Contents

***All these topics are similar with following Training Notes*

- *Pulsar DTS-i 180cc Training Note (Doc. No. 71110321)*
- *Pulsar DTS-i 180cc UG-4 Training Note (Doc. No. 71110834)*
- *Pulsar DTS-i 200cc Training Note (Doc. No. 71110369)*

For more details refer above training notes.

Chapter 1

I Read..... I Learn

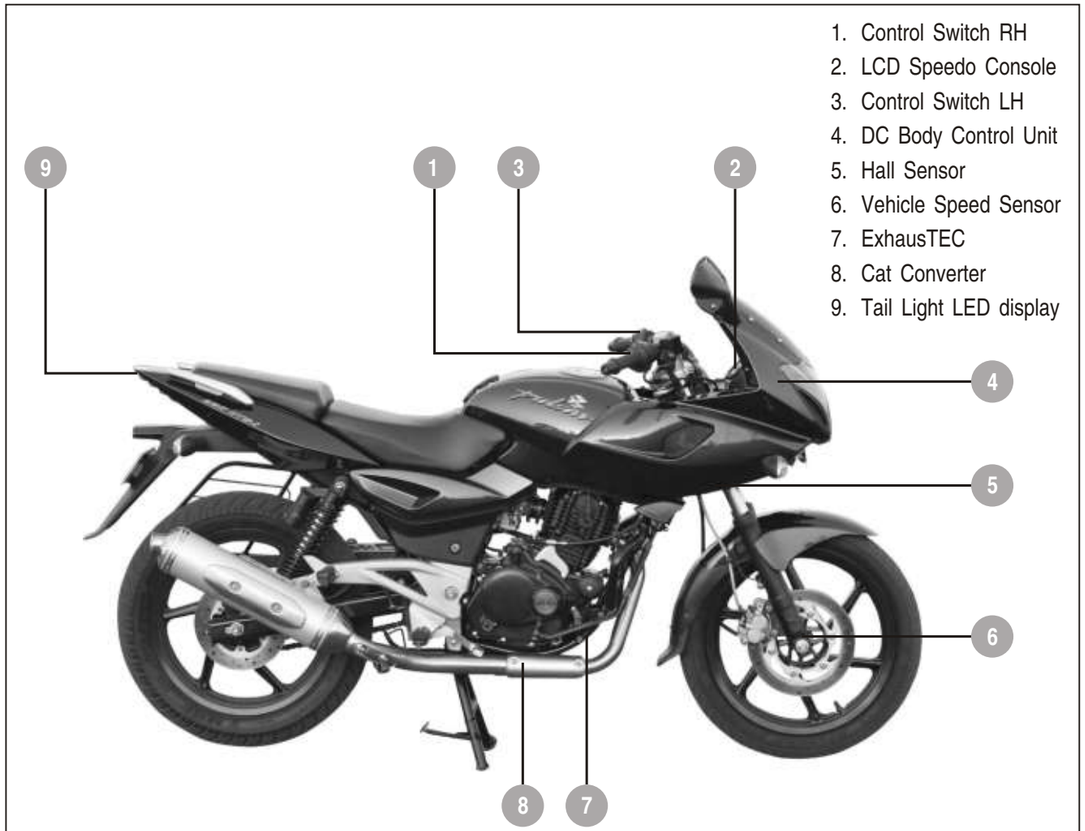
- Identification
- Salient Features
- Technical Specifications
- Read Before You Ride

Identification

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

Frame Number Location:
On RH side of steering tube. Alpha-Numeric 17 digits..

Engine Number Location:
On LH side crankcase near gear change lever. Alpha-Numeric 11 digits..



1. Control Switch RH
2. LCD Speedo Console
3. Control Switch LH
4. DC Body Control Unit
5. Hall Sensor
6. Vehicle Speed Sensor
7. ExhausTEC
8. Cat Converter
9. Tail Light LED display

Salient Features

STYLE

Features :

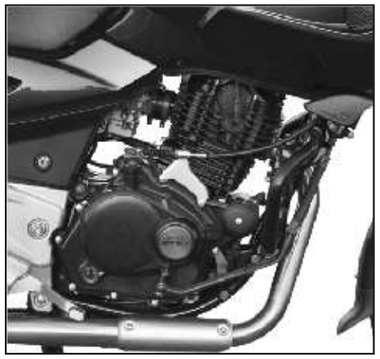
- Brawny masculine looks.
- Black styling.
- Naked chain.
- LED tail lamp.
- 2 piece grab rail.
- Thicker & Pinched clamped fork.
- Stylish split seats.
- 3D chiseled logo.
- Vertical stack twin projector headlamps.

Advantages :

- A bolt assertive stance, neat looks. brains, brawn & definitely male.

Benefit :

- Enhances the sporty & aggressive look of this aerodynamic machine.



POWER & PERFORMANCE

Features :

Engine

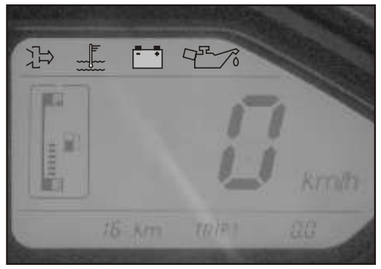
- 4 stroke, DTS-i 220 cc developing 21 ps.
- State of the art features at the heart of digital biking : Digital DC CDI unit, TRICS III, Largest venturi diameter CV carburettor.
- Controlled lubrication system.
- DC digital mapped ignition system.
- Bigger ExhausTEC.
- Bigger catalytic convertor.
- Auto choke.
- Engine oil cooler.

Advantages :

- Legendary DTS-i engine unmatched in industry.
- Optimum ignition timing for any engine rpm, better throttle response and reduced emissions.
- Ease in starting the bike at all conditions.
- Optimum transmission cooling system & smoother feel of gear shift.

Benefit :

- Crisp throttle response for highest engine output for varying load and speed conditions at different levels of acceleration. More power, More mileage, Ultimate refinement.
- Well refine engine & optimum performance with more power.



COMFORT & CONVENIENCE

Features :

- LCD speedo console.
- Self cancelling indicators.
- Thicker front fork & swing arm with needle roller bearing.
- DC ignition & lighting system.

Advantages :

- Easy to read & understand digital speedo, odometer display with two trip meters having resetting facility & warning signals.
- Switching OFF the indicators automatically after completion of turn.
- The telescopic front suspension with anti friction bush & supported with Nitrox shock absorber on rear.
- Easy starting.
- High penetrating, wide spread beam with no head light fluctuations even at lower engine rpm.

Benefit :

- Excellent riding pleasure.
- Feather touch self start.
- Safe night riding.

MANEUVERABILITY & STABILITY

Features :

- Wider & soft compound tubeless tyre.
- Beefy frame with longer wheel base.

Advantages :

- Tubeless tyre do not deflate suddenly in case of a puncture and help in reducing unsprung mass. Less rolling resistance and better road stability is ensured by soft compound.
- More strength with superior high-speed dynamics.

Benefit :

- High stability and good maneuverability.

SAFETY

Features :

- Front - Ventilated 260 mm disc brake.
- Rear - Ventilated 230 mm disc brake.
- 3000 combination ignition cum steering lock.

Advantages :

- Larger front disc brake ensures effective braking comes to an instant halt.
- The lock employing a twin track, pilfer proof key.

Benefit :

- Enhances safety & handling.
- Safe even when not being driven.

Technical Specifications

ENGINE & TRANSMISSION

Type		:	4 Stroke, Natural air cooled supported with an oil cooler.
No. of Cylinders		:	One
Bore		:	67.00 mm
Stroke		:	62.40 mm
Engine Displacement		:	220 cc
Compression Ratio		:	9.5 $\pm$ 0.5 : 1
Idling Speed		:	1400 $\pm$ 100 rpm
Maximum Net Power		:	21 Ps at 8500 rpm
Maximum Net Torque		:	19.12 Nm @ 7000 rpm
Ignition System		:	Microprocessor controlled digital CDI
Ignition Timing		:	10^0 BTDC @ 1000 rpm, 26^0 BTDC @ 2500 rpm
Fuel		:	Unleaded petrol
Fuel Feed		:	Carburetted
Spark Plug		:	Champion P-RG6HCC
Spark Plug Gap		:	0.8 to 0.9 mm
Lubrication		:	Wet sump, Forced
Starting		:	Electric start only
Clutch		:	Wet, multi disc type
Transmission		:	5 speed constant mesh
Primary Reduction		:	3.47 : 1 (66/19)
Gear Ratios			
	1^{st} Gear	:	24.736 : 1 (36/13)
	2^{nd} Gear	:	16.814 : 1 (32/17)
	3^{rd} Gear	:	12.335 : 1 (29/21)
	4^{th} Gear	:	9.677 : 1 (26/24)
	5^{th} Gear	:	7.939 : 1 (24/27)
Final Drive Ratio		:	2.57 : 1 (36/14)

CHASSIS & BODY

Frame Type		:	Double cradle type.
Suspension	Front	:	Telescopic (Stroke : 130mm)
	Rear	:	Trailing arm with coaxial gas assisted hydraulic shock absorbers & coil springs.
Brakes	Front & Rear	:	Hydraulically operated disc brake
Tyres (Tubeless)	Front	:	90 x 90 X 17, 49 P - high grip
	Rear	:	120 / 80 X 17, 61 P - high grip
Tyre Pressure		:	
Front (Solo & Pinion)		:	2.00 Kg/Cm^2 (28.0 Psi)
Rear (Solo)		:	2.00 Kg/Cm^2 (28.0 Psi)
Rear (Pillion)		:	2.25 Kg/Cm^2 (32.0 Psi)

Rims	Front	:	1.85 x 17
	Rear	:	2.50 x 17
Fuel Tank Capacity		:	15 liters

CONTROLS

Steering		:	Handle bar
Accelerator		:	Twist grip type on right side of handle bar
Gears		:	Left foot pedal operated
Clutch		:	Lever operated on left side of handle bar
Brakes	Front	:	Lever operated on rightside of handle bar
	Rear	:	Pedal operated by rightfoot.

ELECTRICAL

System	:	12 Volts (DC)
Battery	:	12V 9Ah, MF type
Head lamp	:	12V, 55/55 W H7
Pilot lamp	:	2 Nos. 12V, 5W each
Tail/stop lamp	:	LED/LED
Turn signal lamp	:	10 W
Turn signal pilot lamp	:	LED
Hi beam indicator lamp	:	LED
Neutral indicator lamp	:	LED
Speedometer lamp	:	LCD Display
Rear No. plate Lamp	:	5 W
Horn	:	12 V DC, 2 Nos.

DIMENSIONS

Length	:	2035 mm.
Width	:	750 mm.
Height	:	1165 mm.
Wheel base	:	1350 mm.
Turning circle radius	:	2500 mm.
Ground Clearance	:	165 mm. (Min)

WEIGHTS

Vehicle kerb weight	:	152 Kg.
Max. total weight	:	282 Kg.

PERFORMANCE

Climbing ability	:	28 % (16^0 Max.)

Notes

- *Values given above are nominal and for guidance only, 15% variation is allowed to cater for production and measurement variation.*
- *All dimensions are under unladen condition.*
- *Definitions of terminologies wherever applicable are as per relevant IS / ISO standards.*
- *Specifications are subject to change without notice.*

Read Before You Ride

Digital LCD Speedo Console

Function

To show display & analogue display of.....

- Warning Indicators : A digital display through icons of key maintenance factors -

1. **Air filter needs cleaning** →
2. **Engine over heating & rise in engine oil temperature** →
3. **Drop in battery voltage** →
4. **Drop in engine oil level** →

- **Tachometer :**

  A analogue display tachometer showing 0~12x1000 rpm display for understanding the engine rpm.

- **Fuel Gauge :**

  A vertical 12 bar equally segmented graphical indicator indicates fuel level inside the fuel tank.

- **Low Fuel Level Indicator :**

  A red colour LED bulb will glow continuously when the fuel level drops below 3.5 liters thus reminding the rider for refueling.

- **Easy to read Digital Speedo Display showing**
  - Vehicle speed - Km/Hr.
  - Odometer - Kms covered.
  - Resetting trip meter - for recording distance covered in trip with resetting provision.

- **Various Indicator Lamps Showing :**

  Side indicators, Neutral position, High beam 'ON' & Side stand 'ON' indicator functioning.

How to Operate

- Put 'ON' ignition key. All 4 icons on top will pop-up & will vanish away automatically. All other will show static display until the vehicle moves on road.
- Other displays are dynamic which functions individually for respective applications.

Benefits

- Upon error in either of 4 systems the respective icon will pop-up & will start blinking stating that the particular system needs maintenance / care / repair. Thus rider is cautioned & can get necessary repairs done.
- Easy to read speedo console displaying the digits.

Starting the Bike

Auto Choke

Function

- Enables easy starting in cold condition.

How to Operate

- Automatic. No manual operation.

Benefits

- Quick & easy engine starting even on a chilled morning.
- No pulling / pushing of choke lever.
- Ensure 100% choke operation every time engine needs.

Caution : Do not open throttle while starting.

Note: In cold condition, due to auto choke remaining 'ON' - for a minute or two, engine revs up. This is a normal phenomenon.

Soft Self Start

Function

- Cranks engine just by feather touch.

How to Operate

- Switch 'ON' ignition & kill switch. Put vehicle into neutral or declutch if in gear.
- Press self start button (0.2 seconds).

Do not open throttle (accelerator) while starting. Once engine starts do not rev up engine while vehicle is parked on stand.

Benefits

- Comfort, Hassle free starting.

Protection Against Over Cranking

Function

On starting the engine by self starter button, if engine doesn't start & starter button is operated for more than 3 times at one go, then, the power supply to starter motor is disabled & would be possible to crank only after a lapse of 20 seconds or you switch 'OFF' & then 'ON' the ignition key.

Benefits

- Protects starter motor.
- Safe guards battery from getting drained.
- Enhances battery life.

Side Stand Indicator

Feature

- It gives indication of side stand 'ON'.

How to Operate

- This operates when vehicle is put on side stand & ignition is 'ON'.

Visual Signal

- Side stand indicator red lamp in speedometer will glow, this is an indication that side stand is to be removed.

Immediately put off side stand while taking vehicle for a ride.

Benefits

- Great safety.
- Remind you to put off side stand before riding.

Side Indicator

Feature

- Car type self cancelling indicators.

Advantage

- No manual operation for putting 'OFF' the indicators. After completing the turn when the rider positions handle bar straight ahead the indicators are put 'OFF' automatically.

Benefits

- Convenience & comfort.

Head Light & DC Electrical System

Feature

- DC lighting system.
- DC ignition system.

Advantage

- Consistent engine performance.
- Constant bright beam from headlamp even at low speeds as against flickering light by AC system.

Benefits

- Convenience power, pick-up & mileage.
- More safety during night driving.

Do not run the bike without battery installed as this would cause damage to electrical components.

Disc Brakes (Front & Rear)

Feature

- Hydraulic disc brakes.

Advantage

- Most efficient & safe braking.

Benefits

- Stopping of vehicle at the desired destination with minimum effort.

Tubeless Tyre

Advantage

- Tubeless tyre do not deflate suddenly in case of puncture and helps in reducing unsprung mass.
  Less rolling resistance ensures complete road stability.

Benefits

- High stability.
- Ease of puncture repair. Can be done by self.
- Less maintenance.

Oil Cooler

Feature

- Oil cooled engine system through forced lubrication in addition to normal natural air cooling.

Advantage

- Optimum engine cooling and maintains lubricating oil viscosity even at higher temperature and extreme stress for optimum performance.

Benefits

- Effective lubrication helps to deliver the higher engine performance under every possible load condition.

Battery

Feature

- Low maintenance battery.

Advantage

- No frequent charging.
- No frequent top up.

Benefits

- Low maintenance cost.

Fuel Saving Tips

- Drive in economy zone i.e. driving at a constant speed @ 40~50 kmph in top gear.
- Avoid following :-
  - Sudden pick-up & frequent braking.
  - Needless & excessive idling.
  - Excessive high speed riding.
- Check & Refill tyre pressure once in a week.
- Fill petrol at reputed petrol pumps.
- Use only branded fuel.

Safe Riding Tips

- Always wear an appropriate helmet while driving.
- Never use mobile phones while driving.
- Always keep rear view mirrors clean.
- Use both, front & rear disc brakes simultaneously. Applying only one brake may cause loss of control & skidding or diving.
- Do not apply front brake when cornering or at turns.
- Familiarise yourself well with seating posture, starting, acceleration & braking of the vehicle.
- Use side indicators before turning.

Battery

How to Keep Battery Healthy

- Switch 'OFF' ignition when engine is not running.
- Do not press brake pedal / brake lever while running otherwise brake light would glow continuously & drain the battery.
- Do not switch 'ON' & 'OFF' ignition switch un-necessarily.
- Get your battery checked/charged during periodic services.

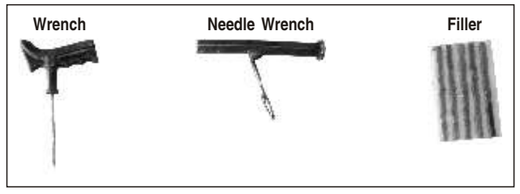
Monsoon Care

Fit and Finish Parts

- It is suggested to take proper care in heavy monsoon / high rainfall area. The appropriate surface preventive coat is to be applied to avoid rusting / poor surface finish on account of adverse atmospheric conditions.
- Clean and lubricate all the important parts as detailed in a Periodic Chart given in User's Guide.
- Do not obstruct engine & engine oil cooler by adding protection sheet from front otherwise engine cooling system gets affected.

Tubeless Tyre

Puncture Repair Method (Filler Type)



Tools & Material Used :

Repairing Tool (Wrench)

Used for placing or piercing the repair compound in place perfectly.

