BAJAJ
MOTORCYCLES

Training Notes

BM 150 | BM 150X

The Training Notes are a comprehensive training guide on service and maintenance operations and procedures to be followed by service personnel at authorised service centres and dealerships whilst attending to the Bajaj Boxer BM 150 & BM 150X.

The Training Note covers standard workshop procedures, simplified for easy learning and understanding for service technicians worldwide.

NOTICE

All information contained in this Training Note is based on the latest product information at the time of publication. Bajaj Auto Limited accepts no liability for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible. All procedures and specifications subject to change without prior notice. The right is reserved to make such changes at any time without prior notice.

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Contents

Key Learning Points

- Understanding the complete anatomy of Vehicle
- Technical Specifications and Performance Parameter
- Briefing and Educating the customer on Appropriate Riding and usage Discipline and Routing Maintenance

CHAPTER 1
I Read ..... I Learn

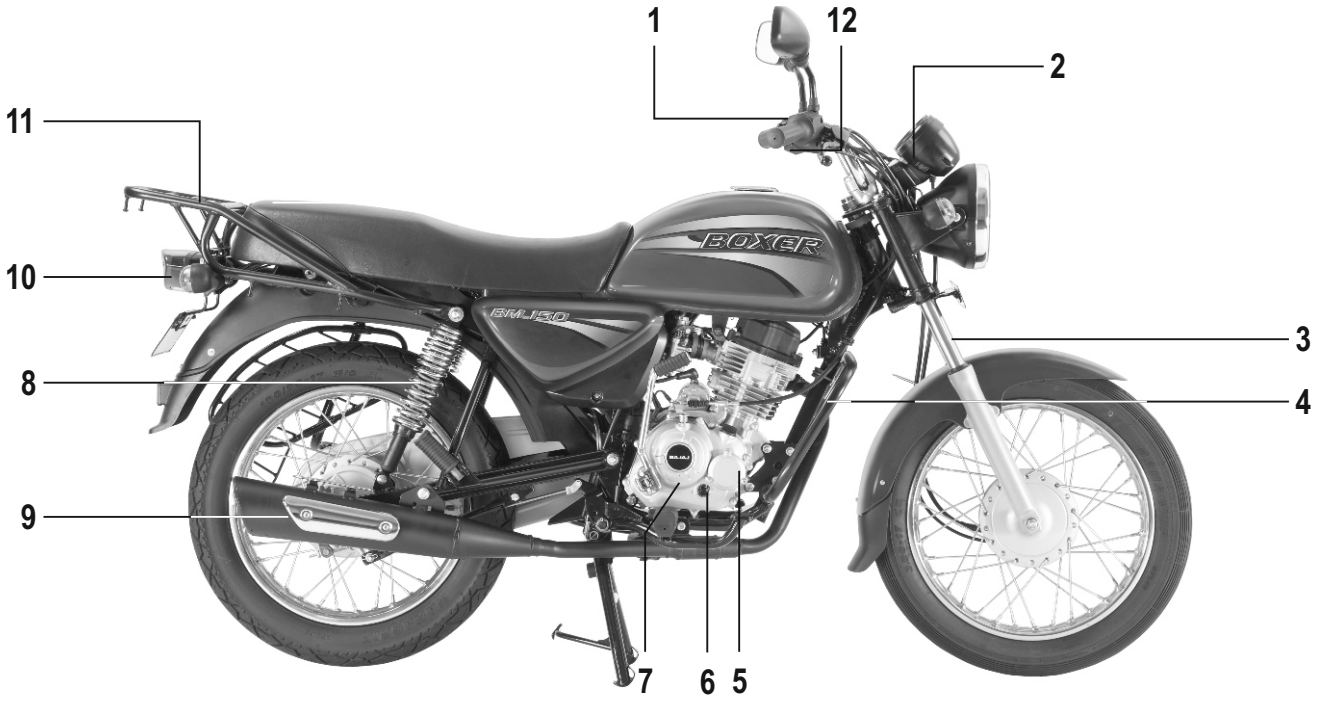
Identification

The Frame and Engine serial numbers are used to register the motorcycle. They are the unique alpha-numeric codes to identify your particular vehicle from others of the same model and type.

Frame Number Location
On LH Side of Steering Tube
(Alpha-Numeric - 17 Digits)

Engine Number Location
On LH Side Crankcase Near Gear Change Lever
(Alpha-Numeric - 11 Digits)

1. RH Control Switch
2. Speedo Console
3. Front Fork
4. Single Down Tube Frame
5. Paper Oil Filter
6. Engine Oil Level Window
7. 4 Speed Transmission
8. Spring-N-Spring Rear Suspension
9. Silencer
10. Tail Lamp
11. Grip Frame
12. LH Control Switch



Salient Features

Performance

Features	Advantage	Benefits
• Engine 144.8 cc • Engine Power: 8.83 kW at 7500 RPM • Engine torque: 12.26 Nm at 5000 RPM	• New generation technology engineered for best mileage and performance as well.	• Better combination of mileage & power.
• Positive crankcase ventilation	• Prevents venting of hazardous engine oil fumes.	• Prevents dust entry inside the engine.
• Paper type oil filtration system.	• Paper type oil filtration system filters out micro level dirt/dust particles from engine oil.	• Increased the life of engine components.
• ExhausTEC.	• Improves engine torque at low rpms and is optimized to get maximum performance from engine.	• No frequent gear change needed.
• Digital CDI • Throttle position sensor (TPS)	• Optimized ignition timing for better throttle response at various engine rpms.	• Refined engine that gives best performance combination of mileage and power.

Salient Features

Safety

Features	Advantage	Benefits
• Powerful 12V 35/35W round headlight.	• Wide spread bright illumination of head light.	• Safe night driving.
• Robust tubular semi double cradle type.	• Excellent ride, handling and stability.	• Safe to drive on any road condition.
• Bigger brake drum Front and Rear 130 mm diameter.	• Larger contact area between brake drum & brake shoes enhances braking efficiency.	• Effective braking.

Salient Features

Style

Features	Advantage	Benefits
• Unique shaped petrol tank with radiant decals. • Round headlight. • Twin pod instrument cluster. • Crome plated front fender. • Silver coloured engine. • Long & wide seat. • Sturdy grab rail.	• Stylish and eye catching looks.	• Robust & unmatchable bike in its class.

Salient Features

Comfort and Convenience

Features	Advantage	Benefits
• Large display fuel meter.	• Ease in understanding about the fuel quantity that is available inside the petrol tank.	• Easy to read fuel level, even in vehicle running condition.
• Long & wide seat.	• High density foam, long/wide seat and optimized saddle position gives a very ergonomic seating posture which aids riding comfort.	• Comfortable & pleasant journey for all.
• Rear : SNS type rear adjustable hydraulic shock absorber. • Front : Ceriani type telescopic front suspension.	• Worlds 1st SNS suspension with longest travel in its class supported with Ceriani type telescopic front suspension.	• Very absorptive and supple suspension for an enhanced riding experience.
• MF battery.	• Low maintenance and no spillage of electrolyte.	• No frequent topping up.

Technical Specifications

Engine & Transmission

Type		:	Four stroke, Natural air cooled, SI Engine
No. of cylinders		:	One
Bore		:	56.00 mm
Stroke		:	58.08 mm
Engine displacement		:	144.8 cc
Compression ratio		:	9.5 ± 0.5 : 1
Idling Speed		:	1400 ± 50 rpm in warm condition
Max. net power		:	8.83 kw @ 7500 rpm
Max. net torque		:	12.26 Nm @ 5000 rpm
Ignition System		:	AC
Ignition Timing		:	Variable as per maps in CDI
Fuel		:	Unleaded Petrol, 87 RON Minimum
Carburettor		:	UCAL UVD20
Spark Plug		:	Champion PRZ9HC & BOSCH UR4AC
Spark Plug Gap		:	0.7 to 0.8 mm
Lubrication		:	Positive Displacement
Starting		:	Kick & Electric Start
Clutch		:	Wet, Multi Disc Type
Transmission		:	4 Speed Constant Mesh
Primary reduction		:	3.571 : 1 (75/21)
Gear Ratios	1st Gear	:	2.833 : 1 (34/12)
	2nd Gear	:	1.733 : 1 (26/15)
	3rd Gear	:	1.227 : 1 (27/22)
	4th Gear	:	0.958 : 1 (23/24)
Final Drive Ratio		:	3.071 : 1 (43/14)

Chassis & Body

Frame Type		:	Tubular
Suspension	Front	:	125 mm Fork travel, Telescopic
	Rear	:	100 mm Rear Wheel travel, SNS
Brakes	Front	:	Mechanically expanding shoe type
	Rear		Mechanically expanding shoe type
Brake Size	Front	:	130 mm Drum brake
	Rear	:	130 mm Drum brake
Tyres	Front	:	3.00 x 17, 45 P
	Rear	:	100/90 x 17, 55 P
Tyre Pressure	Front	:	1.75 Kg / Cm^2 (25.0 PSI)
	Rear (Solo)	:	2.00 Kg / Cm^2 (28.0 PSI)
	Rear (with Pillion)	:	2.25 Kg / Cm^2 (32.0 PSI)
Rims	Front	:	1.6" x 17" Spoke Wheel
	Rear	:	2.15 x 17" Spoke Wheel
Fuel Tank Capacity		:	11.0 Liters
Usable Reserve		:	2.5 Liters
Unusable Reserve		:	1.0 Liter

Technical Specifications

Controls

Steering		:	Handlebar
Accelerator		:	On handle bar, RH grip
Gears		:	Left foot pedal operated, Step shift
Brakes	Front	:	Lever operated, RH hand.
	Rear	:	Pedal operated by RH foot

Electricals

System	:	12 V (AC / DC)
Battery	:	12V 5Ah MF
Head Lamp	:	12 V 35/35 W, HS-1, without pilot lamp
Tail / Stop Lamp	:	12V, 5/21W
Side Indicator Lamp	:	12V, 10 W (4 Nos. - Clear Bulbs)
Speedometer Lamp	:	12V 2W
Neutral Indicator	:	12V, 2W
Turn Signal Indicator	:	12V, 2W
Hi-beam Indicator	:	12V, 2W
Fuel Meter Lamp	:	12V, 2W
Horn	:	12 V DC, 70 mm dia.

Dimensions

Length	:	2016 mm
Width	:	740 mm
Height	:	1055 mm
Wheel Base	:	1285 mm
Saddle Height	:	808 mm
Ground Clearance	:	190 mm

Weights

Vehicle Kerb Weight	:	123 kg
Gross Vehicle Weight	:	253 kg

Performance

Maximum speed	:	100 km/h (with single rider 68 Kg)
Climbing ability	:	25% (14^0 max)

Notes :

- Values given above are nominal & for guidance only, 15% variation is allowed to cater for production & measurement.
- All dimensions are under un-laden conditions.
- Definitions of terminologies wherever applicable are as per Relevant IS/ISO standards.
- Specifications are subject to change without notice.

Periodic Maintenance & Lubrication Chart

Sr No	PM Check Point	Recommended Frequency								Remark
		Service	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	500 ~ 750	4500 ~ 5000	9500 ~ 10000	14500 ~ 15000	19500 ~ 20000	24500 ~ 25000	29500 ~ 30000	
1	Servicing with water wash		✔	✔	✔	✔	✔	✔	✔	Ensure to prevent water entry in Petrol tank, Silencer & electrical parts. Use caustic free detergent for washing.
2	Engine oil (Bajaj DTSi 10000 oil) & engine oil filter*	C,R	R	Top Up	R	Top Up	R	Top Up	R	"BGO DTS-i 10W30 for 100cc models. BGO DTS-i 20W50 for models above 125cc. "
3	Oil strainer, Body centrifugal filter**	CL	CL		CL		CL		CL	Oil Strainer Cleaning at the time of oil Change. Clean body centrifugal flter at 750 Km & at 20K-Platina & Pulsar
4	Starter Clutch (Dry Type)**	L		L	L	L	L	L	L	Use recommended molycote grease
5	Spark plug	CL,A,R			CL,A		CL,A		R	
6	Air Cleaner Element *** & Cover "O" Ring	CL,R	CL	CL	CL	R	CL	CL	R	
7	In line paper filter or Fuel cock paper filter	R				R			R	
8	Fuel cock sediment bowl cleaning	CL				CL			CL	
9	Carburetor rubber duct	C,R					C,R			Check & replace if required
10	Fuel pipe	C,R	C	C	C	R	C	C	R	
11	Valve tappet clearance	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
12	Non-Sealed drive chain cleaning & lubrication	CL,L,A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	• **During 1st free service :** Use lint free cloth for cleaning & SAE 90 oil for lubrication without removing from vehicle. (If chain is excessiively dirty, then chain has to to be removed, cleaned using diesel & lubricated using molten IOC servo compound chain grease.) • **During all other services:** Remove, clean using diesel & lubricated using molten IOC servo compund chain grease.
13	Sealed drive chain cleaning & lubrication	CL,L,A		CL,L, A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	CL,L, A	• During regular service use OKS spray for chain cleaning, without removing chain from vehicle. • If chain is excessiively dirty, then chain has to be cleaned by removing from vehicle. (Customer to apply OKS chain lube spray at every 500 Kms)
14	Engine air breather tube	C	C	C	C	C	C	C	C	Replace if damaged
15	Silencer drain hole cleaning	CL		CL	CL	CL	CL	CL	CL	
16	Silencer tail pipe cleaning **	CL		CL	CL	CL	CL	CL	CL	
17	Brake lining or pad wear & lubricate brake cam & pivot pin** Check pad wear indicator	C,L,R	C	C,L,R	C,L,R	C,L,R	C,L,R	C,L,R	C,L,R	Replace brake shoe/pads at every 15,000 kms

Periodic Maintenance & Lubrication Chart

Sr No	PM Check Point	Recommended Frequency								Remark
		Service	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	500	4500	9500	14500	19500	24500	29500	
			~	~	~	~	~	~	~	
			750	5000	10000	15000	20000	25000	30000	
18	Brake fluid level ** - top up / replace	C,A,R				C,A			R	Use recommended brake fluid (DOT3 / DOT4)
19	Disc brake assembly--check functionality, leakage or any other damage	C			C		C		C	Replace if damaged
20	All cables & rear brake pedal - free play	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
21	Battery electrolyte level , specific gravity	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	Not applicable for VRLA batteries
22	Wiring harness & battery connection - routing, tie bands & clamps tightness	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	
23	Ignition switch barrel cleaning & handle bar control switches contacts cleaning	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	Use recommended Wd40 spray
24	Steering play	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
25	Steering stem bearing *** & cap steering bearing (Plastic)**	C,CL, L,R			C,CL, L,R		C,CL, L,R		C,CL,L ,R	Check & replace if damaged.Use HP Lithon RR3 grease for lubrication
26	Main stand & side stand pin **	CL,L			CL,L		CL,L		CL,L	Use recommended AP grease
27	Swing arm pivot pin (For non silent bush)**	L		L	L	L	L	L	L	Not applicable in case of needle roller bearing
28	All fasteners tightness	C,T	C,T	C,T	C,T	C,T	C,T	C,T	C,T	
29	Engine foundation silent bushes **	C				C			C	Replace if damaged
30	General lubrication - clutch lever, front brake lever, kick lever	L	L	L	L	L	L	L	L	Use recommended AP grease
31	Idle speed / CO%	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
32	Coolant level in expansion tank**	C,A	C,A	C,A	C,A	C,A	C,A	C,A	R	Use recommended 'Reday to Use coolant'.Replace at every 30000 Kms or 2 years (Whichever occurs earlier)
33	Coolant hose damage / clamps / leakage **	C		C	C	C	C	C	C	Check & replace if required
34	Radiator fins **	C		C	C	C	C	C	C	Check & replace if required
35	Spoke tightening ** - Front & Rear	C,T	C,T	C,T	C,T	C,T	C,T	C,T	C,T	

* It is strongly recommended to use only Bajaj genuine oil, in case of any other engine oil of same specification is used the would be every 5000 kms

** As applicable to model

*** more frequent cleaning is required while driving in dusty environment

C: Check, A: Adjust, CL: Clean, R: Replace, T: Tighten, L: Lubricate

Note :- Periodic parts / lubricants as per periodic maintenance & Lubrication chart are mandatory & the same is chargeable to customer

Key Learning Points

- Understanding of Carburettor
- Understanding the CO Checking Procedure and Tune-up for Optimum Mileage
- Standard Operating Procedure

CHAPTER 2

Fuel System

Carburettor Specifications

CO Checking Procedure

Tune-Up for Optimum Mileage

Standard Operating Procedure

Carburettor Specifications

UCAL

Item	Specification
Make	UCAL
Type	UVD20SS
Idling Speed	1400 + 100 rpm
VC Screw Setting	Adjust VC screw to get CO% - 1.5 to 2.5%
Main Jet	102.5
Jet Needle Mark	U-5HPF1
Needle Jet Marking	O-1M
Jet Needle 'e' Clip Position	Single Groove with 2.5 shim
Pilot Jet	12.5
Throttle Valve Mark	2.5 (W-1.5x0.4)
Float Height	14.4 mm
Choke	Manual Choke
Starter Jet	30

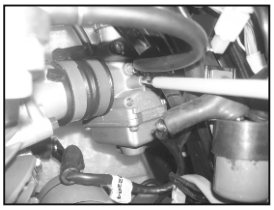
CO Checking & Setting

Readiness of CO Gas Analyser

Warm up the CO Gas Analyzer for 10~15 minutes before proceeding further. Warming up is essential every time machine is put on to purge out any gases left in side.

Carry out Span Check as per manufacturer's Recommendation to confirm the OK condition of the Equipment (If Span Check does not confirm the reading, then carry out Gas Calibration as per mfgrs. recommendation). Set the Equipment display to Zero before taking the reading.

Readiness of the Vehicle



Before checking CO emission, prepare the vehicle for checking the CO.

- Warm up the engine to its normal operating temp. by riding 5~6 Kms. The c'case cover should be warm enough by feel. (Engine Oil Temp. = 600C).

Caution: ***In choke 'ON' condition CO % is high : 9~10%. Hence warming up of engine is a must.***

- Set CO to 1.5 ~ 2.5 %.

