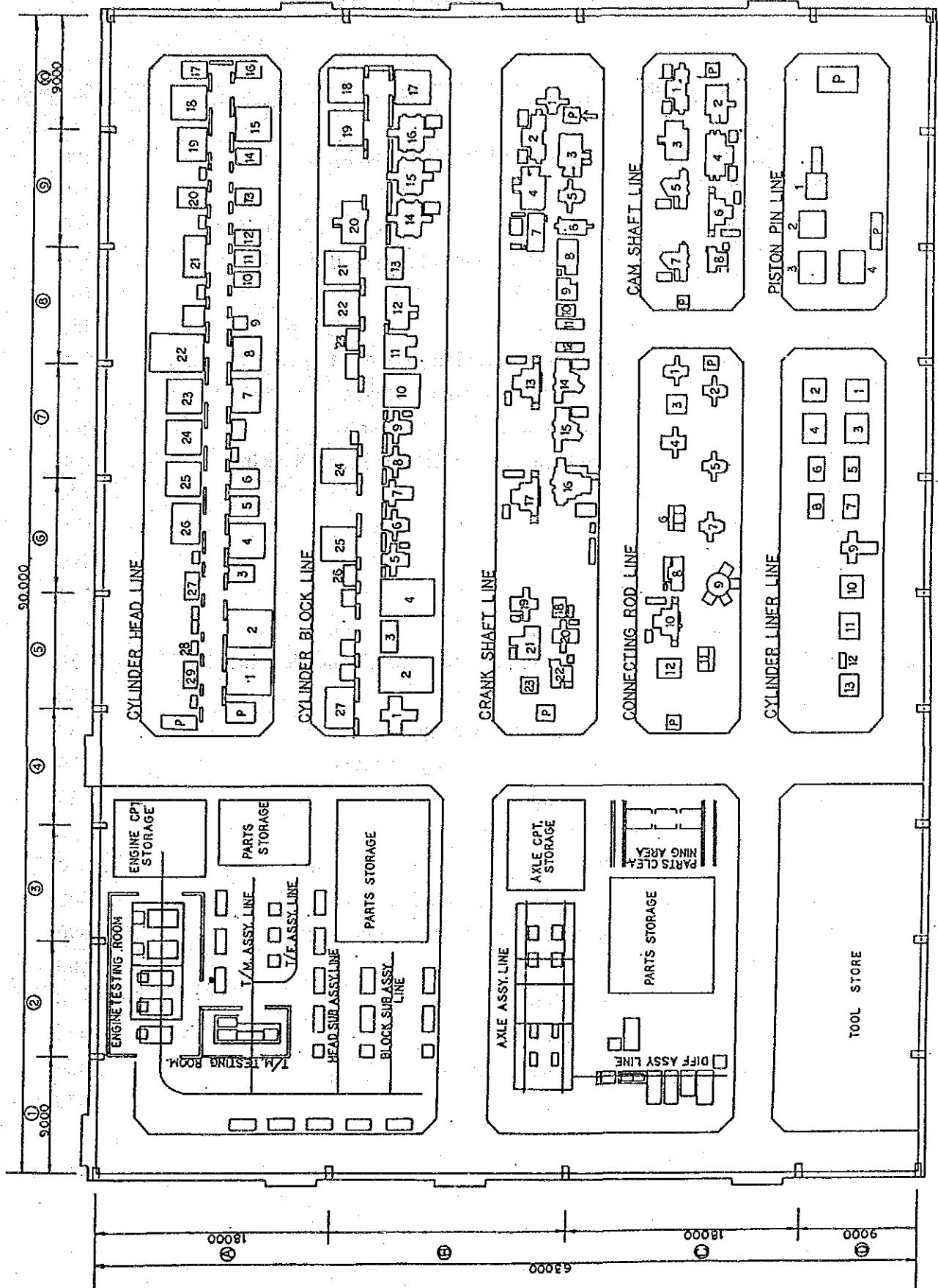
Items	Annual Cost (million Yen)			Component (%)
	F/C	L/C	Total	
1 CP/RM				
A Imported CP/RM (FOB)	181.4	-	181.4	17
Freight & Insurance	21.2	-	21.2	2
Import Duty	-	30.4	30.4	3
Unloading	-	3.0	3.0	0
Sub-total	202.6	33.4	236.0	22
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	202.6	33.4	236.0	22
2 Utilities	0.0	15.3	15.3	1
Variable Cost	202.6	48.7	251.3	23
3 Depreciation	433.7	99.4	533.1	49
4 Amortization	0.0	-	0.0	0
5 Maintenance	210.5	47.7	258.2	24
6 Design Fee	6.5	-	6.5	1
7 Labor	-	0.0	0.0	0
8 Overhead	-	20.6	20.6	2
9 Admin. Cost	-	13.0	13.0	1
Fixed Cost	650.7	180.7	831.4	77
Annual Cost	853.3	229.4	1082.7	100
Unit P. Cost			1082700	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			1082700	

Attached Figure 2-1 LAYOUT OF NEW SHOP (N1:DIFF. AND AXLE MACHINING SHOP. N2:ENGINE SHOP) - NO.4HI -



- ④ : MACHINE SHOP
- ⑤ : HEAT TREATMENT SHOP
- 35A : WAREHOUSE
- 35C : WAREHOUSE
- 59 : PISTON AND PISTON RING MACHINING SHOP
- 60 : PLATING SHOP

Attached Figure 2-2 (1) ..LAYOUT OF ENGINE SHOP. No.4 HI. (N2)



Attached Figure 2-2 (2) CYLINDER HEAD LINE

No.	MACHINE CODE	MACHINE NAME	PROCESS CODE
1	DSM	Double Head Milling Machine	100
2	DSM	"	110
3	4VMD	Vertical Multiple Drilling Machine	120
4	HBPU	Horizontal Boring Power Unit	130
5	OW	Washing Tank	140
6	HHE	Furnace	150
7	2UM	Universal Milling Machine	180
8	3VM	Vertical Milling Machine	190
9	3RD	Radial Drilling Machine	200
10	4VMD	Vertical Multiple Drilling Machine	210
11	4VMD	"	220
12	4VMD	"	230
13	4VMD	"	240
14	4VMD	"	250
15	DTPU	Drilling Tapping Power Unit	260
16	4VMD	Vertical Multiple Drilling Machine	270
17	4VMD	"	280
18	HBPU	Horizontal Boring Power Unit	290
19	3UM	Universal Milling Machine	300
20	OW	Washing Tank	320
21	C	Tester	340
22	DSM	Double Head Milling Machine	370
23	DTPU	Drilling Tapping Power Unit	380
24	HBPU	Horizontal Boring Power Unit	390
25	HBPU	"	400
26	HW	Washing Tank	410
27	C	Tester	430
28	SAS	Hydraulic Press	460
29	C	Leakage Tester	470

Attached Figure 2-2 (3) CYLINDER BLOCK LINE

No.	MACHINE CODE	MACHINE NAME	PROCESS CODE
1	MPU	Milling Power Unit	100
2	DSM	Double Head Milling Machine	110
3	5RD	Radial Drilling Machine	120
4	DSM	Double Head Milling Machine	130
5	3PM	Plain Milling Machine	140
6	3PM	"	150
7	3VM	Vertical Milling Machine	160
8	3PM	Plain Milling Machine	170
9	3PM	"	180
10	DPU	Drilling Power Unit	190
11	VBPU	Vertical Boring Power Unit	200
12	NCTD	Turret Drilling Machine	210
13	5RD	Radial Drilling Machine	220
14	DTPU	Drilling Tapping Power Unit	230
15	DTPU	"	240
16	HBPU	Horizontal Boring Power Unit	250
17	DPU	Drilling Power Unit	260
18	DTPU	Drilling Tapping Power Unit	270
19	DTPU	"	280
20	NCTD	Turret Drilling Machine	300
21	HBPU	Horizontal Boring Power Unit	310
22	DTPU	Drilling Tapping Power Unit	320
23	OW	Washing Tank	330
24	HBPU	Horizontal Boring Power Unit	370
25	HNF	Honing Machine	390
26	OW	Washing Tank	400
27	HW	Washing Equipment	450

Attached Figure 2-2 (4) CRANK SHAFT LINE

No.	MACHINE CODE	MACHINE NAME	PROCESS CODE
1	ZHM	Horizontal Milling Machine	100
2	DTPU	Drilling Tapping Power Unit	110
3	NCL	NC Turret Lathe	120
4	NCL	"	130
5	ZVM	Vertical Milling Machine	140
6	VTL	Turret Drilling Machine	160
7	POL	Pin Lathe	150
8	DPU	Drilling Power Unit	170
9	DPU	"	180
10	DPU	"	190
11	BD	Bench Type Drilling Machine	200
12	BD	"	210
13	COG	Cylindrical Grinding Machine	220
14	COGA	Angular Grinding Machine	230
15	COGA	"	240
16	POG	Pin Grinding Machine	260
17	COG	Cylindrical Grinding Machine	270
18	MGK	Magnaflux Equipment	280
19	2PM	Plain Milling Machine	290
20	2PM	"	300
21	DBZ	Dynamic Balancing Machine	310
22	SFPU	Lapping Unit	320
23	OW	Washing Tank	330

Attached Figure 2-2 (5) CONNECTING ROD LINE

No.	MACHINE CODE	MACHINE NAME	PROCESS CODE
1	2VM	Vertical Milling Machine	100
2	2VM	"	110
3	DPU	Drilling Power Unit	120
4	2PM	Plain Milling Machine	150
5	2VM	Vertical Milling Machine	160
6	MHFB	Fine Boring Machine	200
7	2PM	Plain Milling Machine	210
8	DPU	Drilling Power Unit	220
9	DTDU	Drilling Tapping Power Unit	240
10	2HSG	Surface Grinding Machine	270
11	MHFB	Fine Boring Machine	290
12	HNF	Honing Machine	300

CYLINDER LINER LINE

No.	MACHINE CODE	MACHINE NAME
1	SHFB	Special Horizontal Fine Boring Machine
2	SHFB	"
3	VBPU	Vertical Boring Unit
4	VBPU	"
5	NCL	NC Lathe
6	NCL	"
7	HSAL	High Speed Automatic Lathe
8	HSAL	"
9	2PM	Plain Milling Machine
10	MHFB	Fine Boring Machine
11	HNF	Honing Machine
12	HW	Washing Equipment
13	C	Leakage Tester

Attached Figure 2-2 (6) CAM SHAFT LINE

No.	MACHINE CODE	MACHINE NAME	PROCESS CODE
1	CPU	Centering Machine	100
2	NCL	NC Turret Lathe	110
3	NCL	"	120
4	SPU	Special Power Unit	140
5	HGS	Hobbing Machine	150
6	COG	Copying Grinding Machine	170
7	CMG	Cam Grinding Machine	190
8	SFPU	Lapping Unit	210

PISTON PIN LINE

No.	MACHINE CODE	MACHINE NAME
1	NCL	NC Lathe
2	NCL	"
3	SCG	Center Less Grinding Machine
4	SF	Super Finishing Machine

#4-22 Production of Component Parts of Power Thresher

- No.3 HI: Press & Welding Shop -

(1) Objectives and Outline of the Plan

Local production of power thresher components has already shifted from the first stage close to CKD to the second stage in which some parts are locally produced now, and the plan calls for a drastic expansion of local production in the third stage.

As many of the components to be locally produced in the third stage are large sheet metal products, a huge investment in press working dies is required which would push up the cost drastically. In order to reduce the investment and cost, it would be desirable to study the possibility of application of parts locally developed by HIC. However, this study will probably require a long period, and the following implementation steps are recommended.

Namely, component parts planned for local production in the third stage shall be classified into those which is appropriate to be developed locally and those which can not be. The latter parts will be produced domestically first. The former parts will be developed locally and converted to domestic production when the development work is completed.

Blanking dies are necessary for making components by sheet metal working, but replacing this process by the method of processing on N/C punch press would not only result in a great saving of die cost for power thresher components but it would be economical as N/C punch press can also be extensively utilized for processing of power tiller components which are being produced locally. Accordingly, this punch press is planned to be installed instead of blanking dies.

Planned annual production quantity is 1,000 units/year

(2) Details of the Plan

Details of the plan is shown in Attached Table 2-1.

(3) Estimated Capital Requirement

1) Required Machine and Equipments

The detailed list of required machine and equipments for the plan is shown in attached Table 3-1.

2) Estimated Capital Requirement

The estimated capital requirement is shown in Attached Table 3-2.

(4) Expected Effects of the Plan

1) Foreign Exchange Saving

a) Not localized parts production

The expected foreign exchange saving will be 28,192 yen/unit of thresher. (Assumed production: 1,000 units/year)

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	88,900	148,214
Raw Material Costs	23,700	-
Freight and Insurance	9,000	11,878
Sub-total	121,600	160,092
Working Equipment Costs	10,300	-
TOTAL	131,900	160,092

Note: Engine is not included in the above parts and raw materials. The cost of the machine and equipments covers the additional cost incurred by the present plan. The detail is shown in Attached Table 3-3.

b) Locally developed parts production

The expected foreign exchange saving will be 32,400 yen/unit.

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	44,600	88,900
Raw Material Costs	41,500	23,700
Freight and Insurance	6,900	9,000
Sub-total	93,000	121,600
Working Equipment Costs	3,900	10,300
TOTAL	96,900	131,900

Note: See note of the foregoing table.

2) Production Cost Reduction

The present production cost and the cost after implemented the plan are shown in the followings. The cost covers that of parts manufacturing only.