Repair Compound

Used for filling the puncture. It forms bond with the tyre compound after application.

Solution

Adhesive used for applying the filler material (Few compounds come with self adhesive material also).

Blades

Used for trimming the extra compound above puncture surface, outside the tyre.

Process :

Wrench

Step 1 : Identify the puncture hole and Pierce the wrench.

Repair Compound in Tyre

Step 2 : Pierce the repair compound into the puncture hole with needle type wrench & pull out the wrench.

Cut Excess Compound

Step 3 : Cut the excess compound with blade.

Care and Maintenance of Tyre

- Ensure correct tyre pressure.
- Rim should be free from dirt, rust and should not have any dents.
- Clean the tyre & rim interiors before placing tyre on rim.
- Lubricate tyre beads with mild soap solution before assembling & removing the tyre from rim.

Tyre Pressure	Front	: 2.00 Kg/Cm^2 (28 Psi)
	Rear Solo	: 2.00 Kg/Cm^2 (28 Psi)
	Rear Pillion	: 2.25 Kg/Cm^2 (32 Psi)

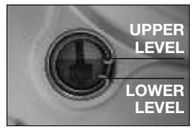
- Follow only recommended puncture repair procedure for removing puncture.
- As far as possible use tyre mounting machine for tyre fitting & removal of tyre from rim to avoid damage to alloy wheels.

Oil Cooler

What Additional Care should I Take?

Engine Oil : Check every week

- Park the vehicle on level surface on center stand to check the oil level.
- Always maintain engine oil level between the upper & lower level.
- Replace the oil in accordance with Periodic Maintenance Chart.



Recommended Oil Grade and Qty

Grade : SAE 20W50 of API 'SG/SJ'+JASO 'MA' grade or superior.
: Bajaj Genuine oil SAE 20W50 of API SL & JASO MA2

Quantity : Drain & Refill 1200 ml. Engine Overhaul 1300 ml.

Check For

- Any leakage in oil cooler pipe.
- Displaying of icons for low engine oil level / engine over heating.

Notes

Chapter 2 I Check... I Maintain

- PDI Checklist
- Periodic Maintenance & Lubrication
- Periodic Service SOP**
- Schedule Maintenance**
- Standard Operating Procedure**
- Special Tools

***All these topics are similar with following Training Notes*

- *Pulsar DTS-i 180cc Training Note (Doc. No. 71110321)*
- *Pulsar DTS-i 180cc UG-4 Training Note (Doc. No. 71110834)*
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For more details refer above training notes.

PDI Checklist

Frame No. | | | | | | | | | | | | | | | | | | **Dealer's Code** _____

Engine No. | | | | | | | | | | | | | | | | | | **Date of PDI** _____

Dealer's Name _____ **PDI done by** _____

Please ensure that following checks are carried out during PDI before delivery of vehicle.

To Check	Check For	✓ if OK or ✗ if NOT OK	Observations / Remarks
ENGINE:			
Engine Oil : SAE 20W50 API SJ or SL + JASO MA)	Oil level OK / Top up if required	☐	
	Oil Leakage if any - specify source of oil leakage	☐	
Idling rpm (warm up)	Check / adjust if required (1400 ± 100 rpm) with tachometer	☐	
Fasteners (Check Torque)	Engine mounting bolts (M8 2.2 Kgm, M10 : 2.4 Kgm)	☐	
	Silencer mounting bolt (3.5 ~ 4.0 Kgm)	☐	
	Drain bolt (2.5 Kgm)	☐	
FUEL SYSTEM			
Fuel Tank / Pipes	No leakage / Correct Fitment	☐	
Carburettor	No leakage / Correct Fitment	☐	
Fuel Cock	Smooth Operation	☐	
FRAME			
Tyre Pressure	2.00 Kg/Cm^2 (28.0 PSI)	☐	
	2.00 Kg/Cm^2 (28.0 PSI)	☐	
	2.25 Kg/Cm^2 (32.0 PSI)	☐	
CONTROLS			
Brakes	Front Brake lever free play (2~3 mm)	☐	
	Rear Brake Pedal free play (5~7 mm)	☐	
Throttle	Grip free play (2~3mm) & smooth operation	☐	
Clutch	Smooth operation, No juddering, Free play 2~3mm	☐	
Clutch Cable	Routing thru the bracket located near lower 'T' on vehicle RH side	☐	
Drive Chain	Slackness standard : 25~30 mm	☐	
SUSPENSION			
Front Fork	No leakage / Smooth working	☐	

To Check	Check For	✓ if OK or ✗ if NOT OK	Observations / Remarks
Rear Shock Absorber	Spring Adjuster notch position : 1st notch (Standard)	☐	
Steering	Smooth operation (No play / sticky movement)	☐	
Lock Operation	Steering cum Ignition, Rider Seat (Pillion + Rider) LH / RH side cover lock	☐	
Fasteners (Check Torque)	Front axle nut (8~9 Kgm)	☐	
	Rear axle nut (8~10 Kgm)	☐	
	Handle bar bolts (2~2.2Kgm)	☐	
	Steering cap bolt (5 Kgm)	☐	
	RSA mounting dome nut (3.5~4.0 Kgm)	☐	
	Swing arm pivot nut (8~10 Kgm)	☐	
	Front & Rear caliper install bolts (2.2~2.8 Kgm)	☐	
	Brake disc allen bolts (2.6~3.2 Kgm)	☐	
	Fork pinch clamp bolt (2.0~2.2 Kgm)	☐	
ELECTRICAL			
Battery	Charge status (12.5V open circuit terminal Voltage)	☐	
	HRD test (To show green light only)	☐	
	Tightness of battery terminals / cables. Petroleum jelly.	☐	
	Position of fuse box (2 nos.)	☐	
All Bulbs Working	Head light (both bulbs working).	☐	
	Headlight tail light illumination switch off after 3 seconds.	☐	
	Pilot lights (2), LED tail/stop, Side indicator, Speedometer LED	☐	
	Auto switch off of indicators (by moving handle bar)	☐	
	Turn pilot, High beam, Neutral indicator, Tell tale icons on Switch LH / RH	☐	
Switch Operation	LH & RH Control, Ignition, Front & Rear brake & Kill switch	☐	
Starter Motor	Proper working / Engagement	☐	
TEST DRIVE			
Starting	Cold Start & Warm Start	☐	
	Working of Auto choke (Click sound when ignition is turned 'ON'	☐	
	Idling Speed (warm Condition) (1400 ± 100 rpm)		
Drive ability	Throttle response	☐	
	Brakes (Front & Rear)	☐	
	Digital speedometer, Odometer, Trip meters, Fuel gauge & Fuel indicator red lamp	☐	

To Check	Check For	✓ if OK or ✗ if NOT OK	Observations / Remarks
CO % Check	CO should be 2% in engine warm condition at Idling rpm	☐	
Cleaning	Wash & Clean vehicle properly	☐	

IMPORTANT NOTE :

- Look for any external damages in transit : Please check, record & rectify send report with photos.
- Moisture / Oil collecting tube of Air filter should be properly fitted and routed correctly.
- Both LH & RH side spark plug caps must be tightly secured and ensure proper functioning of Spark Plugs.
- TPS on carburettor for functioning.

Notes

Periodic Maintenance & Lubrication Chart

Sr. No.	Operation		RECOMMENDED FREQUENCY							
		Servicing	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	750	5000	10000	15000	20000	25000	30000	
1.	Servicing		✓	✓	✓	✓	✓	✓	✓	1st - 750 Km / 30 Days 2nd onward @5000 km
2.	Engine idling speed / CO%	A	A	A	A	A	A	A	A	
3.	Valve tappet clearance	A	A	A	A	A	A	A	A	
4.	Engine oil* - Bajaj DTS-i 10000	R	R		R		R		R	Replace at 10000 km*
5.	Oil strainer / Centrifugal filter	CL	CL		CL		CL		CL	Clean at 10000 km
6.	Spark plugs functioning / Gap (If applicable)	C, A, R	C, A	C, A	C, A	R	C, A	C, A	R	Replace at every 15000 km
7.	Air cleaner element Clean / Replace **	CL, R	CL	CL	CL	R	CL	CL	R	Clean at every 5000 km, Replace at every 15000 km
8.	Air filter cover 'O' Ring	R					R			Replace at every 20000 km
9.	Fuel cock sediment bowl cleaning	CL		CL	CL	CL	CL	CL	CL	
10.	Carburettor float bowl cleaning	CL			CL		CL		CL	Clean at every 10000 km
11.	Carburettor rubber duct	C, R	C	C	C	C	R	C	C	Replace at every 20000 km
12.	Fuel pipes	C, R	C	C	C	C	R	C	C	Replace at every 20000 km
13.	Battery electrolyte level	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
14.	Clutch lever free play	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
15.	Throttle grip play	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
16.	Rear brake pedal free play	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
17.	Brake lining or pad wear	CL, R		CL	CL	CL, R	CL	CL	CL, R	Replace at every 10000 km
18.	Brake fluid level / Top up / Replace (If applicable)	C, A, R	C, A	C, A	C, A	C, A	C, A	C, A	R	Replace at every 30000 km
19.	Master cylinder cup and dust seal (If applicable)	R							R	Replace at every 30000 km
20.	Caliper piston seal and dust seal (If applicable)	R							R	Replace at every 30000 km
21.	Brake hose pipe (If applicable)	C, R							C, R	Replace at every 30000 km
22.	Brake cam & pedal pivot pin	L				L			L	
23.	Steering play	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
24.	Steering stem bearing	C, L, R			C,L,R		C,L,R		C,L,R	

Sr. No.	Operation		RECOMMENDED FREQUENCY							
		Servicing	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	750	5000	10000	15000	20000	25000	30000	
25.	All fasteners tightness	C, T	C, T	C, T	C, T	C, T	C, T	C, T	C, T	
26.	Rear sprocket fasteners	C, T	C, T	C, T	C, T	C, T	C, T	C, T	C, T	
27.	Rear wheel rubber shock damper	C, R			C, R		C, R		C, R	Replace at every 10000 km
28.	Silencer drain hole cleaning	CL	CL	CL	CL	CL	CL	CL	CL	Clean at every 5000 km
29.	Cylinder head de-carbonising, valve lapping & Replace valve oil seals	CL				CL			CL	Clean at every 15000 km
30.	Engine air breather tube	R					R			Replace at every 20000 km
31.	Drive chain slackness adjustment & lubrication	C, A, L	C,A,L	C,A,L	C,A,L	C,A,L	C,A,L	C,A,L	C,A,L	Lubricate at every 500 km, A- slackness whenever required
32.	Drive chain 'O' ring type (If applicable)	L			At every 500 km					
33.	Drive chain remove, clean, inspection & lubricate (O/H)	CL, L			CL, L		CL, L		CL, L	At every 10000 km
34.	Drive chain link lock	R			R		R		R	Replace at every 10000 km
35.	Wheel bearing (for non sealed bearing only)	C, L					C, L			At every 20000 km
36.	Tyre tread wear (replace if worn out till TWI limit)	C, R			C, R	C, R	C, R	C, R	C, R	At every 5000 km i.e. at every service after 2nd service
37.	Front fork oil	R					R			Replace at every 20000 km
38.	Auto choke, Thermal sensor (If applicable)	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	At every 5000 km
39.	TPS (If applicable)	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	At every 5000 km
40.	RSA - Check gas pressure (If applicable)	C, A					C, A			At every 20000 km
41.	Starter clutch bush kit for dry type (If applicable)	CL, R				CL, R			CL, R	
42.	Clutch switch cleaning (If applicable)	CL			CL		CL		CL	
43.	General lubrication	L	L	L	L	L	L	L	L	
44.	Swing arm pivot pin lubrication	L					L			Lubricate at every 20000 km
45.	Engine foundation silent bush (If applicable)	R				R			R	Replace at every 15000 km
46.	Lubrication of gear starter clutch	L		L	L	L	L	L	L	Lubricate at every 5,000 km
47.	Clutch, Accelerator cable	R								Replace at every two years

** : More frequent cleaning may be required when driving in dusty condition.

A - Adjust • C - Check • CL - Clean • L - Lubricate • T - Tighten • R - Replace

Note : Parts / Lubricants to be replaced as per Periodic Maintenance & Lubrication Chart are mandatory and the same are chargeable to customer.

Recommended Oil Grade, Replacement Frequency and Qty.

Grade : SAE 20W50 of API 'SG/SJ'+JASO 'MA' grade or superior.	Replacement frequency for this oil is every 5000 kms
: Bajaj Genuine oil SAE 20W50 of API SL & JASO MA2	Replacement frequency for this oil is every 10,000 kms
Quantity : Drain & Refill 1200 ml. Engine Overhaul 1300 ml.	

Special Tools

Details of Engine Related Special Tool

For carrying out repairs / overhauls, various special tools are required. Some are commonly shared with other models also.

Crankshaft Bearing Extractor

Drawing No : JC 1010 01

Application : To remove bearing from crankshaft

Sprocket Catcher

Drawing No : 37 10DH 36

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

Camshaft Big Bearing Puller

Drawing No : 37 10DH 32

Application : To remove bearing (Decompression assly side) of camshaft.

Camshaft Small Bearing Puller

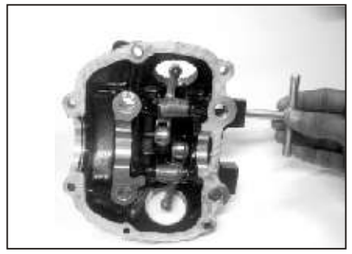
Drawing No : 37 10DH 31

Application : To remove small bearing of camshaft.

Rocker Pin Remover

Drawing No : 37 10DH 35

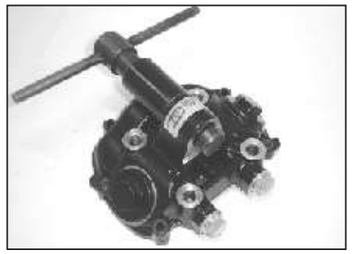
Application : To remove rocker pin from cylinder head.



Silent Bush Puller

Drawing No : 37 10DH 33

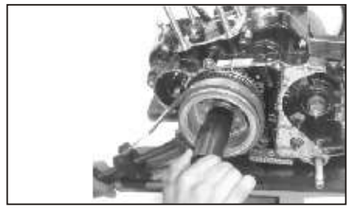
Application : To remove silent bush from cylinder head cover.



Rotor Puller with Butt Pin

Drawing No : 37 10DJ 32

Application : Used to pull out rotor from crankshaft assembly.



Primary Gear Holder

Drawing No : 37 10DJ 28

Application : Use to hold primary gear while loosening / tightening the clutch nut.

Balancer Gear Holder

Drawing No : 37 10DJ 63

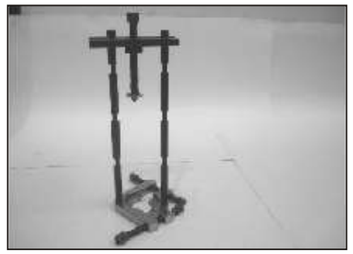
Application : Used to load the pre-tensioned scissor gears of Assly balancer Idler gear.

Special Nut

Drawing No : 37 10DJ 43

Application : Used to remove / fit of centrifugal oil filter nut.

Note : Existing tool can be used by reducing diameter to 25.9 + 0.1 mm



Bearing Race Extractor

Drawing No : 37 00DJ 01

Application : Used for removing the lower bearing race from 'T'

Bearing Extractor

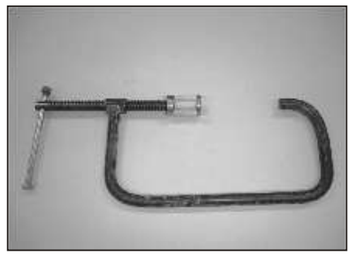
Drawing No : 37 10DJ 76

Application : Used to extract the input shaft brg. from crankcase LH.

Bearing Puller

Drawing No : 37 10DJ 77

Application : Used to pull out the bearing for body balancer from crankcase LH.

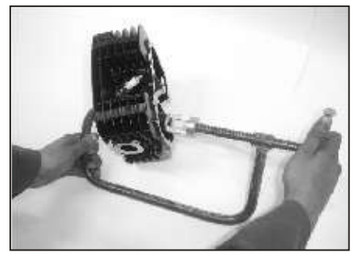


Adaptor and Valve Spring compressor

Adaptor Drawing No : 3710DJ78

Valve Spring Compressor Drawing No.: 37 1031 07

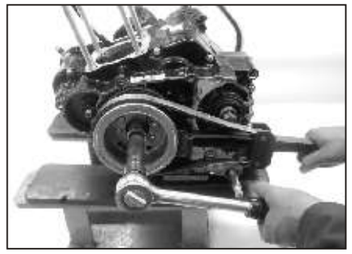
Application : Used for assembling / dismantling inlet, exhaust valves by compressing spring in cylinder head.



Rotor Holder

Drawing No : H6 0721 00

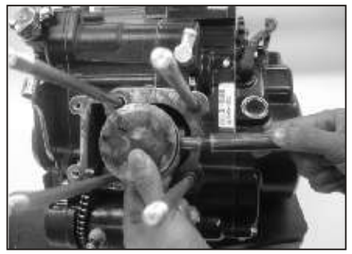
Application : To hold rotor while loosening bolt.



Drift

Drawing No : 74 9309 89

Application : To remove piston pin.



Notes

Details of Frame Related Exclusive Special Tool

For carrying out repairs / overhauls, these 4 new special tools were developed earlier exclusively for Pulsar DTS-i 200cc & Pulsar 220cc & can be used for Pulsar UG-4 also. Rest of the special tools required remains the same which were earlier used for Pulsar, Pulsar DTSi UG-II, Pulsar DTSi UG III.