Note: If engine does not go off, then attend to the additional air supply problem in the carburetor circuit & intake system. After solving the problem once again confirm that engine should die down on closing the V.C. Screw.

- Set CO to 1.5 ~ 2.5 %.
- Set Idling speed to specified Idling 1400 + 100 rpm. Raise the engine to moderate speed at no load condition for about 15 seconds. Then bring back to specified idling RPM.

Taking the Reading

- Remove M-5 bolt and aluminum washer fitted to the nozzle (12mm OD) shown in figure, of the connecting tube welded to silencer pipe before CAT converter.
- Use a Silicon Rubber tube of approximately 300 mm to fit onto the nozzle. Only a Silicon rubber tube should be used, as it has better high temp. resistance & will not deform / melt due to high temp. at the nozzle.
- Connect the other end of the Silicon Rubber tube to the flexible probe pipe of machine. Ensure that the inner diameter of Silicon tube perfectly matches with outer diameter of flexible probe pipe of Gas Analyzer.
- The Silicon rubber tube must fit snugly onto the nozzle to prevent any air / exhaust gas leakage.
- Note the CO / HC readings when the reading display stabilizes.
- As per Emission Norms the recommended CO% for 2 Wheelers is 3.5% at idling RPM. But CO% for Bajaj Vehicles, for best results in terms of fuel efficiency are different for different models. **The ideal CO% is between 1.5 to 2.5% at idling RPM = 1400 + 100.**
- If the reading is shown excess or less than BAL specifications, try to achieve by adjusting V.C. Screw.
- Turning in V.C. Screw will lead to less CO% and turning out will lead to more CO%.

Note: Remember the V.C. Screw should not be taken out more than the recommended position. Every time V.C. Screw setting is changed specified Idling RPM must be restored and then reading should be considered.

- If the CO% is not falling within recommended % in spite of adjusting the V.C. Screw then find out the cause & rectify. After rectifying the problem confirm the CO% in the same way as mentioned above.

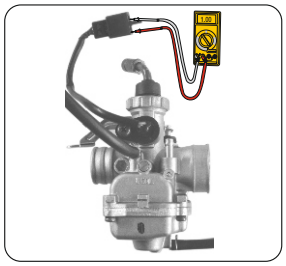
Important: For Better Mileage and Performance, achieve CO% as recommended.

In **Boxer 150** motorcycle for better mileage & performance achieve values given below.

Recommended CO% value w.r.t. V.C. Screw and Idling RPM for Better Fuel Efficiency		
Model	Recommended CO%	Recommended Idling RPM
Boxer 150	1.5% ~ 2.5%	1400 + 100 rpm

Tune Up for Optimum Mileage

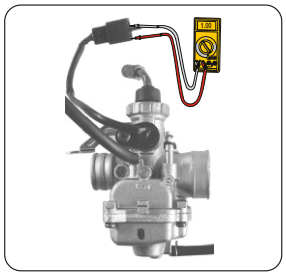
TPS - Hall Sensor : Checking



Continuity check in coupler disconnected condition :

SOP :

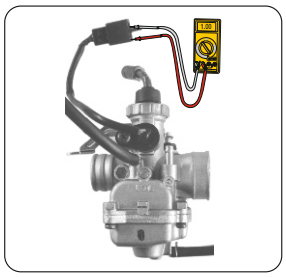
- Disconnect TPS coupler
- Check Continuity between Blue & Black / Yellow wire
- There should **NOT BE** any continuity.



Input supply voltage check :

SOP :

- Connect TPS coupler
- Switch 'ON' ignition key.
- Check voltage between Brown and Black / Yellow wires of TPS Hall Sensor.
- Standard value : 12.5 ± 0.4 volts (Battery voltage).



Voltage check in POT condition:

SOP :

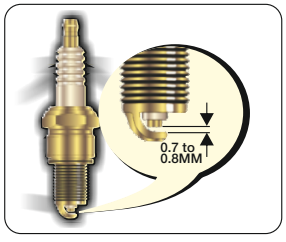
- TPS coupler is in connected condition.
- Ensure engine is running in POT mode.
- Check voltage between Blue & Black / Yellow wire in Partial Open Throttle (POT) condition.
- Standard value : < 1 volt in Partial Open Throttle position.

Voltage check in WOT condition:

SOP :

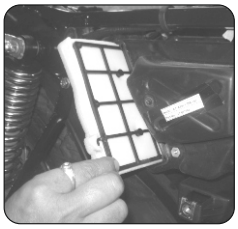
- TPS coupler is in connected condition.
- Ensure engine is running in WOT mode.
- Check voltage between Blue & Black / Yellow wire in Wide Open Throttle (WOT) condition.
- Standard value : 3.0 to 5.0 volts in Wide Open Throttle position.

Engine Tune-up



SPARK PLUG :
BOSCH UR4AC, Champion PRZ9HC

- **Spark Plug Gap : 0.7~0.8 mm.**
- **Replace at Every : 15000 Kms**

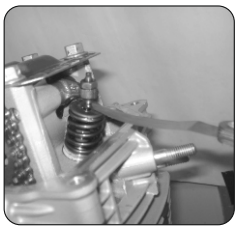


AIR FILTER:

- **Clean at Every : 5000 Kms.**
- **Replace at Every : 15,000 Kms.**

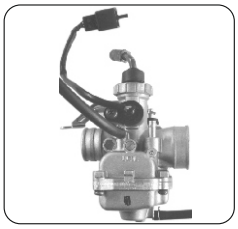
COMPRESSION PRESSURE

- **Standard : 11 to 13 Kg/cm^2**
- **Service Limit : 9.5 Kg/cm^2**



TAPPET CLEARANCE

- **Inlet Valve : 0.05 mm**
- **Exhaust Valve : 0.1 mm**



CARBURATTOR

- **Idling : 1400 ± 100 rpm.**
- **Jet Needle Clip Position : Fixed**
- **CO % : 1.5 ~ 2.5 %.**
- **V.C. Screw Setting : To achieve CO% between 1.5 ~ 2.5**

Other Mandatory Checks

a. Ensure no fuel leakage through fuel cock, fuel lines.

b. Ensure free rotation of both wheels.

c. Ensure correct tyre pressure -
Front wheel : 25 PSI
Rear (Solo) : 28 PSI
Rear (Pillion) : 32 PSI

d. Set control cable free play:
- Clutch lever 2~3 mm.
- Front brake lever 2~3 mm.
- Rear brake pedal 15~20 mm.

e. Chain slackness : 25~30 mm.

f. Check & confirm proper functioning of spark plug.

Key Learning Points

- Understanding of Carburettor
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- Standard Operating Procedure

CHAPTER 3

Engine & Transmission

Carburettor Specifications

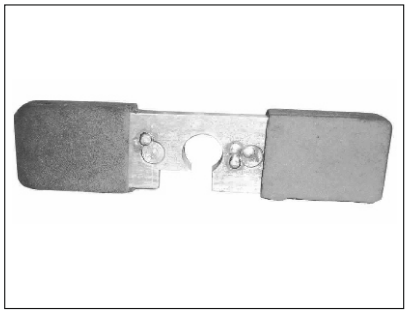
CO Checking Procedure

Tune-Up for Optimum Mileage

Standard Operating Procedure

Special Tools

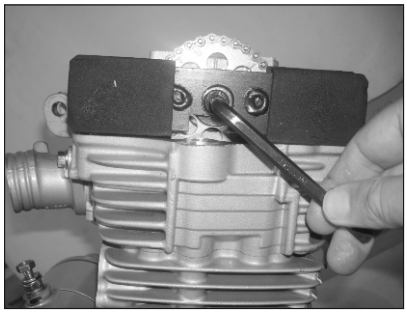
Special Tools

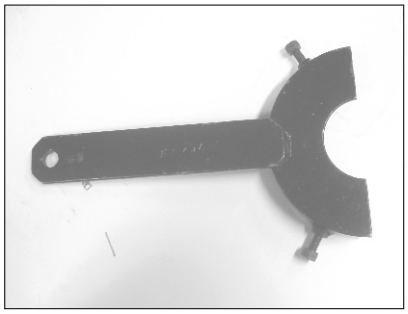


Cam Sprocket Holder

Part No. : F4 1ZJZ 47

Application : For holding sprocket during removal / refitting of Cam sprocket allen bolt.

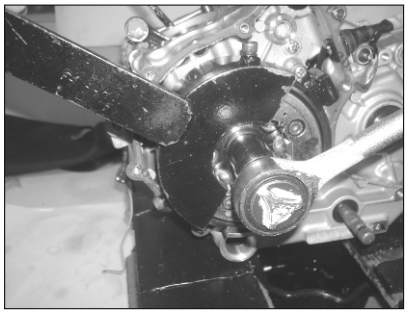


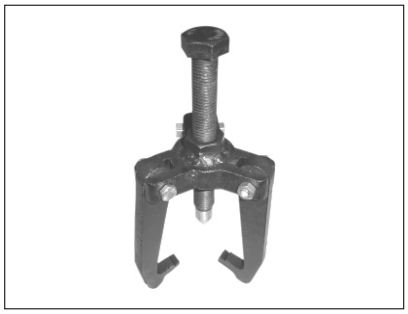


Magneto Rotor Holder

Part No. : F4 1ZJZ 44

Application : To hold rotor while loosening / tightening its nut.

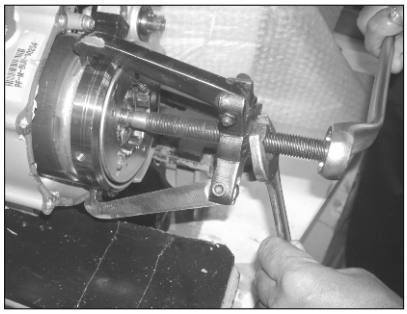


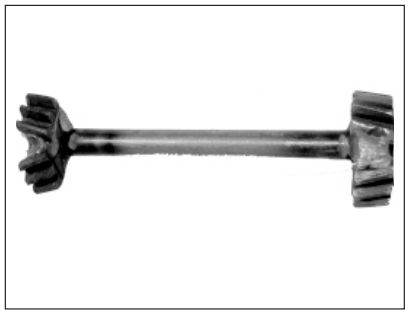


Magneto Rotor Puller

Part No. : F4 1ZJZ 46

Application : To pull out the rotor from crankshaft assembly.

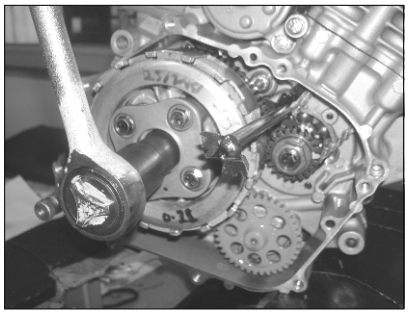




Primary Gear Holder

Part No. : F4 1AJA 11

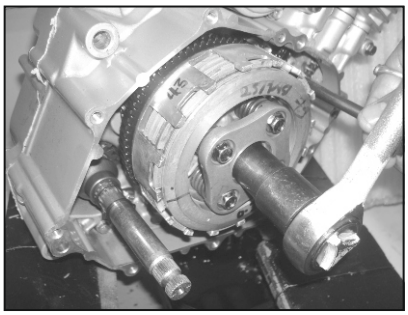
Application : To hold primary and secondary gear while loosening/tightening the primary gear nut & special nut securing clutch.



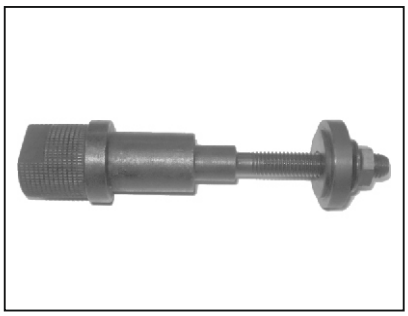
Socket for Clutch Nut

Part No. : 37 10DJ 43

Application : To loosen / tighten special nut securing clutch.



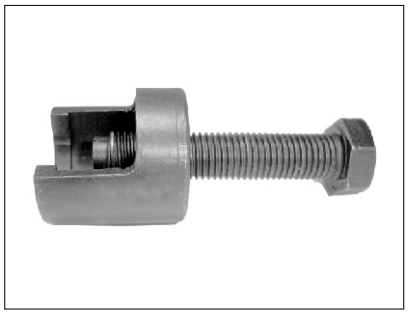
Special Tools



Clutch Dismantling Tool

Part No. : F4 1AJA 58

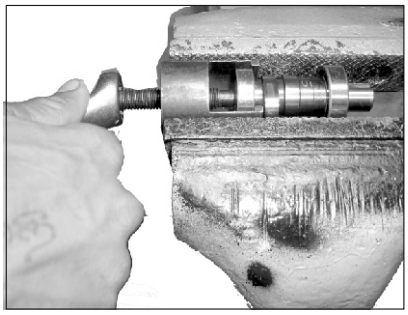
Application : To dismantle & assemble clutch assembly.

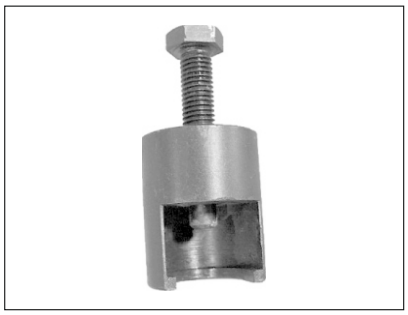


Camshaft Big Bearing Puller

Part No. : 37 10DH 32

Application : To remove big bearing from camshaft.

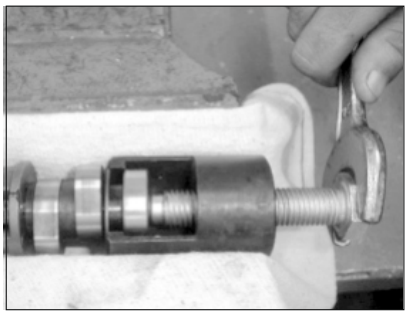


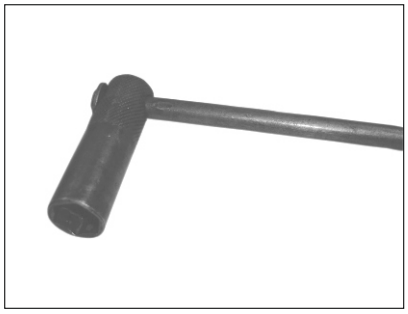


Camshaft Small Bearing Puller

Part No. : 37 10DH 31

Application : To remove small bearing of camshaft.

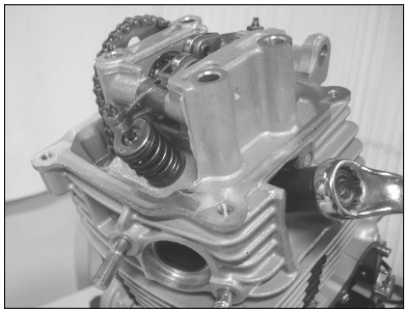




Spark Plug Spanner

Part No. : 37 1040 51

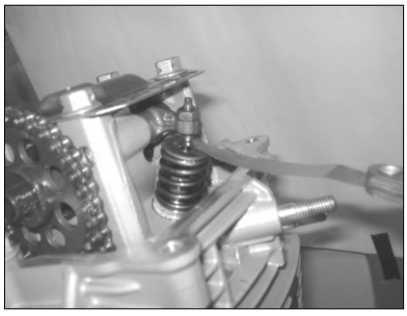
Application : For removing and refitting spark plug.



Valve Tappet Adjuster

Part No. : F4 1ZJW 33

Application : To hold the Valve Tappet screw while adjusting tappet clearance.

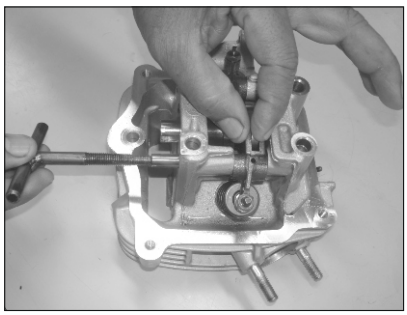


Special Tools

Rocker Shaft Remover

Part No. : 37 10CS 22

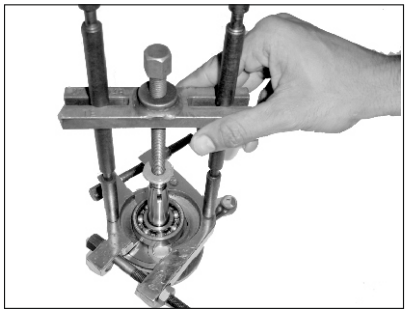
Application : To remove Rocker Shaft from cylinder head.

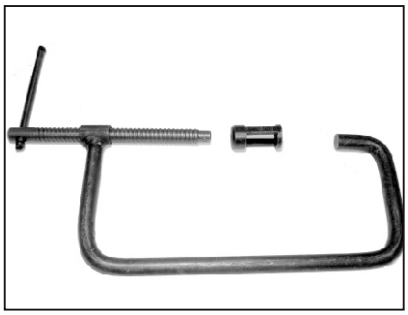


Bearing Extractor

Part No. : 37 1030 48

Application : To Pull out main ball bearing from crankshaft



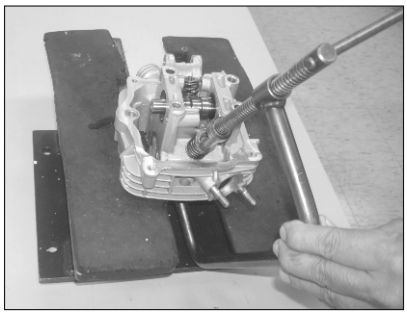


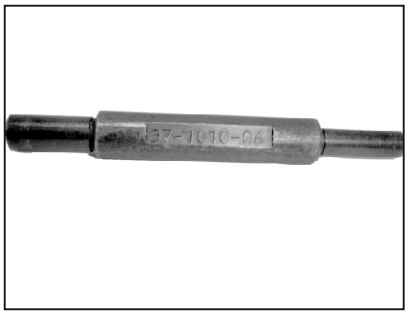
Adaptor & Valve Spring Compressor

Adaptor Part No. : 37 1031 08

Valve Spring Compressor : 37 1031 07

Application : To assemble / dismantle intake, exhaust valve by compressing spring in cylinder head.

