

Course No. : SEC-FMPE-122	Credit Hrs. : 4(0+4)
Course Title : Repair and Maintenance of Tractor and Power Tillers	

Objective : (i) To enable the students to acquire the practical knowledge and skill to repair and maintain tractor and power tiller for different farm operations,

(ii) To make aware of the importance of repair and maintenance of tractors and power tillers for efficient and economic farm operations.

TEACHING SCHEDULE

PRACTICAL

Exercise No.	Exercise Title
1-4	Study of different systems of tractor and power tiller
5-8	Study of different components of engine: piston, cylinder, rings, fly wheel, firing interval and firing order
9-12	Study of fuel system: Working principle, repair and maintenance. Study of Working of fuel pumps, fuel filters and injectors
13-16	Study of lubrication system: Working principle of lubrication system and repair and maintenance. Study of Working of oil filters, oil pumps etc.
17-20	Study of cooling system: Working principle of cooling system and repair and maintenance. Study of Working of thermostat valve
21-22	Study of tractor/ power tiller engine system
23-24	Study of power transmission system of tractor/ power tiller (different types of clutches/gears/ sliding mesh gear box/ constant mesh gear box/ planetary gear box etc. in tractor; power transmission in power tiller)
25-26	Study of differential, final drive, PTO drive, their working principle/ repair and maintenance
27-30	Study of braking system: Different types of brakes, their components and working principle, adjustment and repair maintenance
31-34	Study of steering system: Types of steering system, steering geometry: caster angle, camber angle, toe-in, toe-out etc. Study of working principle of steering system, adjustments, repair and maintenance
35-37	Steering in power tiller: Dog clutch and other arrangements

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38-40	Study of hydraulic system of tractor and their working principle and repair and maintenance
41-44	Study of hitching system, their working principle, practical on hitching, repair and maintenance
45-48	Automatic draft and position control, working principle on draft and position control. Practical on draft and position control, repair and maintenance
49-52	Study of tyres, rims, their construction and specification, repair and maintenance
53-56	Daily, weekly and monthly maintenance schedule. Maintenance after each 50, 125, 250 and 500 hours of operation: Visit to local workshops
57-58	Engine overhauling and assembling: Visit to Local Workshops
59-60	Study of implement hitching and detaching from tractor as well as power tillers
61-64	Safety rules and precautions to be taken during operation of tractor and power tiller

Suggested Readings: [SEC-FMPE-122]

1. Farm Tractor, Power Tiller Maintenance & Repair by S.C. Jain & C.R. Rai, Standard Publications Destructors- Delhi
2. Farm Machinery – An Approach by S.C. Jain and Grace Philip, Standard Publishers, Nai Sarak, Delhi
3. Elements of Agricultural Engineering by Dr. Jagdishwar Sahay, Standard Publishers Distributors, 2006
4. Farm Machinery Equipment by C.P. Nakara, Dhanpat Rai and Sons, Nai Sarak, Delhi
5. Tractor and their power units (Fourth Edition) by John B. Liljedahl, Paul K. Turnquist, David W. Smith & Makoto Hoki, CBS Publishers New Delhi
6. Indian Standard Code IS: 6840-1972- Code of Practice for Preventive Maintenance of Agricultural Wheeled Tractor.
7. Indian Standard Code IS: 13084-1991(reaffirmed 2000): Power Tillers - Installation and Preventive Maintenance - Guidelines.
8. Indian Standard Code IS :8132 1999(reaffirmed 2004): Tractors and Machinery for Agriculture and FORESTRY, powered lawn and garden equipment -, Operator's Manuals - Content and Presentation (Second revision).
9. Indian Standard Code IS :9939 -1981 (reaffirmed 2000): Glossary of Terms relating to Agricultural Tractors and Power Tillers.
10. Using tractors safely: A step-by-step guide, www.hse.gov.uk/pubns/indg185.htm