Fork Oil Seal Fitment Punch :

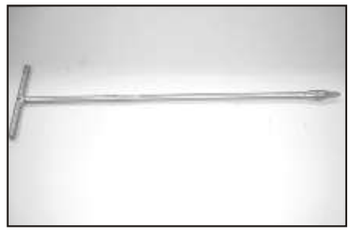
Drawing No:37 1740 03

Application : To fit fork oil seal on outer pipe.

Fork Inner & Outer Tube Extractor:

Drawing No:37 1740 04

Application : Used for removing front fork inner tube from outer tube.



Fork Holder :

Drawing No:37 1740 05

Application : Used for holding the fork piston from inside.

Needle Bearing Puller :

Drawing No:74 9309 93

Application : To remove and refit needle roller bearing from swing arm.

Details of Frame Related Other Common Special Tool

Special Tool Name	Special Tool No.	Application
Bearing Race Extractor	37 10DH 36	Used for removing the lower bearing race from 'T'
Bearing Driver Set	37 1030 61	Common bearing driver set for fitting and removing bearings from crankcase.
Rear Shock Absorber Adjuster	37 00DH 14	For adjusting the notch position of RSA to achieve hard or soft rear suspension.

Chapter 3 Fuel System

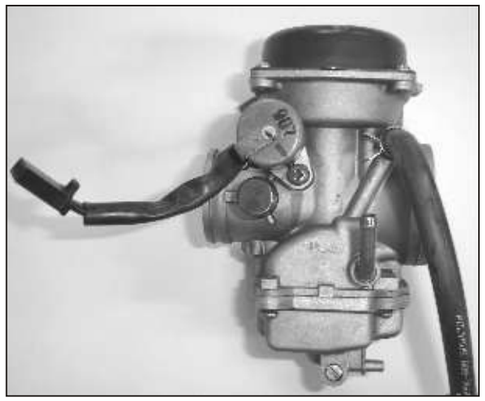
- Fuel Supply system**
- Dismantling / Assembling Fuel Cock**
- Working of Various CV Carburettor Circuits**
- Dos & Don'ts**
- Carburettor Specifications
- Tune-Up for Getting Optimum Mileage

***All these topics are similar with following Training Notes*

- *Pulsar DTS-i 180cc Training Note (Doc. No. 71110321)*
- *Pulsar DTS-i 180cc UG-4 Training Note (Doc. No. 71110834)*
- *Pulsar DTS-i 200cc Training Note (Doc. No. 71110369)*

For more details refer above training notes.

Carburettor Specifications



Make and Type	Ucal-Mikuni BS32, CV type
Identification No.	DK - U1 - UCD32
Idling Speed	1400 ±100
VC Screw setting	2.5 ± 2 turns out
Main Jet	115
Jet needle mark	115 (U5HERI)
Needle jet mark	6
Jet needle clip Position	2nd from top - 2.5 mm shim
Pilot Jet	12.5
Starter jet	Fixed type
Throttle valve	Fixed type
Choke	Auto choke

Auto Choke :

Auto Choke works automatically without any manual intervention for easy start of vehicle. The solenoid type auto choke is located on the carburetor & is supported with thermal sensor & intelligent CDI unit. This auto choke functions when the engine temperature is less than 30°C.

During cold starting when the engine temperature is less than 30°C, thermal sensor senses this temperature & communicates to CDI. The CDI then connects the electrical supply of solenoid unit to earth for circuit completion. This energize the solenoid unit coil & develops magnetic flux which lifts the choke plunger. This allows the air to flow into choke well to develop rich air fuel mixture. This rich mixture is supplied to engine. When the engine temperature reaches to 30°C thermal sensor gives signal to CDI unit & CDI unit disconnects the supply thereby closing the electrical supply going to solenoid unit. This deactivates the coil & the chock plunger comes down.

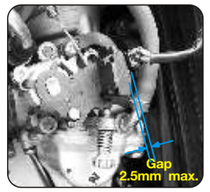
Advantage & Benefit :

Thus the system works automatically as per engine requirement ensuring hassle free starting of engine.

Tune-Up for Optimum Mileage

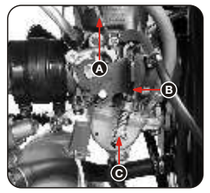
Reed Switch : Maintenance

Check throttle lever movement by rotating it with hand. It should not be sticky in operation and should return back it self on releasing.



- Magnet should not touch with reed switch.
- Gap between magnet & reed Switch should not be more than 2.5 mm.
- Movement of throttle lever with magnet assly and reed switch fitted should be free.

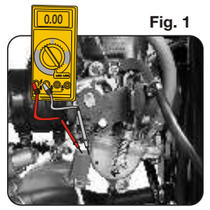
Reed Switch : Setting



- Accelerator cable play: 2-3 mm by adjusting the Adjuster (A).
- Protude stopper (B) of the throttle lever bracket must on idling screw (C) tip.

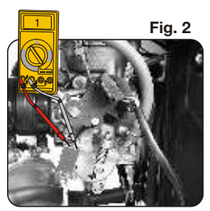
Reed Switch : Checking

Fig. 1



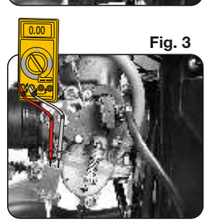
- Keep throttle at zero position. (Fig. 1).
- On connecting multi meter to reed switch coupler it should show continuity.

Fig. 2



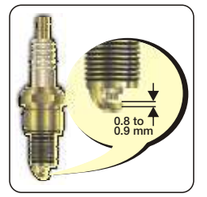
- When throttle is open and Reed Switch magnet crosses to straight edge of fix bracket of Reed Switch (Fig. 2) multi meter should show discontinuity.

Fig. 3



- On De-acceleration, when of Reed Switch magnet re-coinsides with straight edge of fix bracket of Reed Switch (Fig. 3) Multimeter should show continuity.

Engine Tune up



Spark Plug:
Champion P-RG6HCC

Spark Plug Gap :
0.8 to 0.9 mm.

Replace at Every :
15,000 Kms.

Air Filter:

- Clean at every 5,000 Kms.
- Replace at every 15,000 Kms.

Compression Pressure

- Std : 11.0~13.0 Kg/Cm^2
- Service Limit : 9.0~10.0 Kg/Cm^2

Tappet Clearance

- Inlet valve: 0.05 mm
- Exhaust valve: 0.1 mm

Carburattor

Idling: 1400±100 rpm

VC Screw Setting: 2.5 ± 1 turn.

CO %: 1.75~2.25 %

Other Mandatory Checks

a. Ensure no fuel leakage through fuel cock, fuel lines.
b. Ensure free rotation of both the wheels.
c. Ensure correct tyre pressure
   Front wheel: 2.00 Kg/Cm^2 (28.0 PSI)
   Rear wheel: 2.00 Kg/Cm^2 (28.0 PSI) Solo
   2.25 Kg/Cm^2 (32.0 PSI) Pillion
d. Set control cable free play:
   - Front brake lever 2 ~ 3 mm
   - Rear brake pedal 5 ~ 7 mm.

- Important Point to Remember**
- Removal of Engine from Frame**
- Dismantling of Engine**
- Dismantling Engine Sub Assembly**
- Service Data
- Tightening Torques
- Dos & Don'ts - Engine
- CAT Converter
- Controlled Lubrication System

***All these topics are similar with following Training Notes*

- *Pulsar DTS-i 180cc Training Note (Doc. No. 71110321)*
- *Pulsar DTS-i 180cc UG-4 Training Note (Doc. No. 71110834)*
- *Pulsar DTS-i 200cc Training Note (Doc. No. 71110369)*

For more details refer above training notes.

Service Data
Engine

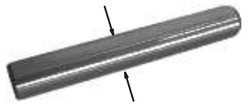
Compression Pressure

Standard Limit	Service Limit
11.0 ~ 13.0 kg/cm^2	9.0 ~ 10.0 kg/cm^2

Valve Clearance

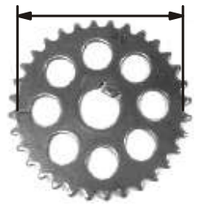
Standard Limit	Service Limit
Inlet 0.03 Exhaust 0.08	Inlet 0.05 Exhaust 0.10

Rocker Arm Shaft Diameter



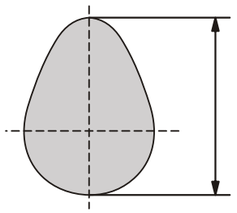
Standard Limit	Service Limit
7.994 ~ 8.0	7.98

Cam Sprocket Diameter



Standard Limit	Service Limit
61.165 ~ 61.285	61.1

Cam Height

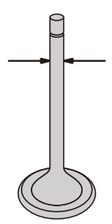


Standard Limit	Service Limit
Inlet 31.3 Exhaust 31.0	Inlet 31.1 Exhaust 30.8

Valve Spring Free Length

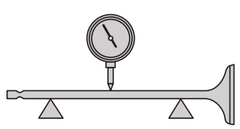
Standard Limit	Service Limit
Inner 38.6 Outer 41.4	Inner 37.6 Outer 40.4

Valve Stem Diameter



Standard Limit	Service Limit
Inlet 4.483 Exhaust 4.464	Inlet 4.463 Exhaust 4.444

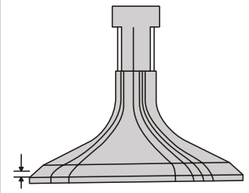
Valve Stem Bend



Standard Limit	Service Limit
TIR 0.01	TIR 0.03

pulsar DTS-i 220

Valve Head Thickness

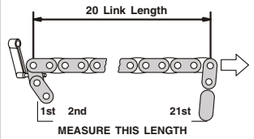


Standard Limit	Service Limit
Inlet 0.5 Exhaust 0.8	Inlet 0.3 Exhaust 0.6

Cylinder Head Warp

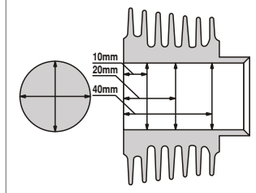
Standard Limit	Service Limit
---	0.05

Camshaft Chain Length 20 Links



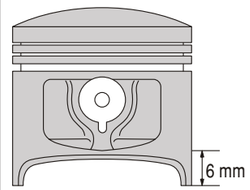
Standard Limit	Service Limit
127.0 ~ 127.20	128.0

Cylinder Inside Diameter



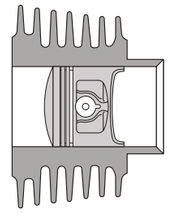
Standard Limit	Service Limit
67.010 ~ 67.018	67.020 ~ 67.028

Piston Diameter



Standard Limit	Service Limit
66.969 ~ 66.981	66.969 ~ 66.981

Piston / Cylinder Clearance



Standard Limit	Service Limit
0.030 ~ 0.050	---

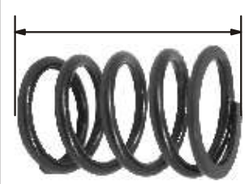
Piston Ring / Groove Clearance

Standard Limit	Service Limit
Top 0.03 ~ 0.07 Second 0.02 ~ 0.06	Top 0.17 Second 0.16

Piston Ring End Gap

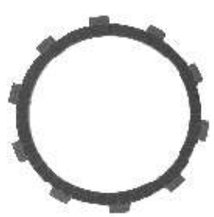
Standard Limit	Service Limit
Top 0.20 ~ 0.35 Second 0.50 ~ 0.65	Top 0.60 Second 0.90

Clutch Spring Free Length



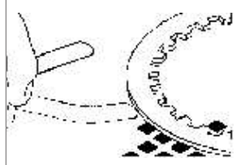
Standard Limit	Service Limit
30.0	29.0

Friction Plate Thickness



Standard Limit	Service Limit
2.9 ~ 3.1	2.75

Pressure Plate Warp



Standard Limit	Service Limit
0.2	0.3

Shift Drum Groove Width

Standard Limit	Service Limit
7.50	7.35

Shift Fork Guide Pin Diameter

Standard Limit	Service Limit
4.5	4.3

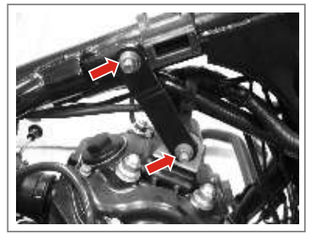
Crankshaft Run Out

Standard Limit	Service Limit
0.02 Max	0.05

ALL DIMENSIONS ARE IN MM

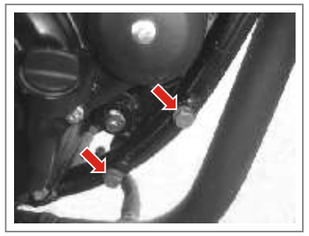
Notes

Cylinder Head Bracket Mtg. Bolts



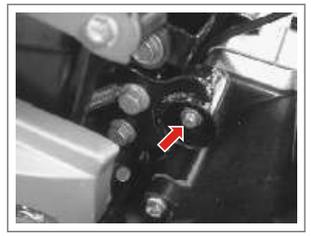
1.8 ~ 2.2 Kg.m

Engine Mounting Bolts



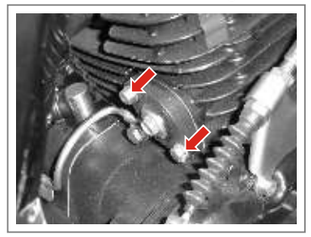
1.8 ~ 2.2 Kg.m

Engine Mounting Nuts



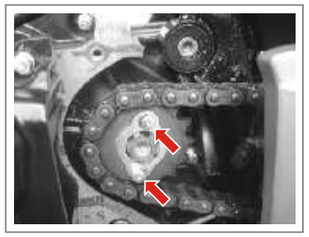
1.8 ~ 2.2 Kg.m

Chain Tensioner Mounting Bolts



1.1 Kg.m

Output Sprocket Bolts

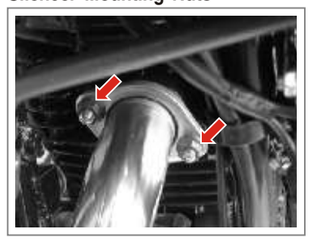


1.1 Kg.m (Loctite 243)

Silencer Mounting Bolt

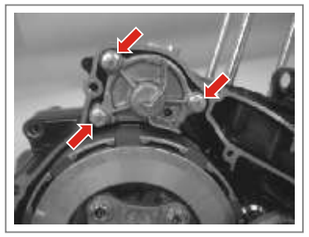
3.5 ~ 4.0 Kg.m

Silencer Mounting Nuts



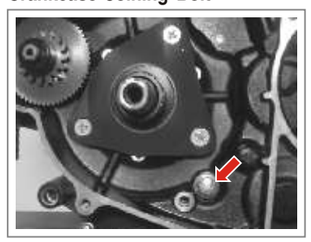
1.4 ~ 1.9 Kg.m

Balancer Gear Cover Bolts



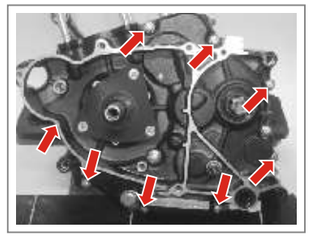
1.0 ~ 1.1 Kg.m (Loctite 243)

Crankcase Joining Bolt



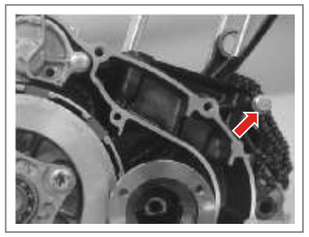
1.2 Kg.m (Loctite 243)

Crankcase Joining Bolts



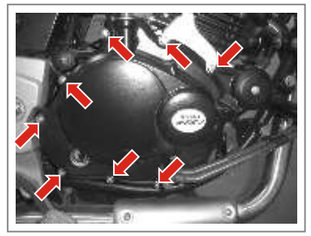
1.1 Kg.m (Loctite 243)

Crankcase Joining Bolt



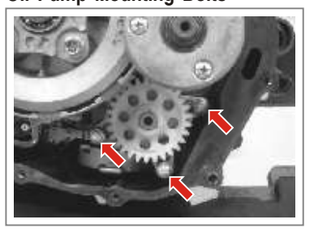
1.1 Kg.m (Loctite 243)

Clutch Cover Bolts



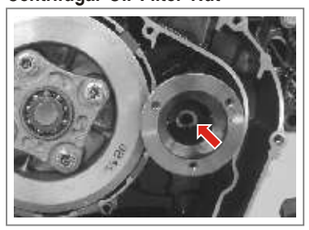
1.1 Kg.m

Oil Pump Mounting Bolts



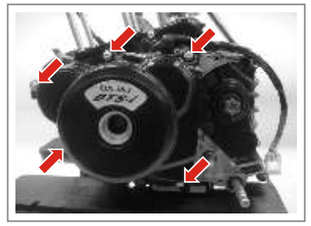
1.1 Kg.m (Loctite 243)

Centrifugal Oil Filter Nut



7.0 Kg.m

Rotor Cover Bolts

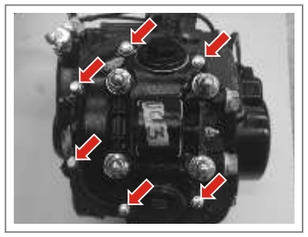


1.1 Kg.m

Clutch Nut (LH Threads)

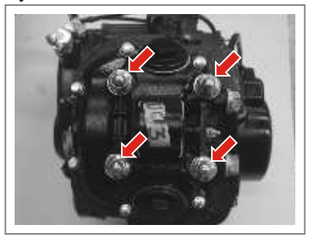
7.0 Kg.m

Cylinder Head Cover Bolts



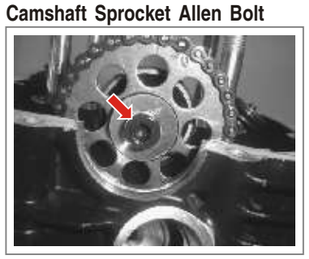
1.0 ~ 1.2 Kg.m

Cylinder Head Cover Nuts



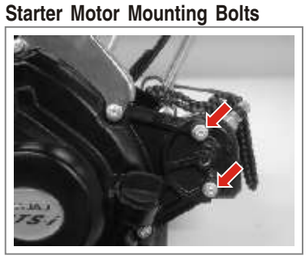
4.0 Kg.m

Camshaft Sprocket Allen Bolt



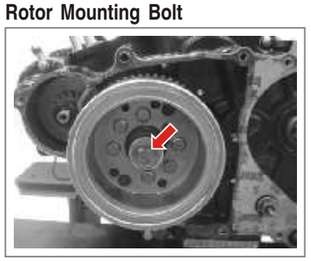
1.4 Kg.m (Loctite 243)

Starter Motor Mounting Bolts



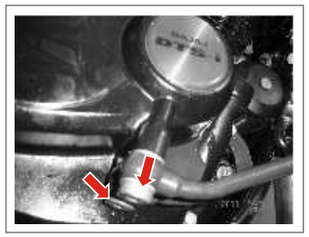
1.1 Kg.m

Rotor Mounting Bolt



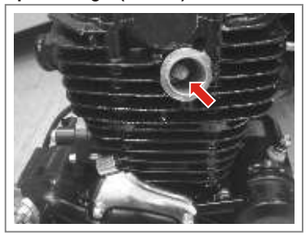
4.5 Kg.m

Oil Cooler Banjo Bolts



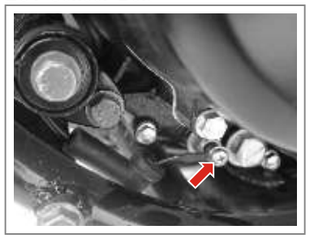
1.6 ~ 1.8 Kg.m

Spark Plugs (2 Nos.)