	Production Costs after Implementation of the Plan		Present
	(Not localiz- ed parts)	(Locally developed parts)	Import Costs
Imported CP/RM costs			
FOB price	112,600	86,100	148,214
Freight & insurance	9,000	6,900	11,878
Sub-total	121,600	93,000	160,092
Local CP/RM costs	-	-	-
Depreciation	9,300	3,600	-
Utility costs	1,200	-	-
Labor costs	-	-	-
Overheads	4,000	2,900	-
Admin. costs	1,000	700	-
Other costs	23,900	16,800	24,014
Sub-total	39,400	24,000	24,014
Mark-up, profit	-	-	-
Excise tax	-	-	-
TOTAL	161,000	117,000	184,106

The costs of parts now imported can be reduced by 23,106 yen/unit through production of non-localized parts, and it will be reduced further by 67,106 yen/unit through development and production of localized parts.

3) Foreign Exchange Investment Pay Out Period

The following index represents the efficiency of investment in view of foreign exchange.

Namely, $A/(B \times C)$

where,

- A = Required foreign exchange investment (yen)
- B = Foreign exchange saving per unit (yen/unit)
- C = Annual production (unit/year)

For the present project;

a) Not localized parts production 4.9 years

- A = 137.9 million yen
- B = 28,192 yen/unit
- C = 1,000 units/year

b) Locally developed parts production 1.7 years

- A = 61.2 million yen
- B = 35,000 yen/unit
- C = 1,000 units/year

Thus, both projects are found very favorable in terms of foreign exchange investment.

3) Other Expected Effects

The present project introduces NC punch press machine, which will make small-sized press parts manufacturing easy.

Attached Table 2-1 CONTENTS OF THE PROJECT FOR EXPANDING DIES & JIGS FOR PRODUCTION
OF POWER THRESHER COMPONENTS AT NO.3 HI

Place of installation:	No.3 HI	
	Not locally developed parts	Locally developed parts
Building	1) Will be done in the shop which is currently used for production. 2) Expansion of the Press & Welding Shop. 3) If the quantity increases, an assembly line will be set up in the No. 2 Assembly Shop.	
Outline of machinery & equipment	1) NC punch press 2) Press working dies, welding jigs (for component parts which can not be locally developed)	1) Press working dies, welding jigs (for component parts which will be locally developed)
Major locally produced component parts	1) Threshing plate	1) Side Steel Plate Left 2) Side Steel Plate Right
Technical data & technical guidance	<u>Technical data</u> (for 3rd stage parts) 1) Working manuals, inspection standards 2) Drawings 3) Die & jig drawings 4) Manual for handling and maintenance of NC press	<u>Technical data</u> 1) Manual for processing Burmanized component parts 2) Drawings of dies & jigs <u>Technical guidance</u> 1) Guidance on processing: 6 man-months
Major component parts and materials	<u>Imported</u> 1) Sheet metal	<u>Imported</u> 1) Sheet metal
Operating cost	1) Power 128 kW 2) Water 0.02 m ³ /Hr 3) Compressed air 0.2 m ³ /Hr	
Required operating manpower	10 person	
Remark		

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-22 Production of Thresher CP
 - No.3 HI: Press & Welding Shop -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	M/E for original CP production		
1 1	NC punch press (cap. 30ton, max traverse 1000mmx1270mm)	Set	1
1 2	Press dies for power thresher:3rd stage parts	Set	1
1 3	Welding jigs for power thresher:3rd stage parts	Set	1
2	M/E for locally developed CP production		
2 1	Press dies & welding jigs	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-22)
a) Not localized parts
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	106.0	-	106.0
2 Freight & Insurance	8.5	-	8.5
Sub-total	114.5	-	114.5
3 Import Duty	-	17.2	17.2
4 Unloading	-	1.6	1.6
5 Installation Cost	-	1.5	1.5
Imported M/E Total	114.5	20.3	134.8
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	23.4	-	23.4
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	23.4	-	23.4
Total Investment	137.9	20.3	158.2

Attached Table 3-2: REQUIRED INVESTMENT (#4-22)
b) Locally developed parts
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	40.0	-	40.0
2 Freight & Insurance	3.2	-	3.2
Sub-total	43.2	-	43.2
3 Import Duty	-	6.5	6.5
4 Unloading	-	0.6	0.6
5 Installation Cost	-	0.5	0.5
Imported M/E Total	43.2	7.6	50.8
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	4.0	-	4.0
B Eng Fee	14.0	-	14.0
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	18.0	-	18.0
Total Investment	61.2	7.6	68.8

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-22)
a) Not localized parts

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	112.6	-	112.6	70
Freight & Insurance	9.0	-	9.0	6
Import Duty	-	18.2	18.2	11
Unloading	-	1.7	1.7	1
Sub-total	121.6	19.9	141.5	88
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	121.6	19.9	141.5	88
2 Utilities	0.0	1.2	1.2	1
Variable Cost	121.6	21.1	142.7	89
3 Depreciation	6.9	2.4	9.3	6
4 Amortization	0.0	-	0.0	0
5 Maintenance	3.4	0.6	4.0	2
6 Design Fee	0.0	-	0.0	0
7 Labor	-	0.0	0.0	0
8 Overhead	-	4.0	4.0	2
9 Admin.Cost	-	1.0	1.0	1
Fixed Cost	10.3	8.0	18.3	11
Annual Cost	131.9	29.1	161.0	100
Unit P.Cost			161000.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact.Cost			161000.0	

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-22)
b) Locally developed parts

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	86.1	-	86.1	74
Freight & Insurance	6.9	-	6.9	6
Import Duty	-	14.0	14.0	12
Unloading	-	1.3	1.3	1
Sub-total	93.0	15.3	108.3	93
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	93.0	15.3	108.3	93
2 Utilities	0.0	0.0	0.0	0
Variable Cost	93.0	15.3	108.3	93
3 Depreciation	2.6	1.0	3.6	3
4 Amortization	0.0	-	0.0	0
5 Maintenance	1.3	0.2	1.5	1
6 Design Fee	0.0	-	0.0	0
7 Labor	-	0.0	0.0	0
8 Overhead	-	2.9	2.9	2
9 Admin. Cost	-	0.7	0.7	1
Fixed Cost	3.9	4.8	8.7	7
Annual Cost	96.9	20.1	117.0	100
Unit P. Cost			117000.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			117000.0	

#4-23 Expansion of Local Production of Power Tiller Parts

- No.3 HI: AME Shop -

(1) Objectives and Outline of the Plan

Conversion to local production of power tiller KMB 200 is making steady progress and has already reached 70.8% now.

This model has already undergone changes due to technological innovation in Japan, and the Japanese manufacturer is retaining the processing facilities of parts merely to supply them to Burma whose production has not been localized yet. Aging of these processing machines and equipment, jigs, dies, etc. in Japan is advancing, however, with many of them nearing the time for replacement.

On the other hand, the present model is heavy weight type, and the development of models suitable to Burmese cultivation practice and field conditions is required (#9-9). If the new model is developed in the near future, it is advisable to refrain from replacement of parts production facilities in Japan, and investment on local production of parts.

Therefore, the parts production facilities in Japan should be maintained and utilized as much as possible. At the same time, the new model development should be started immediately. The parts, which can be used even after the model change, should be produced locally.

(2) Detail of the Plan

1) Local production of main handle cover

The main handle cover will not be changed even with model change. In addition, the dies kept in Japan for main handle cover production has already been deteriorated and the replacement with new dies is urgently required. therefore, it is recommend to promote local production of main handle cover by introducing renewed dies, jigs and inspection tools with utilizing the existing production facilities.

2) Local production of tiller blade

40 pieces of blades in two types are necessary for fitting with each power tiller. In Japan, twice the quantity of blades fitted and shipped by the power tiller manufacturers are sold in the market as spare parts.

Although the demand for spare parts in Burma is not very large yet, it is sure to increase with the popularization of power tillers. Hence, it is necessary to realize domestic production of blades in order to supply them quickly and inexpensively.

Blades can be produced by utilizing the spare capacity of No.3 HI Mamootie forging line and additional providing one set each of rolling machine and bending machine as well as forging metal dies.

Planned annual production: 72,000 pcs/year

3) The following parts will be locally produced in line with the commencement of production of new developed model.

No.	Parts Name	No.	Parts Name
1	Collar for Reverse Gear	11	Handle Stay (B)
2	Interlock Spring	12	Main Speed Change Rod
3	Speed Change Rod	13	Connecting Rod for Steering
4	Shift Rod Supporter (BIT:SPD)		Clutch
5	Checking Plate	14	Main Clutch Lever
6	Shift Arm for Blade Speed Change	15	Wheel Cover (Left)
7	Steering Clutch Arm Shaft	16	Wheel Cover (Right)
8	Shaft for Shift Fork Arm	17	12T Bevel Gear
9	Fulcrum for Tightener Spring	18	14T Bevel Gear
10	Handle Stay (A)		

(For further detail, see Attached Tables 2-1 and 2-2.)

(3) Estimated Required Capital

1) Required Facilities

The details of machine and equipments required in the present plan are shown in Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in Attached Table 3-2.

(4) Expected Effects of the Plan

1) Foreign Exchange Saving

The change in foreign exchange requirement per unit power tiller at present and after implementation of the project is shown below.

a) Tiller blade

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	-	11,780
Raw Material Costs	4,722	-
Freight and Insurance	389	940
Sub-total	5,111	12,720
Working Equipment Costs	2,333	-
TOTAL	7,444	12,720

Note: The cost of machine and equipments covers additional costs incurred with this project only. the detail is shown in Attached Table 3-3. The raw material costs is assumed 40% of parts price (this rate is also applicable to other parts).

The annual production quantity of tiller blade was estimated by the following formula:

$$(\text{Annual production quantity of tiller blade}) = A \times (1 + B)$$

where,

A = Quantity of power tiller production

B = Rate of spare parts required

The rate of spare parts required is assumed 0.8, while annual production of power tiller is assumed 1,000 units based on the production plan. As a result, tiller blade requirement is 72,000 pieces, or 1,800 units equivalent.

b) Main handle cover production

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	-	6,350
Raw Material Costs	2,500	-
Freight and Insurance	200	510
Sub-total	2,700	6,860
Working Equipment Costs	4,500	-
TOTAL	7,200	6,860

c) Other parts production

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Parts	-	15,020
Raw Material Costs	6,010	-
Freight and Insurance	490	1,200
Sub-total	6,500	16,220
Working Equipment Costs	29,100	-
TOTAL	35,600	16,220

Local production of tiller blade contributes to 5,276 yen/40 pieces of foreign exchange saving, but it cannot be expected from other parts production. The relationship between production quantity and foreign exchanger saving is shown in the following tables.

- Main handle cover production

Production (Unit/year)	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
1,000	7,200	6,860
1,100	6,545	6,860
1,200	6,000	6,860

If the production increases to 1,100 units/year, then the foreign exchange saving can be expected to result.

- Other part production

Production (Unit/year)	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
1,000	35,600	16,220
2,000	17,800	16,220
3,000	11,867	16,220

If the production increases to 3,000 units/year, then the foreign exchange saving can be expected.

2) Production Cost Reduction

Cost of these parts production are compared with present import cost in the following table.

		(unit: yen per item)	
		Production Costs After Implementation of the Plan	Present Import Costs
Tiller blade (Annual Production 1800 units including 1000 units for HIC)	Variable cost	6,000	14,800
	Fixed cost	3,500	-
	Sub-total	9,500	14,800
	Mark-up	-	-
	Excise tax	-	-
	Total	9,500	14,800
Main handle cover (Annual Production 1000 units)	Variable cost	3,100	7,880
	Fixed cost	6,400	-
	Sub-total	9,500	7,880
	Mark-up	-	-
	Excise tax	-	-
	Total	9,500	7,880
Other parts (Annual Production 1000 units)	Variable cost	8,300	22,860
	Fixed cost	41,300	-
	Sub-total	49,600	22,860
	Mark-up	-	-
	Excise tax	-	-
	Total	49,600	22,860

The production cost can be reduced by the local production for tiller blade and main handle cover, but it increases production costs in the case of other parts.

(4) Recommendation on Implementation of the Plan

The local production of tiller blade is quite effective in terms of foreign exchange saving and production cost reduction. The pay out period index of foreign exchange investment is also short.

In the case of main handle cover production, foreign exchange saving cannot be expected according to the foregoing calculation. However, it should be kept in mind that the die of Japanese producers almost worn out and replacement is indispensable. Therefore, even if the production will not be localized, the cost of die replacement has to be burdened by the parts production regardless of whether the production is taken place in Japan or in Burma, resulting in the price increase. Thus, conversion of its production into local production at this period will be quite acceptable.

Conversion to local production of other parts will neither contribute to foreign exchange saving nor production cost reduction due to big burden of investment on facilities. Model change of the power tiller is in progress to make it lighter. It may cause the revision of component parts in the future. Therefore, it is recommended that the local production of other parts should be examined in the course of the development of localized power tiller production.