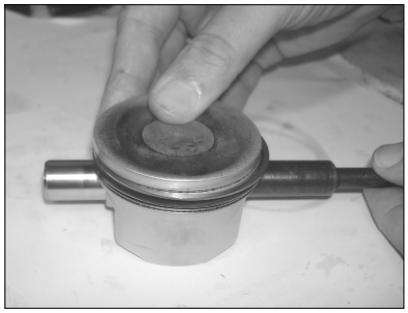


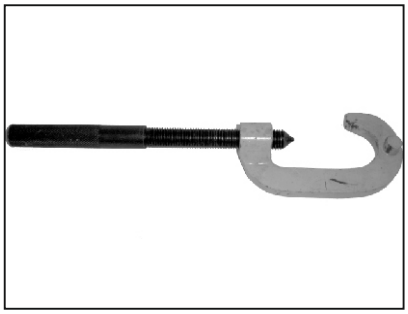


Drift Piston Pin

Part No. : 37 1010 06

Application : To remove refit piston pin.

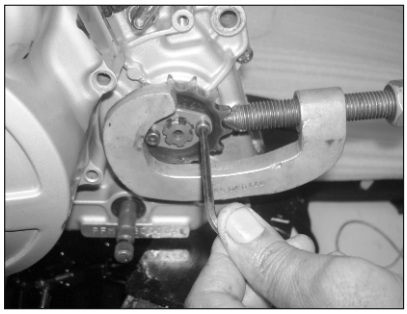




Output Sprocket Holder

Part No. : 37 1030 53

Application : To hold the output sprocket while removing sprocket allen bolts.

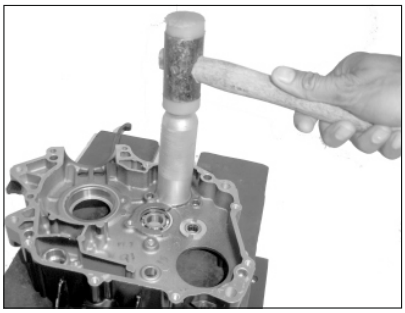


Special Tools

Driver for Fitting Bushing Gear Shift Drum

Part No. : E6 1011 00

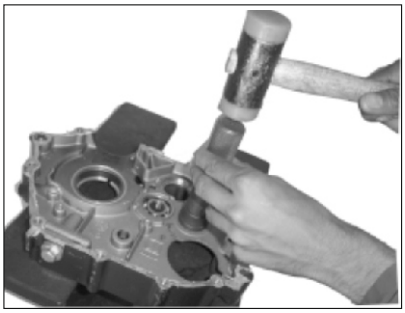
Application : To assemble "Bushing with PTFE Lining" at parent hole of crankcase RH for "Gear Shift Drum" mounting.



Bearing Driver Set

Part No. : 37 1030 61

Application : Common bearing driver set for fitting & removing bearings from crankcase.



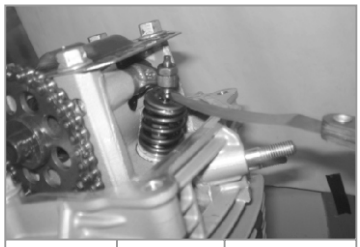
NOTES

Service Limits

Compression Pressure

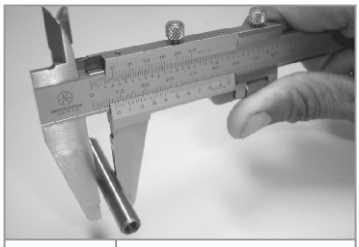
Std. Limit	11.0 ~ 13.0 kg/cm2
Ser. Limit	Min 9.5 kg/cm2

Valve Clearance



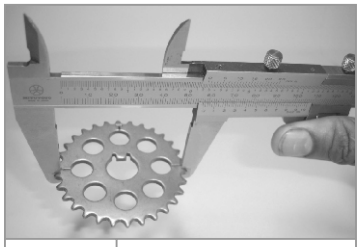
	Intake	Exhaust
Std. Limit	In 0.05	Ex 0.1
Ser. Limit	—	—

Rocker Arm Shaft Diameter



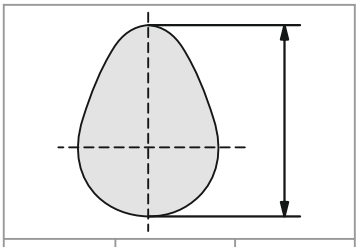
Std. Limit	7.994 ~ 8
Ser. Limit	7.98

Cam Sprocket Diameter



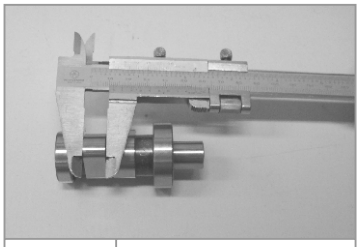
Std. Limit	61.165 ~ 61.285
Ser. Limit	60.865 ~ 61.285

Cam Height



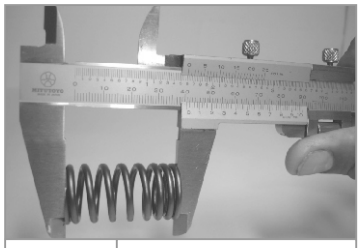
	Intake	Exhaust
Std. Limit	30.084	30.122
Ser. Limit	30.009	30.047

Cam Lobe Width



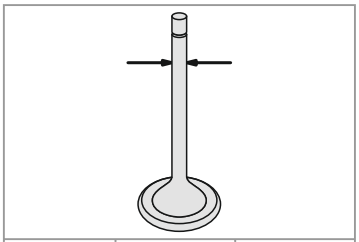
Std. Limit	7 mm
Ser. Limit	—

Valve Spring Free Length



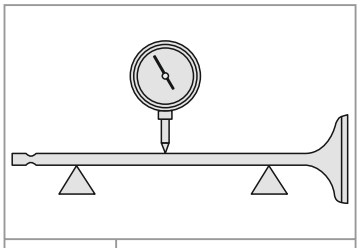
Std. Limit	38.74
Ser. Limit	35.29

Valve Stem Diameter



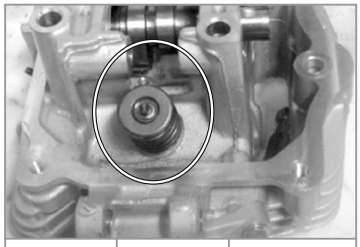
	Intake	Exhaust
Std. Limit	4.475~4.49	4.455~4.47
Ser. Limit	4.46	4.45

Valve Stem Bend



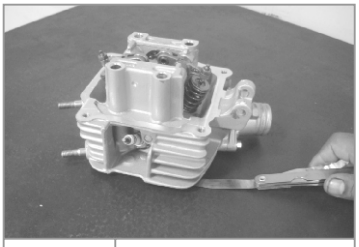
Std. Limit	0.01
Ser. Limit	> 0.01 Replace

Valve Stem to Guide Clearance



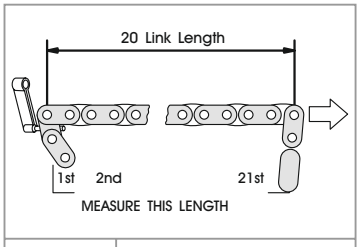
	Intake	Exhaust
Std. Limit	0.01 ~ 0.037	0.025 ~ 0.052
Ser. Limit	Max 0.07	Max 0.07

Cylinder Head Warp



Std. Limit	0.03 mm
Ser. Limit	0.05 mm

Camshaft Chain Length

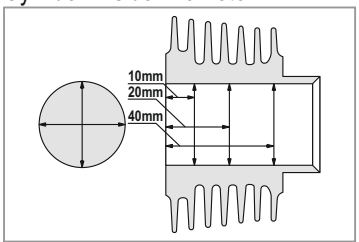


Std. Limit	127.00 ~ 127.48 mm
Ser. Limit	128.9 mm

ALL DIMENSIONS ARE IN MM

Service Limits

Cylinder Inside Diameter

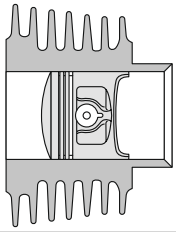


Group A	56.008 ~ 56.018
Group B	56.018 ~ 56.028

Piston Diameter

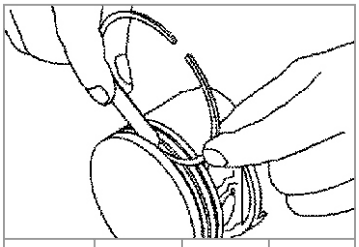
Group A	55.968 ~ 55.978
Group B	55.978 ~ 55.988

Piston Cylinder Clearance



Std. Limit	0.03 ~ 0.05
Ser. Limit	Max 0.06

Piston Ring Groove Clearance

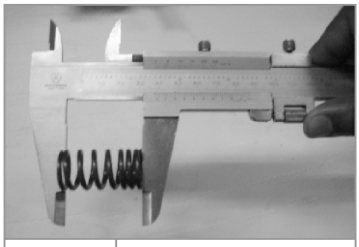


	Top	Second	Oil Ring
Std. Limit	0.03~0.07	0.02~0.06	0.03~0.11
Ser. Limit	0.15	0.15	—

Piston Ring End Gap

	Top	Second	Oil Ring
Std. Limit	0.1~0.25	0.3~0.45	0.2~0.7
Ser. Limit	0.4	0.6	—

Clutch Spring Free Length



Std. Limit	35.0
Ser. Limit	32.6

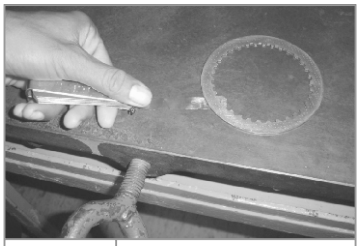
Friction Plate Thickness

Std. Limit	3.0
Ser. Limit	2.8

Steel Plate Thickness

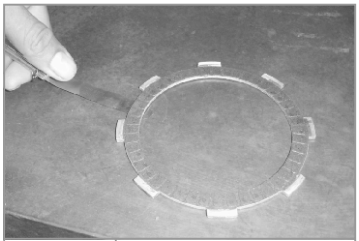
Std. Limit	1.6
Ser. Limit	---

Steel Plate Warp



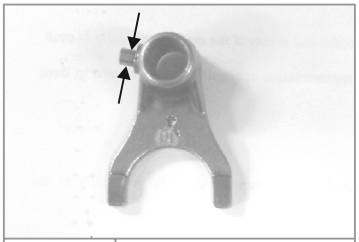
Std. Limit	0.1
Ser. Limit	0.15

Friction Plate Warp



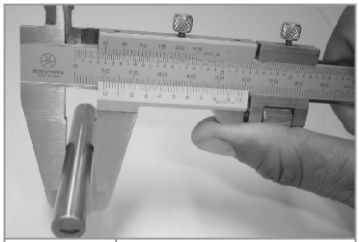
Std. Limit	0.1
Ser. Limit	—

Gear Shift Fork Guide Pin Dia



Std. Limit	4.45 ~ 4.49
Ser. Limit	4.4

Shaft Fork Shift O.D.

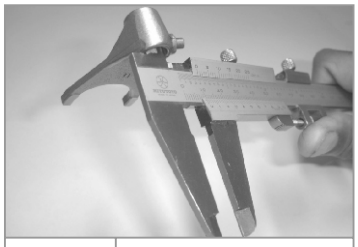


Std. Limit	9.972 ~ 9.987
Ser. Limit	9.96

ALL DIMENSIONS ARE IN MM

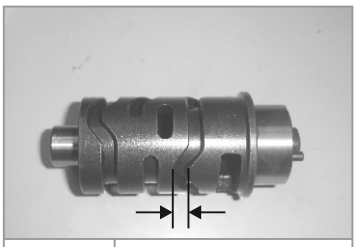
Service Limits

Fork Shift I.D.



Std. Limit	10.0 ~ 10.022
Ser. Limit	10.03

Shift Drum Groove Width

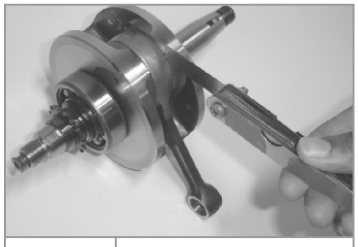


Std. Limit	4.55 ~ 4.70
Ser. Limit	4.75

Crankshaft Run Out

Std. Limit	0.02
Ser. Limit	0.05

Con Rod Side Clearance



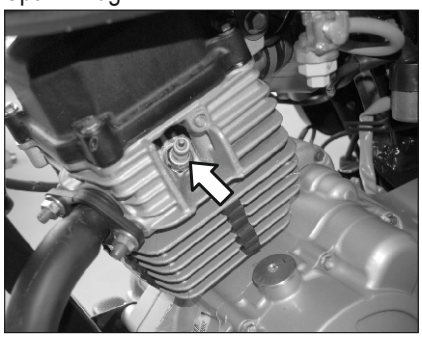
Std. Limit	0.1 ~ 0.35
Ser. Limit	0.7

ALL DIMENSIONS ARE IN MM

NOTES

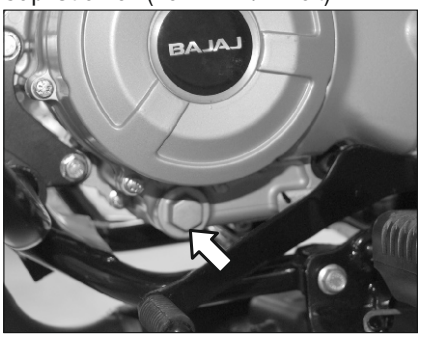
Tightening Torques

Spark Plug



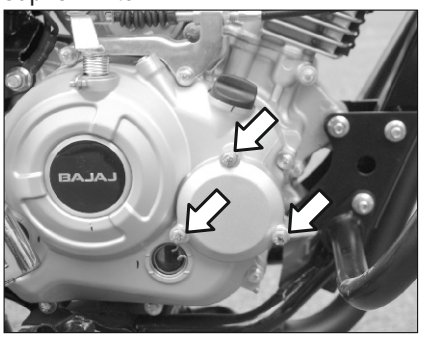
1.3 ~ 1.5 Kgm

Cap Strainer (18 mm A/F Bolt)



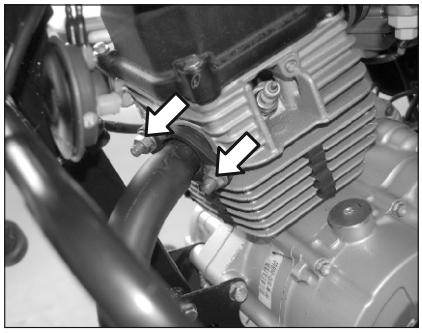
0.9 ~ 1.1 Kgm

Cap Oil Filter



0.9 ~ 1.1 Kgm

Silencer Mounting Nuts

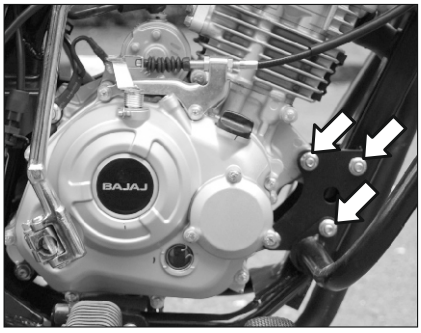


2.0 ~ 2.2 Kgm

Silencer Bracket Bolt

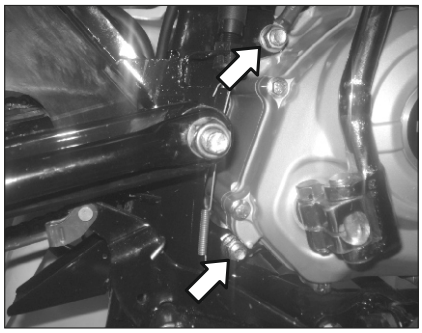
3.5 Kgm

Engine Mounting Bolts



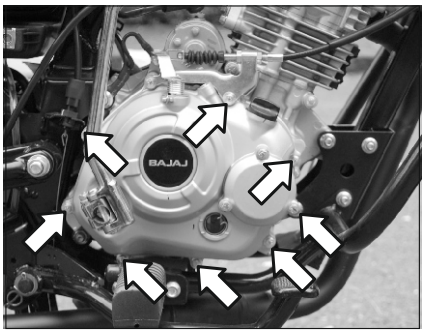
2.0 ~ 2.2 Kgm M8 : 12 MM

Engine Mounting Bolts



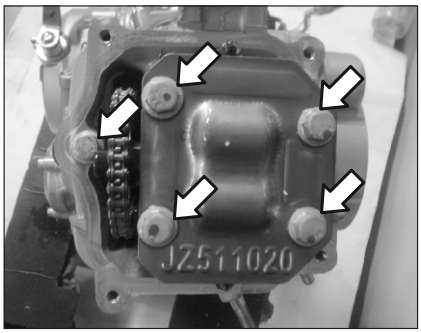
3.0 ~ 3.2 Kgm M10 : 14 MM

Clutch Cover Bolts



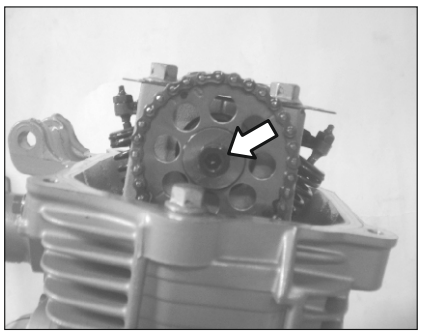
0.9 ~ 1.1 Kgm

Cylinder Head Bolts (12 mm)