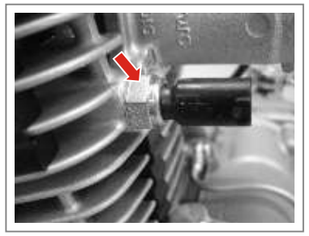
1.4 Kg.m

EOT Sensor Bolt



1.0 ~ 1.2 Kg.m

ET Sensor Bolt



1.2 ~ 1.4 Kg.m

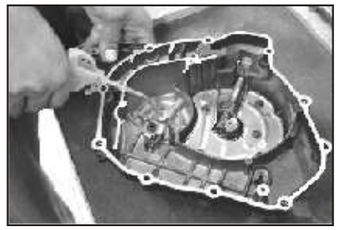
Oil Cooler Bracket Bolt

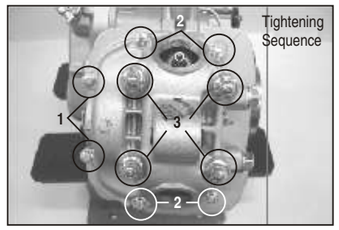
0.8 ~ 1.0 Kg.m

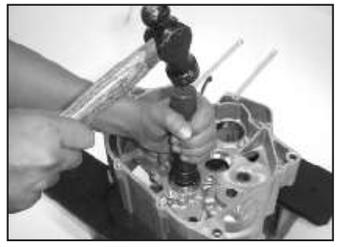
Oil Pressure Switch Bolt

1.2 ~ 1.5 Kg.m

✓ Dos







- Always set / adjust valve tappet clearance in engine cold condition.
  Intake : 0.0 5mm Exhaust : 0.10mm
- Always blow compressed air into clutch cover oil passage inner gallery in opposite to the direction of flow of oil
- Always tighten engine foundation bolts as per recommended sequence.
- Always replace engine oil by recommended quantity and quality of oil.

Recommended Oil Grade, Replacement Frequency and Qty.

Grade : SAE 20W50 of API 'SG/SJ'+JASO 'MA' grade or superior. Replacement every 5000 kms

: Bajaj Genuine oil SAE 20W50 of API SL & JASO MA2 Replacement every 10,000 kms

Quantity : Drain & Refill 1200 ml. Engine Overhaul 1300 ml.

- Always keep breather passage in clean condition & confirm it is clear by blowing compressed air. This will facilitate oil fumes to escape from engine crankcase otherwise clogged breather passage would lead to oozing out of oil through oil seals, 'O' Rings, Gaskets & Breather pipe.
- Whenever installing Spark Plugs, first screw by hand & then tighten to specified torque. This is to ensure proper fitment & avoid thread damage.
- Always use wire gauge for setting spark plug electrode gap.
- Use feeler gauge for setting valve clearance.
- Always follow loosening / tightening sequence of cylinder head bolts otherwise its surface may get warped.
- Always fit piston ring as per standard SOP & ensure their end position.
- Always rotate 'Gear Starter Clutch' in clockwise direction & pull it out immediately. Place plastic cap into one way clutch rollers for securing them their position.
- Tighten nut-bolts in criss-cross pattern for matching of mating surfaces to avoid distortion otherwise it leads to oil leakage.
- Always use Loctite to bolts, screws & nuts wherever recommend.
- Ensure crankcase / clutch cover oil passages are clear by pumping oil using a 'Oil Can'.
- Always replace circlips & locks of transmission gears, kick shaft assembly if removed. Circlips / locks tend to loose their spring tension once removed.
- While assembling cylinder block, always apply thin layer of engine oil to cylinder walls & piston rings for ease of fitment & to prevent dry running.
- Blow dust free / moisture free air in all the orifices, passages of the engine components & confirm that the oil passages are clear.
- Always apply oil during assembling engine components, particularly at friction prone area to avoid dry running.
- Confirm seating of circlip locks by rotating on their seat to avoid further consequences.
- While installing engine bearings always tap / pressed on the race which is taking seat to avoid damage to the bearing otherwise axial / radial clearance may increase.

✗ Don'ts

- Don't reuse 'O' rings, gaskets, Oil seals, Circlip locks as they use their strength & properties, once they are opened.
- Don't adjust spark plug electrode gap by hacksaw blade or with judgement of eye otherwise it will affect the engine performance.
- Don't adjust valve tappet clearance by hacksaw blade or with judgement of eye otherwise it will affect the engine performance.
- Don't set valve tappet clearance in engine hot condition.
- While removing rotor, don't rest the rotor holder & special tool against gear change lever.
- Don't over tighten cylinder head cover bolts.
- Don't fit 2nd piston ring 'UP' side 'Down'. This could lead to smokey exhaust & higher engine oil consumption.
- Don't wash engine bearings with water.
- Don't blow compressed air on engine bearing otherwise they will get permanently spoiled.

Notes

CAT Converter

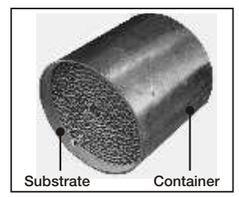
Function

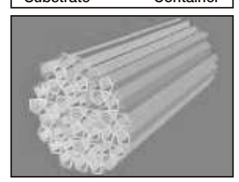
The air fuel mixture which is burnt inside the combustion chamber does not burn completely and give rise to harmful gases like carbon monoxide (CO); Hydrocarbon (HC) and Nitrogen oxide (NO_x). The cat converter converts these harmful gases into harm less gases. The catalyst is a material in the catalytic converter that causes chemical change without being a part of chemical reaction. In effect the catalyst encourages chemicals to react with each other.

Construction :

A catalytic converter is fitted inside the silencer body after the ExhausTEC port and consist of 4 main parts.

1. The substrate or the support which is of honeycomb ceramic type or metallic type.
2. The wash coat or intermediate layer such as alumina which provides a suitable surface for adhesion of the noble metals on to substrate surface and facilitate high thermal stability during the chemical reaction.
3. Catalyst material (noble material) like Palladium, Platinum, Rhodium in different proportions are (which is thin layer) deposited on the wash coat.
4. Housing or canning is the outer cover of the unit which can be interfaced with the vehicle exhaust system.



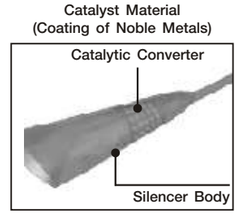


Working

When the engine starts the temperature at the exhaust port is around 500°C. The cat converter operates at 250 - 300°C. As the exhaust gases pass over the larger surface area coated with catalyst the chemical reaction takes place. The harmful gases are converted into harmless gases because of the chemical reaction.

CO + HC + No_x changes to Co_2 + H_2O + N

Thus it converts hazardous gases into harmless gases.



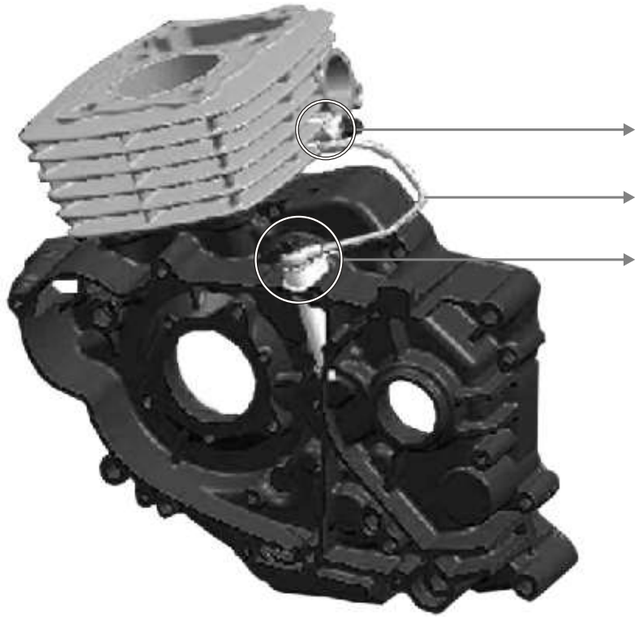
Gases Present	Converted into
• Carbon monoxide CO	- Carbon Dioxide CO_2
• Hydrocarbons HC	- Carbon DioxideCO_2 and Water Vapour H_2O
• Nitrogen Oxide No_x	- Nitrogen N_2

A catalytic converter may have two different catalysts. One catalyst treats the HC and CO The other treats No_x.The catalyst for HC and CO encourages the HC to unite with Oxygen to become H_2O (Water) and CO_2 (carbon dioxide). It also encourages the CO to unite with Oxygen to become Co_2 or Carbon Dioxide. This type of converter is an oxidizing converter, because it oxidizes the HC and CO (To oxidize means to combine with oxygen). The metals like Platinum and Palladium are used as oxidizing catalysts. The catalyst for the No_x works differently. It splits the oxygen from Nitrogen. The No_x becomes harmless Nitrogen & Oxygen. This type of converter is a reducing converter. The metal Rhodium reduces the NO_x to Nitrogen and Oxygen. The silencer with the catalytic converter has been matched & designed to give optimum engine performance & very good reduction in emission level to meet the emission norms.

Don'ts

1. Do not pour 2T oil / Engine oil into silencer.
2. Do not turn off the ignition key when the vehicle is in gear / running condition. Bring the engine into neutral & then put off the ignition.
3. In case of carburettor flooding / overflow immediately rectify the defect too rich mixture flowing down the cat converter might lower down its efficiency.

Controlled Lubrication System



The key changes for controlled lubrication with closed clutch are as mentioned below -

- Separate oil passage in Cylinder Block & Crankcase. Both passages are connected by banjo & pipe.
  - Passage in cylinder block supplies forced oil coming from oil pump.
  - Passage in the crankcase connects to Input shaft on magneto side end.
- Hole on the input shaft (clutch end) is converted to orifice of 1.5 mm diameter for controlled supply of oil to clutch.
- Clutch housing has been modified to closed type to retain required quantity of oil consistently.

Advantages

1. Smoother gear shift feel.
2. Controlled clutch lubrication.

pulsar DTS-i 220

Chapter 5

Frame & Suspension

- Service Limits
- Tightening Torques
- Tubeless Tyre & Puncture Repair Procedure**
- SOP for Tubeless Tyre Removal**
- Dismantling & Assembling Front Fork**
- Front Disc Brake**
- Dismantling & Assembling of Rear Disc Brake
- Dismantling & Assembling of Rear Cover Seat
- Dismantling & Assembling of Front Fairing and Head Light Assembly

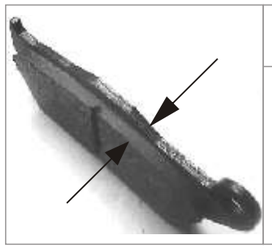
***All these topics are similar with following Training Notes*

- ***Pulsar DTS-i 180cc Training Note (Doc. No. 71110321)***
- ***Pulsar DTS-i 180cc UG-4 Training Note (Doc. No. 71110834)***
- ***Pulsar DTS-i 200cc Training Note (Doc. No. 71110369)***

For more details refer above training notes.

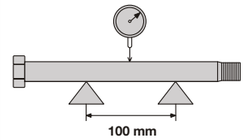
Frame

Brake Pad Thickness



Standard Limit	Service Limit
Front 7.4 Rear 6.5	Front 3.8 Rear 3.3

Axle Run Out



Standard Limit	Service Limit
TIR 0.1 or Less	TIR 0.2

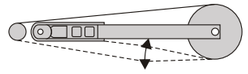
Axial Wheel Run Out with tyre

Standard Limit	Service Limit
TIR 1.0 or Less	TIR 2.0

Radial Wheel Run Out with Tyre

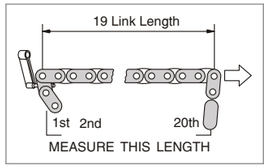
Standard Limit	Service Limit
TIR 0.8 or Less	TIR 2.0

Drive Chain Slack



Standard Limit	Service Limit
25 ~ 30	35 ~ 40

Drive Chain Length (19 Link)

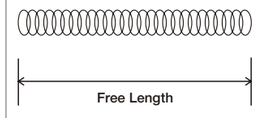


Standard Limit	Service Limit
301.6 ~ 302.1	307.0

Rear Sprocket Warp

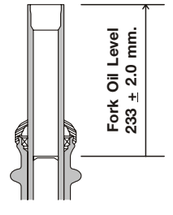
Standard Limit	Service Limit
0.4 or Less	0.5

Front Fork Spring Free Length



Standard Limit	Service Limit
373.0	368.0

Front Fork Oil



Oil Grade : SAE 10W20

Oil Quantity : Drain & Refill
295 ml

: Complete Overhaul
320 ± 2.5 ml

ALL DIMENSIONS ARE IN MM

Tightening Torques
Frame

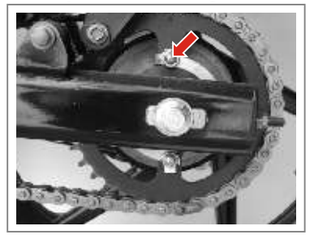
Front Axle Nut

8.0 ~ 10.0 Kg.m

Rear Axle Nut

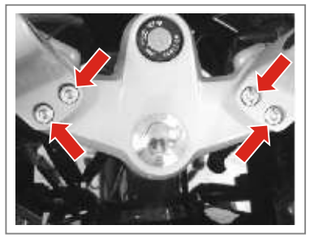
8.0 ~ 10.0 Kg.m

Rear Sprocket Mounting Nut



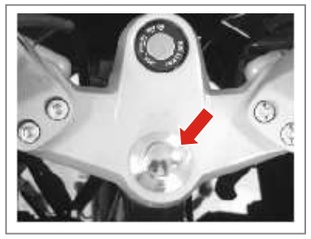
3.2 ~ 3.8 Kg.m (Loctite 243)

Handle Bar Holder Bolts



2.0 ~ 2.2 Kg.m

Steering Top Cap Bolt

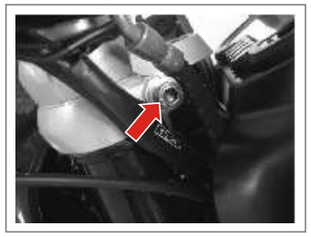


5.0 Kg.m

Steering Stem Nut (slotted)

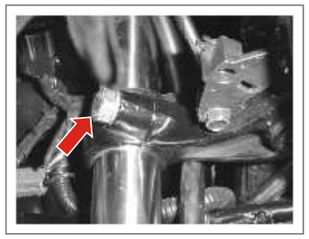
0.5 Kg.m

Upper Clamp Allen Bolt



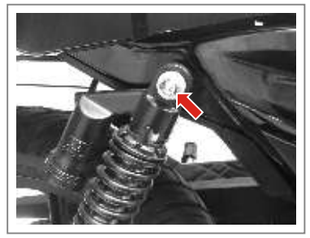
1.8 ~ 2.0 Kg.m

Lower Clamp Bolt



2.5 ~ 3.0 Kg.m

RSA Mounting Dome Nut

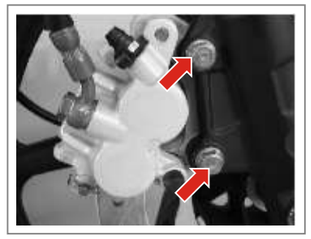


3.5 ~ 4.0 Kg.m

Swing Arm Pivot Nut

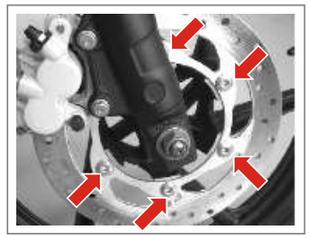
8.0 ~ 10.0 Kg.m

Front Caliper Install Bolts



2.2 ~ 2.8 Kg.m (Loctite 243)

Front Brake Disc Allen Bolts



2.6 ~ 3.2 (Loctite 243)