Attached Tabale 2-1 CONTENTS OF THE PROJECT FOR EXPANDING LOCAL PRODUCTION OF PARTS
FOR POWER TILLER AT NO.3 HI

Place of installation:		No. 3 HI	
Parts:	Main handle cover	Other parts (18 parts)	
Building	No.3 HI's existing Press & Welding Shop	New building for expanding local production of engine parts will be used. (Required area: common use of engine parts building, 60 m x 36 m = 2,160 m ²)	
Outline of machinery & equipment	1) Press working dies, welding jigs, inspection tools	1) Air Drop Hammer 2) CNC Lathe 3) Vertical Milling M/C 4) Horizontal Milling M/C 5) Crank Press 110 tons	
Technical data & technical guidance	Technical data 1) Processing manuals 2) Inspection manuals 3) Drawings (working drawings/die & jig drawings)	Technical guidance 1) Schematic working diagrams 2) Schematic inspection diagrams 3) Drawings (working drawings/die and jig drawings)	Technical guidance 1) Guidance on installation and test run of machinery & equipment: 3 man-months 2) Guidance on manufacturing: 6 man-months 3) Training: handling and operation of machinery and equipment: 6 man-months
Major component parts and materials	Imported 1) Sheet metal	Local 1) Projection nuts	Imported 1) Sheet metal 2) Bar
Operating cost	1) Power 1.1 kW		1) Power 58.0 kW 2) Water 0.03 m ³ /Hr 3) Compressed air 0.34 m ³ /Hr
Required operating manpower	1 person		17 persons
Remark			

Attached Table 2-2 CONTENTS OF THE PROJECT FOR PROVISION OF MACHINE & EQUIPMENT
FOR PRODUCTION OF TILLER BLADES AT NO.3 HI

Place of installation	No.3 HI	
Building	Utilized Mamootie Forging Shop Required area for 2 new machine: 30 m ²	
Brief description of machine & equipment	<u>Import</u> 1) Rolling machine 2) Bending machine 3) Dies for tilling blades	<u>Local</u> 1) Utilizes No.3 HI Mamootie forging line
Technical data and technical guidance	<u>Technical data</u> 1) Manual for installation of equipment 2) Manual for handling and operation of equipment 3) Manual for manufacturing procedure 4) Drawings of jigs and dies	<u>Technical guidance</u> 1) Manufacturing guidance : 6 man-months 2) Training of manufacturing technology : 6 man-months
Major components & materials	<u>Import</u> 1) Sheet metal (spring steel)	<u>Local</u>
Operating cost	1) Power 7.8 kw	
Required manpower for operation	3 persons	
Remark		

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-23 Production of CP of Power Tiller
- No.3 HI: @ AME Project Plants -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	M/E for main handle cover production		
1 1	Press die, welding jig & gauge for KMB200 main handle cover	Set	1
2	M/E for power tiller blade		
2 1	Special forging roll M/C for edging	Set	1
2 2	Special bending M/C	Set	1
2 3	Forging dies, die set and jigs	Set	1
3	M/E for new power tiller CP manufacturing shop		
3 1	Air drop hammer	Set	2
3 2	CNC lathe	Set	3
3 3	Vertical milling M/C	Set	1
3 4	Horizontal milling M/C	Set	1
3 5	Upright drilling M/C (2 head)	Set	1
3 6	Bench type drilling M/C	Set	2
3 7	Thread rolling M/C	Set	1
3 8	Bevel gear generator	Set	1
3 9	Crank press 110ton	Set	1
310	Arc welding M/C	Set	1
311	Air grinder (pencil type)	Set	1
312	Jig & die	Set	1
313	Measuring instrument	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-23)

- P.Tiller Blade -

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	43.2	-	43.2
2 Freight & Insurance	3.5	-	3.5
Sub-total	46.7	-	46.7
3 Import Duty	-	7.0	7.0
4 Unloading	-	0.7	0.7
5 Installation Cost	-	0.3	0.3
Imported M/E Total	46.7	8.0	54.7
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	1.5	-	1.5
B Eng Fee	21.6	-	21.6
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	23.1	-	23.1
Total Investment	69.8	8.0	77.8

Attached Table 3-2: REQUIRED INVESTMENT (#4-23)

- Main Handle Cover -

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	46.4	-	46.4
2 Freight & Insurance	3.7	-	3.7
Sub-total	50.1	-	50.1
3 Import Duty	-	7.5	7.5
4 Unloading	-	0.7	0.7
5 Installation Cost	-	1.7	1.7
Imported M/E Total	50.1	9.9	60.0
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	1.8	-	1.8
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	1.8	-	1.8
Total Investment	51.9	9.9	61.8

Attached Table 3-2: REQUIRED INVESTMENT (#4-23)

- Other CP -

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	299.0	-	299.0
2 Freight & Insurance	23.9	-	23.9
Sub-total	322.9	-	322.9
3 Import Duty	-	48.4	48.4
4 Unloading	-	4.5	4.5
5 Installation Cost	-	1.7	1.7
Imported M/E Total	322.9	54.6	377.5
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	27.0	-	27.0
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	27.0	-	27.0
Total Investment	349.9	54.6	404.5

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-23)
- P.Tiller Blade -

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	8.5	-	8.5	50
Freight & Insurance	0.7	-	0.7	4
Import Duty	-	1.4	1.4	8
Unloading	-	0.1	0.1	1
Sub-total	9.2	1.5	10.7	63
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	9.2	1.5	10.7	63
2 Utilities	0.0	0.1	0.1	1
Variable Cost	9.2	1.6	10.8	63
3 Depreciation	2.8	1.0	3.8	22
4 Amortization	0.0	-	0.0	0
5 Maintenance	1.4	0.2	1.6	9
6 Design Fee	0.0	-	0.0	0
7 Labor	-	0.4	0.4	2
8 Overhead	-	0.4	0.4	2
9 Admin. Cost	-	0.1	0.1	1
Fixed Cost	4.2	2.1	6.3	37
Annual Cost	13.4	3.7	17.1	100
Unit P. Cost			9500.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			9500.0	

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-23)
 - Main Handle Cover -

Items	Annual Cost (million Yen)			Component
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	2.5	-	2.5	26
Freight & Insurance	0.2	-	0.2	2
Import Duty	-	0.4	0.4	4
Unloading	-	0.0	0.0	0
Sub-total	2.7	0.4	3.1	33
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	2.7	0.4	3.1	33
2 Utilities	0.0	0.0	0.0	0
Variable Cost	2.7	0.4	3.1	33
3 Depreciation	3.0	1.2	4.2	44
4 Amortization	0.0	-	0.0	0
5 Maintenance	1.5	0.3	1.8	19
6 Design Fee	0.0	-	0.0	0
7 Labor	-	0.1	0.1	1
8 Ovehead	-	0.2	0.2	2
9 Admin. Cost	-	0.1	0.1	1
Fixed Cost	4.5	1.9	6.4	67
Annual Cost	7.2	2.3	9.5	100
Unit P. Cost			9500.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			9500.0	

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-23)
- Other CP -

Items	Annual Cost (million Yen)			Component
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	6.0	-	6.0	12
Freight & Insurance	0.5	-	0.5	1
Import Duty	-	1.0	1.0	2
Unloading	-	0.1	0.1	0
Sub-total	6.5	1.1	7.6	15
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	6.5	1.1	7.6	15
2 Utilities	0.0	0.7	0.7	1
Variable Cost	6.5	1.8	8.3	17
3 Depreciation	19.4	6.6	26.0	52
4 Amortization	0.0	-	0.0	0
5 Maintenance	9.7	1.6	11.3	23
6 Design Fee	0.0	-	0.0	0
7 Labor	-	2.5	2.5	5
8 Overhead	-	1.2	1.2	2
9 Admin. Cost	-	0.3	0.3	1
Fixed Cost	29.1	12.2	41.3	83
Annual Cost	35.6	14.0	49.6	100
Unit P. Cost			49600.0	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			49600.0	

#4-24 Expansion of Local Production of Farm Engine Parts

- No.3 HI: Press & Welding Shop -

(1) Outline of Objectives and Planning

At present, local production of farm engines KNB 5B and KND 7 is steadily in progress along with the expansion of local production of pumps and power tillers.

As said models have already undergone changes due to technological innovation, however, the Japanese manufacturer is retaining the processing facilities of applicable component parts merely for supplying those parts whose production has not been localized yet in Burma. many of the processing machines and equipment, jigs and dies for those engine parts are aging and nearing the time for replacement, however. Thus, those parts in the future should be locally produced in Burma as much as possible.

- 1) Air cleaners and fuel tanks will be domestically manufactured in a short-term plan partly because these parts especially require renewal of the equipment and partly because these can be easily manufactured from technical standpoint in Burma.
- 2) The following parts will be locally produced in the intermediate and longer range.

No.	Parts Name	No.	Parts Name
1	Holder for Indication Signal	11	Oil Supply Pipe
2	Knob for Speed Change Lever	12	Joint for LUB. Oil Pipe
3	Guide Plate for Speed Change	13	Buffle Cover
4	Baffle Cover	14	Indication Signal
5	Oil Supply Port Cap Ass'y	15	Joint for Fuel Over Pipe
6	Oil Suction Pipe	16	Setting bolt for Starting Base
7	Fuel Supply Pipe (A)		
8	Fuel Supply Pipe (B)		
9	Fuel Over Flow Pipe		
10	Fuel Injection Pipe		

3) Annual planned production will be as follows:

KND 5B	5600 units per annum
KND 7	2500 units per annum

(2) Details of the Plan

Refer to Attached Table 2-1.

(3) Estimated Capital Requirement

1) Required Facilities

Machinery and equipment required for the plan is indicated in Attached Table 3-1.

2) Estimated Capital Requirement

The estimated capital requirement for the plan is as indicated in Attached Table 3-2.

(4) Expected Effects of the Plan

1) Domestic Production of Air Cleaner and Fuel Tank

a) Effect of Foreign Saving Exchange

Saving of foreign exchange amounts to 512 yen.

	Foreign Currency Required at Implementation of Plan (yen per set)	Foreign Currency Required for Import (yen per set)
Cost of Parts	-	3,544
Raw Material Costs	1,418	
Freight and Insurance	163	284
Sub-total	1,582	3,828
Working Equipment Costs	1,735	-
TOTAL	3,316	3,828

Note: The working equipment costs are only for the additional costs incurred by this plan. For detail, see Attached Table 3-3. Annual production is assumed as follows:

	for KND 5B	for KND 7
Air cleaner	5,600 sets	2,100 sets
Fuel tank	-	2,100 sets

Price of product is based on average price of air cleaner prices (2,250 yen for KND 5B and 2,720 yen for KND 7) and fuel tank price (7,820 yen), weighted by production quantity. The raw material cost is assumed 40% of CP price.

b) Production Cost Reduction

A comparison of production costs for one piece at present and after the implementation of the present plan is as follows:

(unit: yen per set)

	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	1,418	3,544
Freight & insurance	163	284
Sub-total	1,582	3,828
Local CP/RM costs	-	-
Depreciation	1,398	-
Utility costs	-	-
Labor costs	-	-
Overheads	82	-
Admin. costs	51	-
Other costs	1,031	766
Sub-total	2,561	766
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	4,143	4,594

Therefore, production cost reduction per one item in this plan is expected 451 yen.

2) Number of Years Required for Recovery of Foreign Capital Investment

The foreign capital investment on the present plan is expected to be recovered in 36 years, as shown in the following formula:

$$(\text{The number of years required}) = A / (B \times C)$$

Where,

A = Estimated foreign exchange required (178,500,000 yen)

B = Foreign exchange saving per item (512 yen/item)

C = Annual production (9,800 items/year)

3) Domestic Production of the Other Parts

a) Foreign Exchange Saving

Foreign exchange saving by implementation of the plan is not anticipated because of low production size (assumed, production is 7,700 units equipment per annum).

	Foreign Currency Required at Implementation of Plan (yen per unit)	Foreign Currency Required for Import (yen per unit)
Cost of Products	-	2,864
Raw Material Costs	1,156	-
Freight & Insurance	130	229
Sub-total	1,286	3,093
Working Equipment Costs	7,779	-
TOTAL	9,065	3,093

Note: The working equipment costs are only for the additional costs incurred by this plan. For detail, see Attached Table 3-3. Product cost is based on average price weighted by engines KND 5B, KND 7 and others.

b) Production Cost Reduction

A comparison of production costs for one piece at present and after the implementation of the present plan is as follows:

(unit: yen per unit equipment)

	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	1,156	2,864
Freight & insurance	130	229
Sub-total	1,286	3,093
Local CP/RM costs	-	-
Depreciation	5,753	-
Utility costs	195	-
Labor costs	571	-
Overheads	234	-
Admin. costs	143	-
Other costs	4,208	619
Sub-total	11,104	619
Mark-up, profit	-	-
Excise tax	-	-
TOTAL	12,390	3,712

Therefore, because of the low production output of the present plan a reduction in production costs cannot be anticipated.

4) Other Effects Expected

Availability of component parts of current model machines, thereby prevention of production breakdown is ensured by their domestic production. These models have been outmoded and difficulty in obtaining component parts by import is forecast.