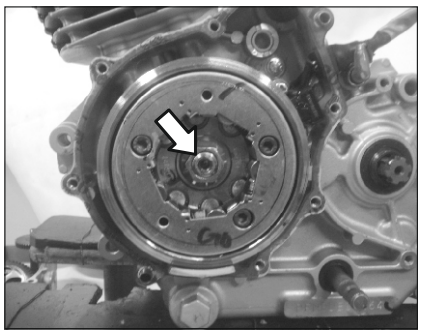
2.2 ~ 2.5 Kgm

Cam Sprocket Allen Bolt



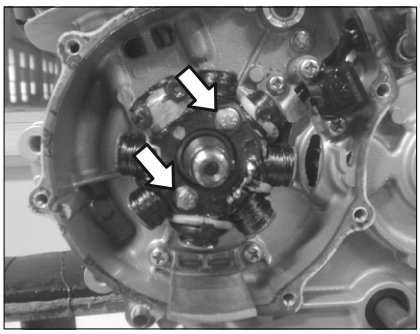
1.6 ~ 1.8 Kgm

Rotor Mounting Nut



5.0 ~ 5.5 Kgm

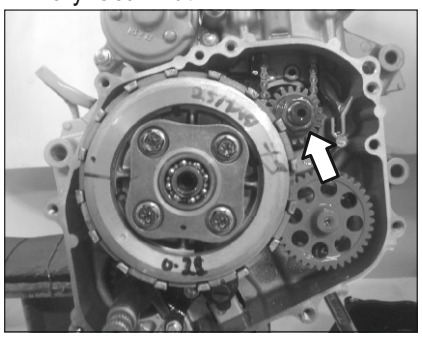
Stator Plate Bolts



0.9 ~ 1.1 Kgm

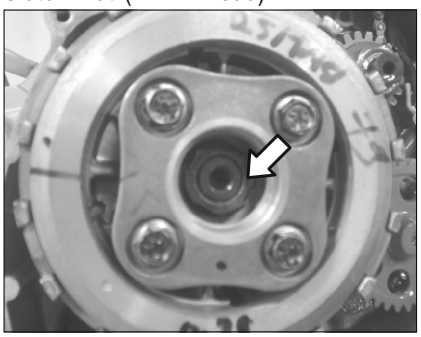
Tightening Torques

Primary Gear Nut



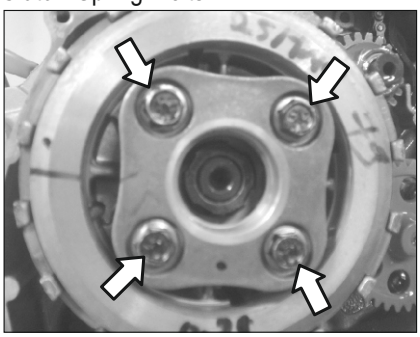
5.0 ~ 5.5 Kgm

Clutch Nut (L.H. Thread)



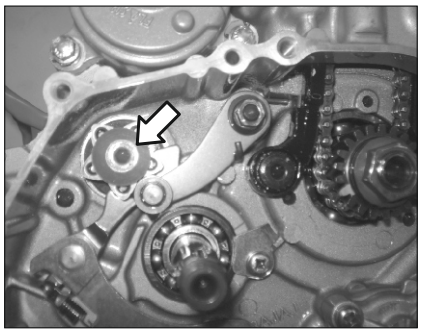
6.0 ~ 6.5 Kgm

Clutch Spring Bolts



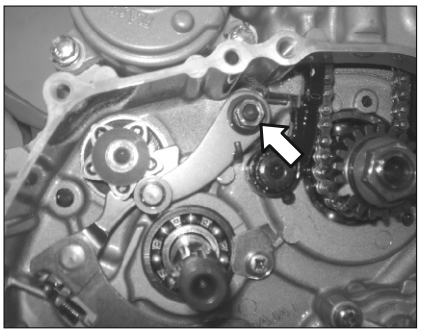
1.1 ~ 1.0 Kgm

Drum / Cam Allen Bolt



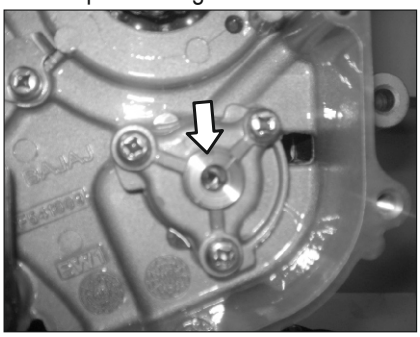
0.9 ~ 1.1 Kgm

Stud Inhibitor Nut



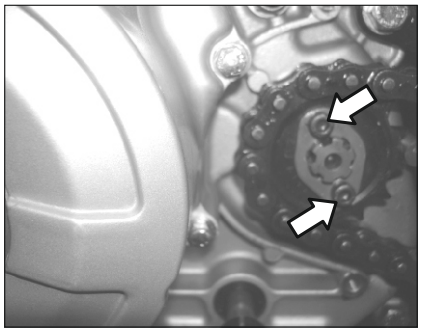
0.9 ~ 1.1 Kgm

Oil Pump Mounting Screws



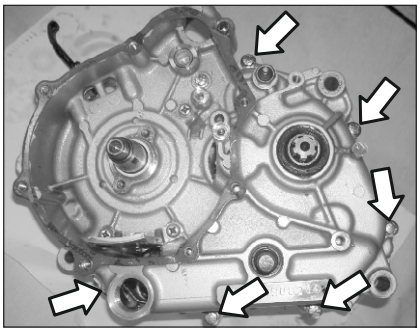
0.5 ~ 0.7 Kgm

Output Sprocket Bolts



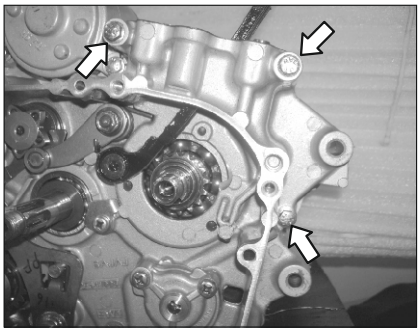
0.8 Kgm

Crankcase Joining Bolts



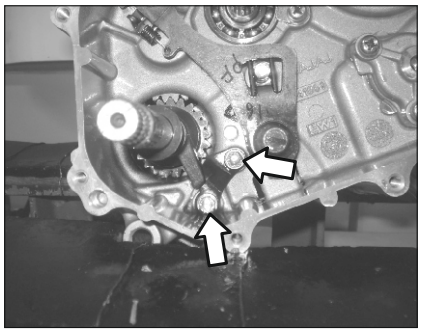
0.9 ~ 1.1 Kgm

Crankcase Joining Bolts



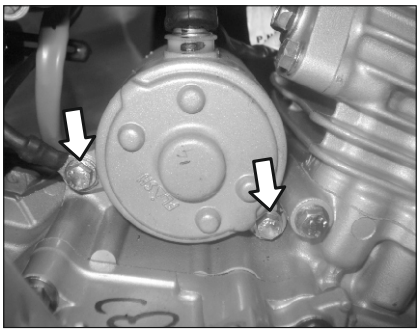
0.9 ~ 1.1 Kgm

Kick Guide Bolts



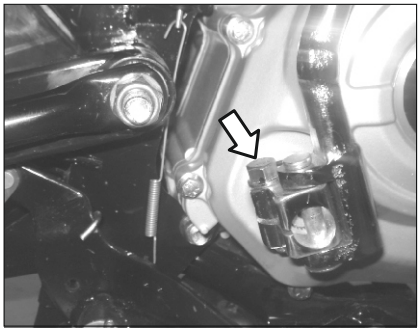
0.9 ~ 1.1 Kgm

Starter Motor Mounting Bolts



0.9 ~ 1.1 Kgm

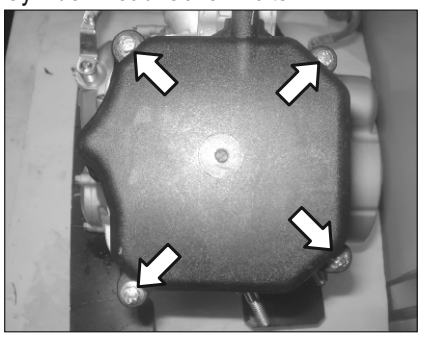
Bolt Kick Lever



2.0 ~ 2.2 Kgm

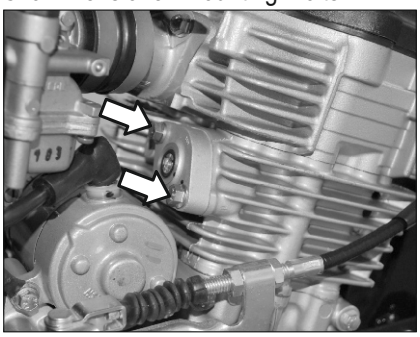
Tightening Torques

Cylinder Head Cover Bolts



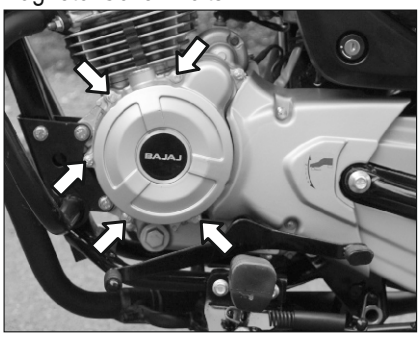
0.9 ~ 1.1 Kgm

Chain Tensioner Mounting Bolts



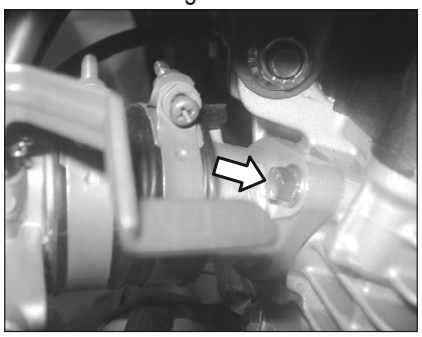
0.9 ~ 1.1 Kgm

Magneto Cover Bolts



0.9 ~ 1.1 Kgm

Manifold Mounting Bolts



0.9 ~ 1.1 Kgm

NOTES

Notes

Key Learning Points

- Understanding of Carburettor
- Understanding the CO Checking Procedure and Tune-up for Optimum Mileage
- Standard Operating Procedure

CHAPTER 4

Frame & Suspension

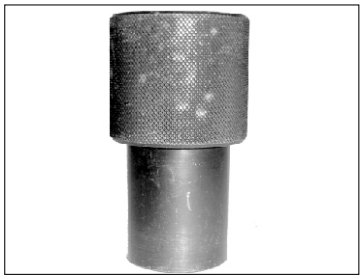
Carburettor Specifications

CO Checking Procedure

Tune-Up for Optimum Mileage

Standard Operating Procedure

Special Tools

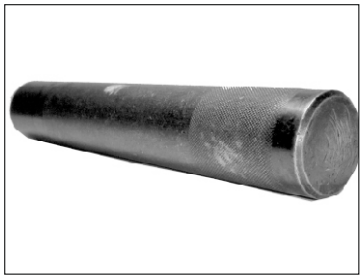


Fork Oil Seal Driver

Part No. : 37 1830 07

Application :

To fit fork oil seal in its seat provided at outer pipe ID.

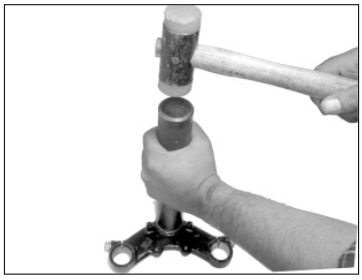


Stem Bearing Driver

Part No. : 37 1830 05

Application :

To fit bearing race on fork under holder bracket

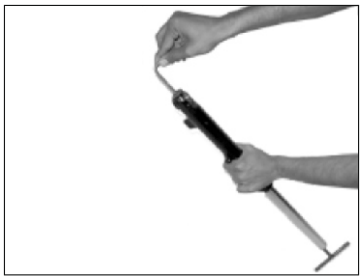


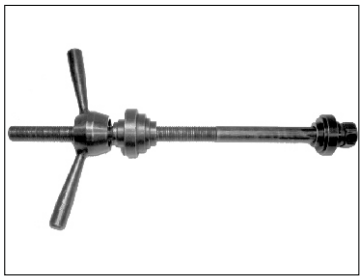
Front fork cylinder holder handle with adaptor

Part No. : 37 1830 06

Application :

To hold fork cylinder while loosening / tightening fork allen head bolt at bottom.





Installer Upper & Lower Bearing Race Frame

Part No. : 37 1801 06

Application :

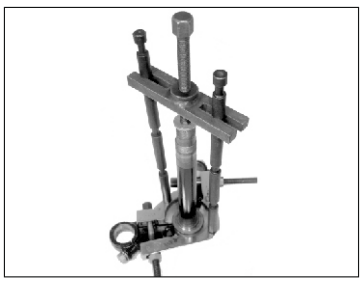
To install upper & lower steering races / cones into their seats inside frame.

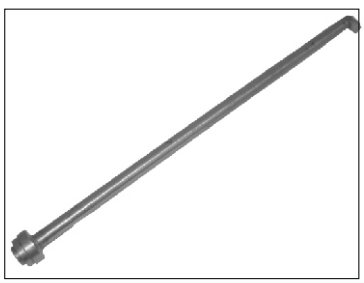
Bearing Race Extractor

Part No. : 37 1030 48

Application :

To Pull out steering race from ' Fork Under Holder bracket'



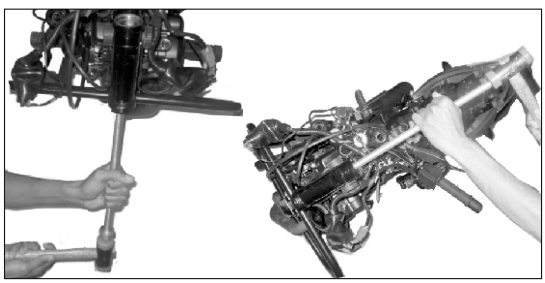


Steering Cone Remover

Part No. : 37 1805 06

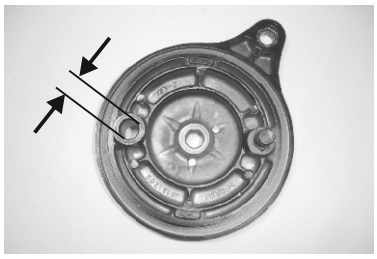
Application :

To remove steering cones from frame.



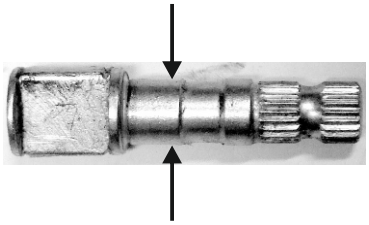
Service Limits

Brake Panel Cam Hole Dia.



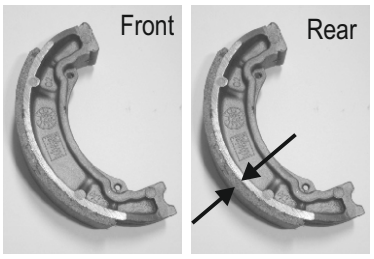
Std. Limit	12.00 ~ 12.03
Ser. Limit	12.8

Brake Cam Diameter



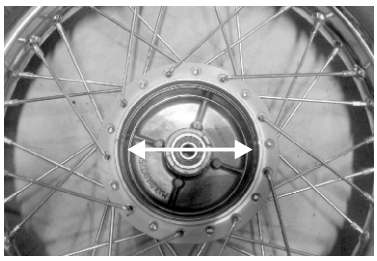
Std. Limit	11.95 ~ 11.98
Ser. Limit	11.88

Brake Shoe Lining Thickness



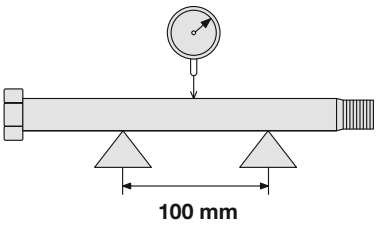
Std. Limit	3.9 ~ 4.5
Ser. Limit	2.5

Brake Drum Inside Dia. Front



Std. Limit	110~110.16
Ser. Limit	110.75

Axle Run Out

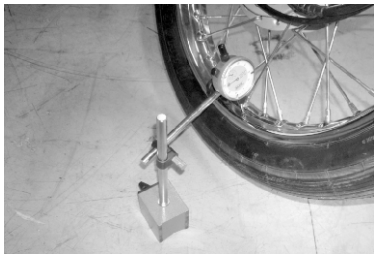


Std. Limit	TIR 0.05
Ser. Limit	TIR 0.2

Axial Wheel Run Out

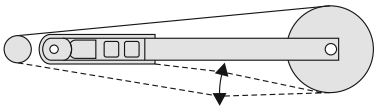
Std. Limit	TIR 0.08
Ser. Limit	TIR 2.0

Radial Wheel Run Out



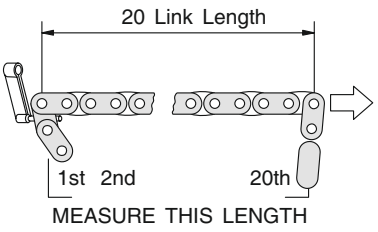
Std. Limit	TIR 1.0
Ser. Limit	TIR 2.0

Drive Chain Slack



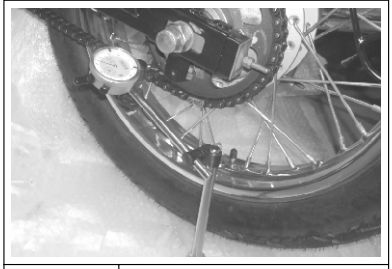
Std. Limit	25 ~ 30
Ser. Limit	40

Drive Chain Length



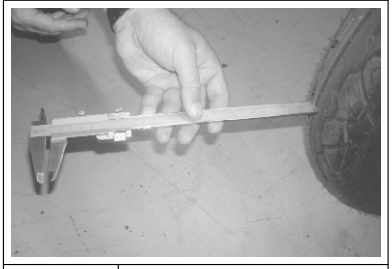
Std. Limit	254.0 ~ 254.6
Ser. Limit	260.0

Rear Sprocket Warp



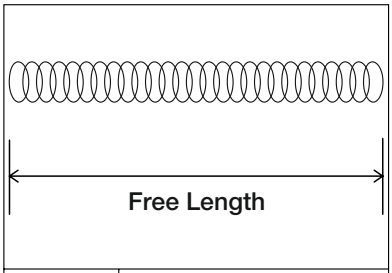
Std. Limit	TIR 0.4 or Less
Ser. Limit	TIR 0.5 or less