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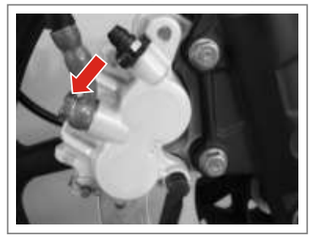
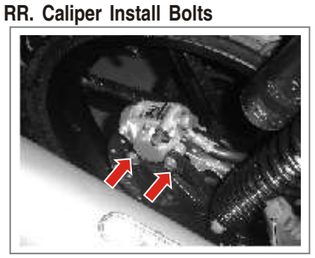
Front Brake Banjo Bolt Caliper



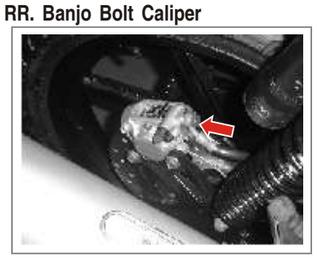
2.2 ~ 2.8 Kg.m

RR. Caliper Install Bolts



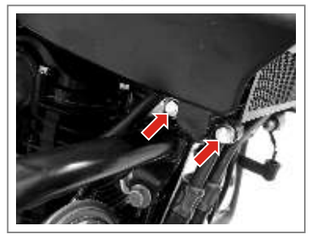
2.2 ~ 2.8 Kg.m (Loctite 243)

RR. Banjo Bolt Caliper



2.2 ~ 2.8 Kg.m

Oil Cooler Pipe Bolts



1.0 ~ 1.2 Kg.m

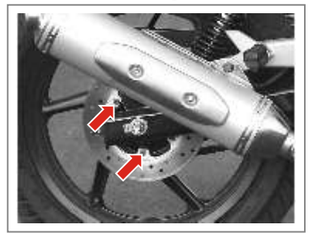
Oil Pressure Sensor

1.2 ~ 1.5 Kg.m

Fork Pinch Bolt

2.0 ~ 2.2 Kg.m

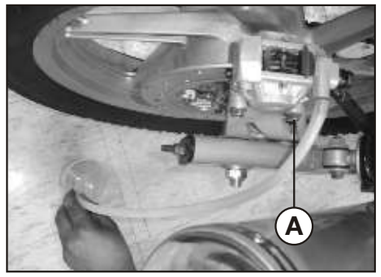
Rear Disc Mounting Bolts



0.9 ~ 1.1 Kg.m (Loctite 243)

Dismantling & Assembling of Rear Disc Brake

Rear Disc Brake Dismantling :



Remove :

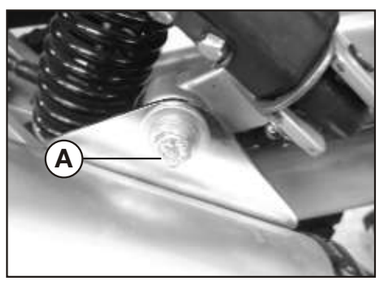
- Dust Cap
- Connect flexible tube to bleeding nipple.
- Loosen the bleeding nipple. (A)
- Collect the brake oil into container

Remove :

- Reservoir cap
- Rubber diaphragm
- Disconnect rear brake switch socket

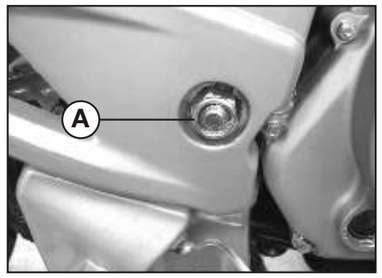
Remove :

- Circlip
- Hose pipe
- Collect the oil into measuring jar



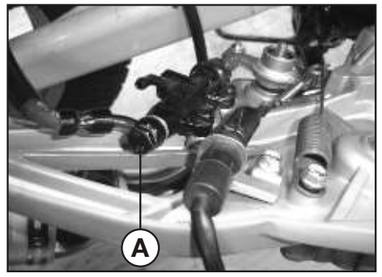
Remove :

- Silencer tail mounting bolt (A)



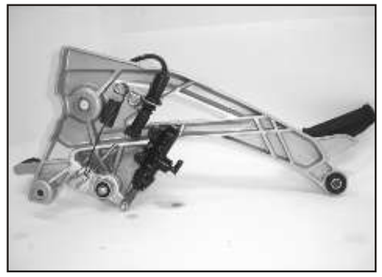
Remove :

- RH foot step nut (A)
- RH foot step lower mounting bolt
- RH foot step assly



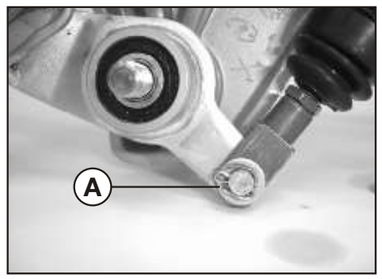
Remove :

- Banjo bolt (A)
- 2 copper platted Washer



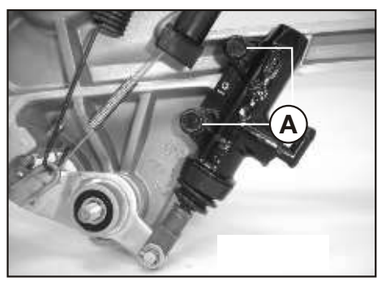
Remove :

- RH foot step assly with master cylinder



Remove :

- Bolts
- Split pin (A)
- Washer
- Pin



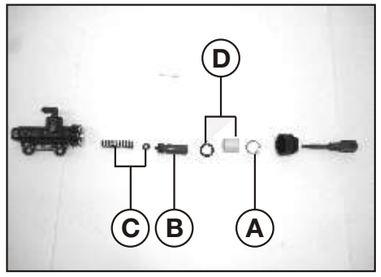
Remove :

- Master cylinder assly bolts (A)

Dismantling of Sub Assemblies : Master Cylinder

Remove :

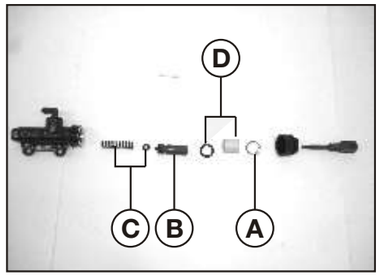
- Plunger
- Rubber cap



Remove :

- Circlip (A)
- Piston with oil seal (B)
- Spring with special copper washer (C)
- Bush and 'O' ring (D)

Assembling of Sub Assemblies : Master Cylinder

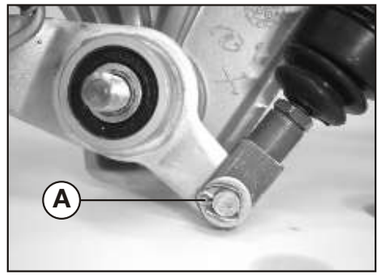


Fit :

- Spring with special copper washer (C)
- Piston with oil seal (B)
- 'O' ring & Bush (D)
- Circlip (A)

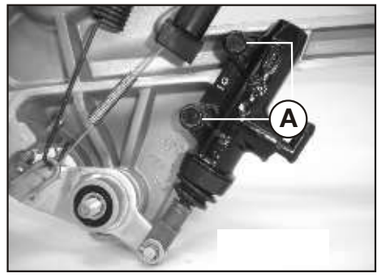
Fit :

- Rubber cap
- Plunger



Fit :

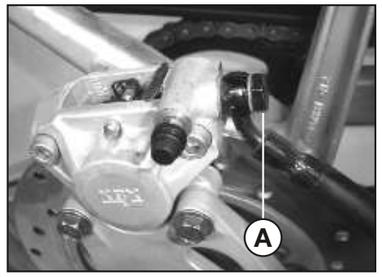
- Pin
- Washer
- Split Pin (A)



Fit :

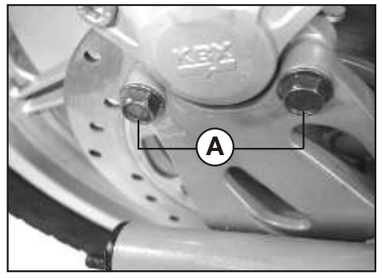
- 2 Bolts (A)

Caliper Assembly Removal



Remove :

- Banjo Bolt (A)
- 2 copper plated Washer

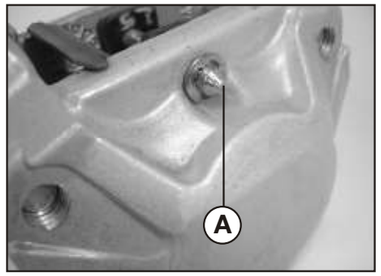


Remove :

- 2 Bolts

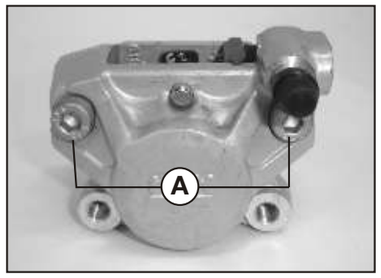
Remove :

- Caliper Assembly Complete



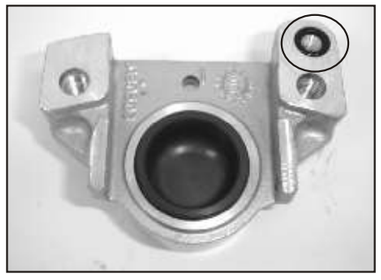
Remove :

- E- Clip (A)



Remove :

- 2 Allen Bolt (A)

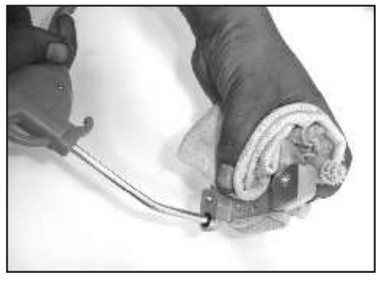


Remove :

- LH and RH caliper body with 'O' ring
- Spring Pad
- Brake lining / pads

Note :

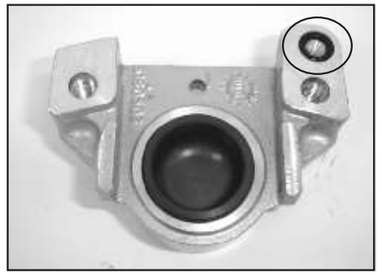
Remember to collect 'O' ring between caliper halves



Remove :

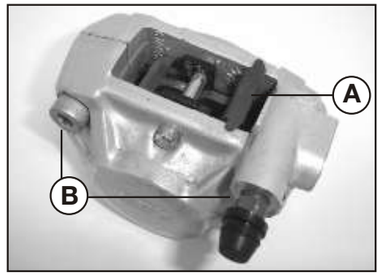
- Blow compressed air to remove piston from caliper body
- Piston
- 2 'O' rings

Fitment of Caliper Assembly :



Fit :

- 2 'O' rings
- Piston Assembly

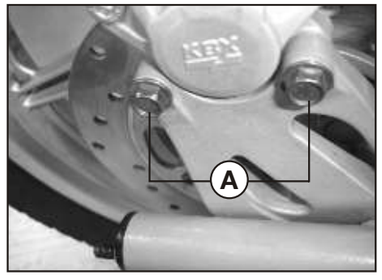


Fit :

- Disc Pad in RH caliper body
- Spring (A)
- Disc Pad in LH caliper body
- 2 Allen Bolts (B)

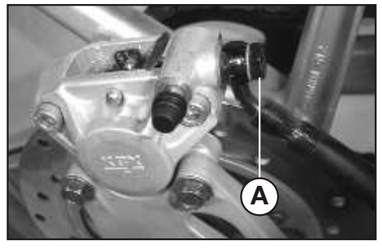
Fit :

- 'E' clip (A) on pin



Fit :

- Caliper assembly on disc
- 2 Bolts



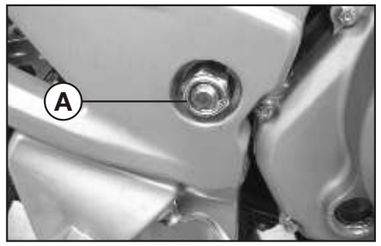
Fit :

- Banjo (A)
- 2 Copper plated washers

Fitment of Rear Master Cylinder Assly on Foot Step

Fit :

- Banjo (A)
- 2 Copper plated Washer
- Hose Pipe
- Circlip



Fit :

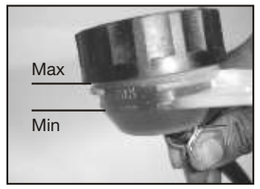
- RH Foot step assly
- Nut (A)
- RH foot step lower mounting bolt
- Silencer tail mounting washer and bolt

Fit :

- Fill oil in container

Note :

Fill upto the level as indicated.



Brake Bleeding :

Fit :

- Carry out brake bleeding to remove the trapped air
- Tighten bleeding nipple
- Dust cap

Fit :

- Top up the level in reservoir

Fit :

- Rubber diaphragm
- Cap

Air Bleeding of Disc Brake System :

- For air bleeding from Front / Rear Hydraulic brake system first top up the master cylinder / Reservoir with brake oil.
- Operate the brake lever / pedal slowly in order to get the oil filled in the hose and oil passages
- Connect transparent tube or syphon pump to the bleeder screw / nipple at caliper or syphon pump
- Operate the brake lever / pedal and keeping in pressed position loosens the bleeder screw so that some oil escapes with air bubbles.
- Keep on operating the brake lever / pedal till the air bubble escape out completely through bleeder screw, and top up the master cylinder / reservoir if required.
- Once the air escapes out from the hose pipe the brake lever / pedal meets resistance, which indicates completion of air bleeding
- After completing the bleeding, top up the master cylinder / reservoir up to the maximum level mark.

Note : *Syphon pump can be used for air bleeding effectively.*

Brake Fluid for Disc Brakes :

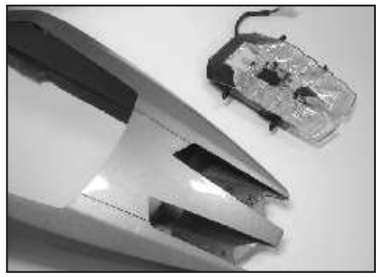
Always use only recommended brake fluid from sealed container to ensure durability of the system. Never reuse brake fluid removed from a system.

Important points on 2 wheeler disc brake system :

- Since front disc brake is more powerful than Rear Disc Brake, apply front and rear brake together gradually. Avoid braking during turning.
- Use only DOT 3 or DOT 4 brake fluid from a sealed container of recommended brands.
- Do not apply mineral oil for cleaning any brake parts. Use only brake fluid for cleaning the seals.
- Do not apply mineral based grease on bore, pistons and seals of master cylinder and caliper. Apply only recommended assembly fluid.
- Do not use cotton cloth to wipe cylinder bore, fibers of cloth will remain in cylinder bore surface.
- Ensure dust free condition during assembly.
- Do not polish friction disc with sand paper, as hard particles deposited in the lining may damage steel disc.
- While filling the reservoir after bleeding, ensure that drops or splashes do not remain on the painted surface or plastic surface, since brake fluid is corrosive.

Dismantling & Assembling of Rear Cover Seat

Assembling the Cover Seat



Fit :

- Tail lamp assembly into cover seat.
- 4 screws

Fit :

- The cover seat
- Grab rail bolts
- Cover seat bolts

Fit :

- Connect the coupler
- Route the wires and cables properly

Fit :

- Rider and pillion seat
- LH & RH pannel

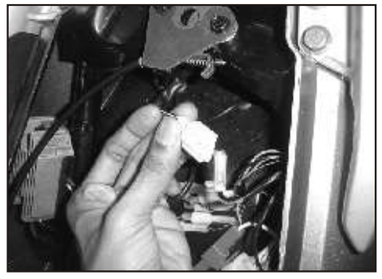
Dismantling the Cover Seat

Remove :

- LH Pannel
- RH Pannel

Remove :

- Pull the pillion seat lock cable
- Pillion seat
- Pull the rider seat lock cable
- Rider seat



Remove :

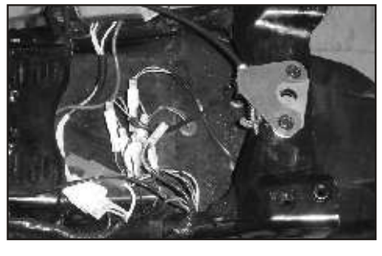
- Tail lamp connection

Note :

Ensure correct routine of wires and cables.

Remove :

- Grab rail bolts
- Cover seat bolts



Remove :

- Pull out the cover seat

Note :

Grip and pull out the cover seat firmly as bottom inside end is plugged into rubber grommet.