Attached Table 2-1 CONTENTS OF THE PROJECT FOR EXPANSION OF LOCAL PRODUCTION
OF FARM ENGINE PARTS AT NO.3 HI

Place of installation:	No.3 HI	
	Parts:	Other 16 farm engine parts
Building	Air cleaner for KND 5B and KND 7, fuel tank for KND 7	
Building	To be installed within No.3 HI's Press & Welding Shop Required area: 10m x 10m = 100m ²	Newly constructed within No.3 HI. Required area: 36 m x 60 m = 2,160 m ²
Outline of machinery & equipment	1) Press working die for air cleaner, welding jigs 2) Press working dies and welding jigs for fuel tank 3) Inspection equipment for air cleaner 4) Leak testing equipment for fuel tank	1) CNC Lathe 2) Crank Press 3) Spot Welding M/C 4) Jig & Die 5) Others
Technical data & technical guidance	Technical data 1) Processing manual 2) Assembling manual 3) Inspection manual 4) Drawing (drawings of parts to be processed/drawings of dies and jigs) Technical guidance 1) Guidance on installation of machinery and equipment: 1 man-month 2) Guidance on test processing: 3 man-months	Technical data 1) Processing manual 2) Inspection manual 3) Drawings (drawings of parts to be processed/drawings of dies and jigs) Technical guidance 1) Guidance on construction of building: 6 man-months 2) Guidance on installation and test run of machinery and equipment: 3 man-months 3) Guidance on manufacture: 5 man-months 4) Training in Japan on handling and operation of machinery and equipment: 6 man-months
Major component parts and materials	Imported Sheet metal, O-ring, steel wool Local Rubber packing, clamp bolt, label, seal washer	Imported Pipe, bar
Operating cost	1) Power 42 kw 2) Water 0.02 m ³ /Hr 3) Compressed air 0.13 m ³ /Hr	1) Power 161.2 kw 2) Water 0.06 m ³ /Hr 3) Compressed air 0.72 m ³ /Hr
Required operating manpower	6 persons	30 persons
Remark		

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-24 Production of CP of Diesel Engine
- No.3 HI: AME Shop No.1 -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	For air cleaner and fuel tank production		
1 1	Pres'g dies & weld'g jigs for air cleaner for KND5B & KND7	Lot	1
1 2	Pressing dies and welding jigs for fuel tank for KND7	Lot	1
1 3	Inspection equipment for air cleaner for KND5B, KND7	Set	1
1 4	Leakage checking equipment for fuel tank KND7	Set	1
2	For other parts production		
2 1	CNC lathe	Set	10
2 2	Rolling machine	Set	1
2 3	Crank press 60ton	Set	2
2 4	Spot welding machine	Set	3
2 5	Bending machine	Set	6
2 6	Brazing equipment	Set	8
2 7	Jig & die for KND5B	Set	1
2 8	Jig & die for KND7	Set	1
2 9	Measuring instrument	Lot	1
210	Building materials	Lot	1
211	Wiring & piping materials for power line	Lot	1
212	Air compressor 37kW	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-24)

- Air Cleaner & Fuel Tank Production -

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	153.4	-	153.4
2 Freight & Insurance	17.9	-	17.9
Sub-total	171.3	-	171.3
3 Import Duty	-	25.7	25.7
4 Unloading	-	2.6	2.6
5 Installation Cost	-	0.6	0.6
Imported M/E Total	171.3	28.9	200.2
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	7.2	-	7.2
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	7.2	-	7.2
Total Investment	178.5	28.9	207.4

Attached Table 3-2: REQUIRED INVESTMENT (#4-24)

- Other CP Production -

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	194.2	35.8	230.0
2 Freight & Insurance	22.7	-	22.7
Sub-total	216.9	35.8	252.7
3 Import Duty	-	32.5	32.5
4 Unloading	-	3.3	3.3
Building Total	216.9	71.6	288.5
Bldg & Land Total	216.9	71.6	288.5
2 1 Imported M/E (FOB)	358.5	-	358.5
2 Freight & Insurance	41.9	-	41.9
Sub-total	400.4	-	400.4
3 Import Duty	-	60.1	60.1
4 Unloading	-	6.0	6.0
5 Installation Cost	-	18.7	18.7
Imported M/E Total	400.4	84.8	485.2
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	40.5	-	40.5
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	40.5	-	40.5
Total Investment	657.8	156.4	814.2

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-24)
 - Air Cleaner & Fuel Tank Production -

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	13.9	-	13.9	34
Freight & Insurance	1.6	-	1.6	4
Import Duty	-	2.3	2.3	6
Unloading	-	0.2	0.2	0
Sub-total	15.5	2.5	18.0	44
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	15.5	2.5	18.0	44
2 Utilities	0.0	0.0	0.0	0
Variable Cost	15.5	2.5	18.0	44
3 Depreciation	10.3	3.4	13.7	34
4 Amortization	1.4	-	1.4	3
5 Maintenance	5.1	0.9	6.0	15
6 Design Fee	0.2	-	0.2	0
7 Labor	-	0.0	0.0	0
8 Overhead	-	0.8	0.8	2
9 Admin.Cost	-	0.5	0.5	1
Fixed Cost	17.0	5.6	22.6	56
Annual Cost	32.5	8.1	40.6	100
Unit P.Cost			4142.9	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact.Cost			4142.9	

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-24)
- Other CP Production -

Items	Annual Cost (million Yen)			Component (%)
	F/C	L/C	Total	
1 CP/RM				
A Imported CP/RM (FOB)	8.9	-	8.9	9
Freight & Insurance	1.0	-	1.0	1
Import Duty	-	1.5	1.5	2
Unloading	-	0.1	0.1	0
Sub-total	9.9	1.6	11.5	12
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	9.9	1.6	11.5	12
2 Utilities	0.0	1.5	1.5	2
Variable Cost	9.9	3.1	13.0	14
3 Depreciation	32.7	11.6	44.3	46
4 Amortization	8.1	-	8.1	8
5 Maintenance	18.5	3.6	22.1	23
6 Design Fee	0.6	-	0.6	1
7 Labor	-	4.4	4.4	5
8 Overhead	-	1.8	1.8	2
9 Admin. Cost	-	1.1	1.1	1
Fixed Cost	59.9	22.5	82.4	86
Annual Cost	69.8	25.6	95.4	100
Unit P. Cost			12389.6	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			12389.6	

#4-25 Electricians' Tools Production

- No.3 HI: Hand Tool Shop -

(1) Outline of Objectives and Planning

At present, No.3 HI's hand tool forging and finishing shop is producing such hand tools as spanner, plier, driver, and hammer.

As electric appliances of the nature of consumer goods will become popular with the progress of electrification (it plans to locally produce also electrician's hand tools such as plier and screw driver as an extension of HIC's existing technology).

Machinery and equipment, dies and others which currently exist in the hand tool forging and finishing shop of No.3 HI will be utilized as much as possible by supplementing them with machinery, equipment and dies especially needed for local production of electricians' tools.

1) Product Line and Planned Production Quantities

1. Spark testing screw driver set for Planned production quantity

<u>Product line</u>	<u>Planned production quantity</u>
1. Side cutting plier for electrician, type MA-480	5,000 pcs./year
2. Spark testing screw driver set for electrician, type 5300	15,000 pcs./year

(2) Details of the Plan

Refer to Attached Table 2-1.

(3) Estimated Capital Requirement

1) Required Facilities

Machinery and equipment required for the plan is indicated in Attached Table 3-1.

2) Estimated capital Requirement

The estimated capital requirement for the plan is as indicated in Attached Table 3-2.

(4) Expected Effects of the Plan

1) Foreign Exchange Saving

Foreign exchange saving per piece of product is 88 yen (assuming an annual production at 20,000 pieces).

	Foreign Currency Required at Implementation of Plan (yen per piece)	Foreign Currency Required for Import (yen per piece)
Cost of Products	-	1,820
Raw Material Costs	910	-
Freight & Insurance	75	153
Sub-total	985	1,973
Working Equipment Costs	900	-
TOTAL	1,885	1,973

Note: The working equipment costs are only for the additional costs incurred by this plan. For detail, see Attached Table 3-3. The above imported product price is based on the average of following import prices weighted by production quantity of various electrician tools.

Side cutting plier 3,320 yen/piece
Spark testing screw driver set 1,320 yen/piece

The raw materials cost is assumed 50% of the product price.

2) Production Cost Reduction

A comparison of production costs for one item at present and after the implementation of the present plan is as follows:

	(unit: yen per item)	
	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	910	1,820
Freight & insurance	75	153
Sub-total	985	1,973
Local CP/RM costs	-	-
Depreciation	710	-
Utility costs	105	-
Labor costs	185	-
Overheads	15	-
Admin. costs	35	-
Other costs	515	197
Sub-total	1,565	197
Mark-up, profit	76	65
Excise tax	263	-
TOTAL	2,889	2,235

Therefore, because of the low production output of the present plan a reduction in production costs cannot be anticipated.

3) Number of Years Required for Recovery of Foreign Capital Investment

The foreign capital investment on the present plan is expected to be recovered in 133 years, as shown in the following formula:

$$(\text{The number of years required}) = A / (B \times C)$$

Where,

A = Estimated foreign exchange required (233.4 million yen)

B = Foreign exchange saving per item (88 yen/piece)

C = Annual production (20,000 pieces/year)

Attached Table 2-1 CONTENTS OF THE PROJECT FOR PROVISION OF MACHINERY & EQUIPMENT
FOR PRODUCTION OF ELECTRICIANS' TOOLS AT NO.3 HI

Place of installation		No.3 HI	
Item	Side cutting plier for electrician	Spark testing screw driver set for electrician	
Building	No.3 HI's Hand Tool Production Shop (finishing) will be used. Required area: 36 m ²		
Outline of machinery & equipment	1) Side cutting plier production facilities 2) Dies for side cutting plier	1) Spark testing driver set production facilities 2) Dies for spark testing driver set	
Technical data (materials) and technical guidance	<u>Technical data</u> 1) Teaching manual on machinery and equipment to be induced	<u>Technical guidance</u> 1) Guidance on installation, operation and adjustment of machinery and equipment to be induced: 6 men x 2 months = 12 man-months	
Major component parts and materials	<u>Imported</u> 1) 500 kg for Body 2) 80 kg for Rivet 3) 250 kg for Dipped Handle 4) 250 kg for Insulated Handle 5) 5000 pcs for Vinyl Punch	<u>Imported</u> 1) 4500 kg for Bits 2) 1500 kg for Chuck 3) 750 kg for Handle 4) 600 kg for Plastic Case 5) 600 kg for Partition 6) 15000 pcs Nut Holding Screw Driver (C.P) 7) 15000 pcs Awl (C.P) 8) 15000 pcs Spring (C.P) 9) 15000 pcs Fuse (C.P) 10) 15000 pcs Screw (C.P)	
Operating cost	1) Power 200 kW 2) Water 2 m ³ /Hr 3) Compressed air 20 m ³ /Hr		
Required operating manpower	25 persons		
Remark			

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-25 Production of Electrical Tools
- No.3 HI: @ Hand Tool Shops -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	Special forging roll machine for edging	Set	1
2	Special bending machine for bending	Set	1
3	Forging die, die set and jig	Set	1
4	Major machines and equipment		
4 1	M/E for side cutting plier	Set	1
4 2	M/E for speak testing screw driver	Set	1
4 3	Metal molds for S.C. plier	Set	1
4 4	Metal molds for S.T.S. driver	Set	1
5	Other machines and equipment		
5 1	Spare parts	Lot	1
6	CP & RM		
6 1	RM for side cutting plier	Lot	1
6 2	CP & RM for spark testing screw driver	Lot	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-25)

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	183.4	-	183.4
2 Freight & Insurance	15.4	-	15.4
Sub-total	198.8	-	198.8
3 Import Duty	-	29.8	29.8
4 Unloading	-	2.7	2.7
5 Installation Cost	-	1.7	1.7
Imported M/E Total	198.8	34.2	233.0
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	21.6	-	21.6
C Software	13.0	-	13.0
D Interest	0.0	-	0.0
Other Costs Total	34.6	-	34.6
Total Investment	233.4	34.2	267.6

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-25)

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	18.2	-	18.2	36
Freight & Insurance	1.5	-	1.5	3
Import Duty	-	3.0	3.0	6
Unloading	-	0.3	0.3	1
Sub-total	19.7	3.3	23.0	45
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	19.7	3.3	23.0	45
2 Utilities	0.0	2.1	2.1	4
Variable Cost	19.7	5.4	25.1	49
3 Depreciation	12.0	2.2	14.2	28
4 Amortization	0.0	-	0.0	0
5 Maintenance	6.0	1.0	7.0	14
6 Design Fee	0.0	-	0.0	0
7 Labor	-	3.7	3.7	7
8 Overhead	-	0.3	0.3	1
9 Admin. Cost	-	0.7	0.7	1
Fixed Cost	18.0	7.9	25.9	51
Annual Cost	37.7	13.3	51.0	100
Unit P. Cost			2550.0	
10 Mark-up			76.5	
11 Excise Tax			262.7	
Ex-fact. Cost			2889.2	

#4-26 Construction of New Alloy Steel Foundry

- No.3 HI -

(1) Objectives and Outline of the Plan

HIC has no full-scale steel foundry. No.3 HI has merely a foundry making small-sized iron castings at relatively large quantities. The capability to supply iron and steel materials is a basic industrial requirement for the industrial development of HIC and Burma as a whole. Thus, it is recommended to establish the capability of supplying alloy steel and plain steel castings which is not available at the present time.

Alloy steel is a raw material for manufacturing metallic dies. HIC uses metallic dies of various kinds for plate work press, forging, etc., and the dies are imported from abroad. In the Renovation Plan there are projects foster the capability to design, repair and finally make metallic dies. However, the raw materials for making die will be continued to be imported. This might obstruct the timely supply of raw materials for manufacture of metallic dies, resulting in disorder of production schedule of parts and products. The capability to supply raw materials for manufacture of metallic dies will contribute to establishment of the integrated system to make metallic dies.

Steel castings are a requisite in industrial machinery and plant facilities manufacturing as parts that require high strength. This new steel foundry is expected to play a role to meet with the demand of other industrial corporations such as cement industry and mining industries, and ordinary market besides supplying steel castings to HIC itself.

As afore said the current output of iron castings of HIC consists mainly of the mass-production of small-sized items, the facilities of the existing foundry are also equipped accordingly. Such being the case, the existing foundry is not adequate for job production of small lots of large-sized iron castings. The demand for large-sized castings is very few at present, but in the future it is expected to increase for manufacturing various kinds of industrial machinery. These products should be made at a foundry equipped with facilities

suited for large-sized castings, and since most of these facilities can be shared with steel castings, the facilities for large-sized castings is planned to be established at the alloy steel foundry. Thus, the alloy steel foundry will play the roles summarized in the followings.

- Supply of raw materials of metallic dies of various kinds used in HIC.
- Supply of steel castings to HIC and other corporations (such as cement industries, mines, etc.)
- Manufacture of large-sized iron castings

(2) Details of the Plan

1) Items to be produced:

- Blocks and ingots of metallic molds of various types
- Steel castings of industrial equipment of various types for cement industry, mining, etc.
- Large-sized iron castings for industrial equipment of various types

2) Production: 1,900 t/year

3) Facilities:

This project is planned to start production at the later phase of the Renovation Plan.