Tyre Tread Depth



Std. Limit	Front : 5.0 Rear : 6.0
Ser. Limit	Up to TWI

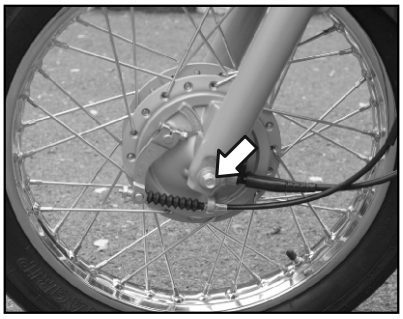
Front Fork Spring Free Length



Std. Limit	378 + 4
Ser. Limit	378

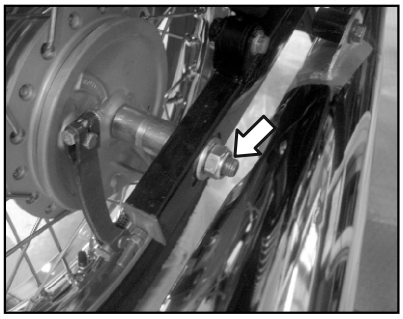
Tightening Torques

Front Axle Nut



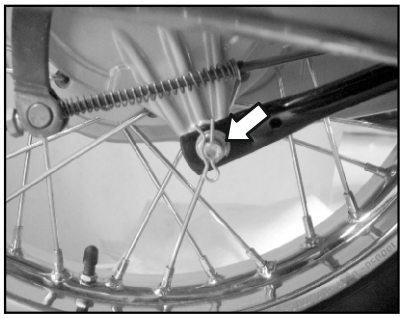
4.5 ~ 5.5 Kgm

Rear Axle Nut



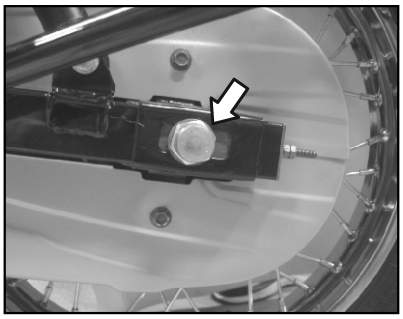
8.0 ~ 10.0 Kgm

Tie Rod Nut



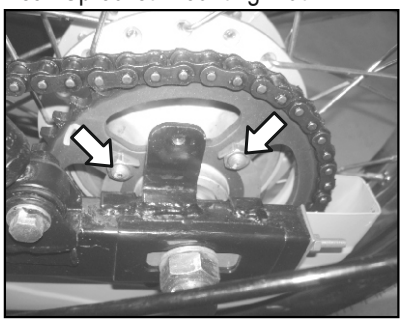
3.0 ~ 3.2 Kgm

Rear Sleeve Nut



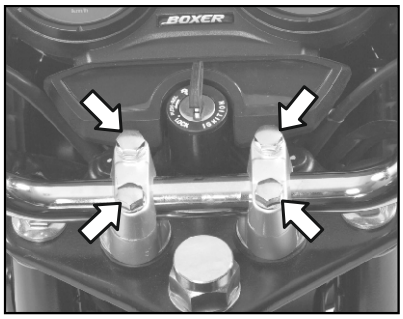
7.0 ~ 8.0 Kgm

Rear Sprocket Mounting Nut



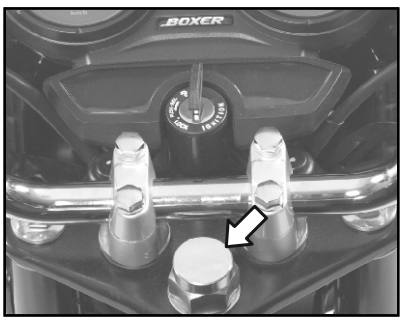
3.0 ~ 3.2 Kgm

Handle Bar Holder Bolts



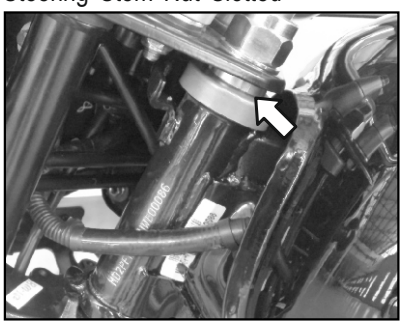
1.0 ~ 1.4 Kgm

Fork Center Nut



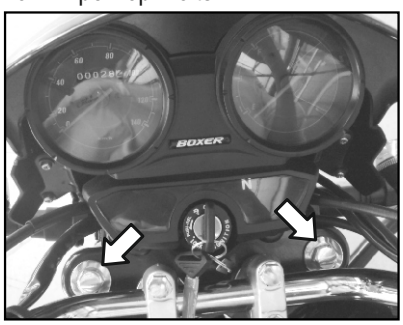
4.5 ~ 5.0 Kgm

Steering Stem Nut Slotted



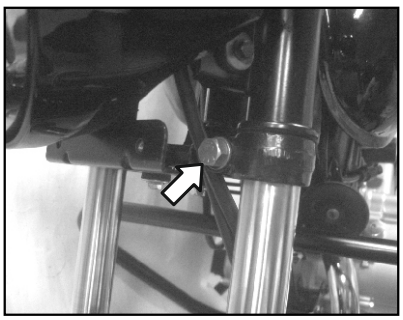
0.4 ~ 0.6 Kgm

Fork Pipe Top Bolts



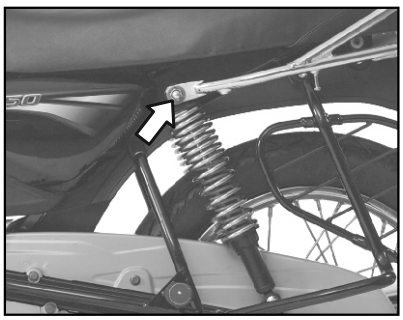
3.0 ~ 3.5 Kgm

Fork Under Bracket Bolts



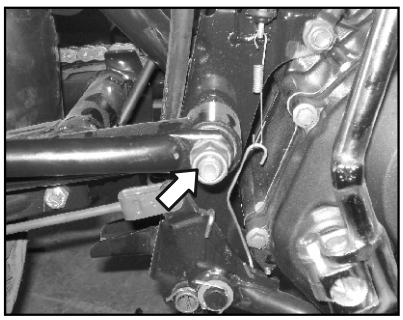
3.0 ~ 3.2 Kgm

RSA Mounting Nut (Upper)



3.0 ~ 3.2 Kgm

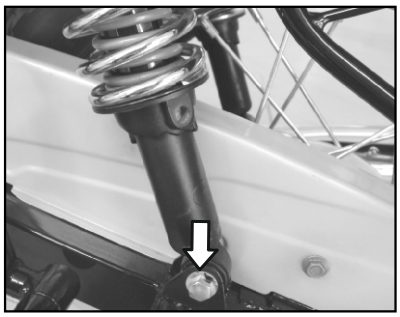
Swing Arm Shaft



4.5 ~ 5.5 Kgm

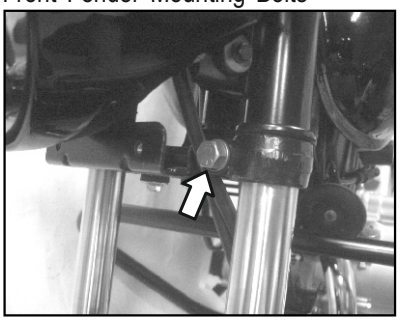
Tightening Torques

RSA Lower Bolt



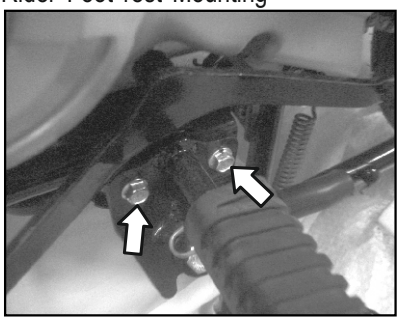
2.3 ~ 2.7 Kgm

Front Fender Mounting Bolts



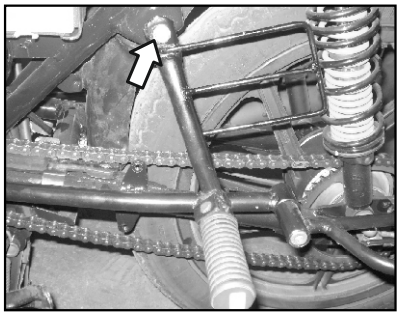
2.0 ~ 2.2 Kgm

Rider Foot rest Mounting



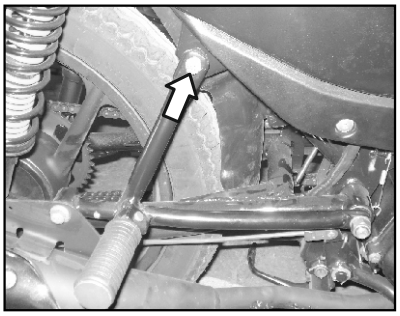
2.0 ~ 2.2 Kgm

LH Stay Bolt



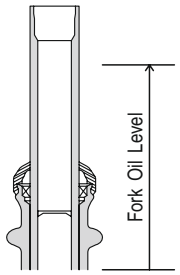
2.0 ~ 2.2 Kgm

RH Stay Bolt



2.0 ~ 2.2 Kgm

Front Fork Oil Grade & Capacity



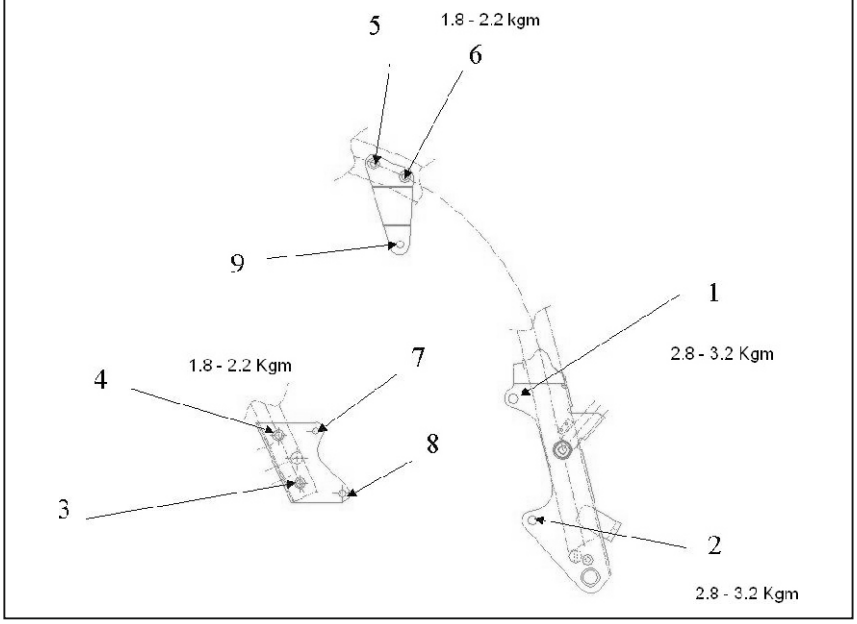
Grade :
SAE 10W20

Quantity :
140 + 2.5 ml
/ per Fork Leg

Grease Application Points		
S.N.	Vehicle Component	Type of Grease
1.	Bearing balls of steering	HP Lithon RR3 grease
2.	Swing arm shaft	
3.	Front wheel axle	
4.	Rear wheel axle	
5.	Brake pedal pivot	
6.	Center stand shaft	
7.	Side stand 'U' bracket	
8.	Gear shifter lever pivot	

Loctite Applications		
S.N.	Vehicle Fastener	Type of Loctite & Loctite Colour
1.	Rider step mtg. bolts	Thread Locker 243 Dark Blue Colour
2.	RSA lower bolt	

Engine Mounting Bolt Tightening Sequence



Notes

Key Learning Points

- Understanding of Carburettor
- Understanding the CO Checking Procedure and Tune-up for Optimum Mileage
- Standard Operating Procedure

CHAPTER 5
Electricals

Carburettor Specifications

CO Checking Procedure

Tune-Up for Optimum Mileage

Standard Operating Procedure

Battery

Battery Technical Specification

	For Self Start
• Make	Exide / Amco / Minda
• Voltage	12 Volt
• Type	MF Battery
• Capacity	5 Ah
• Specific gravity of electrolyte for initial filling of new battery	1.24 for use above 10°C, 1.28 for use below 10°C
• Initial charging duration	13 hrs (This ensures 100% battery Is charged).
• Charging current specification	0.5 Amp

Initial Charging Procedure for dry charged Battery

- Fill each cell with battery grade sulfuric acid of the correct sp. gravity (1.24 at room temp. for use above 10°C & 1.28 at room temp. for use below 10°C)
- Allow the battery to stand for 30 min. after filling.
- Keep vent plugs open. Connect battery to charger & charge at 0.5 Amp. Charging voltage of charger should be 14.5 volt min. without connecting the battery.
- Charge continuously for 13 hours (charging duration will depend upon the condition of the battery) Specific gravity of fully charge battery after rest period of 1 hour will be 1.24 & battery voltage will be 12.9 Volts.
- After charging push vent plugs strip firmly into place & wash off acid spillage with water & dry the battery.
- Using the battery load tester confirm for good indication of state of charge of battery.

Battery Charging Procedure

In case battery is discharged follow the procedure given below by using constant current. “Battery Charger” of 0.5 Amp. charging current specification for 5 Ah battery

- Remove battery from vehicle
- Clean battery throughly
- Remove vent / filler plug strip
- Top up level with distilled water in between Min and Max. level
- Connect to battery charger & ensure respective terminal are connected properly
- Set charging current at 0.5 A DC for 5 Ah Battery. Charging voltage of charger should be more than 14.5 volt without connecting the battery .
- Charge battery (battery charging time depends upon the charging condition of the battery)
- Check specific gravity of each cell & voltage after 1 hour it should be 12.5 volt & specific gravity 1.24 for the fully charged battery.
- Disconnect the battery from the changer.
- Fit vent / filler plug strip firmly.
- Reconnect battery terminals
- Apply petroleum jelly to the battery terminals.

Electrical Checking Procedure

Fuse

- Inspect the fuse element.
- Check continuity of fuse.
- If it is blown out, replace.
- If a fuse fails repeatedly, check the electrical system to determine the cause. Replace it with a new fuse of proper amperage capacity.
- If fuse is replaced by lower capacity fuse, it may lead to repetitive fuse blowing problem.

Note : Never use higher capacity fuse.

Caution : When replacing a fuse be sure the new fuse matches the specified fuse rating for that circuit. Installing that a fuse with a higher rating may cause damage to wiring & components.

Front Brake Light Switch

- Turn 'ON' the ignition switch.
- The brake light should glow brightly when the front brake lever is pressed.
- If it does not, check the front brake switch.

	Brown	Blue	Continuity check by multimeter
Lever Pressed	●	●	Continuity is shown
Lever Released	●	●	No Continuity

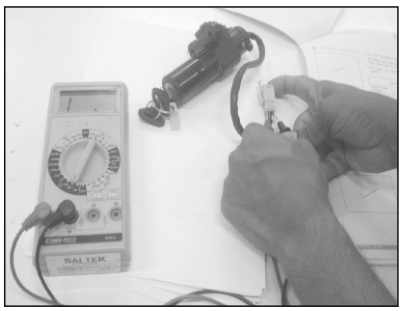
Rear Brake Light Switch

- Turn 'ON' the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal
- If it does not operate check continuity of rear brake switch.

	Brown	Blue	Continuity check by multimeter
Brake Pedal Pressed	●	●	Continuity is shown
Brake Pedal Released	●	●	No Continuity

Electrical Checking Procedure

Ignition Switch



Measuring & Testing Equipment : Multimeter

	Brown	White	Black-White	Black-Yellow
OFF	●	●	●———	———●
ON	●———	———●	●	●

SOP :

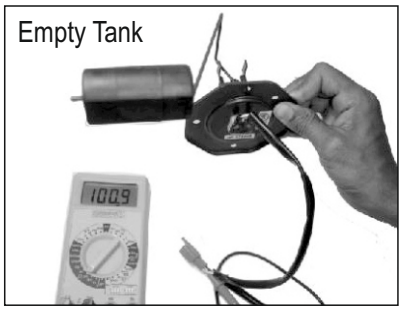
- Switch OFF Ignition key.
- Disconnect Ignition switch's coupler.
- Remove Ignition Switch from vehicle .
- Check continuity between wires in 'ON' & 'OFF' position.

Standard Value :

- Beep Sound & Continuity in 'ON' position. No continuity in 'OFF' position.

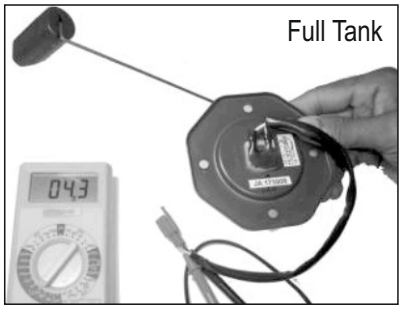
Note:
- Don't use duplicate or non-OE Ignition key.
- Never lubricate Ignition switch by oil / grease.

Fuel Gauge - Tank Unit



Measuring & Testing Equipment : Multimeter

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	As per chart given below
	White / Yellow	Black / Yellow	



Standard Value :-

Fuel Level	Fuel Quantity Liter	Standard Value Ohm
Empty Tank	1.3 liters	100 ± 5
Half	5.9 liters	46 ± 4
Full Tank	9.0 liters	9 ± 15

Electrical Checking Procedure

Starter Relay

Measuring & Testing Equipment : Test Jig or Multimeter

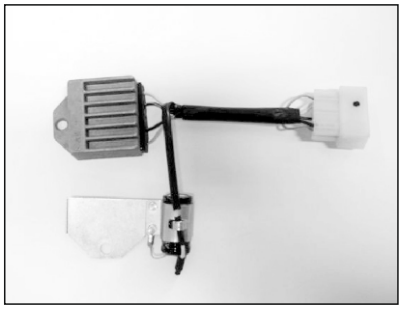
Connection : Test Jig - Connect starter relay coupler to Test Jig & it show result as OK / Defective

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	3.5~4.3 Ohms
	Starter Relay Coil Red - Yellow Wire	Starter Relay Coil Black Wire	

SOP :

- Switch OFF engine.
- Disconnect coupler from Relay.
- Connect multimeter to Starter Relay coil terminals.
- Check resistance.