Remove :

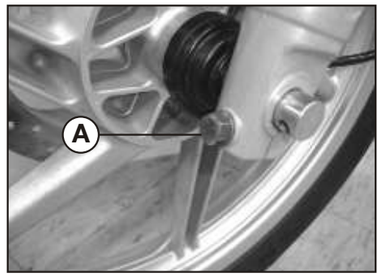
- 4 Screws
- Tail lamp assly

Fit :

- Inspect the tail lamp assly

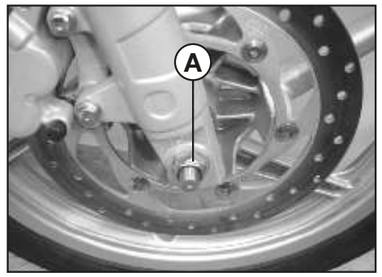
Dismantling & Assembling of Front Fairing & Head Light Assly

Fairing Removal



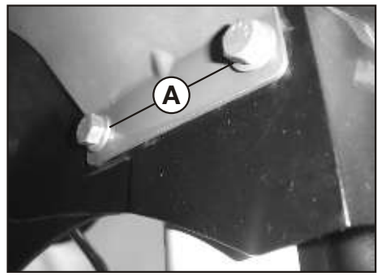
Remove :

- Loose pintch clamp bolt (A)



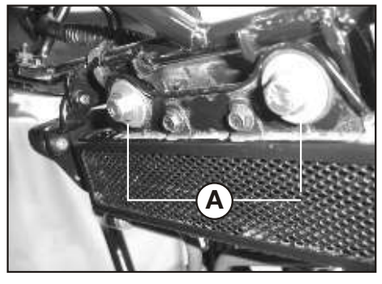
Remove :

- Axle Nut (A)
- Axle
- Speedo sensor coupler disconnect



Remove :

- Mudgaurd Bolts (A) 4 Nos
- Brace fender

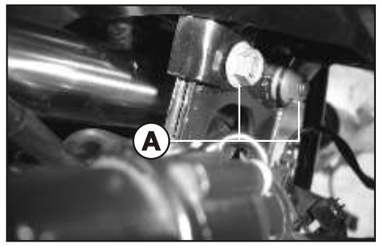


Remove :

- Oil cooler bolts (A)
- Sleeve 2 Nos
- Washer 2 Nos

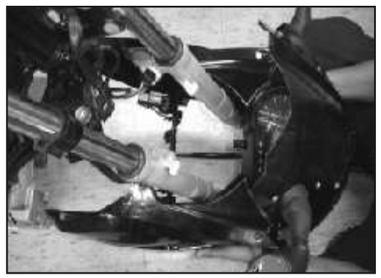
Disconnect :

- Wiring harness flexible clamp
- All harness couplers



Remove :

- 2 Bolts (A) of central mounting
- Nut 2 Nos
- Washer 2 Nos



Remove :

- Slide down the fairing assly down through the fork l;egs

Fairing Fitting :

Fit :

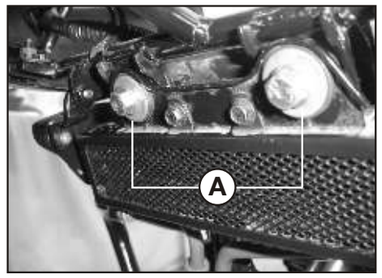
- Guide the fairing assly upward through the fork legs

Fit :

- Mounting the fairing on chassis central bracket
- Bolt 2 Nos
- Washer 2 Nos
- Nut 2 Nos

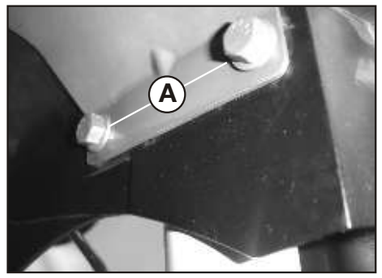
Fit :

- Connect all wiring harness couplers
- Route the harness properly
- Speedo sensor coupler



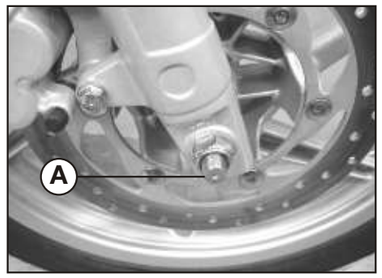
Fit :

- Sleeve 2 Nos
- Washer 2 Nos
- Oil cooler botls (A)



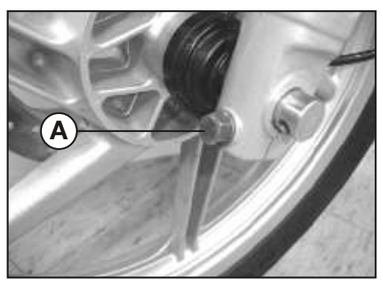
Fit :

- Brace fender
- Mudgaurd bolts (A) 4 Nos



Fit :

- Speedo sensor assly
- Axle
- Axle nut (A)



Fit :

- Pinch clamp bolt (A)

Chapter 6 Electrical

- Digital Twin Spark Ignition (DTS-i)
- DC Ignition System
- Maintenance Electrical
- Dos & Don'ts
- Electrical Circuit Diagrams

DTS-i & DC Ignition System

DTS-i (Digital Twin Spark Ignition) Ignition System

1. The most obvious feature is the Twin Spark Plug configuration of the Engine. The cylinder head has 2 spark plugs one on either side. The spark plugs are of the same Heat range (Champion P-RG6HCC (Resistive) and have similar electrode gaps. These also spark simultaneously, This has been done to improve the combustion process by reducing the time of combustion. The end results are low emissions, good fuel economy and good drive-ability
2. To enable the sparking of the 2 spark plugs, a intelligent CDI capable of handling this was developed. Further more, the ignition timing has been optimised to give the best output from engine (10^0 BTDC @ 1000 rpm, 26^0 BTDC @ 2500 rpm). To enable optimum ignition timing for part throttle loads and full throttle loads, there are separate ignition maps stored in the memory of the CDI. These are activated depending on the throttle opening and engine speed. The Digital CDI has a bit Microprocessor which handles all these inputs and gives out the required and correct spark advance.
3. To enable switching the required ignition maps, a magnetically operated need switch is incorporated on the carburettor throttle shaft and carburettor body. This is known as TRICS. Throttle Responsive Ignition Control System.
4. This engine has been extensively tuned for more Power and Torque.
5. The DTSi technology has enabled the Pulsar to meet 2010 norms without any Secondary air injection devices.

DC Ignition System

DC Ignition System works on DC electrical energy given by battery. The vehicle battery is always kept charged by the magneto through DC voltage regulator which is incorporated in the RR unit. Hence the role of battery is very important & you can not disconnect the battery from the vehicle. Disconnection of battery will disable the starting of the vehicle.

Advantage

- Constant & Consistent high intensity current is available even at low engine RPM which gives improved combustion and better startability.
- No head light voltage fluctuations even at lower rpm resulting into safe night ride.

Maintenance Electrical

Battery

Technical Specification :

• Type & Capacity	12V - 9 AH
• Specific gravity of electrolyte for initial filling of new battery	1.24 for use above 10^0C
• Specific gravity of electrolyte for initial filling of new battery	1.28 for use below 10^0C
• Initial charging duration	10 ~ 15 hrs
• Initial charging current	0.9 to 1 Amp

Initial Charging Procedure

1. Fill each cell with battery grade sulfuric acid of the correct Sp. gravity (1.24 at room temp. for use above 10^0C and 1.28 at room temp. for use below 10^0C).
2. Allow the battery to stand for 30 min. after filling.
3. Keep vent plugs open. Connect battery to charger and charge at 0.9 Amp.
4. Charge continuously for 10~15 hours taking Sp. gravity readings every hour. Fully charged condition is indicated when all cells are gassing freely and evenly and show no rise in specific gravity over 3 successive readings.
5. After charging push vent plugs strip firmly into place and wash off acid spillage with water and dry the battery.
6. Using the battery load tester confirm for good indication of state of charge of battery.

Checking the Specific Gravity

The charge condition of the individual cell can be checked by measuring Sp. gravity of electrolyte in that cell. The specific gravity of electrolyte can be checked by using Hydrometer having small diameter spout.

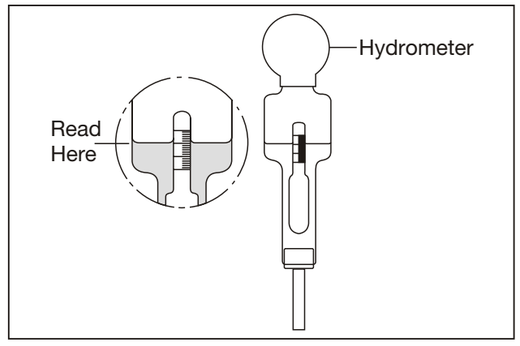
For measuring the Sp. gravity bring the electrolyte in the Hydrometer to eye level, and read the graduations on the float scale bordering on the lower meniscus (i.e. curved down portion of electrolyte surface) as shown in the figure. After charging is over, fit the filling caps strip, wash acid spillage with water. Dry the battery. Ensure terminals are clean.

Battery Installation:

Install the battery on vehicle as described below

a. Ensure that in all six cells the level of electrolyte is near the maximum level mark.

b. To clean and dry the surface wipe the top of the battery with a clean cloth. Install the battery inside the box provided on floor board. Fasten the battery firmly with bracket & allied fasteners.



c. Connect cables to the positive and negative terminals properly. Reverse connections will damage the charging system permanently.

d. Always connect “negative (earthling) terminal” at last.

e. Clean battery terminals and cable connections. Smear them with petroleum jelly to avoid corrosion.

g. Check that the battery cable connections are firm & cables do not rub against any metal components.

Battery Charging Procedure :

This is a M.F (Maintenance Free) battery. This battery is not having any exhaust tube instead it has a unique vent mechanism. The electrolyte level in this M.F. battery needs to be topped up with distilled water not exceeding the max level if found that the electrolyte level is below min level / dropped down. In case battery in discharged and needs to be charged using battery changed procedure is as follows :

- Remove battery from vehicle. Clean battery throughly
- Remove gang bar strip.
- Top up with distilled water to max level when electrolyte level is less than half of min & max level.
- Connect battery to charge & ensure respective terminal are connected properly.
- Set charging current at 0.9 A DC.
- Charge battery for 3/4 hrs., then check voltage and sp. gravity.
- Battery open circuit voltage should be > 12.5 volts (when disconnected from charger) & special gravity in all 6 cells should be 1.240. This is a confirmation check for a fully charged battery.
- Disconnect the battery from the charger.
- Fit gang bar plug firmly.
- Using the battery load tester confirm for good indication of state of charge of battery.
- Connect battery on to vehicle.
- Apply petroleum jelly on battery terminal.

Battery Maintenance

For the optimum performance and longer battery life the maintenance of battery is important.

a. Always keep the battery clean and dry.
b. Visually inspect the surface of the battery container. If there are any signs of cracking or electrolyte leakage from battery, replace the battery.

Never add acid or ordinary tap water for topping up since this will shorten Battery life.

Non Use Maintenance

When the vehicle is likely to remain off-road for longer, time then Non Use Maintenance should be carried out as follows otherwise the battery may get sulphated and permanently damaged.

a. Remove the battery from vehicle.
b. Maintain electrolyte at 'Upper Level'.
c. During off service period, battery should be charged once a month or if the battery DC voltage drops below 12.3 V.
d. Keep the battery fully charged.
e. Store the battery in cool, dry place.
f. Keep the battery away from rain, dew, moisture and direct sunlight.

Battery Sulphation

A sulphated battery is one which has been left standing in a discharged condition or undercharged to the point where abnormal lead sulphate has formed on the plates (Sulphate cells looks like white crystal like sugar). Where this happens, the chemical reactions within the battery are affected and results in loss of capacity. Mostly the causes of sulphation are as under:

a. Undercharging.
b. Standing in a partially or completely discharge condition for long time.
c. Low electrolyte level : If electrolyte level is permitted to fall below the top of the battery plates, then the exposed surfaces will harden and will become sulphated.
d. Adding acid : If acid is added to a cell in which sulphation exists the condition will be aggravated.
e. High specific gravity : If specific gravity is higher than the recommended value, then sulphation may occur.
f. High temp.: High temp. accelerates sulphation, particularly of an idle, partially discharged battery.

Voltage of the sulphated battery

Cells of the sulphated battery will show low specific gravity. Follow the procedure given below.

- Check voltage before charging.
- Charge for 2 hours
- Check voltage every hour. If voltage increases then continue charging. But if voltage does not increase, discontinue charging. Otherwise battery charger will get permanently damaged. If battery is not badly sulphated (i.e. voltage more than 9 volts), then battery can be revived by special treatment. In such case it is advisable to give sulphated battery to authorised dealer of battery manufacturer for necessary special treatment.

How to Determine Condition of Battery

Specific gravity check: - Whether battery is fully charged or partially charged, it will always show same "no load voltage" of 12 volts or more (unless battery cells are damaged due to sulphation etc). But specific gravity of the fully charged battery and partially charged battery will be different. Fully charged battery will show Sp. gravity of 1.240 while partially charged battery will show less specific gravity. Therefore, specific gravity check is very important to know condition of the battery.

Note : Use of battery load tester will give the

Switches :

Front Brake Light Switch Inspection :

- Turn ON the ignition switch.
- The brake Light LED Blank should get on when the front brake (Lever is pressed) is applied.
- If it does not, check the Front brake switch.

	Brown	Blue
Lever Pressed	●	●
Lever Released	●	●

Rear Brake Light Switch Timing Inspection :

- Turn ON the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal
- If it does not operate as specified, adjust the brake light switch or check the switch.

	Brown	Blue
Pedal Pressed	●	●
Pedal Released	●	●

Neutral Switch :

- The neutral switch will be in ON position only when the engine is in neutral.
- The neutral light will not glow when vehicle is in gear.

	Light Green	Ground
'ON' (Vehicle in neutral)	●	●
'OFF' (Vehicle in gear)	●	●

Ignition Switch :

	White	Brown
'OFF'	●	●
'OFF'	●	●

Stator Plate Coils Inspection :

- Disconnect stator plate coupler
- Set multi meter on ohm range. (Ohm Meter)

Pickup Coil Resistance :

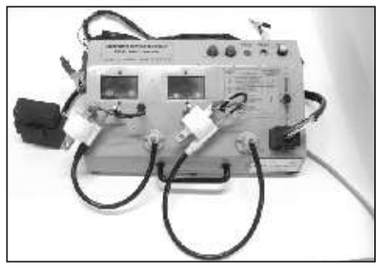
Range	Connections		Reading
2 K Ω	Meter +ve	Meter -ve	365 ± 20 Ohm
	White/Red	Green/White	

Stator Assembly : (3 phased stator coil)

Range	Connections		Reading
200 Ohms	Meter +ve	Meter -ve	0.9 ~ 1.1 Ohm @ 25^0 C
	Yellow	Yellow	

SOP :

- Switch OFF vehicle.
- Disconnect stator plate coupler
- Connect multimeter between yellow wires.
- Check resistance values between :
  Y1 & Y2
  Y2 & Y3
  Y1 & Y3



H.T. Coils : (Inspection Using Multimeter)

- Measure the primary winding resistance as follows
- Connect the Multi meter probe between primary input terminal and core of the H.T. coil.
- Measure the secondary winding resistance as follows
- Remove the plug cap by turning it counter clockwise.
- Connect the Multi meter probe between the H.T. cable and core of the H.T. coil.
- Measure primary winding resistance.
- Measure secondary winding resistance.
- If the values does not match as per the values mentioned below, replace the coil.

Primary Winding	0.3 to 0.5 Ohm
Secondary Winding	4.5 to 6.5 K Ohm

- 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 known.
- Visually inspect the secondary winding lead.
- If it shows any damage, replace the coil.

Fuse :

Main Fuse Inspection (Capacity = 10 Amp) / Secondary Fuse Inspection (Capacity = 5 Amp)

- Inspect the fuse element
- If it is blown out, replace the fuse.
- If a fuse fails during operation, the electrical system to determine the cause, & then replace it with a new fuse of proper amperage.

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

Relay :

Solenoid Relay (Inspection Using Multi meter)

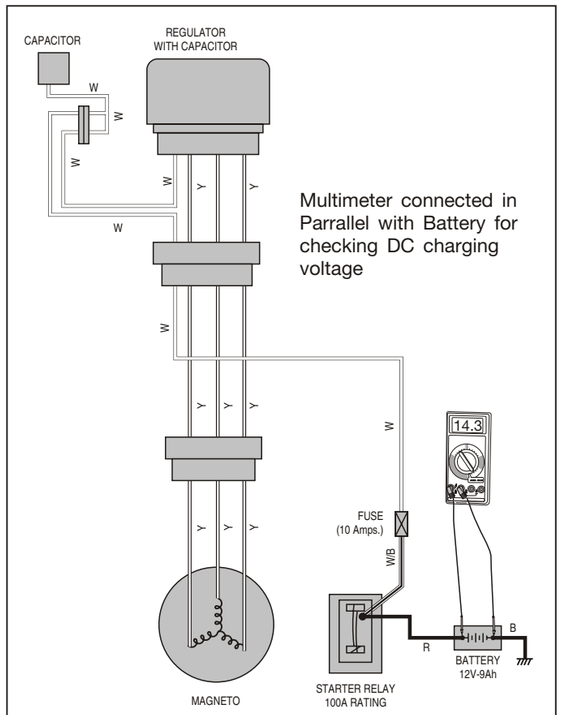
Coil Resistance	Meter +ve	Meter -ve	Reading
X 200 Ohm	Red/Yellow	Black	3.9 ± 0.5 Ohm

Clutch Switch :

The clutch switch has 3 wires and it has contact configuration of this vehicle is not having interlock relay Instead its working is taken care of by clutch switches.

	Meter -ve	Meter +ve	Black/Yellow
Both ON & OFF Clutch Lever Released		0.3 ~ 0.7 V	
ON Clutch Lever Pressed	●	●——●	

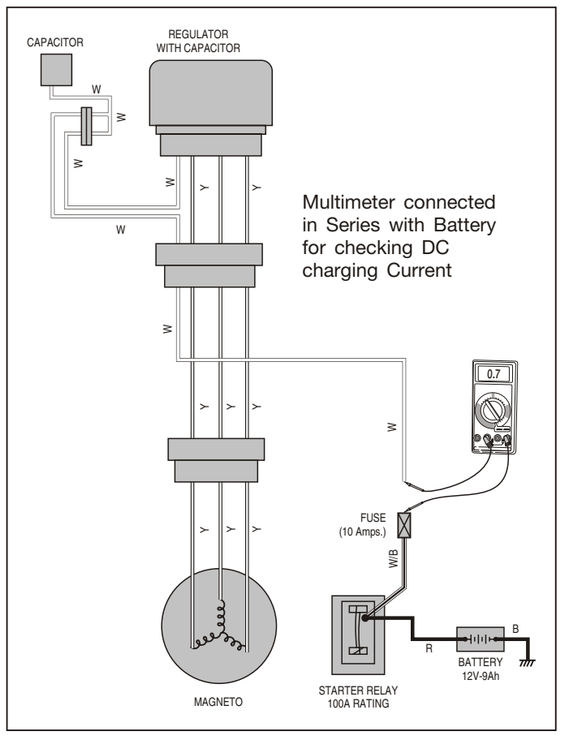
Check this parameter in Diode mode of multi meter.