The new alloy steel foundry will be installed in No.3 HI, with size of the order of 48m x 108m (5,184m²). The layout of alloy steel foundry is shown in Attached Figure 2-1.

The main facilities required to realize the planned production are mentioned in the followings.

- Melting shop and raw materials receiving facilities
- Mold and core making facilities
- Sand treatment facilities
- Finishing facilities

- Machining facilities
- Forging facilities
- Transportation facilities

The maintenance shop, patterns repair shop, laboratory, etc., that will be required concurrently with the implementation of the plan, are assumed to share the existing facilities of No.3 HI and therefore, they are excluded from the plan.

Such items as patterns, core boxes, metallic flasks, etc., are excluded from this plan, and they will be taken into consideration after deciding concretely the products to be manufactured. Also the utility facilities are excluded from this plan.

(3) Estimated Capital Requirement

1) Required Facilities

Machinery and equipment required for the plan is indicated in Attached Table 3-1.

2) Estimated Capital Requirement

The estimated capital requirement for the plan is as indicated in Attached Table 3-2. The project concept of the present plan is still preliminary phase and therefore, the cost estimate is for the reference only.

The estimated production cost is shown in Attached Table 3-3 for the alloy steel at 1,900 tons of annual production, though the production cost is hard to be estimated at this level of project concept without definit product specifications and raw material supply sources.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-26(1) Construction of Alloy Steel Foundry
- No.3 HI: # Alloy Steel Foundry -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	Melting and raw material receiving shop		
1 1	Overhead trvl'g crane with lift'g magnet flr. controlled	Set	1
1 2	1Raw material weighing device	Set	1
1 2	2Working deck and chute	Set	1
1 3	Motor drive traverser for raw material	Set	1
1 4	Tote box for raw material	Set	1
1 5	Set of weighing device for ferro-alloy	Set	1
1 6	Set of high frequency crucible (1t furnace & 2t furnace)	Set	1
1 7	Set of secondary wiring material from transp'n to furnace	Set	1
1 8	Set of secondary cooling water unit	Set	1
1 9	Set of primary cooling water unit	Set	1
110	Set of piping material for cooling water	Set	1
111	Overhead travelling crane for melting work flr. controlled	Set	1
112	Set of pouring ladle	Set	1
113	Mixer for lining material	Set	1
114	Ladle preheating and drying device	Set	2
115	Set of tools for lining work	Set	1
116	1Ventilating fan for pouring zone	Set	4
116	2Set of dust hood and duct	Set	1
117	Immersion thermometer	Set	1
118	Optical pyrometer	Set	2
119	Set of tools for sampling work	Lot	1
120	Set of tools for metling work	Lot	1
121	Working deck for melting work	Set	1
2	Molding and core making shop		
2 1	1Sand receiving hopper	Set	2
2 1	2Feeding device	Set	2
2 2	Single trough continuous sand mixer:cap. 6t/h	Set	2
2 3	Vibrating table for molding:size 1,800x1,200mm, cap. 2,000kg	Set	2
2 4	Gravity roller conveyor	Set	2
2 5	VRH molding machine:chamber size L1,750xW1,250xH450mm	Set	1
2 6	Mold traverser	Set	1
2 7	Gravity roller conveyor for curing zone	Set	1
2 8	Rollover pattern draw machine	Set	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-26 (2) Construction of Alloy Steel Foundry
- No.3 HI: # Alloy Steel Foundry -

No	Items	Unit	No.
2 9	Mold traverser	Set	1
210	Gravity roller conveyor for flask & pattern setting	Set	1
211	Gravity roller conveyor for coating	Set	1
212	Infrared dryer with roller conveyor	Set	1
213	Gravity roller conveyor for core set'g and mold closing zone	Set	1
214	Mold traverser	Set	2
215	Gravity roller conveyor for pouring and cooling zone	Set	4
216	Gravity roller conveyor for empty flask returning zone	Set	1
217	Gravity roller conveyor for bottom board returning zone	Set	1
218	Overhead travl'g crane with cont'l cabin for pour'g&Mold trs	Set	1
219 1	Suspension crane floor controlled:cap. 2 tons	Set	2
219 2	Set of steel structure for item 219-1	Set	1
220 1	Monorail hoist floor controlled:cap. 1 ton	Set	1
220 2	Set of steel structure for item 220-1	Set	1
221 1	Bench type pneumatic sand rammer	Set	2
221 2	Floor type pneumatic sand rammer	Set	2
222	Set of metal flask (excl. from the estimated budget)	Lot	1
223	Set of plastic pattern (excl. from the estimated budget)	Lot	1
224	Set of bottom board (excl. from the estimated budget)	Lot	1
225 1	Tank for coating material with agitator	Set	1
225 2	Spray gun	Set	2
226	Portable conveyor	Set	1
227	Set of tools for molding and core making	Set	1
228 1	Vertical closing shell core blowing machine	Set	2
228 2	Automatic core unloader	Set	2
229 1	Sand receiving hopper	Set	2
229 2	Feeding device	Set	2
230	Extended arm continuous sand mixer:cap. 6t/h	Set	1
231	Set of gravity roller conveyor	Set	1
232	Free balance loader	Set	1
233	Set of metal core box (excl. from the estimated budget)	Lot	1
234	Set of wooden core box (excl. from the estimated budget)	Lot	1
235	Set of wooden pallet&box for core transp'n(excl. est.budget)	Lot	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-26 (3) Construction of Alloy Steel Foundry
- No.3 HI: # Alloy Steel Foundry -

No	Items	Unit	No.
3	Sand treatment shop		
3 1	Shake-out and lump sand crushing machine	Lot	1
3 2 1	Ventilating fan	Set	1
3 2 2	Set of dust hood and duct	Set	1
3 3	No. 1 belt conveyor for return sand	Set	1
3 4	Overband magnet separator	Set	1
3 5	No. 2 belt conveyor for return sand	Set	1
3 6	No. 1 bucket elevator for return sand	Set	1
3 7	Vibrating screen:cap. 20t/h	Set	1
3 8	Sand hopper	Set	1
3 9	Belt feeder	Set	1
310	No. 2 Bucket elevator for return sand	Set	1
311	Sand reclamation equipment:cap. 10t/h	Set	1
312	No. 3 bucket elevator for return sand	Set	1
313	Sand cooler:cap. 10t/h	Set	1
314	No. 3 belt conveyor for return sand	Set	1
315	Bucket elevator with grating chute	Set	1
316	Sand storage hopper	Set	1
317	Belt feeder	Set	1
318	Pneumatic conveyor:cap. 10t/h	Set	1
319	Control panel	Set	1
320	Dust collector	Set	1
321	Set of dust hood and duct	Set	1
4	Cleaning and fettling shop		
4 1	Overhead travelling crane floor controlled:cap. 5 tons	Set	2
4 2	Shot hanger blasting m/c:max.load 500kg/hook cap. 15hook/h	Set	1
4 3 1	Motor chain block	Set	2
4 3 2	Set of steel structure for item 403-1	Set	1
4 4	Gas cutting device	Set	2
4 5	Powder cutting device	Set	1
4 6	H.trtm't furnace for nolmalzing, tempr'g & Annealing	Set	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-26(4) Construction of Alloy Steel Foundry
- No.3 HI: # Alloy Steel Foundry -

No	Items	Unit	No.
4 7	Bogie type H.trtm't furnace for quenching (cap. 5,000kg)	Set	1
8	Water pool for quenching	Set	1
9	Swing table type shot blasting machine for descaling	Set	1
10	Gauging device	Set	5
11 1	Swing grinder	Set	2
11 2	Motor chain block	Set	2
11 3	Set of steel structure for item 411-2	Set	1
12	High frequency disc grinder	Set	8
13	High frequency power unit	Set	3
14	Pneumatic chipping hammer	Set	6
15	Set of hand tools for fettling	Set	1
16	Wooden table for grinding work	Set	8
17	Electric arc welder for repairment	Set	2
5	Machining shop		
1	Universal high speed lathe (swing over bed 450mm)	Set	1
2	Precision high speed lathe (swing over bed 260mm)	Set	1
3	Universal milling machine:table size 1,100x270mm	Set	1
4	Vertical milling machine:table size 1,300x270mm	Set	1
5	Face bor'g m/c:face plate dia.500mm table sz. 1,350x830mm	Set	1
6	Radial drilling machine:cap. max.dia. 45mm	Set	1
7	Upright drilling machine:cap. max.dia. 40mm	Set	1
8	Bench drilling machine:cap. max.dia. 13mm	Set	1
9	Surface grinder:table size 600x300mm	Set	1
10	Cylindrical grinder (swing over bed 330mm)	Set	1
11	Hack sawing machine	Set	1
12	Abrasive cut-off machine	Set	1
13	Double headed tool grinder	Set	1
14	Surface plate	Set	1
15	Set of hand tools for finishing	Set	1
16	Wooden table	Set	2
17	Overhead travel'g crane flr. controlled:cap. 3 tons	Set	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 4-26(5) Construction of Alloy Steel Foundry
- No.3 HI: # Alloy Steel Foundry -

No	Items	Unit	No.
6	Forging shop		
6 1	Heating furnace for forging material	Set	2
6 2	Pneumatic drop hammer:rated cap. 1000kgs	Set	1
6 3	Pneumatic forging hammer:rated cap. 250kgs	Set	1
6 4	Set of forging die (excl. from the estiamted budget)	Set	1
6 5	Set of hand tools for forging	Set	1
6 6	Overhead travelling crane floor controlld:cap. 3tons	Set	1
7	Transportations facility		
7 1	Fork lift truck:cap. 5,000kg engine 4 cycle, water cooled d.	Set	1
7 2	Fork lift truck:cap. 2,000kg engine 4 cycle, water cooled d.	Set	5
7 3	Battery powered fork lift truck:cap. 1,000kg	Set	1
7 4	Shovel loader:type wheel type shovel loader	Set	1
7 5	One wheel truck	Set	5
7 6	Trailer	Set	5
7 7	Hand pallet truck	Set	15
7 8	Hand truck with one sleeve	Set	10
7 9	Hand truck with two sleeves	Set	10
710	Drum handling truck	Set	2
711	Gas cylinder handling truck	Set	1
712	Box pallet	Set	200
8	Building & foundation materials for alloy steel foundry		
8 1	Set of steel structure	Lot	1
8 2	Set of siding and roofing material (local survey)	Lot	1
8 3	Set of steel door and window sash	Lot	1
8 4	Set of galss and putty	Lot	1
8 5	Set of gutter and rain proof material	Lot	1
8 6	Set of roof fan with motor	Lot	1
8 7	Set of cement for stopping flood	Lot	1
8 8	Set of cement for water proof	Lot	1

Attached Table 3-2: REQUIRED INVESTMENT (#4-26)

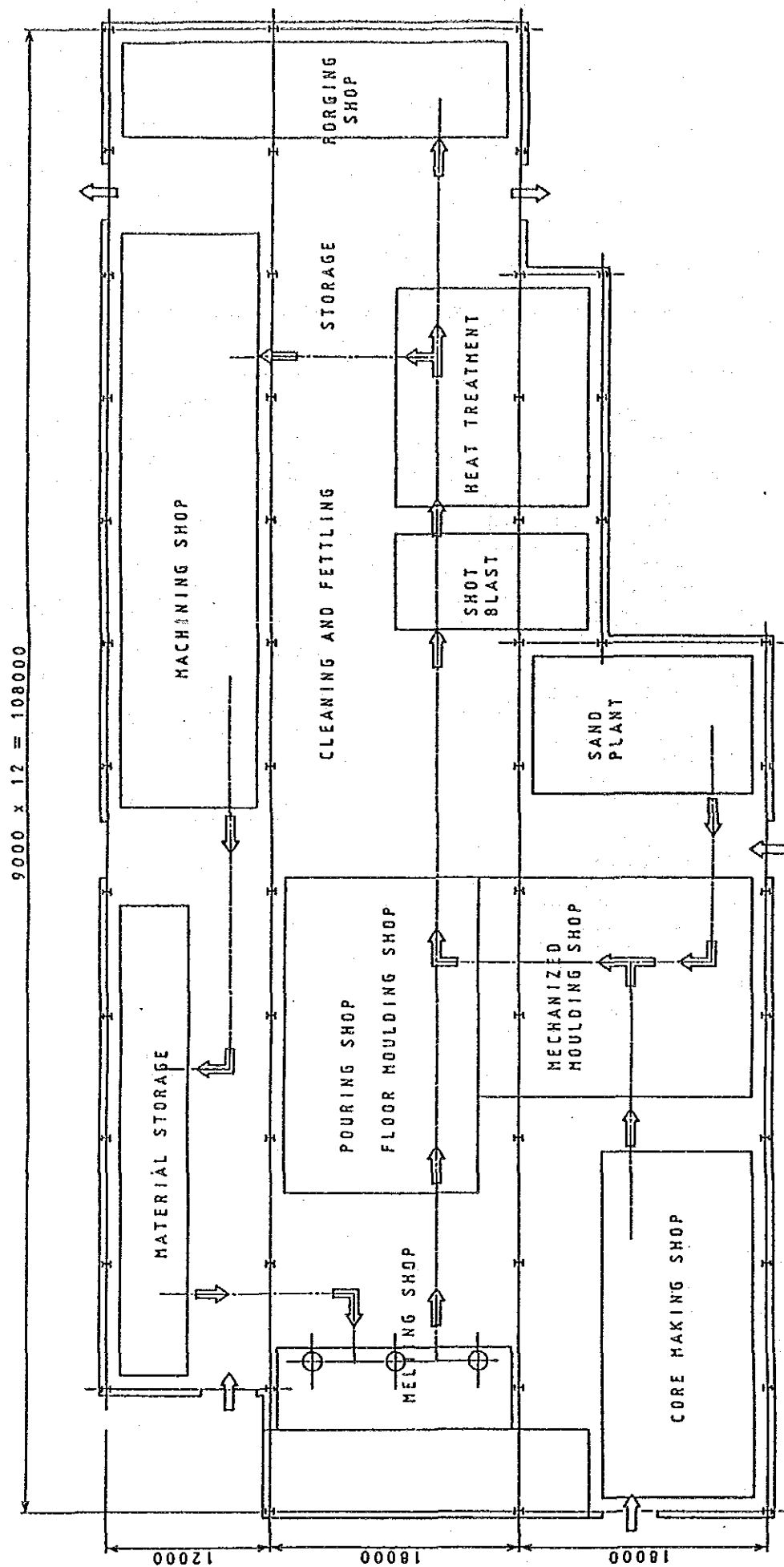
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	1311.0	-	1311.0
2 Freight & Insurance	124.5	-	124.5
Sub-total	1435.5	-	1435.5
3 Import Duty	-	215.3	215.3
4 Unloading	-	28.7	28.7
5 Installation Cost	-	3.9	3.9
Imported M/E Total	1435.5	247.9	1683.4
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	212.4	-	212.4
C Software	116.8	-	116.8
D Interest	0.0	-	0.0
Other Costs Total	329.2	-	329.2
Total Investment	1764.7	247.9	2012.6

