SYLLABUS

For the Trade of

MECHANIC REPAIR & MAINTENANCE OF TWO WHEELER.

UNDER CTS

2005

Designed by

Government of India
Ministry of Labour & Employment (DGE&T)
Central Staff Training And Research Institute
EN Block, Sector –v Salt Lake City
Kolkata - 700091

LIST OF MEMBERS ATTENDED TRADE COMMITTEE MEETING

Sl. No.	Name	Office	
1	Sri M.S. Lingaiah, Director	CSTARI, Salt Lake, Kol.	**Chairman**
2	Sri P. K. Roy, Sr. Envr. Engineer	W.B.Pollution Control Board	Member
3	Sri T.S. Ramanathan, Dy. Manager (HRD)	CSC Ltd. Kolkata	Member
4	Kashi Nath Karmakar, Sr. Faculty Automobile Engineering	G.T.T.I. Sealdah Branch	Member
5	Maj.(Retd.) D.K.Ghosh, G.M.	Dewar's Garage Kolkata	Member
6	Mr. Debabrata Halder, Works Manager	Rolta Motor (Bajaj Auto) Kolkata	Member
7	Sri R. Senthil Kumar, JDT	CSTARS, Salt Lake, Kol.	Member
8	Sri T. Mukhopadhyay, DDT	CSTARS, Salt Lake, Kol.	Member
9	Sri A. Chakraborty, ADT	-DO-	Member
10	Sri P.K. Koley, T.O.	-DO-	Member
11	Sri A.B. Dhara. T.O.	-DO-	Member
12	Sri S.B. Sarder, T.O.	-DO-	Member

GENERAL INFORMATION

1. Name of the Trade	:	Mechanic Repair & Maintenance of Two Wheelers
2. N.C.O. Code No.	:	
3. Duration	:	6 months
4. Entry Qualification	:	Passed Class 10^{th} Exam. Under 10+2 System of Education or its equivalent.
5. Workshop Space	:	875 Sq. ft (35´ x 25´)

****

Week wise Break-up Curriculum

Name of the CTS course: Mechanic Repair & Maintenance of Two Wheeler
Duration: 6 Month

Week No	Related Theory	Practical	Engineering Drawing	Workshop Cal. & Science
1	Introduction to Central Motor Vehicles Acts & Rules			
	General introduction to the course, duration of the course & course content .Importance of safety and general precaution observed in the section. Fire extinguishers used for different type of fire .Storing &handling of inflammables materials .Elementary First Aid	Familiarization with the Institute. Importance of trade training. Introduction to machinery used in the trade-type of jobs done by the trainees in the trade. Introduction to safety equipments and their uses etc.		
2.	INTRODUCTION Identify the parts & General servicing of Two Wheeler, washing, cleaning, oiling, greasing and lubricating.	General description of Two-wheeler. Location, function and purpose of two-stroke engine. Type of frame of Two-wheeler.	Introduction to Engineering Drawing and Blue Print reading. Free hand sketching of straight lines, rectangles, square and circles.	Common fractions. Additions, substation, multiplication and Divisions. Applied workshop problems involving fractions and vulgar fractions.
3 & 4	SUSPENSION WORK Servicing of suspension changing bush, checking shock absorbers. Cleaning & Checking shock absorbers. Cleaning & checking the wheel bearings and greasing.	Description, location, suspension-mounted part of Two wheeler type of suspension fork acting provided in shock absorber.	Free hand sketching of nuts & bolts-studs with dimension from samples.	Properties of ferrous & non-ferrous metals and their uses.

			Free hand sketching of solids and hollow bodies such as square, cylinder, rings and cones.	Brief description of manufacturing process of steel, copper & aluminum.
5 & 6	BREAK WORK Adjusting brake pedal play, servicing the brake system, cleaning, checking, greasing and assembling. Inspecting the shoes and wheel drums, changing of brake lining. Repairing and maintenance of hydraulic disc brake used in Motorcycles.	Arrangement of brakes in Two-wheeler mechanical breaks provided in Two-wheeler.	Explanation of simple orthographic projection Fist angle	Metric system, metric weight and measurement units used conversion from FPS to Metric system & vice versa.
7 & 8	TRANSMISSION Adjusting clutch lever free play, removing clutch assembly from Two-wheeler, cleaning and inspecting parts. Replacing defective parts. Fitting clutch assembly. Repair work of Automatic clutch and automatic transmission used in motor brakes.	Description of clutch and its type, function construction and arrangement of the clutch disc. Type of gearbox construction common troubles.	Explanation of simple orthographic projection in 3rd angle Views of simple hollow & solid bodies with dimensions .	Exercises involving Metric & FPS Shop problems in metric systems Meaning of tenacity, elasticity, brittle mess, compressibility & ductility-examples of each.
9 & 10	Checking, adjusting and replacing defective parts (chain, sprocket, shafts) in power transmission from engine to driving wheel.	Different types of power transmission systems used in two-wheeler.	Isometric drawings of simple objects such as square, and rectangular blocks with grooves-key ways. Isometric drawings of simple objects such as square, and rectangular blocks with grooves-key	Effect of alloying elements and properties of cast iron and steel alloys. Shop problems on force, work done, energy & power.