DC Charging Voltage Measurement : (Use fully charged battery while measuring)

To measure the DC voltage; set the meter at 20VDC range. Connect the meter +ve lead to white from RR unit and meter -ve lead to ground. Start the engine and set it at 4000±25 RPM. Measure the voltage with and without headlight switch to the ON position. Stop the engine disconnect the meter leads.

Meter Range	Specification at 4000±25 RPM
DC 20 Volt	14.3 to 14.7 V



Battery DC Charging current : (Use fully charged battery ensuring battery voltage = 12.5 ± 0.3 V before measuring)

To measure the DC charging current, set the meter at 20ADC. Connect meter+ve lead to White/black lead from RR Unit and meter -ve lead to battery +ve lead.

Start the engine and set it at 4000±25 RPM. Measure the DC charging current. The DC charging current should be 0.7 A max stop the engine and disconnect meter leads. Connect the RR unit and battery.

Meter Range	Connection		Specification
DC10A	Meter +ve White/Black terminal of R/R	Meter -ve Battery (+) lead (White)	0.7 A max at 4000+25 RPM

Note :
Connect multi meter in series with the circuit while conducting above test.

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	Standard value	Graphical Bar on Instrument cluster
Empty Tank	1.25 ± 0.3 Liter	90~100 Ohm	0 Bar
Reserve	2.5 ± 0.3 Liter	75~81 Ohm	2 Bars
Half Tank	4.5 ± 0.3 Liter	39~44 Ohm	6 Bars
Full Tank	8.5 ± 0.3 Liter	4~10 Ohm	12 Bars

Note: Before checking the above, please confirm

- *Battery Voltage*
- *Speedometer coupler & fuel gauge tank unit coupler connection is firm.*

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.

Horn

Measuring & Testing Equipment : DC Clamp Meter

Meter Range	Connections	Standard Value
20 DC A	Encircle clamp meter jaws around Brown wire of horn	2.2 Amps

SOP :

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

Auto Choke Solenoid Coil Inspection

Measuring & Testing Equipment : Multimeter

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	12 ± 10 %
	Brown	Orange/Brown	

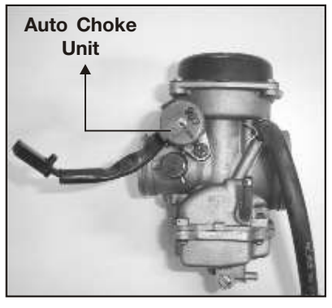
SOP :

- Disconnect coupler of solenoid operated choke.
- Connect Multimeter lead wires to Brown & Orange / Brown wires.
- Check resistance of Coil

Auto Choke Working

In Engine running condition & when engine RPM are greater than 900 the solenoid operated choke is switched 'ON' for specified time depending upon engine temperature. The chart of choke operation vis-a-vis engine temperature is given below.

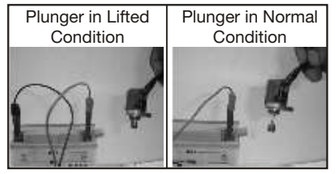
Engine RPM	Temperature of Engine Sensed by Thermal Sensor	Approximate time for which solenoid choke is 'ON'
RPM > 900	< 15°C	A minute or Two
	15 ~ 20°C	Few Seconds
	20 ~ 30°C	Fewer Seconds
	30 ~ 35°C	Very Few Seconds
	> 35°C	CHOKE OFF

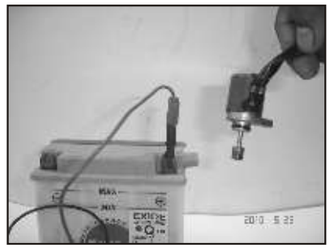


Auto Choke

This choke circuit is by-starter type and choke actuation is electric, automatically controlled by an electronic circuit. No user intervention is necessary. 'CDI' controls the Auto Choke circuit. When engine is started either by kick or self start mechanism, the thermal sensor senses engine temperature. If engine temperature is below predefined temperature, the coil in solenoid choke gets energized & the choke plunger gets lifted. The choke is switched off as soon as engine attains predefined temperature. During choke operation, additional air-fuel mixture is supplied for starting the engine. This increases the mixture strength and it facilitates easy and quick engine start even in very cold conditions.

- The choke operation is optimized for starting under all conditions for minimizing fuel consumption as well as for optimizing battery life
- Temperature sensor is mounted on cylinder block for giving engine temperature input to CDI.





Auto Choke Functional Check

Visual Confirmation on component :

Check 1:

- Remove Choke Unit from Carburettor assembly.
- Switch 'ON' Ignition Key.
- Solenoid operated choke plunger must get lifted for a second & then again plunger must fall down in engines OFF condition. With one Rotation of crankshaft i.e. one pulse, choke is on for approx. 10 Sec. If engine temperature is less than 30°C

Check 2 :

- Connect solenoid operated choke connection to external supply of 12 volt DC & check / confirm the working of choke (whether solenoid operated choke gets 'ON' i.e. plunger remaining lifted as long as the external supply is in connection.

Connection of External Supply (Another battery)	
+ ve terminal	- ve terminal
Brown	Orange / Brown

Check 3 :

- Remove Choke Unit from carburettor assembly but coupler is connected to harness.
- Disconnect coupler of Thermal Sensor. (Means thermal sensor is in 'Open' condition)
- Solenoid operated choke plunger must get lifted for few seconds (Approximately 10 seconds) in engine idling condition.

Check 4 :

- Remove Choke Unit from carburettor assembly but coupler is connected to harness.
- Short Blue wire to ground / earthing. (Means thermal sensor is in 'Short' condition).
- Solenoid operated choke plunger must get lifted for few seconds (Approximately 10 seconds) in engine idling condition.

Starter Motor - Current Drawn

Measuring & Testing Equipment : DC Clamp Meter

Meter Range	Connections	Standard Value
200 DC A	Encircle clamp meter transformer jaws around thick Red wire of starter motor.	35 ~ 45 Amps Spark Plug Caps removed

SOP :

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

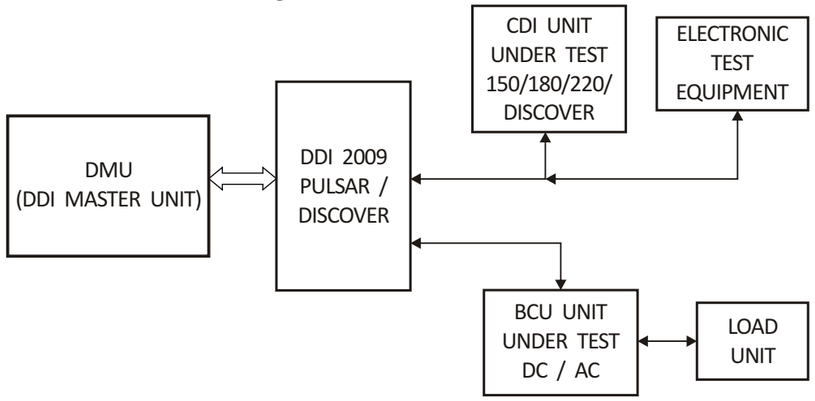
Inspection of Parts on DDI

Testing of Electronic Parts Using Test Jig

The microprocessor based Digitron Diagnostic Instrument provided with a load unit as a set is developed for testing of Electrical & Electronic components / sub assemblies. (Also has compatibility in testing of Discover DTS-Si CDI).

This is plug-in test instrument which has to be connected with DDI Master Unit (DMU).

Connection Block Diagram



How to Conduct Test

Connect power cord of 230V, 50Hz AC to DMU & power cord plug into power socket.

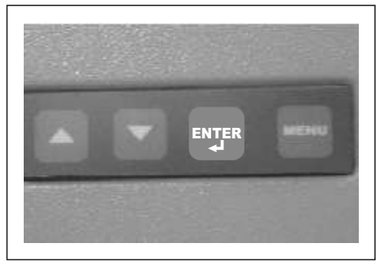
STEP 1

Connecting DDI to DMU

Connect providing wiring harness label as “DDI to DMU“ to 8 pole male connector on DMU unit.

- Other ends of the harness connect to 15 pin DB male connector label as “DMU” on the DDI unit. **(Fasten well the screw of this connector using screw driver to avoid loose contacts).**
- Switch ‘ON’ the Supply.
- Put ‘ON’ the DMU unit.
- LCD screen on the DMU unit will display message “**Welcome to DDI Master Unit IV**”
- Then screen will display message “Connecting Unit....”.
- Now after connecting, DMU unit will identify the plug in unit. DMU will display message “**Digitron Diagnostic Instrument 2009 for Pulsar.**

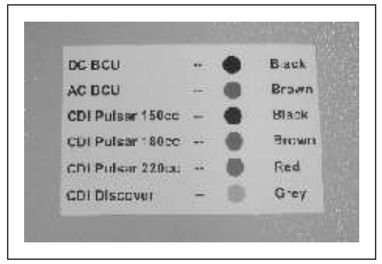
STEP 2



Conducting Test

- Next display screen will display Menu screen of various unit that can be tested by this DDI unit. User can select any one of the following list of components, by using UP / DOWN scroll keys on the DMU unit ,
  1. CDI Unit Pulsar 150
  2. CDI Unit Pulsar 180
  3. CDI Unit Pulsar 220
  4. Auto Choke CDI Pulsar 220
  5. Auto Choke CDI Discover
  6. DC BCU Check
  7. AC BCU Check
  8. Starter Relay
- Upon selection, the Selected menu will start Blinking.
- Once selection is done, press ENTER key for testing selected component.
- Now screen will display message “CONNECT UNIT “(component to be tested).
- To start test, press ENTER key. To return to Main Menu, press MENU key.
- Once Enter key is pressed, DDI unit start the testing of the connected component & screen on the DMU unit will display the message as “TEST IN PROGRESS”.

CAUTION
Do not press any key till the test is cover.



- Once the testing of the component is over, screen will indicate message ”TEST COMPLETE”. To view result, press Enter key. In case of BCU unit testing, user has to press Enter key each time to view result of the various Function of BCU.

NOTE:

- *Connect the appropriate CDI / BCU & select the respective menu. Refer the sticker pasted below the DDI.*
- *Make all connection firmly & tighten the screw of all connector using screw driver.*
- ***Connect only one component at the time for testing.***

Harness :

- Use appropriate wiring harness to connect component to be tested to DDI / DMU. All wiring harness have unique label. Following are the labels and description of the wiring harness.

LABEL	DESCRIPTION
DDI TO DMU	TO CONNECT DDI UNIT TO DMU MASTER UNIT
CDI UNIT	TO CONNECT DDI UNIT TO CDI UNIT
DDI TO E. TEST EQUIPMENT	TO CONNECT DDI-CDI UNIT TO ELECTRONIC TEST EQUIPEMENT
STARTER / KILL SW RELAY	TO CONNECT DDI UNIT TO STARTER / KILL RELAY
BCU	TO CONNECT DDI UNIT TO BCU UNIT
TO LOAD UNIT	TO CONNECT BCU TO LOAD UNIT
LOAD UNIT TESTING	USED TO TEST LOAD UNIT

- *Before using load unit for testing BCU, please check all lamp of the load units are working properly by using wire harness label as ”LOAD UNIT TESTING”. Connect connector of this harness to load unit & the other end of the harness having crocodile clips to vehicle Battery Supply. Ensure that all the lamps are glowing. If not replace with 12V, 22W Auto lamp.*

Service Information for JONS Plug Solder / Repairs

Follow the Pin layout given below if any wire’s soldering is given away of 8 Pole John’s Plug for wiring harness.

Pin Layout for Wiring DDI to DMU

1 Black (Small) Wire	2 Red (Small) Wire
3 Red Wire	4 Orange Wire
5 Black Wire	6 Yellow Wire
7 Green Wire	8 Blue Wire

Pin Layout For DDI to E.TEST EQUIPMENT

1 Black Wire	2 Yellow Wire
X	4 Black (Big) Wire
X	X
X	X

Dos & Don'ts
Generic

Horn

✓ Dos

Ensure that horn is firmly fitted on frame

Ensure that horn is free from dust and mud accumulation.

Ensure that horn wires are intact.

Ensure that horn switch button is operating freely.

Ensure that battery is fully charged.

- Adjust horn by phillips screw driver
  - without removing silicon sealant from the adjustment screw.
  - by rotating screw in the direction of arrow provided in the screw.

Ensure that resonator is not pressed by any portion of cables or wiring harness as it will result in distorted sound.

✗ Don'ts

Never remove resonator cap as it could result in water entry & subsequent malfunctioning of horn

Do not apply pressurised water jet directly on horn resonator.

Never adjust nut on horn cap side & bracket end (back side) as it will result in horn malfunctioning & failure.

Do not remove silicon sealant from adjustment screw as it will result in water entry in horn.

Do not hit by mallet / screw driver on horn resonator.

Battery

✓ Dos

- Always install recommended capacity of battery on the bike.
- Secure battery firmly in its box / cage.
- Always keep battery terminals clean & in firmly tightened condition
- Connect Red colour wire of the harness to the +ve terminal of the battery & Black colour wire of the harness to -ve terminal of the battery.
- Ensure presence of petroleum jelly to the battery terminals. Apply if not.
- Always maintain electrolyte level above half of maximum & minimum level marks & top-up with distilled water only.
- Keep the top cover of battery clean & tight
- Check battery charging current/ voltage periodically. Over charging / under charging is harmful for battery Life.
- Re-charge battery by specified constant current (0.9 Ampere)
- Check specific gravity of each cell for understanding charge status of the battery
- Ensure that rubber grommet provided on +ve & -ve terminals of battery is intact.
- Ensure that vent mechanism of the battery is free from dirt / dust & grime.
- Apply WD-40 Rust Spray to jammed battery terminals to remove rust.
- Always confirm the charge condition of battery using a Battery load tester at PDI stage & before installing battery on vehicle booster charge it.

✗ Don'ts

- Do not install a lower / higher capacity battery than what is recommended.
- Never add acid into the battery.
- Do not top-up battery with mineral water or tap water as the chlorine & iron content in water will reduce battery life.
- Do not blow hammer on battery terminals & clamps.
- Do not apply grease on battery terminals / cable clamps.
- Do not over fill the battery.
- Do not keep your battery idle for more than three to four weeks.
- Never quick charge the battery with high current, as this will seriously affect battery life.
- Do not add extra electrical load on battery as it will draw more current & will reduce battery life.
- Do not cover vent mechanism of battery by cloth / paper or any other object.

Ignition System

Dos

- Always install recommended capacity of battery on the bike.
- Always replace spark plug by correct heat range plug.
- Check & adjust spark plug gap periodically. Adjust it to 0.6~0.8 mm by feeler gauge / wire gauge.
- Replace spark plug at every 15,000 kms.
- Check for firm fitment of spark plug in cylinder head.
- Ensure H.T. cable secondary connection is firmly fitted in spark plug cap and H.T. coil.
- Check that CDI coupler is tightly fitted.
- Check for proper functioning of TPS - Hall sensor.
- Always use a right size socket during removal and re-installation of spark plug.

Don'ts

- Do not replace spark plug by non recommended one (different heat range).
- Never short circuit H.T. coil primary wire to ground. It could lead to CDI failure.
- Do not remove grease from CDI and magneto coupler as it is provided for rust prevention.
- Do not adjust the spark plug gap with any instruments like screw Driver, pliers etc.
- Do not drive the vehicle without battery. Driving motorcycle in battery removed condition could cause damage to electrical components like voltage regulator because of no load Condition.

Lights

Dos

- Check that all bulbs are firmly fitted in bulb holder.
- Ensure that all fixing screw of bulb housing are intact.
- Ensure that Reflector / Glass of Head Lamp, Tail Lamp, Side indicator is intact.
- Check that couplers and wires of bulbs are in good condition.

Don'ts

- Do not install a lower / higher capacity battery than what is recommended.
- Do not use Higher / Lower wattage Bulbs.
- While washing Vehicle do not direct pressurized water jet on Head Light, Tail Light,Indicators.
- Do not ride on brakes.
- Do not start Vehicle with light control switch in ON condition.