Attached Table 3-3: PRODUCTION COST STATEMENT (#4-26)

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	456.0	-	456.0	48
Freight & Insurance	43.3	-	43.3	5
Import Duty	-	74.9	74.9	8
Unloading	-	10.0	10.0	1
Sub-total	499.3	84.9	584.2	62
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	499.3	84.9	584.2	62
2 Utilities	0.0	114.1	114.1	12
Variable Cost	499.3	199.0	698.3	74
3 Depreciation	86.1	15.7	101.8	11
4 Amortization	0.0	-	0.0	0
5 Maintenance	43.1	7.4	50.5	5
6 Design Fee	0.0	-	0.0	0
7 Labor	-	11.0	11.0	1
8 Overhead	-	44.6	44.6	5
9 Admin. Cost	-	42.7	42.7	4
Fixed Cost	129.2	121.4	250.6	26
Annual Cost	628.5	320.4	948.9	100
Unit P. Cost			499421.1	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			499421.1	

ATTACHED FIGURE 2-1. ROUGH LAYOUT & PROCESS FLOW FOR ALLOY STEEL FOUNDRY



#5-1 Production of Rubber Parts for Vehicles

- No.6 HI: Rubber Parts Production Plant -

(1) Objectives and Outline of the Plan

Currently there is a total dependence on imports for industrial rubber parts. There are about 340 different items of the light and heavy vehicles ranges involved including such important safety items as the oil seal, brake hose, and fuel hose.

The present plan aims the effective use of domestic resources and at saving foreign exchange currently expended on imports and on the improving of technical expertise through the local production of industrial rubber parts. This will be achieved through shared use of part of the currently operating equipment of No.6 HI.

Since production is on a small scale for a large range of industrial rubber products, and a wide range of management conditions and technical factors is involved due to the particularities of raw materials, proportion mix for materials, operational conditions, assurance of product quality and its stability. For this reason the transfer of technology all at once would be difficult and it is necessary to proceed with the orderly introduction of rubber parts for vehicle use, production processes and particular parts gradually.

For the environmental conditions of use industrial rubber parts are required to be heat resistant, oil proof, and weather proof and the technical expertise for different parts widely differs. Therefore, it is necessary to begin with those items which are relatively easy technically. The Attached Table 1-1 gives a list of the items which are considered to be relatively easy in this sense.

As the oil seal, brake hose and fuel hose are important safety parts it is best not to proceed with their local production for the time being.

The main machining processes are shown in the separate Attached figure 1-1.

Productive capacity including service parts is to be an amount equivalent to 5,000 vehicles parts per annum.

A technical service is required for the practical training in installation of equipment, trial running, operational methods, confirmation of quality and maintenance of equipment, etc.

(2) Details of the Plan

1) Shared Equipment for Production of Rubber Parts

- Installation of equipment for mixing the ingredients and solvents, for masticating and tempering of the materials.
- As the particular characteristics of rubber parts are determined by the distribution of raw materials in the compound technical expertise required increases with the range of particularities.
- Installation of the inspection equipment required for verification of product quality.

2) Production Equipment for Floor Mat Production

- Mold extracting device to be installed with a large press.
- Shared use of the existing equipment of the previous process.

3) Production Equipment for the Sponge Mat Weather Strip

- Installation of equipment including an extruding device, vulcanizer and shaping press.
- Because of the particular nature of the parts it is necessary to realize precisely certain specific conditions of distribution and preparation of raw materials, and of the foam molds and this involves a large amount of technical expertise and the technical requirement is great.

4) Solid Type Weather Strip and Rubber Hose Production Equipment

- Installation of equipment including an extruding machine, winding machine, vulcanizer and molding press, etc.
- The equipment and devices are generally the same as those for the sponge type strip but the processing performance differs, the solid type having the greater performance capacity.
- Rubber hoses included in the plan are of a general use nature. The brake hose and fuel hose for vehicles are not concerned here since these are important safety parts.

5) Vibration Insulating Rubber and Molded Rubber Parts Production Equipment

- Installation of vulcanizing and forming equipment for molded parts using metal molds for shaping.
- Parts using materials with particular qualities such as the piston cap or oil seal are important parts and are therefore not included under this heading.

6) Production Equipment for the Wrapped Type V-Belt

- Installation of long and short type production lines (one line each) to include materials processing facilities.
- The equipment required for production of the toothed belt and cord are not concerned by the plan.
- Conveyance equipment, measuring devices and jigs are included.

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

The amount of foreign exchange required for one vehicle is as follows (Assumed an annual production; parts for 5,000 vehicles):

	Foreign Exchange Required at Implementation of Plan (yen per vehicle)	Amount of Foreign Exchange Required at Present (yen per vehicle)
Cost of Products	-	26,190
Raw Material Costs	-	-
Freight & Insurance	-	2,910
Sub-total	-	29,100
Working Equipment Costs	68,740	-
TOTAL	68,740	29,100

Note: The working equipment costs are only for the additional costs incurred by this plan. For details of the above items refer to the Attached Table 3-3.

The initial price of rubber parts for one vehicle differ considerably from the light to heavy vehicle models. The estimates given are the prices of parts for a 3.5 ton truck. The included initial prices for the individual parts are as follows:

1. Floor mat	4,560 yen per item
2. Weather strip (sponge type)	3,550
3. Weather strip (slid type)	5,310
4. Formed rubber	11,960
5. V-belt	810
Total	26,190

The present plan has the objective of utilizing domestic resources, and with the present scheduled production output a saving of foreign exchange cannot be anticipated. However,

1. The present plan only concerns the production output of vehicles of HIC but a demand for spare parts from the general market can be expected.
2. If the technical expertise and equipment accumulated by the production of vehicle parts is utilized it will be easy to undertake the manufacture of other industrial rubber parts in the future.

Therefore, the actual production output is expected to be larger than that of the present scheduled production output.

(5) Recommendation of Implementation of the Plan

As has already been remarked, from a technical point of view it is better not to introduce all of the parts at one time, and introduction of the facilities by different manufacturing methods separately is desirable. The index for the relative degree of economic viability of the various parts groups.

The production of floor mat estimated to have a high economic viability is to be commenced in the first stage. Next, introduction of the V-belt, which does not have a high figure for economic viability in the calculations here, but which is expected to have a large demand in various industrial uses, is advisable. Economic viability is good and introduction technically easy for the weather strip (solid) and formed rubber. In contrast to these introduction of the weather strip (sponge type) presents problems both technically and economically.

Moreover, since a large variety of technical expertise aspects are involved and completion of a contract for the supply of technology is a pre-requisite to its implementation.

Parts Group	Working Equipment	Imported Parts	A/B
	Costs (FOB, 1,000 yen) (A)	Price per Vehicle (FOB yen) (B)	
Floor mat	93,000	4,560	20.4
Weather strip (sponge)	489,000	3,550	137.7
Weather strip (solid)	111,500	5,310	21.0
Formed rubber	376,000	11,960	70.8
V-Belt	1,761,000	810	2,174.1

Note: This excludes shared equipment costs.

Attached Table 1-1 RUBBER COMPONENT PARTS TO BE MANUFACTURED WITH PRIORITY

Model	Part No.	Part Name	Compound No.						
			120-01	150-01	180-01	190-01	200-01	210-01	
B600	0118 13 431	Rubber, Washer					x		
----	0014 26 693	Valve Cap				x			
	0114 33 681	Boot, Wheel Cyl.							x
	0111 34 775	Rubber, Bush	x						
	0118 41 682	Stopper Rubber			x				
	0110 41 692	Grommet					x		
	0106 43 092	Stopper							
	0111 52 541	Bonnet Cushion Rubber		x					x
	0130 53 186	Vent. Stopper							x
	0111 53 492	Battery Side Pad							x
	0111 53 771	Front Grille Cushion							x
	0114 56 131	Floor Drain Plug							x
	0111 56 511	Insulation Rubber							x
	0111 56 514	Insulation Rubber						x	
	0111 66 695	Protector, Cord						x	
X2000	0118 41 682	Rubber, Stopper			x				
-----	0111 41 692	Protector			x				
	0118 43 911	Pipe, Breather			x				
	0647 51 018	Gear Box Cover			x				
	0647 53 594A	Cover							x
	0647 53 596	Stopper Rubber			x				
	0127 53 751	Seal Rubber			x				
	0063 58 223	Friction Rubber							x
	0136 65 752	Packing							x
	0647 65 879	Inner Handle Cover							x
	0829 67 151	Protector							x
	0647 68 725	Stopper Rubber		x					
	2587 69 142	Gasket							x

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 5-1(1) Rubber parts production
No.6 HI: #Rubber parts production plant

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Expansion of building		
2	Imported M/E		
1	ME for common use process		
1 1	Neander (201)	Set	1
1 2	Additional testing equipment	Set	1
1 3	Materials handling equipment and others	Lot	1
2	ME for floor mat production		
2 1	2,000ton hydroulic press	Set	1
2 2	Miscellaneous	Lot	1
3	ME for weatherstrip (sponge) production		
3 1	Extruder	Set	1
3 2	Continuous vulcanizing furnace	Set	1
3 3	Press for corner junction	Set	3
3 4	Miscellaneous	Set	3
4	ME for weatherstrip (solid) production		
4 1	Extruder	Set	2
4 2	Braider/winder	Set	1
4 3	Vulcanizer	Set	2
4 4	Miscellaneous	Lot	1
5	ME for rubber cushion/ molded rubber		
5 1	Vertical injection M/C	Set	7
5 2	Horizuntal injection M/C	Set	2
5 3	Molds	Set	1
5 4	Miscellaneous	Lot	1
6	ME for lap type V belt production		
6 1	Machining line	Set	1
6 2	Short-sized products line (up to 79")	Set	1
6 3	Long-sized products line (80" or more)	Set	1
6 4	Mat'ls hordlg, measuring equipment and jigs	Set	1

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 5-1(2) Rubber parts production
No.6 HI: #Rubber parts production plant

No	Items	Unit	No.
7	Others		
7 1	Compression press	Set	6
7 2	Bush inserting/hardening M/C	Set	1
7 3	Painting equipment	Set	1
7 4	Mold washing M/C	Set	1
7 5	Silicon baking oven	Set	1
7 6	Mold surface treatment equipment	Set	1
7 7	Past coating equipment	Set	1
7 8	Mold	Set	1
7 9	Projector	Set	1
710	Washing equipment	Set	1
711	Mold	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#5-1)

(Unit: million yen)