Capacitor

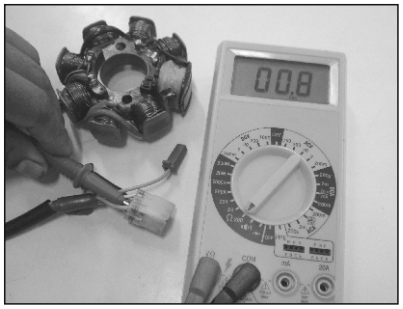


Checking Method :

Touch +ve wire of capacitor to earth. Spark will occur.
This Indicates capacitor is OK.

Note: Capacitor is very important for Battery charging function, so ensure capacitor coupler is always firmly connected.

Lighting Coil



Measuring & Testing Equipment : Multimeter

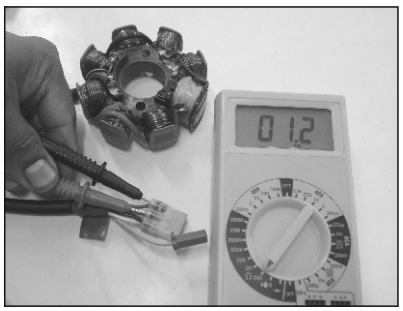
Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	0.9~1.3 Ohms
	Yellow	Black	

SOP :

- Switch OFF engine.
- Disconnect stator plate coupler
- Connect multimeter between Yellow & Black wires.
- Check resistance value between Yellow & Black wires.

Electrical Checking Procedure

Battery Charging Coil



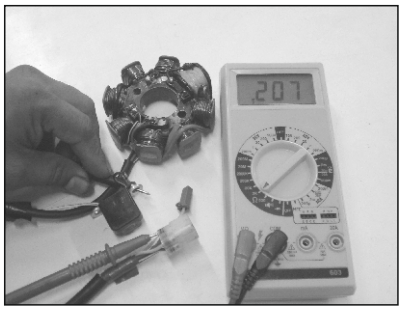
Measuring & Testing Equipment : Multimeter

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	1.8~2.2 Ohms
	Blue / White	Blue / White	

SOP :

- Switch Off Ignition Key.
- Disconnect Stator Plate Coupler
- Connect multimeter between 2 Blue / White wires.
- Measure resistance between 2 Blue / White wires.

Pick-Up Coil



Measuring & Testing Equipment : Multimeter

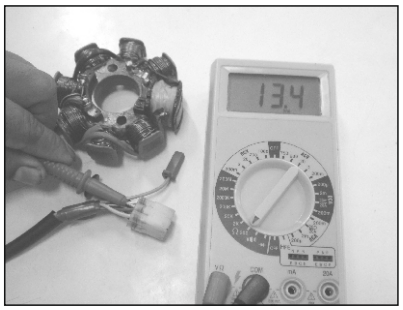
Meter Range	Connections		Standard Value
2 K Ohms	Meter +ve	Meter -ve	193.5~236.5 Ohms
	White / Red	Black / Yellow	

SOP :

- Switch Off Ignition Key.
- Disconnect Stator Plate Coupler
- Connect multimeter between White / Red & Black / Yellow wires.
- Measure resistance between White / Red & Black / Yellow wires.

Note: Ensure gap 0.5~0.7 mm between pole of pick-up coil & rotor peep.

Exciter Coil



Measuring & Testing Equipment : Multimeter

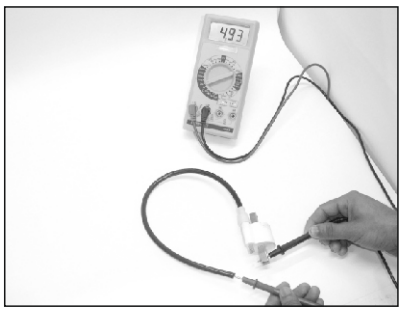
Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	13.23~16.17 Ohms
	Red	Black	

SOP :

- Switch OFF engine.
- Disconnect stator plate coupler
- Connect multimeter between Red & Black wires.
- Check resistance value between Blue / White & Blue / White.

Electrical Checking Procedure

H.T. Coil Inspection

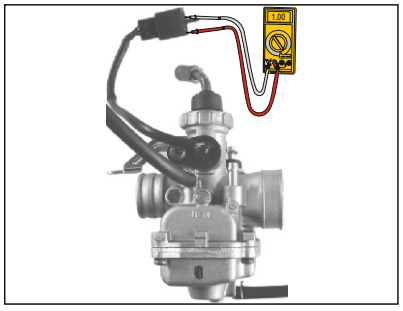


H.T. Coil : (Inspection Using Multimeter)

- Measure the primary winding resistance as follows
- Connect the multimeter between input terminal & GND plate on the core.
- Measure the secondary winding resistance as follows
- Remove the plug cap by turning it counter clockwise.
- Connect the multimeter between H.T. cable end & GND plate on the core.
- Measure primary winding & secondary winding resistance.
- If the value does not match as per, specifications replace the coil.
- If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked test replace the coil with one OK coil.
- Visually inspect the secondary winding lead.
- If it shows any damage, replace the coil.

Primary Winding	0.3 Ω to 0.5 Ω at 25°C
Secondary Winding	4.5 k Ω to 6.5 K Ω at 25°C

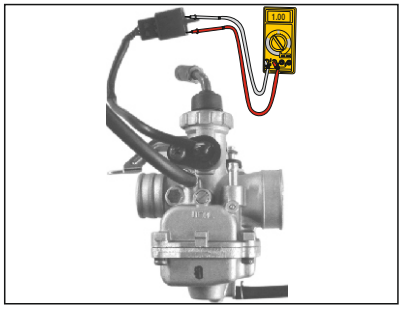
TPS Checking



CONTINUITY CHECK

- Disconnect TPS coupler
- Check Continuity between Blue & Black / Yellow wire
- There should not be any continuity.

Meter Range	Connections		Standard Value
Continuity Mode	Meter +ve	Meter -ve	No continuity must be shown.
	Blue	Black / Yellow	

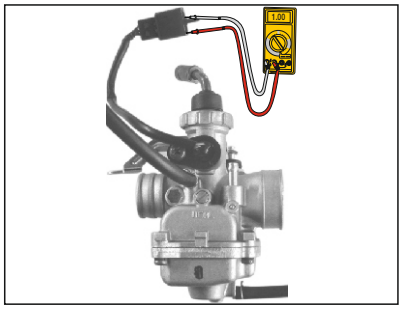


INPUT VOLTAGE CHECK

- Connect TPS coupler.
- Switch 'ON' Ignition Key.
- Check voltage between Brown & Black/Yellow wires of TPS Hall Sensor.

Meter Range	Connections		Standard Value
20 V DC	Meter +ve	Meter -ve	12.4 Volts (Battery Voltage)
	Brown	Black / Yellow	

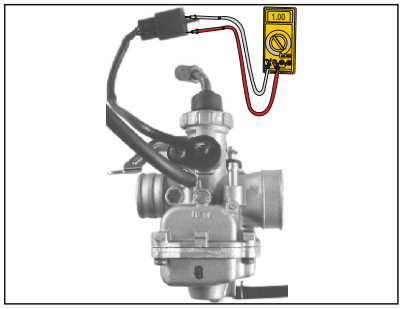
Electrical Checking Procedure



POT VOLTAGE CHECK

- TPS coupler is in connected condition.
- Switch 'ON' Ignition key.
- Check voltage between Blue & 'Black / Yellow' wire in POT condition.

Meter Range	Connections		Standard Value
20 V DC	Meter +ve	Meter -ve	Less than 1 Volt
	Blue	Black / Yellow	

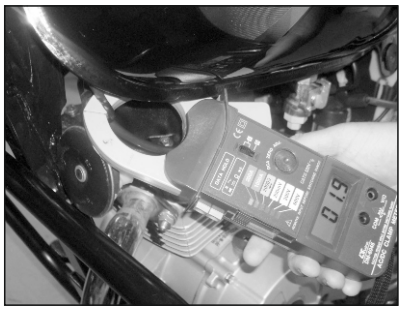


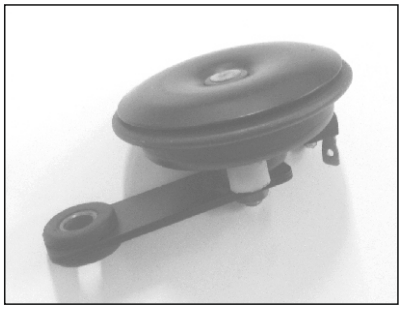
WOT VOLTAGE CHECK

- TPS coupler is in connected condition.
- Switch 'ON' Ignition key.
- Check voltage between Blue & 'Black / Yellow' wire in WOT condition.

Meter Range	Connections		Standard Value
20 V DC	Meter +ve	Meter -ve	3.0 ~ 5.0 VDC
	Blue	Black / Yellow	

Horn





Measuring & Testing Equipment : DC Clamp Meter

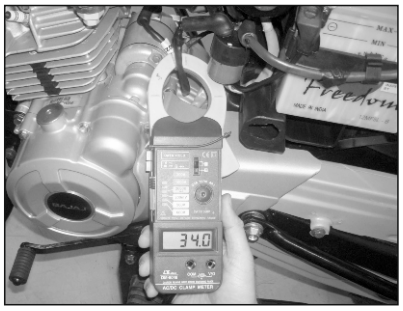
Meter Range	Connections	Standard Value
200 DC A	Encircle clamp meter jaws around Brown wire of horn	2 Amps Max.

SOP :

- Encircle clamp meter jaws around Brown wire of Horn.
- Press horn switch & check instantaneous current drawn by horn.

Electrical Checking Procedure

Starter Motor Current Drawn

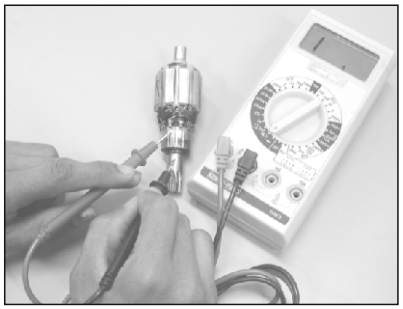


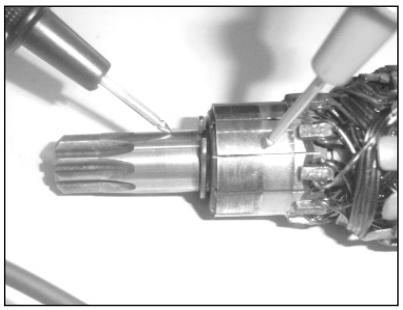
Starter Motor - Current Drawn

- Switch 'ON' Ignition Key & disconnect both spark plug caps (care to be taken so that spark does not jump to metal part)
- Select range & set clamp meter Zero reading.
- Encircle red input wire of starter motor by clamp meter jaws.
- Ensure battery is fully charged. Confirm the charged condition using battery load tester.
- Crank engine by pressing self starter button.
- Press self starter button 3 seconds & check cranking current displayed on clamp meter LCD display.

Meter Range	Connections	Standard Value
200 DC A	Encircle clamp meter jaws around thick Red wire of Starter Motor	30 ~ 38 Amp

Starter Motor Armature





Starter Motor Armature

- Dismantle starter motor & take out Armature.
- Remove dust by air blow.
- Check continuity between starter motor shaft & each segment on commutator.
- Replace armature if continuity is shown.

Meter Range	Connections		Standard Value
Continuity Mode	Meter +ve	Meter -ve	No continuity is shown
	Commuter Segment	Shaft	

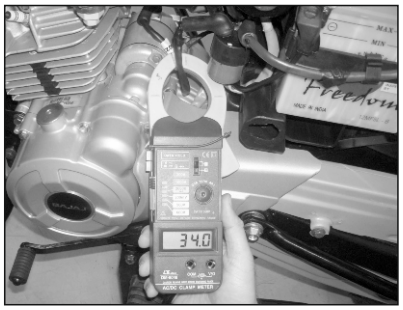
- Replace armature if continuity is observed
- Check continuity between each pair of adjacent segments on commutator.

Meter Range	Connections		Standard Value
Continuity Mode	Meter +ve	Meter -ve	No continuity is shown
	Any segment on commutator	Adjacent segment on commutator	

- Replace armature if continuity is not shown between any two adjacent pair of commutator segments.

Electrical Checking Procedure

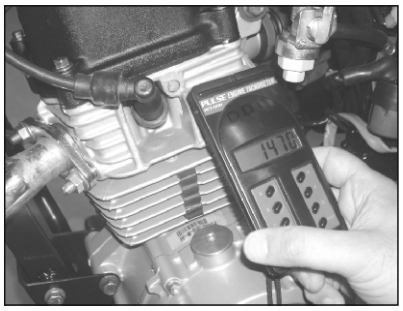
AC Lighting Voltage Measurement



- Open head light housing.
- Start engine & set it at 4500 rpm ensure headlight, tail light & speedometer lights are 'ON'.
- Ensure Hi/Lo beem switch at 'Hi' beam mode. Set multimeter at 20VAC.
- Connect multimeter as per chart given below.
- Voltage should be 12 to 13.5 V AC. This indicates RR unit is functioning perfectly & giving regulated ACV output for lighting circuit.

	Connections		Standard Value
Empire rpm 4500 rpm with H/L, T/C speedo light 'ON' + Hi beam 'ON'	Meter +ve	Meter -ve	13.2 to 13.8 V AC
Multimeter set at 20V AC	Red-Black wire at H/L socket	Earth wire at H/L socket	

Battery Charging Voltage Measurement



Use fully charged battery while measuring

Ensure V_B = 12.5 $\pm$ 0.3 V before checking

V_B = Battery open circuit terminal voltage with Battery terminals in disconnected condition.

To measure the DC voltage; set the meter at 20V DC range. Connect the meter +ve lead to Battery +ve terminal & meter -ve lead to battery -ve terminal without disconnecting battery wires. Start the engine & set it at 1500 RPM. Measure the voltage with headlight switch in 'ON' position. Switch OFF Ignition key & disconnect the meter leads.

Meter Range	Connections		Standard Value
20 V DC	+ve Lead	-ve Lead	14.4 $\pm$ 0.3 Volts
	Battery +ve terminal	Battery -ve terminal	

Note : For DC voltage measurement connect multimeter in parallel circuit.

Electrical Checking Procedure

Battery DC Charging Current Measurement

Use fully charged battery while measuring.

Ensure V_B = 12.5 $\pm$ 0.3 V before checking.

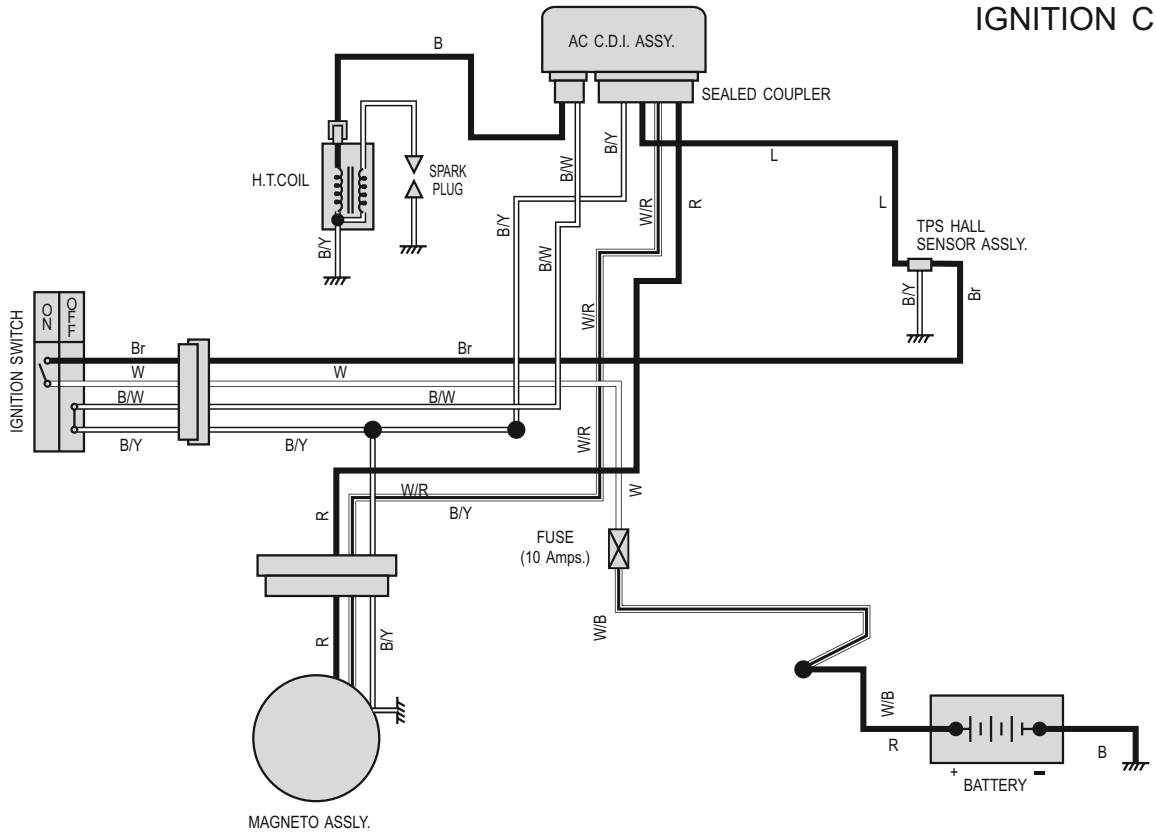
To measure the DC charging current, set the meter to 10A DC range. Disconnect Red wire from Battery +ve terminal connect meter +ve lead to Red wire of wiring of wiring harness & -ve lead to +ve terminal of battery. Start the engine & set it at 4000 RPM. Put ON the headlight & measure the DC charging current. The DC charging current should be 0.7 A max. Switch OFF Ignition key & disconnect the meter leads. Connect the RR unit & battery.

