

HOW TO START MANUFACTURING INDUSTRIES

ASSEMBLY OF WHEEL TRACTORS

The offered technology includes all technical assistance for complete assembly and testing of tractors using assembly of delivered components (CKD) and assembly of delivered tractor parts and assembly elements (PKD) as well as the first phase of production of wheel tractors of the above mentioned power.

Tractor components loaded in warehouses are transported to the assembly line where different assemblies and sub-assemblies make parts of the tractor or engine, and the whole tractor is assembled on the main assembly line.

This production process offers the workers many possibilities to acquaint themselves with the tractor both with its construction and the function of its assembly. This forms the basis for further advancement in the production of tractors.

All tractors in this programme have Perkins engines of the latest design with reduced fuel consumption and low air pollution. Engines are adapted to all climatic conditions.

Wheel tractors show good performance with all kinds of attached agricultural implements. The tractor's gearbox has 10 forward and 2 reverse gears. The clutch is of a dual type. A PTO shaft provides 720 r.p.m., at an engine speed of 2250 r.p.m. The steering mechanism is hydrostatic or mechanical. The hydraulic system operates at a pressure of 175 bars.

The tractors can be equipped with various units and accessories depending on the programme accepted.

PROCESS DESCRIPTION

With this technology the assembly of complete tractors and a part production of tractor components is envisaged. Know-how and technical assistance are included.

The processes involved in the assembly and production of tractor components may be roughly divided in the following activities:

- Complete assembly of tractors and engines from delivered SKD and PKD elements,

- Production of tractor components (metal cutting and forming, heat treatment, surface protection of finished components)
- Organization of tractor components production through local co-operation (engaging all available machine capacities in local industries showing interest in co-operation).

With the proposed investment about two hundred various tractor components can be produced in local factories.

The assembly and production of wheel tractors is a one-shift continuous process (with the exception of a few machines which would run in two shifts).

PRODUCTION CAPACITY

The production capacity is 3,000 assembled wheel tractors per year. This calculation is based on 7,5 working hours per day and 275 days per year.

REQUIRED MACHINERY AND EQUIPMENT

I t e m

1. Copying gas cutting machine with photocell
2. Sheet metal shearing machine 2500 x 10 mm
3. Eccentric press 100 t
4. Trimming press 100 t
5. Arc welding sets
6. Metal sawing machine
7. Lathe 1500 x 200
8. Lathe 100 x 150
9. Turret lathe
10. Radial drilling machines - (4 pcs.)
11. Horizontal milling machine
12. Vertical milling machine
13. Column drilling machine
14. Bench type drilling machine
15. Tool grinding machine - universal
16. Heat treatment oven
17. Oil hardening bath
18. Heat treatment salt bath
19. Tempering salt bath
20. Oil and water hardening bath
21. Complete galvanization line
(zinc plating, phosphating, passivating)
22. Cranes 500 kp/5 m
23. Front-operated diesel fork lift truck
24. Storage equipment (racks)
25. Mechanized engine assembly line

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26. Universal lathe 1000/150
27. Engine testing table
28. Bosch pumps testing table
29. Diesel engine automiser testing table
30. Bracket electric hoist 125 kp
31. Bracket electric hoist 250 kp
32. Bracket electric hoist 500 kp
33. Transmission assembly line
34. Transmission test table
35. Rear axle assembly line with rotary carriage
36. Engine preparation line
37. Tractor parts degreasing unit using trichloroethylene vapours
38. High pressure hot water washing machine
39. Main assembly line - mechanized floor conveyor
40. Tractor body painting plant (rinsing, painting, baking of paint)
41. Tractor filling pumps (oil, naphtha, water)
42. Mono-rail crane 1 t
43. Tractor sheet metal parts painting plant (130°/30')
44. Compressor station with air tank
45. Pneumatic installation in the whole factory
46. Pneumatic tools for assembly
47. Various accessories for assembly
48. Several hundred items of special and standard tools and accessories for assembly
49. Work benches 100 x 800 and 1500 x 800 mm (40 pcs)
50. Control tools and accessories
51. Equipment for mechanical and electrical maintenance of machines and units
52. Office furniture
53. Workshop racks, metal and wooden pallets etc.
54. Other equipment intended for normal production

FOB price of machinery and equipment: US \$ 740.000

REQUIRED RAW MATERIALS

I t e m	Quantity
Carburized steel of guaranteed quality	120 tons/year
Carburized steel of non-guaranteed quality	350 tons/year
Low-alloyed steel	150 tons/year
Cast iron GG quality	80 tons/year
Electric cables, various	135 km/year

REQUIRED MANPOWER

Qualification	No.
(a) <u>Operating staff</u>	
Qualified mechanics (tractor assembly shop)	75

Qualified mechanics (tractor parts manufacture shop)	50
Qualified workers (heat treatment and surface protection)	15
Unskilled workers	30
	TOTAL: 170
(b) Administration and management	as necessary

REQUIRED UTILITIES

Electric power	350 kWh per tractor
Naphta	28 l per tractor
Technological water	18 t per tractor

REQUIRED AREA FOR PLANT SITE

A total area of 30,000 m² is needed, including 4,000 m² for the plant, warehouses and auxilliary accommodation.



TRACTOR MODELS