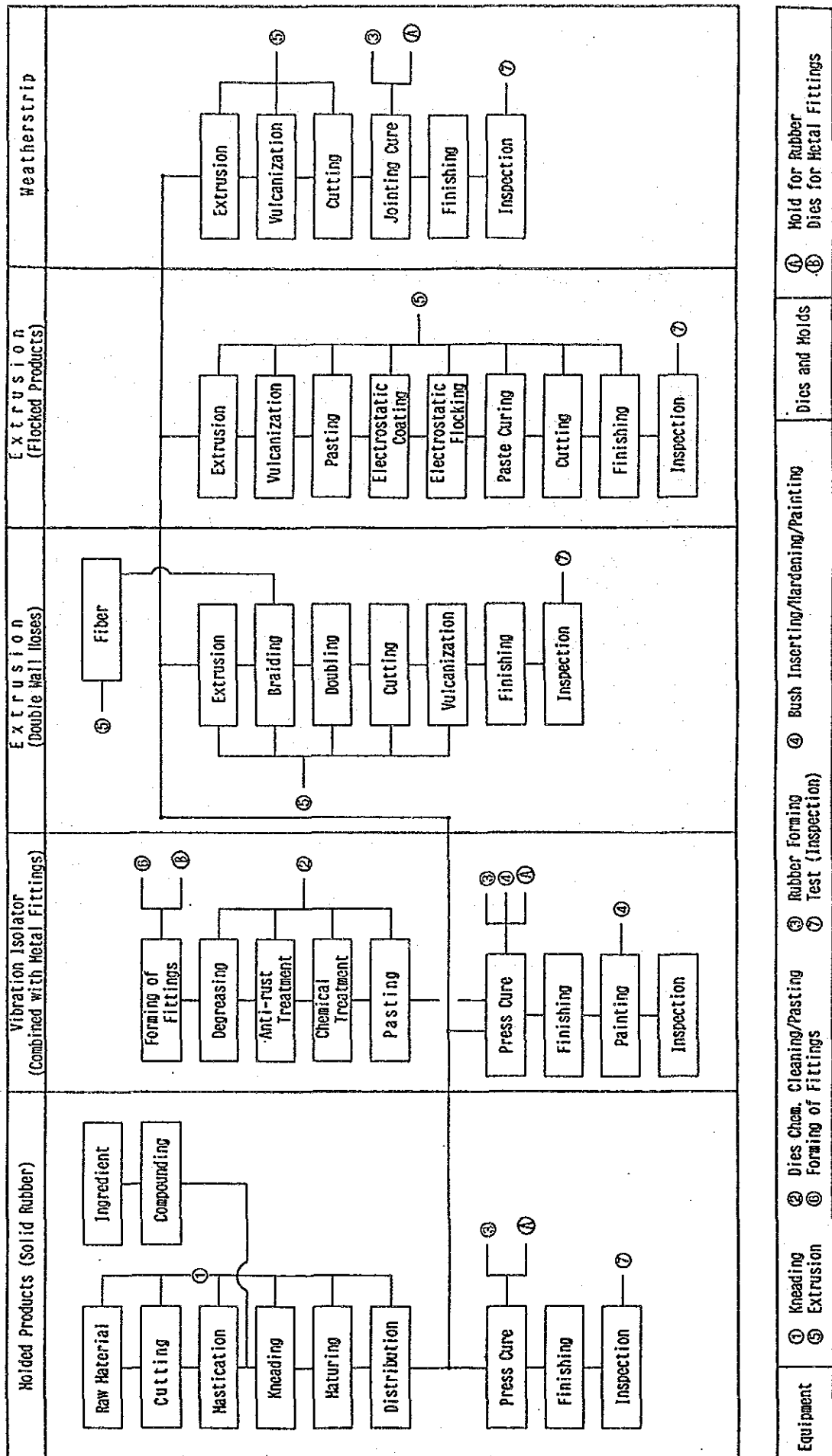
Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	230.4	320.9	551.3
2 Freight & Insurance	18.0	-	18.0
Sub-total	248.4	320.9	569.3
3 Import Duty	-	37.3	37.3
4 Unloading	-	3.2	3.2
Building Total	248.4	361.4	609.8
Bldg & Land Total	248.4	361.4	609.8
2 1 Imported M/E (FOB)	3317.9	-	3317.9
2 Freight & Insurance	258.8	-	258.8
Sub-total	3576.7	-	3576.7
3 Import Duty	-	536.5	536.5
4 Unloading	-	46.5	46.5
5 Installation Cost	-	112.8	112.8
Imported M/E Total	3576.7	695.8	4272.5
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	50.0	-	50.0
B Eng Fee	194.4	-	194.4
C Software	5.0	-	5.0
D Interest	0.0	-	0.0
Other Costs Total	249.4	-	249.4
Total Investment	4074.5	1057.2	5131.7

Attached Table 3-3: PRODUCTION COST STATEMENT (#5-1)

Items	Unit	No.	Annual Cost (million Yen)			Component (%)
			F/C	L/C	Total	
1 CP/RM						
A Imported CP/RM (FOB)			0.0	-	0.0	0
Freight & Insurance			0.0	-	0.0	0
Import Duty			-	0.0	0.0	0
Unloading			-	0.0	0.0	0
Sub-total			0.0	0.0	0.0	0
B Local CP/RM			-	0.0	0.0	0
P/RM Total			0.0	0.0	0.0	0
2 Utilities			0.0	0.0	0.0	0
Variable Cost			0.0	0.0	0.0	0
3 Depreciation			224.5	55.1	279.6	57
4 Amortization			0.0	-	0.0	0
5 Maintenance			114.8	30.5	145.3	30
6 Design Fee			4.4	-	4.4	1
7 Labor			-	0.0	0.0	0
8 Overhead			-	52.8	52.8	11
9 Admin. Cost			-	6.8	6.8	1
Fixed Cost			343.7	145.2	488.9	100
Annual Cost			343.7	145.2	488.9	100
Unit P. Cost					97780.0	
10 Mark-up					0.0	
11 Excise Tax					0.0	
Ex-fact. Cost					97780.0	

Note: Raw material rubber cost is not included.

Attached Figure 1-1 RUBBER FORMING PROCESS



#5-2 Plastic Parts production for the Electric Fan

- No.3 HI: AME Component Shop No.1 -

(1) Objectives and Outline of the Plan

Changeover to resin commodities is a worldwide trend and this allows for diversification with regard to colouring and processing. There is a large possibility for the changeover to resin items for the HIC products in the areas of electrical appliances and vehicle parts.

In order to undertake this changeover it is necessary to make modifications in almost all of the present processing methods. after doing away with the molds it will be necessary to do away with the secondary machining processes as that is the main aim of the changeover to resin production. Therefore, in order to proceed in this direction it will be necessary to undertake the change to resin items for all areas where this is possible.

For example, the present plan for resinification of the electric fan was tried on a partial basis but it is clear that such a re-design gives rise to a number of disadvantages and shortcomings.

The present plan is for furthering the changeover to resin for the electric fan which has a very bad reputation in comparison with products from other sources which are currently competing in the market.

At present HIC produces each of the following types of electric fan:

desk fan	two types (25 cm and 30 cm diameter round shape)
stand fan	one type (40 cm round shape)
ceiling fan	one type (120 cm hanging type)

Demand for the fans is strong so that production for the stand fan and ceiling fan is stable and being continued.

At present, steel sheets and aluminum die casts are used in large number for the electric fan parts. Therefore, in comparison with resin parts these raw materials, in particular aluminum, restriction and cost of obtaining these and productivity are problems. The changeover to resin production can be expected to bring the following results:

1. A saving of foreign currency
2. A reduction in materials costs
3. An increase in productivity
4. Assurance of market competitiveness

Further, the injection molding equipment to be installed for this present plan can be used for the changeover to resin production of other electrical products and vehicle parts. In order to use the equipment introduced in the present plan for adapting other items to resin production a change in the layout of the AME Shop No.1 is desirable. Provision of an exclusive area for the resin processing section and re-arrangement to allow the smooth running of other operations is necessary.

(2) Details of the Plan

- 1) Model changes for changing the fan blades from steel to plastic, and for changing the body and body of the fan from aluminum die cast to plastic parts are required.

Model changes are to be carried out first with the two types of desk fan since the changeover to resin production is expected to have the maximum results with this. As the following stage the model change of the stand fan and evaluation of resin changeover for other HIC products is considered appropriate.

The following equipment is to be installed:

400 ton grade injection molding machine
200 ton grade injection molding machine
50 ton grade injection molding machine

This will permit implementation of:

1. Production of the 30 cm box fan parts, production of the engine
 2. Production of the 40 cm desk fan parts
- 2) The AME Component Shop No.1 possesses functions for press processing, machining, assembly processing for the engine and fan and these are managed independently one from the other. These should be organized

in order to allow for effective operations of the various functions including the plastic processing envisaged here. The overall layout is shown in Attached Figure 1-1.

It is advisable to divide the shop into the following sections:

1. Plastic processing section
2. Press and metal mold section
3. Metal machining section
4. Motor and fan assembly section

However, since this change in layout only involves re-arrangement of existing machinery it is not included in the present plan.

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Capital

A saving of in foreign capital for one set fan as shown below can be achieved (Assumption of annual production; 6,000 sets of fan).

	Foreign Currency Required at Implementation of Plan (yen per vehicle)	Amount of Foreign Exchange Required at Present (yen per vehicle)
Cost of Products	2,333	6,900
Raw Material Costs	-	-
Freight & Insurance	184	550
Sub-total	2,517	7,450
Working Equipment Costs	13,733	-
TOTAL	16,250	7,450

Note: Figures for present production are the performance figures for 1987. For details of the above items refer to the Attached Table 3-3.

Because of the low production output working equipment costs are high and savings of foreign capital cannot be expected to result. The variations in production output and the amount of foreign capital required are as follows:

Production Output (set)	Req. Foreign Exchange when Plan Implemented (yen per set fan)	Present Foreign Exchange Required (yen per set fan)
6,000	16,250	7,450
12,000	9,384	7,450
18,000	7,095	7,450

2) Reduction in Production Costs

A comparison of production costs for one item at present and after the implementation of the present plan is as follows:

(unit: yen per set fan)

	Production Costs After Implementation of the Plan	Present Production Costs
Imported CP/RM costs		
FOB price	2,333	6,900
Freight & insurance	183	550
Sub-total	2,517	7,450
Local CP/RM costs	-	5,070
Depreciation	12,517	760
Utility costs	-	470
Labor costs	-	1,290
Overheads	2,583	2,100
Admin. costs	333	610
Other costs	6,017	3,810
Sub-total	21,450	14,110
Mark-up, profit	719	650
Excise tax	14,811	13,320
TOTAL	39,497	35,530

Because of the low level of production output a reduction in production costs cannot be expected to result.

The relation between production costs and production output is as follows:

(unit: yen per set fan)

Production Output (Present Plan=100)	Variable Costs	Fixed Costs	Mark-up	Excise Tax	Total
6,000	2,933	21,034	719	14,811	39,497
6,500	2,933	19,415	670	13,811	36,829
7,000	2,933	18,029	629	12,955	34,546

If a production output level of 6,800 sets fan (approx. 1.13 times the present plan) a greater reduction in production costs compared to that achieved by the present plan is possible.

4) Other Effects to be Expected

Hereafter, utilization of the injection molding machine obtained for the resin production of electrical products, vehicle parts and other products will be possible. However, in order to proceed with the model changes needed for the changeover to resin production it will be necessary to increase the commercial product development capabilities.

(5) Recommendation on Implementation of the Plan

The plastic parts production equipment to be introduced under the present plan is not only for the present product the burden of the production cost is too large to be allocated to the fan alone. However, it is advisable as already noted to proceed with the plan on the basis of forming a foundation for resin production to include other products.

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 5-2 Plastic Parts Production
- No.3 AME Shop No.1 -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1 1	Injection M/C 200ton w/attachment facilities	Set	1
1 2	Injection M/C 400ton w/attachment facilities	Set	1
1 3	Injection M/C 50ton w/attachment facilities	Set	1
1 4	Winding M/C	Set	1
1 5	Thread rolling M/C	Set	1
1 6	Die for guard mark	Set	1
1 7	Die for guard ring	Set	1
1 8	Die for blade	Set	1
1 9	Die for lower knee joint	Set	1
110	Die for stnad	Set	1
111	Die for bottom plate	Set	1
112	Die for louver filter	Set	1
113	Die for louver	Set	1
114	Die for front case	Set	1
115	Die for switch cover	Set	1
116	Die for blade	Set	1
117	Die for front case	Set	1
118	Press for core	Set	1
119	Press for york/cover	Set	1
120	Press for small metal parts	Set	1
121	M/C and jig for assembly	Set	1
122	Die for core	Set	1
123	Die for roter diecast	Set	1
124	Die for york/cover	Set	1
125	Die for gear box	Set	1
126	Die for york suporter	Set	1
127	Die for cover of box fan	Set	1

Attached Table 3-2: REQUIRED INVESTMENT (#5-2)

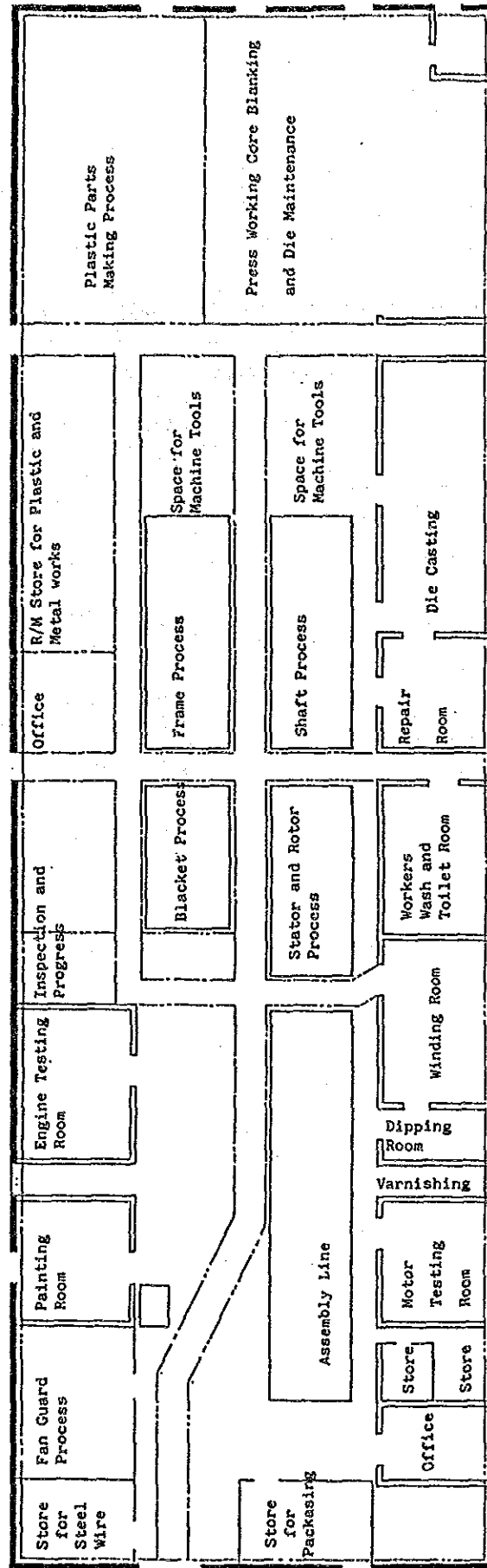
(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	835.9	-	835.9
2 Freight & Insurance	65.2	-	65.2
Sub-total	901.1	-	901.1
3 Import Duty	-	135.2	135.2
4 Unloading	-	11.7	11.7
5 Installation Cost	-	28.7	28.7
Imported M/E Total	901.1	175.6	1076.7
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	25.2	-	25.2
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	25.2	-	25.2
Total Investment	926.3	175.6	1101.9

Attached Table 3-3: PRODUCTION COST STATEMENT (#5-2)

Items	Annual Cost (million Yen)			Compo- nent (%)
	F/C	L/C	Total	
1 CP/RM				
A Imported CP/RM (FOB)	14.0	-	14.0	10
Freight & Insurance	1.1	-	1.1	1
Import Duty	-	2.3	2.3	2
Unloading	-	0.2	0.2	0
Sub-total	15.1	2.5	17.6	12
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	15.1	2.5	17.6	12
2 Utilities	0.0	0.0	0.0	0
Variable Cost	15.1	2.5	17.6	12
3 Depreciation	54.1	21.0	75.1	52
4 Amortization	0.0	-	0.0	0
5 Maintenance	27.0	5.3	32.3	22
6 Design Fee	1.3	-	1.3	1
7 Labor	-	0.0	0.0	0
8 Ovehead	-	15.5	15.5	1
9 Admin.Cost	-	2.0	2.0	1
Fixed Cost	82.4	43.8	126.2	88
Annual Cost	97.5	46.3	143.8	100
Unit P.Cost			23966.7	
10 Mark-up			719.0	
11 Excise Tax			14811.4	
Ex-fact.Cost			39497.1	

Attached Figure 1-1 LAYOUT OF THE PROCESS FOR AWE COMPONENT SHOP NO.1



#5-3 Enameled Copper Wire Production

- No.5 HI -

(1) Objectives and Outline of the Plan

The enameled copper wiring used in Burma is imported and partly locally produced. The domestic production capacity is for 50 tons per year, and this is considerably under the domestic demand. HIC annually uses some 120 tons in production of electrical appliances (a detailed breakdown of this is shown in Attached Table 1-1) and only 20 tons of this is received from domestic sources.