Meter Range	Connections		Standard Value
DC 10 Amp	Meter +ve	Meter -ve	0.7 A Max. @ 4000 RPM with fully charged battery
	Red wire of Harness	Battery +ve terminal	

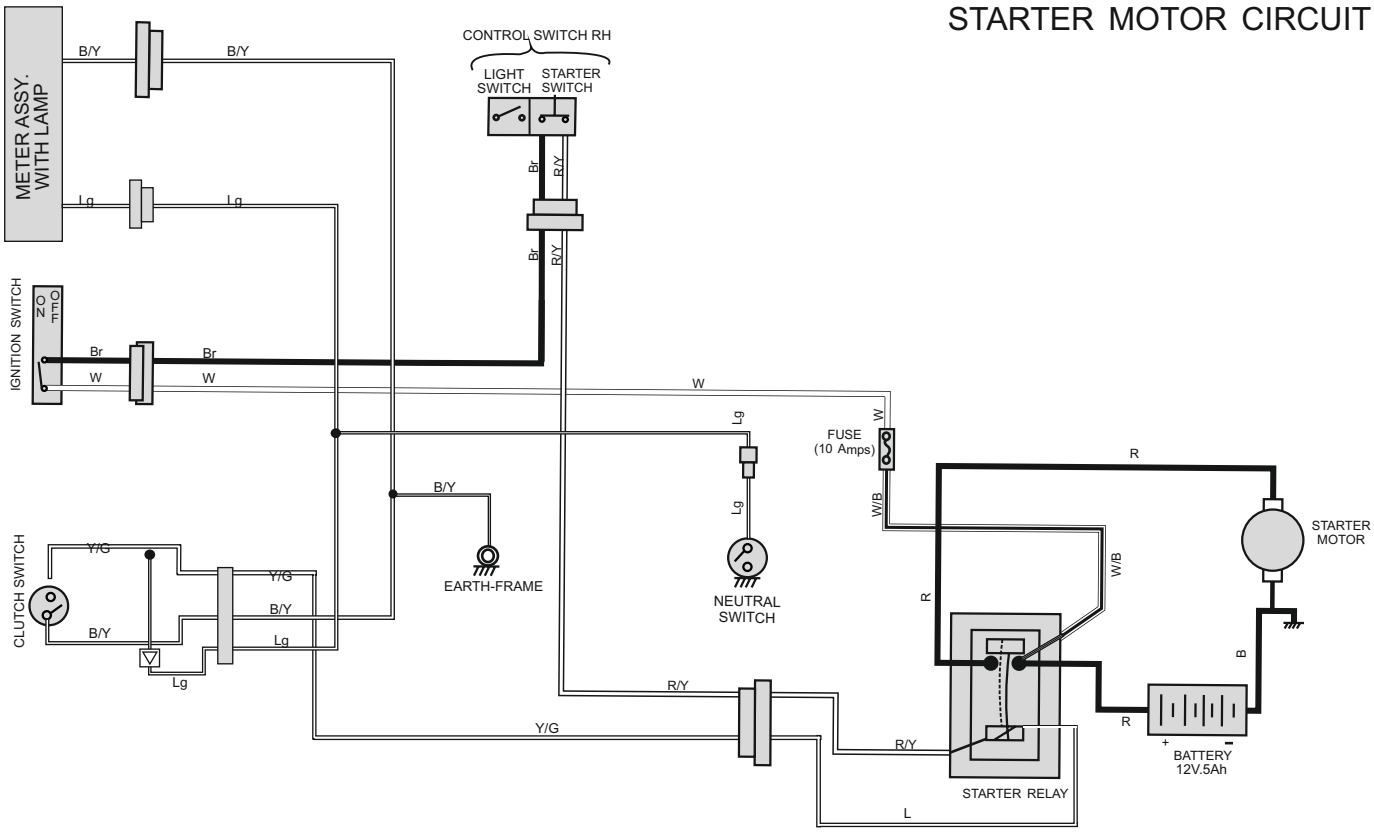
Note : For DC current measurement connect multimeter in series circuit.