			ways.	
11 & 12	ENGINE WORK Dismantling the unserviceable engine, cleaning and inspecting the parts, checking engine bore piston rings, connecting rod, bearings, crankshaft, assembling all the parts and measures the gaps. Engine Timing setting and Valve Timing setting of 4 -S Engine.	Description of two-stroke engine. Important working parts in the engine. Description of valve less engine and its merits and demerits. Study about LPG kit used in Motorcycle and Three Wheelers.	Free hand sketch of clutch Assembly used in two wheeler	Applied problems on work, energy and power .
13 & 14	Dismantling a four-stroke engine of two-wheeler cleaning, inspecting and assembling parts.	Four stroke engines, advantages of four-stroke engine. - Reed value	Free hand sketch of different types of valves & pistons used in two wheelers.	Calculation of areas of square, rectangle, triangle, circles and regular polygon
15 & 16	Dismantling the air cleaner, cleaning, inspecting, cleaning fuel tank, servicing carburetor, rectifying causes for engine not starting, high fuel consumption	Description of carburetor, fuel system type and location, Fuel tank – LPG & C.N.G. .	Freehand sketching of different types of valves & pistons	Calculation of volume of square, rectangular & conical blocks, volume of cylinders (solid & hollow)
17 & 18	Starting engine, tuning for slow speed, checking smoke and setting for exhaust gas emission measurement as per norms. Used by Tachometer.	Types of fuels exhaust gas pollution control-emission standard.	Free hand sketch of 2 _& 4 stroke cycles	- Do -
19 & 20	IGNITION SYSTEM Dismantling the C.B. point cleaning electronic Ignition system & inspecting and replacing the pitted points. Making wiring harness and check different Electrical circuits used in Two-wheelers.	Principal of electronic ignition, advantage of electronic ignition.	Free hand sketch of electrical symbols and different electrical circuits of 2 wheeler	Heat and Temperature, Thermometers-centrigrade & Fahrenheit scale, their conversion. Use of temperature measuring instruments-their description & uses.

21 & 22	STEERING WORK Inspect and adjust rake of front fork, dismantle trailing link ,adjust heavy duty thrust races.	Description of different types of steering handle ,fork mounted over races.	Free hand sketch of assembly of2 wheelers.	Electricity and its effects, static and dynamic electricity-AC & DC differences. Magnets-natural & artificial types-poles of magnets-magnetic fields. Defination of ampere, volt & ohm-units of ampere, volt, ohm. Ohm's Law.
23& 24	ELECTRICAL ACCESSORIES REPAIR Tracing the A.C /D.C electrical circuit in a two wheeler, checking horn, head light, indicator and replacing if necessary.	Description of light circuits and function of each circuit. Description electronic apparatus/ Battery charging system.	Free hand sketch of combustion chambers of different types	Calculations based on Ohm's Law. Lubricants types Viscosity and effects of temperature on viscocity.High detergent oil and its applications Gears and belt drives, problems on gear and belt drive.
25& 26	Revision & Test			

Achievement –At the end of the Course the trainee shall be able to

(1) Service a two wheeler
(2) Dismantle, inspect and assemble different units on a Two Wheeler
(3) Trace out different troubles in a Two Wheeler and rectify them.
Set exhaust smoke as per norms.

****

LIST OF TOOLS AND EQUIPMENT FOR A BATCH OF 16 TRAINEES

SL. NO.	DESCRIPTION	QUANTITY
1	D.E. Spanner (6 to 32 mm)	2 sets
2	Ring Spanner (6 to 32 mm)	2 sets
3	Piler combination 200 mm 250 mm	4 each
4	Circlip pliers (internal and external 150 mm	4 nos.
5	Round nose pliers 150 mm	2 nos.
6	Long nose pliers 150 mm, 200 mm	4 each
7	Screw driver (II/d) 300 mm	2 each
8	Screw driver light duty 150 mm, 200 mm, 250 mm.	2 each
9	Star screw driver set	2 sets
10	F/tank puller	2 nos.
11	Monkey wrench 300 mm	2 nos.
12	Bench vice 300 mm	2 nos.
13	Socket wrench (long)	2 sets
14	Socket wrench (box)	2 nos.
15	Plug wrench	2 sets
16	Grease gun	2 sets
17	Allen key set	2 sets
18	Magneto puller cot	2 sets
19	Hacksaw frame	2 nos.
20	Hammer (big 7 small)	2 each
21	Plastic hammer	2 nos.
22	Oil can	2 nos.
23	File flat, round (Rough & smooth) 250mm, 300 mm	2 each
24	Engine mounting puller	2 nos.
25	Clutch puller	2 nos.
26	Shock absorber puller	2 nos.
27	Chisel	2 nos.
28	Punch	2 nos.
29	Snip	2 nos.
30	Piston ring compressor and expander	1 each
31	Piston ring puller	2 nos.
32	Adjustable wrench 300 mm	2 nos.
33	Pipe wrench 200 mm	2 nos.
34	Tyre lever	2 sets.
35	Feeler gauge (25 blades)	2 nos.
36	Caliper (150 mm inside / outside)	2 nos.
37	Steel rule 300 mm	6 nos.
38	Vernier caliper 200 mm	2 nos.
39	Hydrometer	2 nos.
40	Scooter / Motor cycle repairing stand	1 no.
41	Spark plug testing & cleaning machine	1 no.
42	Gas Analyzer with temperature & speed sensor	1 no.

43	Scooter (two stroke engine)	1 no.
44	Scooter (four stroke engine)	1 no.
45	Motor cycle (two stroke engine)	1 no.
46	Motor cycle (four stroke engine)	1 no.
47	Ridge cutter	1 no.
48	Bearing puller general	4 nos.
49	Two wheeler lifting stand	1 set
50	Fire extinguisher	2 nos.
51	Fire buckets with stand	2 no.
52	Stroscoping Timing light	1 no.
53	Tachometer	1no.
54	Battery charger (Multiampere)	1 no.

SOCIAL STUDIES:

The syllabus has already been approved and is common for all trades.