As an increase in demand for enameled copper wiring is anticipated not only within the HIC but from various other users it is desirable that HIC expand its resources for local production at least to cover the quantity used in production of its own products.

The present plan proposes installation of the production equipment needed in response to the above. No.5 HI has been chosen as the location for installation.

Local production of products is done using the horizontal method. There are problems with even thickness, strength and adhesion of paint film. Use for low voltage services is possible but there are quality problems with use of high voltages and wiring with wide diameters. The present plan is based on the adoption of the vertical method with its acknowledged excellence in forming the film compared to the horizontal method.

The minimum diameter of wire used by HIC is 0.08 mm, and HIC has expressed its interest in production of the full range of diameter products. However, this would require introduction of the four types of wire drawing machine and three types of enameling oven. As the equipment expenditure required by this would be excessive the present plan proposes production equipment for the range from the 0.16 mm diameter items to those with a 2.6 mm diameter. For articles with a diameter of less than 0.14 mm diameter a decision should be made on the basis of demand increases hereafter. Also, the total required quantity of wiring not met by the present plan amounts to 9.37% (refer to the Attached Table 1-1).

(2) Details of the Plan

a) Product types:

Oleo-resinous enameled copper wires (JIS C 3202)

Polyvinyl formal enameled copper wires (JIS C 3203)

Polyester enameled copper wires (JIS C 3210)

b) Range of product dimensions

From 0.16 mm diameter to 2.6 mm diameter

c) Equipment required

Wire drawing machine 3 types

Enameling oven 2 types

(3) Estimated Capital Requirement

1) Required Facilities

The details of equipment and devices required in the present plan are shown in the Attached Table 3-1.

2) Estimated Capital Requirement

The estimated amount of capital required is shown in the Attached Table 3-2.

(4) Expected Effects of the Plan

1) Saving of Foreign Exchange

A saving of in foreign exchange of cannot expected to result form the production output of the present plan (with an annual production assumption; 120 tons).

	Foreign Currency Required at Implementation of Plan (yen per kg)	Amount of Foreign Exchange Required at Present (yen per kg)
Cost of Products	-	1,980
Raw Material Costs	830	-
Freight & Insurance	65	150
Sub-total	895	2,130
Working Equipment Costs	1,279	-
TOTAL	2,174	2,130

Note: The working equipment costs are only for the additional costs incurred by this plan. For details of the above items refer to the Attached Table 3-3.

However, the scheduled production output of the plan is based on the present required quantity of HIC, and in the future an increase in production or of demand from other public corporations could be expected to result in a saving of foreign exchange. The relation of the saving of foreign exchange to each kg of production output is as follows:

Production Output (tons per year)	Required Foreign Capital (yen per kg)	Saving in Foreign Capital (yen per kg)
120	2,174	-44
130	2,076	54
140	1,991	139
150	1,918	212

2) Production Costs

As shown in the Attached Table 3-3 production costs for one kg is 2,971 yen (not including the mark-up or excise tax). For imported goods the price is 2,478 yen per kg (on arrival at the shop). Therefore, with the scheduled production output of this plan an increase in domestic prices will result. However, if an annual production level of 160 tons is reached then domestic production is

advantageous. As already stated, if this level of production is anticipated to be necessary in the near future due to the increase in production of HIC products and demand from other public corporations then the implementation of the present plan will be desirable.

Production Output (tons per year)	Variable Cost (yen/kg)	Fixed Cost (yen/kg)	Total (yen/kg)
120	1,041	1,930	2,971
160	1,041	1,448	2,489
200	1,041	1,158	2,119

Attached Table 1-1

REQUIREMENT FOR ENAMELED WIRE AND COVERAGE OF H/E

Wire Diameter, mm	User of Wire	Specification of Coating			Requirement kg
		E	W	PVF	
2.60	H H M				700
2.10	Generator				300
1.80	H H M				4,000
1.70	Trans			○	15,600
1.50	Generator			○	3,500
1.40	Trans			○	2,000
1.30	"			○	15,000
1.10	"				6,000
1.00	F a n				2,900
0.95	H/L Balast			○	2,000
0.90	"			○	1,500
0.85	F a n				1,100
0.80	Fan & Trans			○	9,700
0.75	F a n			○	4,950
0.70	"			○	4,200
0.60	"			○	5,000
0.55	"			○	2,200
0.40	H/L Balast		○	○	15,000
0.35	F a n			○	50
0.30	Dynamo lamp				500
0.29	H/L Balast		○	○	3,500
0.26	F a n			○	—
0.23	"			○	200
0.20	"			○	8,090
0.18	"			○	200
0.16	"			○	500
0.14	M o t o r			○	—
0.12	H H M				9,400
0.10	H/L Balast			○	660
0.08	H H M			○	1,150
Total					119,900

Wire Drawing H/C	Enameling Oven	Remarks
Supplied from No. 6 DI (5,000kg)		Total Requirement 119.9 ton/year Major H/E
13 Dies H.D.H/C	Vertical Furnace A, B, C and D (four chambers)	wire Drwg. H/C 3sets Enam'g Oven 2sets •inclusive of one horizontal H/C
19 Dies H.D.H/C (26,250kg)		0.16mm ~ 2.6mm (118.8T/year)
30 Dies H.C.H/C (8,990kg)	Horizontal Furnace (Y chamber)	
Not Planned (11,210kg)	Not planned	11,210 kg or 9.35% of the total requirement
19,900kg		

Attached Table 3-1 LIST OF REQUIRED FACILITIES

#: 5-3 Enameled Copper Wire Production
- No.5 HI: N.A. -

No	Items	Unit	No.
1	Bldg & Land		
A	Land		
B	Bldg		
2	Imported M/E		
1	M/C for enemel coated wire production		
1 1	M/C for vertical furnace	Set	1
1 2	Material for testing for 1 1	Set	1
1 3	M/C for horizontal furnace	Set	1
1 4	Material for testing for 1 3	Lot	1

Attached Table 3-2: REQUIRED INVESTMENT (#5-3)

(Unit: million yen)

Items	Investment		
	Foreign	Local	Total
1 Bldg & Land			
A Land	-	0.0	0.0
B 1 Building	0.0	0.0	0.0
2 Freight & Insurance	0.0	-	0.0
Sub-total	0.0	0.0	0.0
3 Import Duty	-	0.0	0.0
4 Unloading	-	0.0	0.0
Building Total	0.0	0.0	0.0
Bldg & Land Total	0.0	0.0	0.0
2 1 Imported M/E (FOB)	1548.5	-	1548.5
2 Freight & Insurance	120.8	-	120.8
Sub-total	1669.3	-	1669.3
3 Import Duty	-	250.4	250.4
4 Unloading	-	21.7	21.7
5 Installation Cost	-	112.8	112.8
Imported M/E Total	1669.3	384.9	2054.2
3 Local M/E	-	0.0	0.0
4 Other Costs			
A License Fee	0.0	-	0.0
B Eng Fee	64.8	-	64.8
C Software	0.0	-	0.0
D Interest	0.0	-	0.0
Other Costs Total	64.8	-	64.8
Total Investment	1734.1	384.9	2119.0

Attached Table 3-3: PRODUCTION COST STATEMENT (#5-3)

Items	Annual Cost (million Yen)			Compo- nent
	F/C	L/C	Total	(%)
1 CP/RM				
A Imported CP/RM (FOB)	99.6	-	99.6	28
Freight & Insurance	7.8	-	7.8	2
Import Duty	-	16.1	16.1	5
Unloading	-	1.4	1.4	0
Sub-total	107.4	17.5	124.9	35
B Local CP/RM	-	0.0	0.0	0
CP/RM Total	107.4	17.5	124.9	35
2 Utilities	0.0	0.0	0.0	0
Variable Cost	107.4	17.5	124.9	35
3 Depreciation	100.2	23.1	123.3	35
4 Amortization	0.0	-	0.0	0
5 Maintenance	50.1	11.5	61.6	17
6 Design Fee	3.2	-	3.2	1
7 Labor	-	0.0	0.0	0
8 Overhead	-	38.5	38.5	11
9 Admin. Cost	-	5.0	5.0	1
Fixed Cost	153.5	78.1	231.6	65
Annual Cost	260.9	95.6	356.5	100
Unit P. Cost			2970.8	
10 Mark-up			0.0	
11 Excise Tax			0.0	
Ex-fact. Cost			2970.8	

#5-4 Local Production of Manganese Dioxide

Outline of Objectives and Planning

The manganese dioxide used as the depolariser for the dry cell batteries produced by HIC is currently imported.

Since Burma produces manganese domestically HIC has expressed the intention of locally producing the manganese dioxide required for dry cell battery production. In this connection HIC requested the survey group to perform an analysis of two samples of manganese dioxide domestically produced. The survey group carried out a series of analysis tests. Results of the examination are shown in the Attached Tables 1-1 and 1-2.

These test results are insufficient to permit evaluation of the possibility of the present plan. It is therefore necessary to carry out the plan survey outlined below.

- a) Samples from each of the manganese dioxide producing mines should be analysed in a sufficient quantity.
- b) Confirmation should be made of technical conditions such as the quantity of ore reserves of each mine and ore quality.
- c) Implementation of the local sites to be carried out by specialists from the industrialized countries.

Attached Table 1-1 ANALYSIS OF MANGANESE DIOXIDE IN BURMA

1. Sample

MTB1 TAGAUNG TAUNG

MKB1 KYAUK PADAUNG

2. Result of Chemical Analysis

	<u>MTB1</u>	<u>MKB1</u>
Manganese Dioxide (%)	57.3	92.9
Manganese (%)	41.8	59.1
Water (%)	1.10	0.65
Insoluble in HCL (%)	22.5	2.86
Iron (%)	1.74	0.22
Copper (%)	0.24	0.079
Nickel (%)	0.022	0.0019
PH	3.9	6.2

3. Result of Qualitative Analysis

Refers to Attached Table 2

4. Crystalline Structure of Manganese

Detected Materials and its Strength

	<u>MTB1</u>	<u>MKB1</u>
KMnO_4 18	SSS	— S Stands for 'Strong'
Mn_2O_3 3	S	— W Stands for 'Weak'
δ -MnO 2	W	—
β -MnO 2	—	SSS
MnO 2 (Ramsdellite)	—	S
α -SiO 2	SS	—

5. Comments:

- (1) As far as MKB1 is concerned it is very interesting that the percentage of manganese dioxide is 92.9% even though β -MnO₂ is main component.
- (2) On the condition that these samples are not selected intentionally, there will be possibility to use the manganese for dry cell battery production.
- (3) Taking such high figures into consideration, it is possible that the manganese has been processed beforehand in some way.

Attached Table 1-2 RESULT OF QUANTITATIVE ANALYSIS

Equipments: = X-Ray Fluorescence Analyser 3080E Scanning = Excitation Source X-Ray Tube RH Voltage/Current 50KV/50MA		MTB1 Tagaung Taung	HKB1 Kyauk Padaung
	Pb	Tr	—
Analysis Condition: Diaphragm MM 30 Sample Treatment 02 Annex 11 Pressure(Ton) 15	Sn	—	—
	Cd	—	—
	As	Tr	Tr
	Zn	Tr	300
	Cu	550	800
	Ni	600	Tr
01 Cut 02 Alminium Ring 03 Cylinder 04 Liquid 05 Film 06 Filtration 07 Others 11 No 12 Cellulose 13 Stearate 14 Others	Co	Tr	Tr
	Fe	37,000	6,500
	Mn	653,000	1,340,000
	Cr	750	600
	Ti	500	Tr
	Ca	3,000	6,000
	K	12,600	1,200
	Cl	—	—
Remarks: #129B - 31, 32	S	Tr	Tr
	P	400	550
	Si	82,700	5,800
	Al	11,500	1,800
	Hg	Tr	Tr
	Na	Tr	Tr
	F	—	—
	Ba	Tr	500
	Mo	—	Tr
	Y	650	Tr
	Sr	2,300	2,900
	V	Tr	500