Electrical Circuit Diagrams

IGNITION CIRCUIT

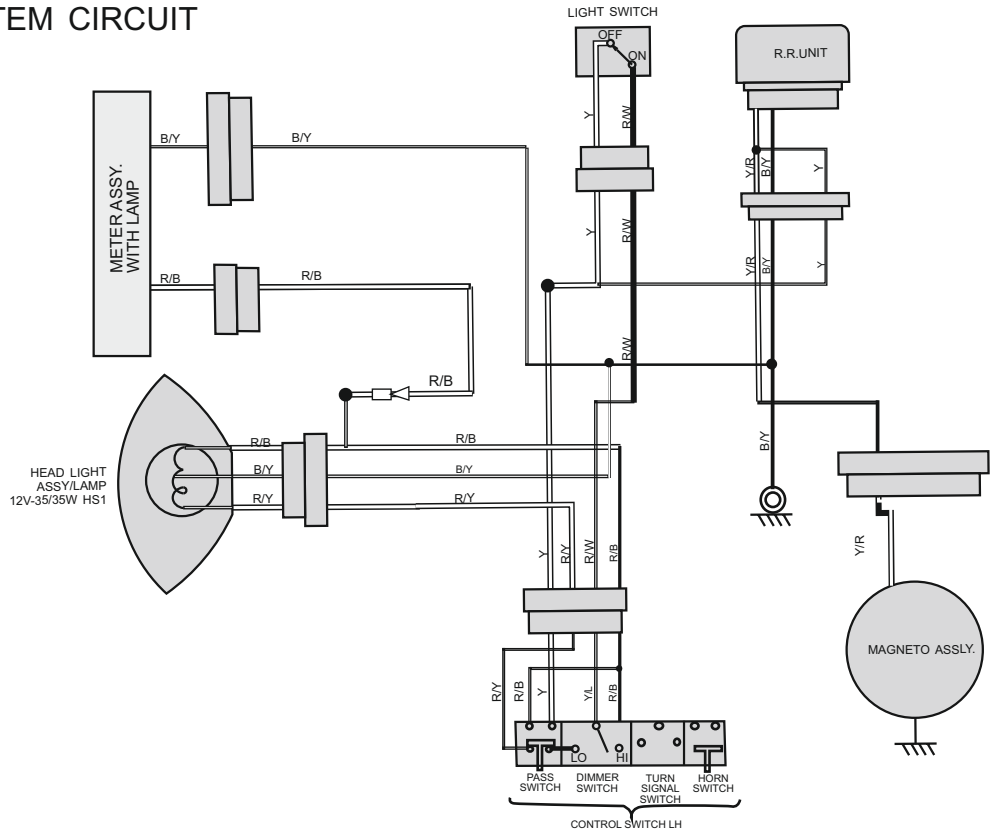


STARTER MOTOR CIRCUIT

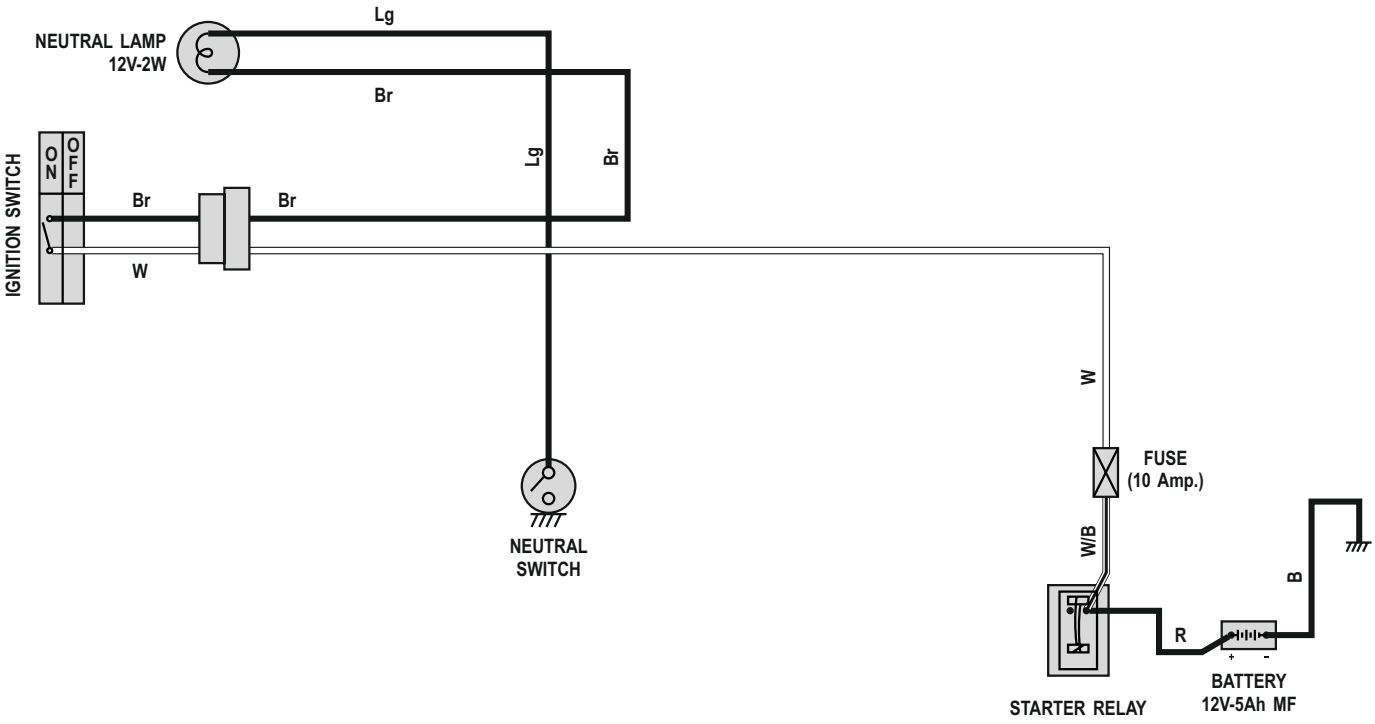


Electrical Circuit Diagrams

LIGHT SYSTEM CIRCUIT

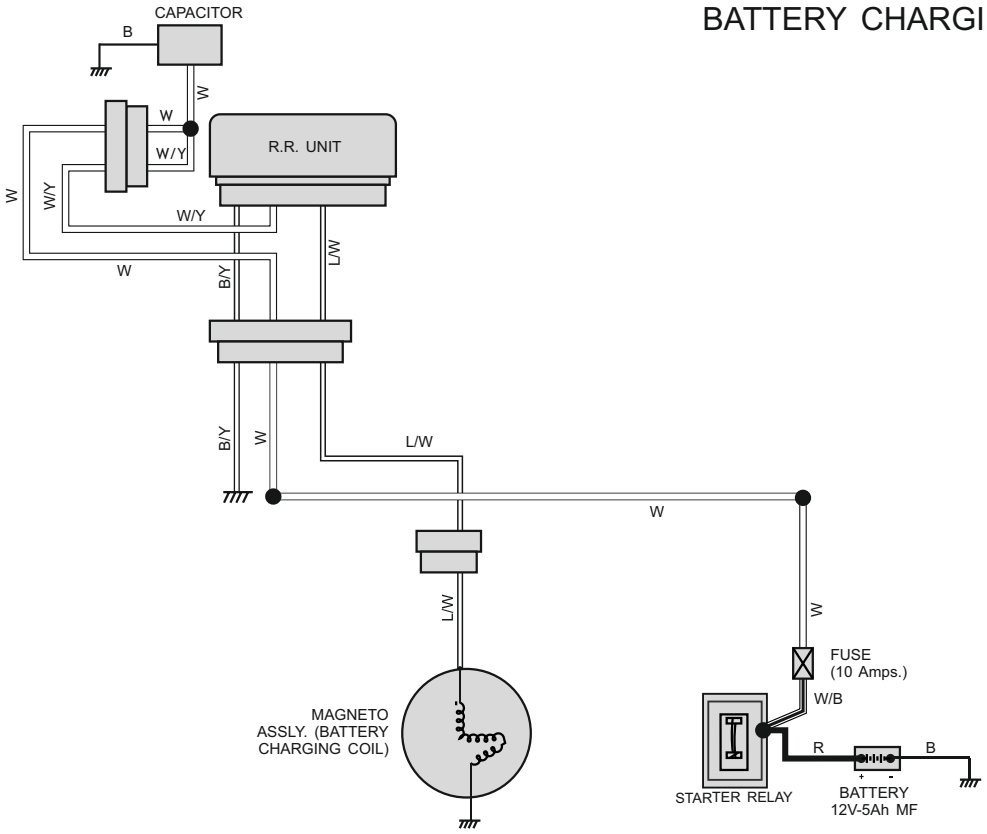


NEUTRAL LIGHT CIRCUIT

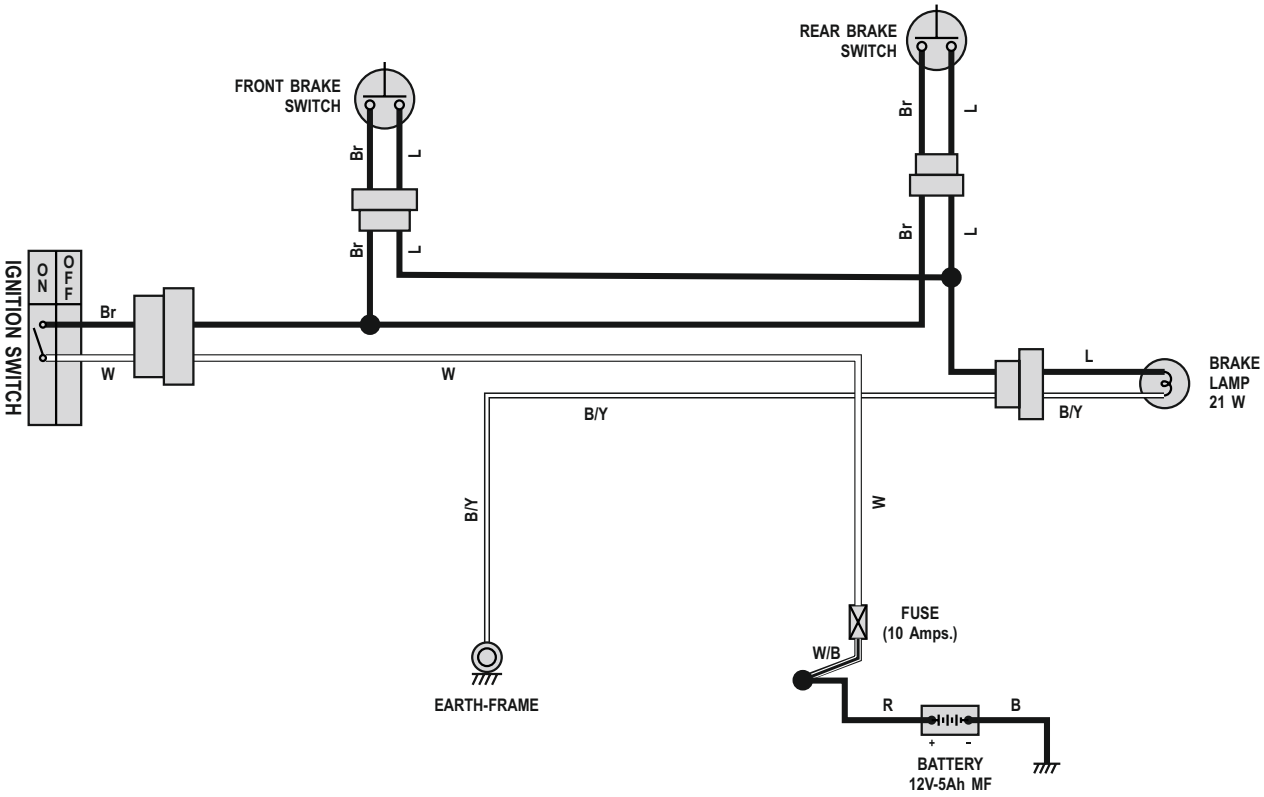


Electrical Circuit Diagrams

BATTERY CHARGING CIRCUIT

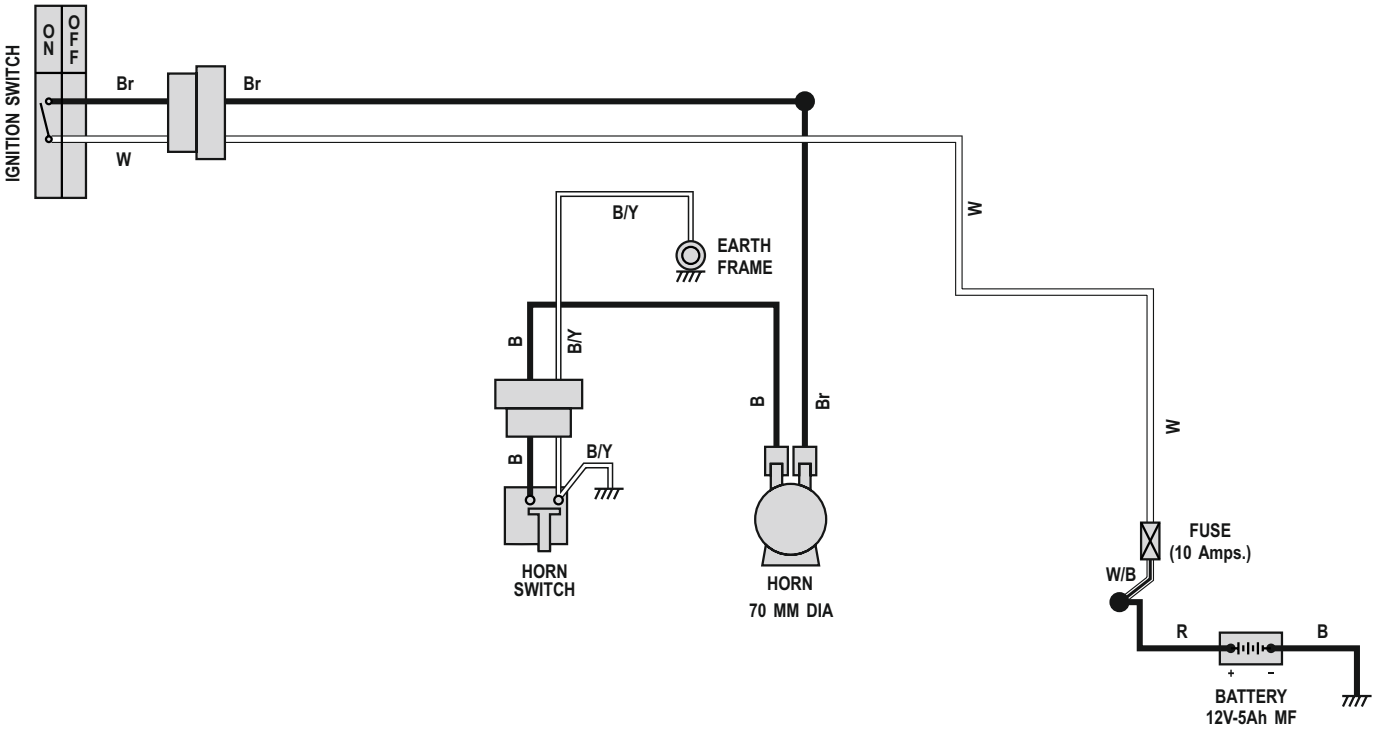


BRAKE LAMP CIRCUIT

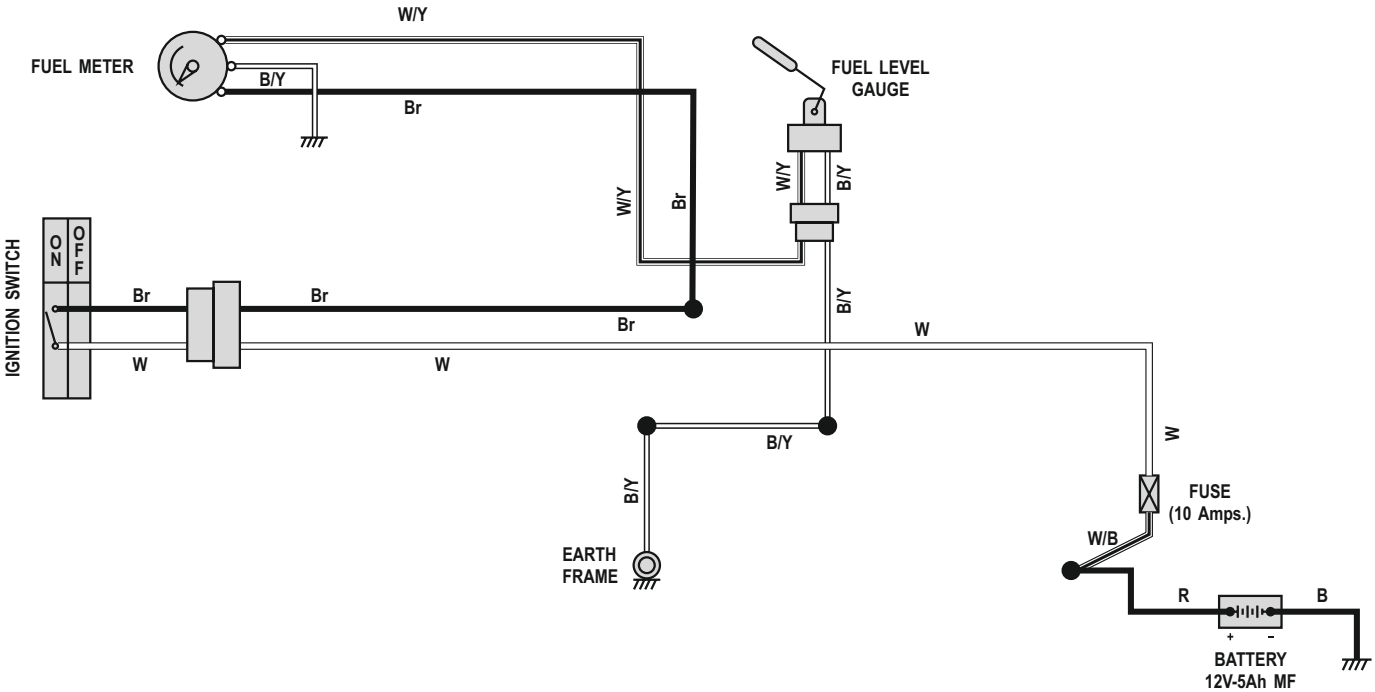


Electrical Circuit Diagrams

HORN CIRCUIT

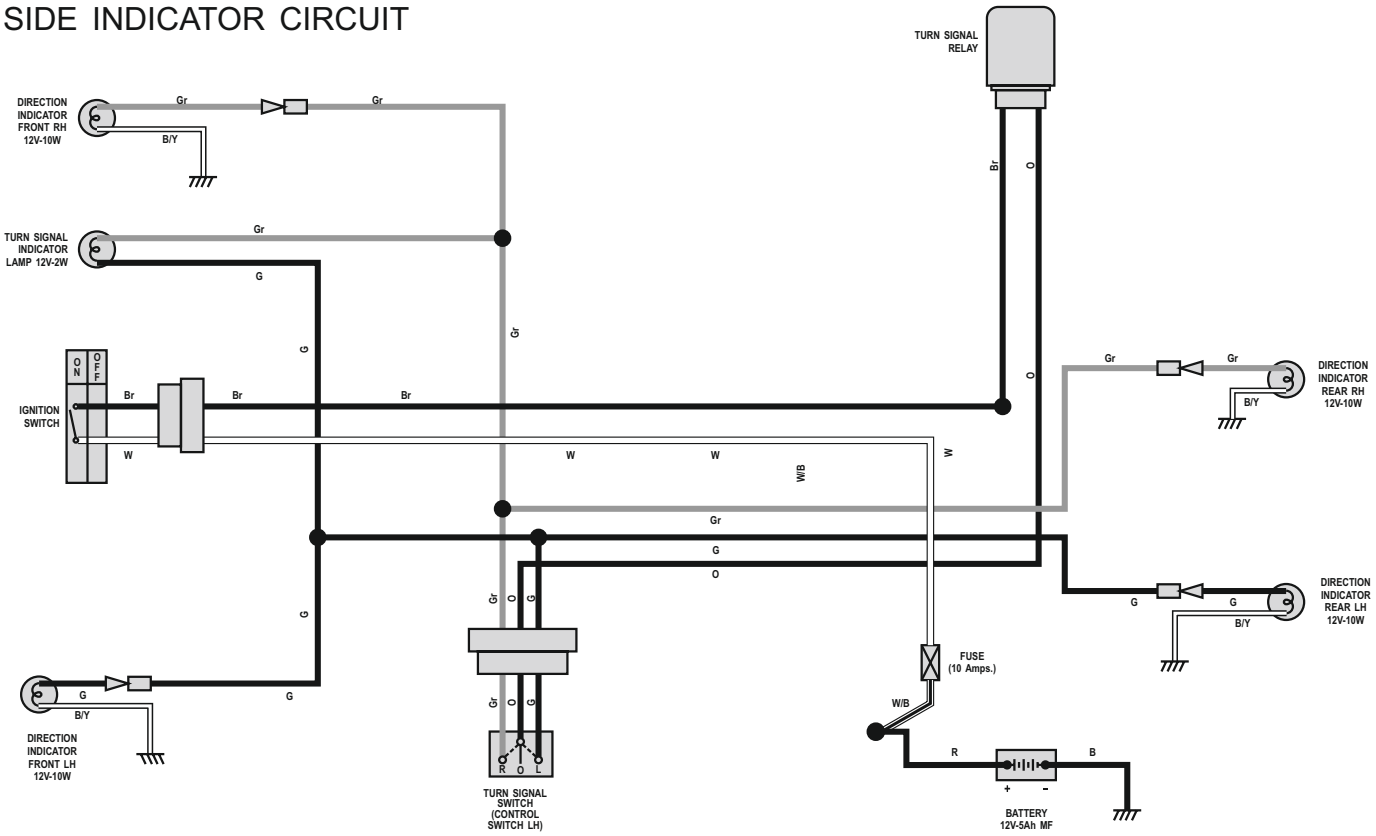


FUEL GAUGE CIRCUIT

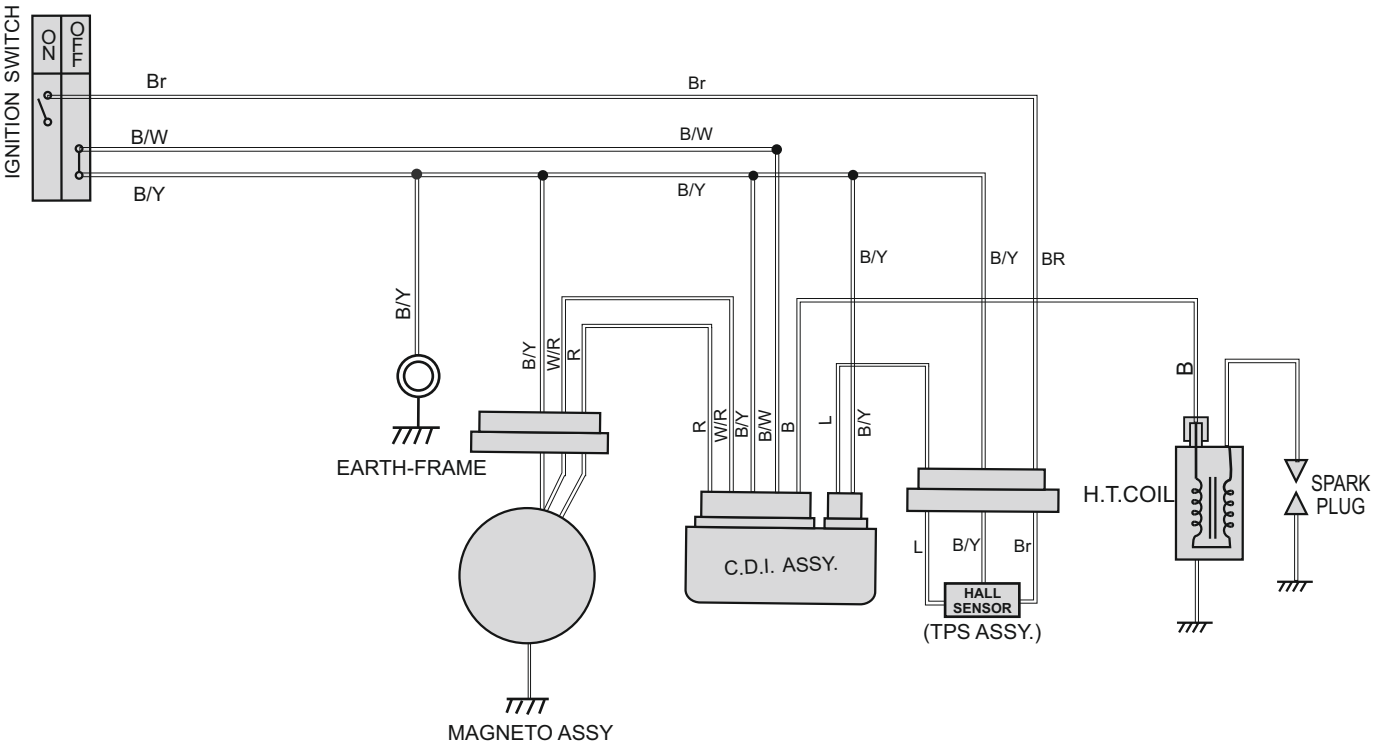


Electrical Circuit Diagrams

SIDE INDICATOR CIRCUIT



IGNITION CIRCUIT



Key Learning Points

- Understanding of Carburettor
- Understanding the CO Checking Procedure and Tune-up for Optimum Mileage
- Standard Operating Procedure

Boxer BM 150X

Key Features

Standard Operating Procedure

Features

BM 150X shares the same platform as Boxer BM 150 and has been designed keeping in mind, similar models that exist in some markets offering utility, features & looks of an on/off road motorcycle.

The key differences between the 2 models have been highlighted in detail as given below.

Appearance

Boxer BM 150

Boxer BM 150X

Other Key Differences

Component	Boxer BM 150 (existing)	Boxer BM 150X (New variant)	Advantages
Tyres	 Front : 3.00X17" Street Rear : 3.00X17" Street	 Front : 3.00X17" Semi knobby Rear : 100/90X17" Semi knobby	- Black alloy wheels & wider rear tyres - Black alloy wheels compliment off-road usage. - Semi knobby tyres providing good grip in muddy off-road conditions. - More number of grooves in the semi knobby tyres ensures traction in loose sand and mud thus providing good control.
Front Fender			- Split type front fender has been provided in BM 150X against single piece type in standard BM 150. - Raised front fender provides the utility of an off-roader, while the rear portion provides the necessary protection from splash, without compromising off-road utility

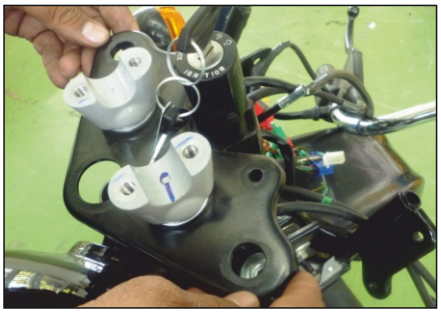
Features

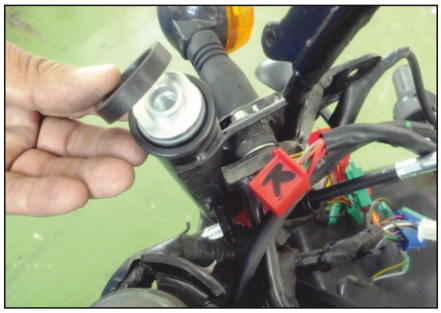
Component	Boxer BM 150 (existing)	Boxer BM 150X (New variant)	Advantages
Front Fork			- For complete protection against dirt, mud and dusty conditions, front fork has been provided with bellows. These bellows also provide a purposeful off-road look. *Note: Suspension strokes remains the same as in standard BM 150.*
Colour & Graphics			- Refreshed & appealing styling for differentiation to complement the looks of an off-roader.

SOP - Front Fork

Remove

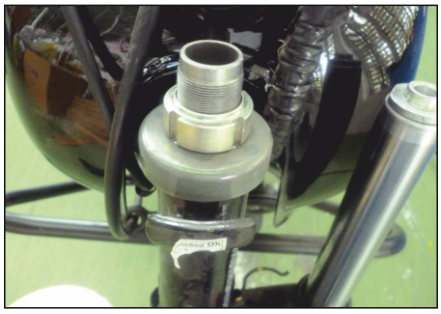
- Fork top bolts 2 Nos. & fork central nut.
- Take out upper bracket with ignition switch.





Remove

- 2 dust seal.
- Head light support bracket.



Remove

- Slotted nut.
- Take out 2 dust seal.

- Take out front fork assembly.

Remove

- Speedometer and front brake cable connection.

Remove

- Front Axle and Front wheel assembly.

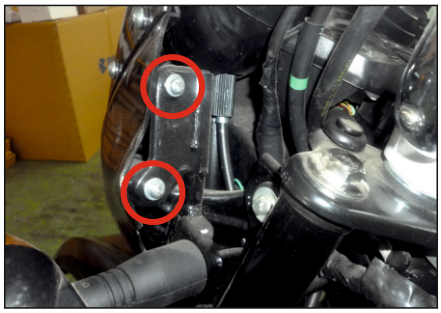
- Front mudguard bolts 4 nos.
- Take it out.

Remove

- Front fender mounting bolts.
- Take it out.

Remove

- Handle bar mounting bolts 4 nos.
- Take it out
- Lift handle bar assembly to right side.

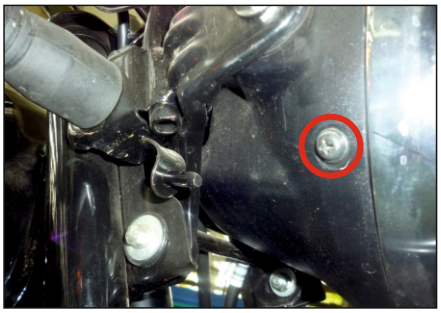


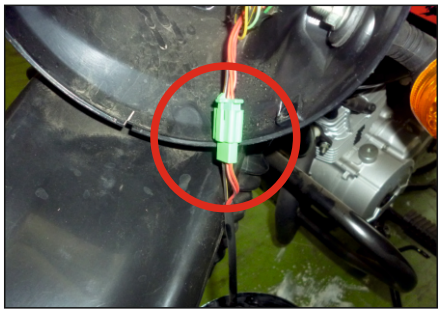
Remove

- 4 nos. screws of Head lamp cowling.
- Take it out.

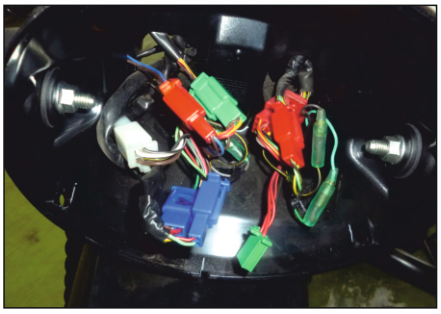
Remove

- Head lamp screws (LH & RH)



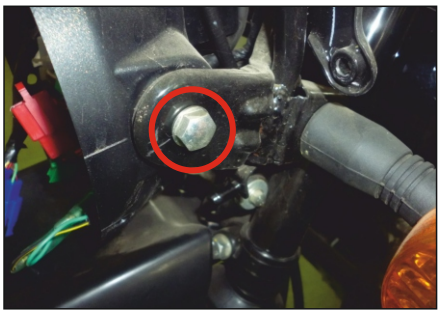


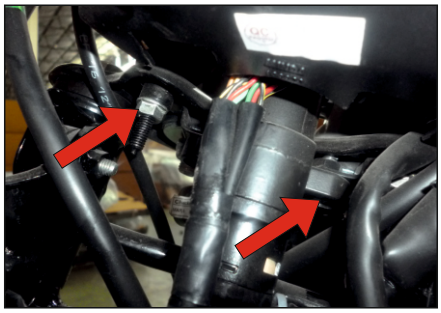
- Disconnect the all couplers.



Remove

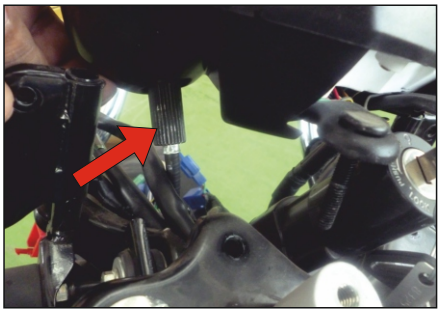
- Head lamp mounting bracket bolt (LH&RH) & take out head lamp assembly.





Remove

- Two bolts of speedometer (LH&RH).
- By disconnecting connection take it out.



BM 150 | BM 150X

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