Switches

Dos

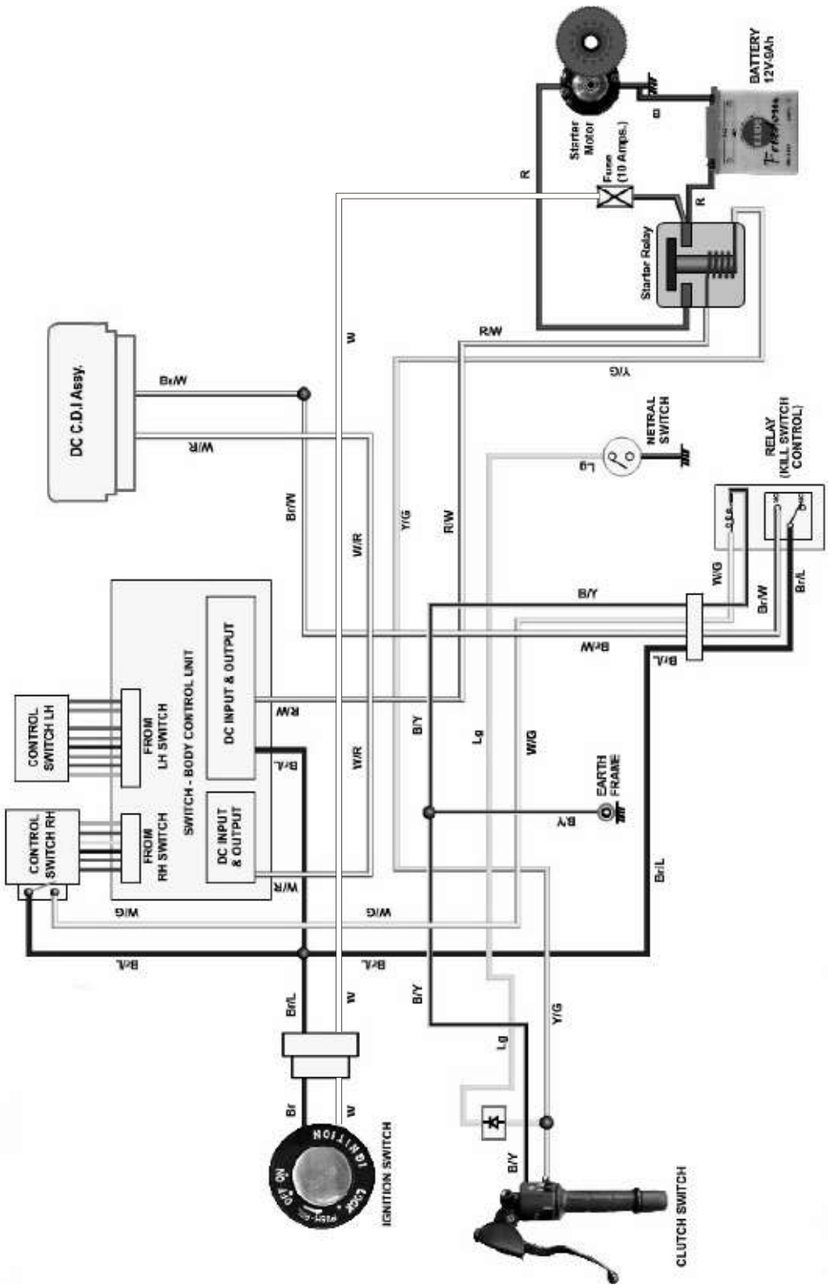
- After washing the vehicle ensure to apply dry air on switches before operation.
- Always ensure that grommets provided on clutch switch, front brake switch and rear brake switch are intact.
- Always apply WD-40 Rust Spray to sticky switches.

Don'ts

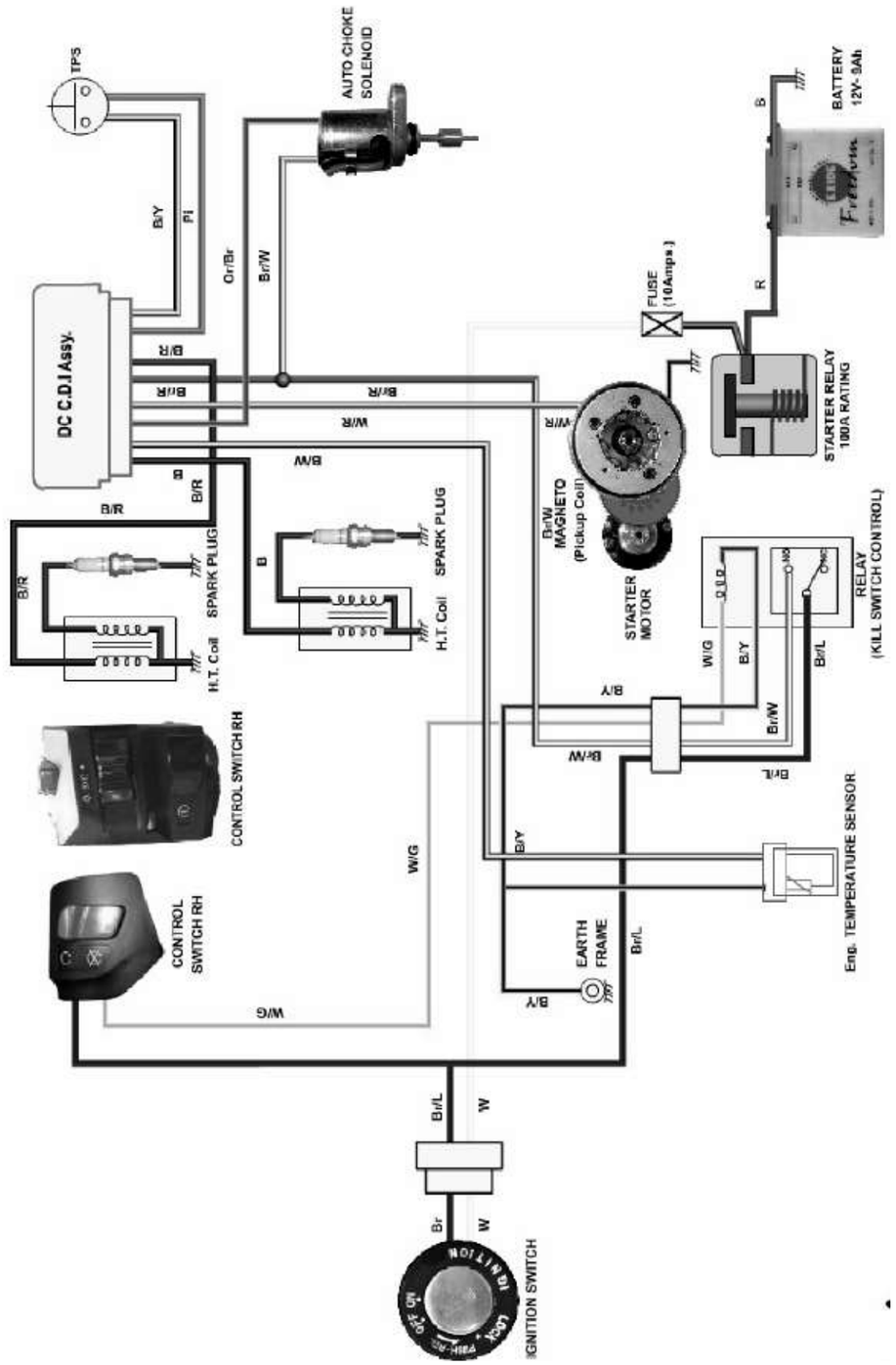
- Do not apply direct pressurized water jet on control switches.
- Do not lubricate electrical switches by oil or grease.
- Do not over tighten the switches.
- During warranty period do not dismantle control switches.
- Do not add extra electrical loads e.g. musical horns, additional horns, buzzers as it will reduce switch contact life & battery life &battery life.
- Do not operate switch immediately after water servicing.

Electrical
Circuit Diagrams

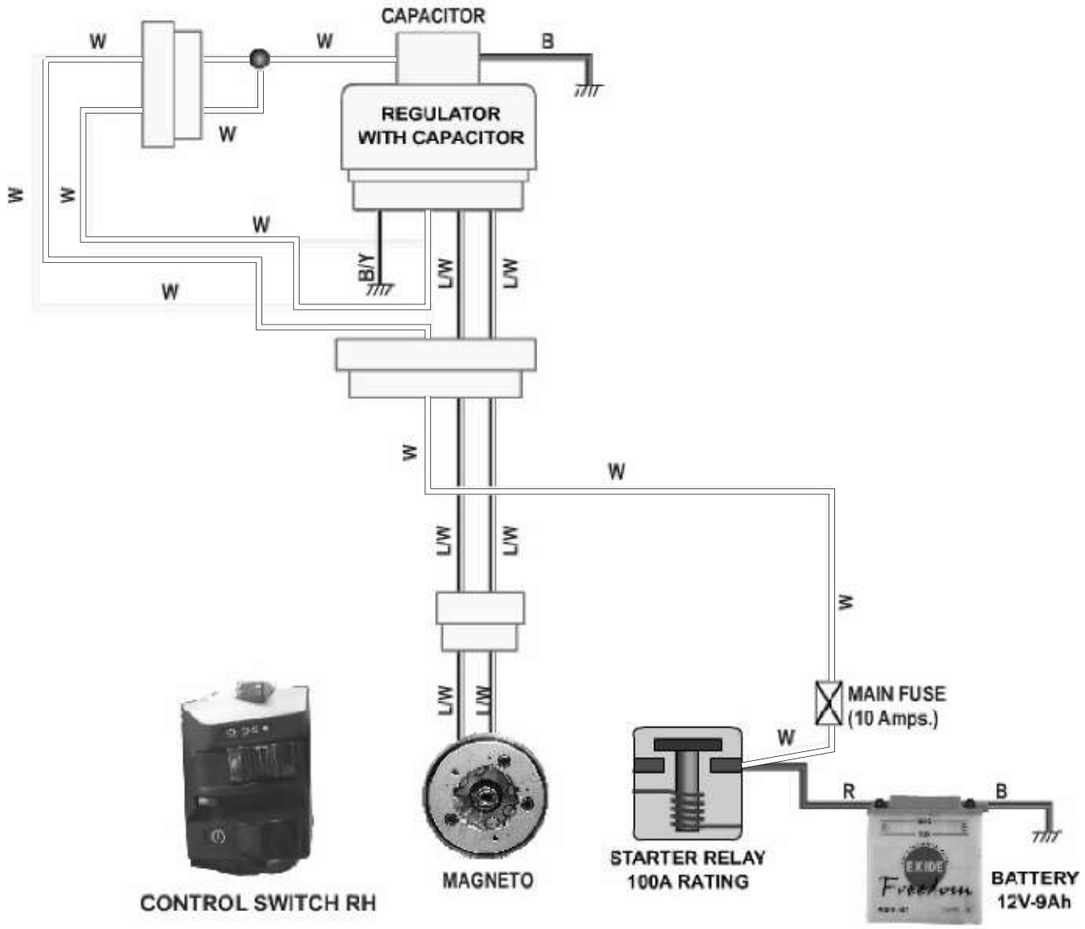
Starter Motor Circui



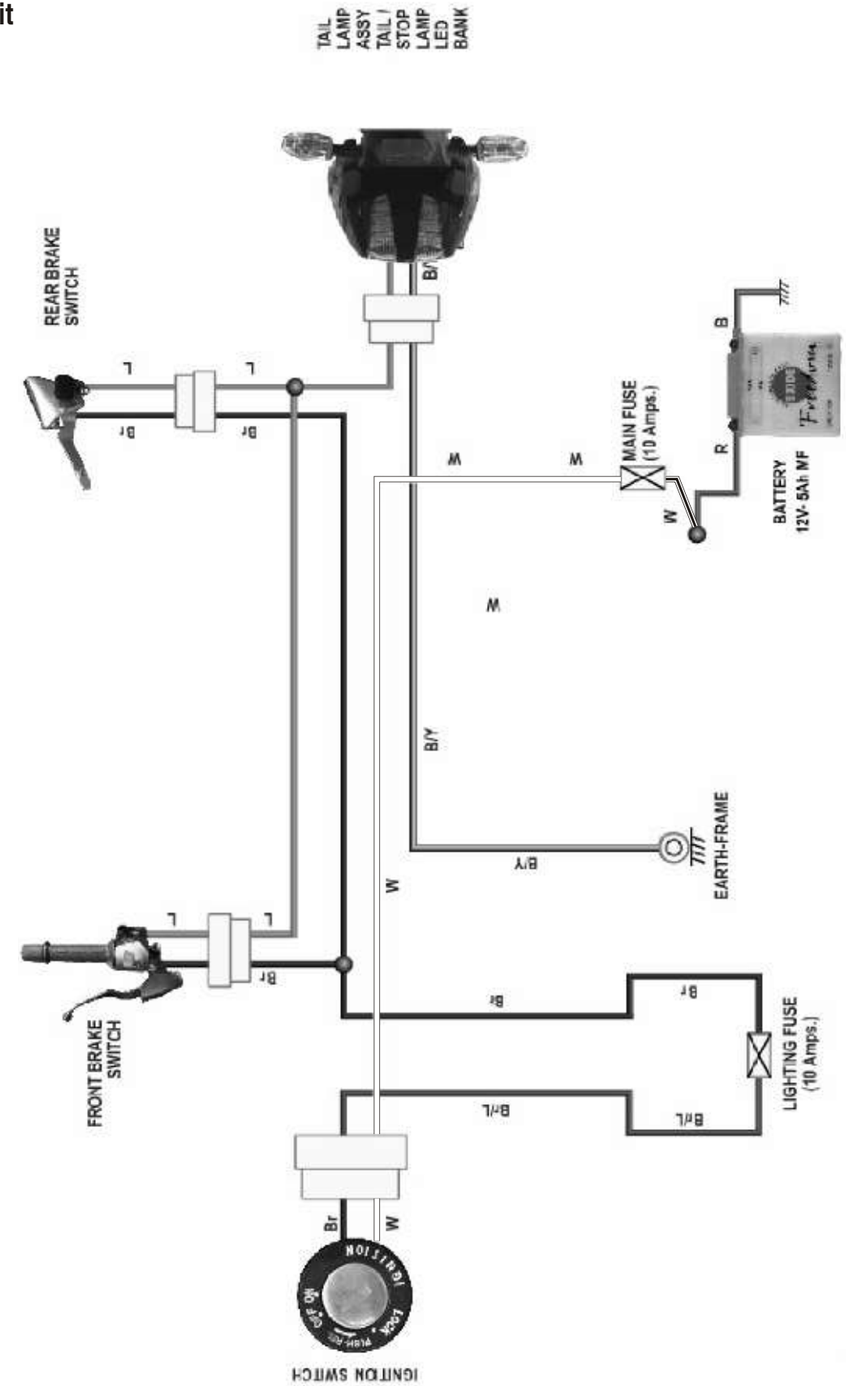
DC Ignition Circuit



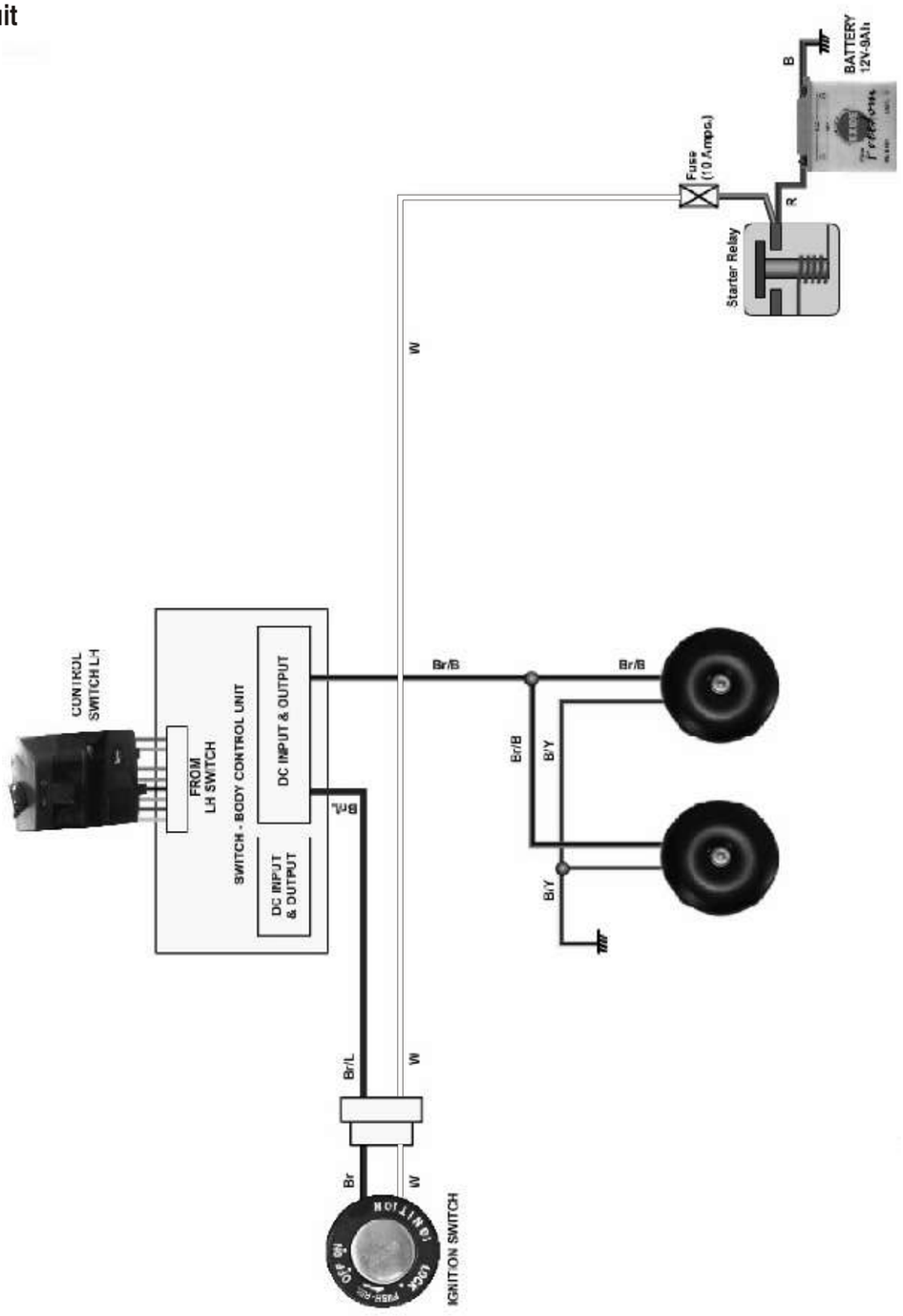
Battery Charging Circuit



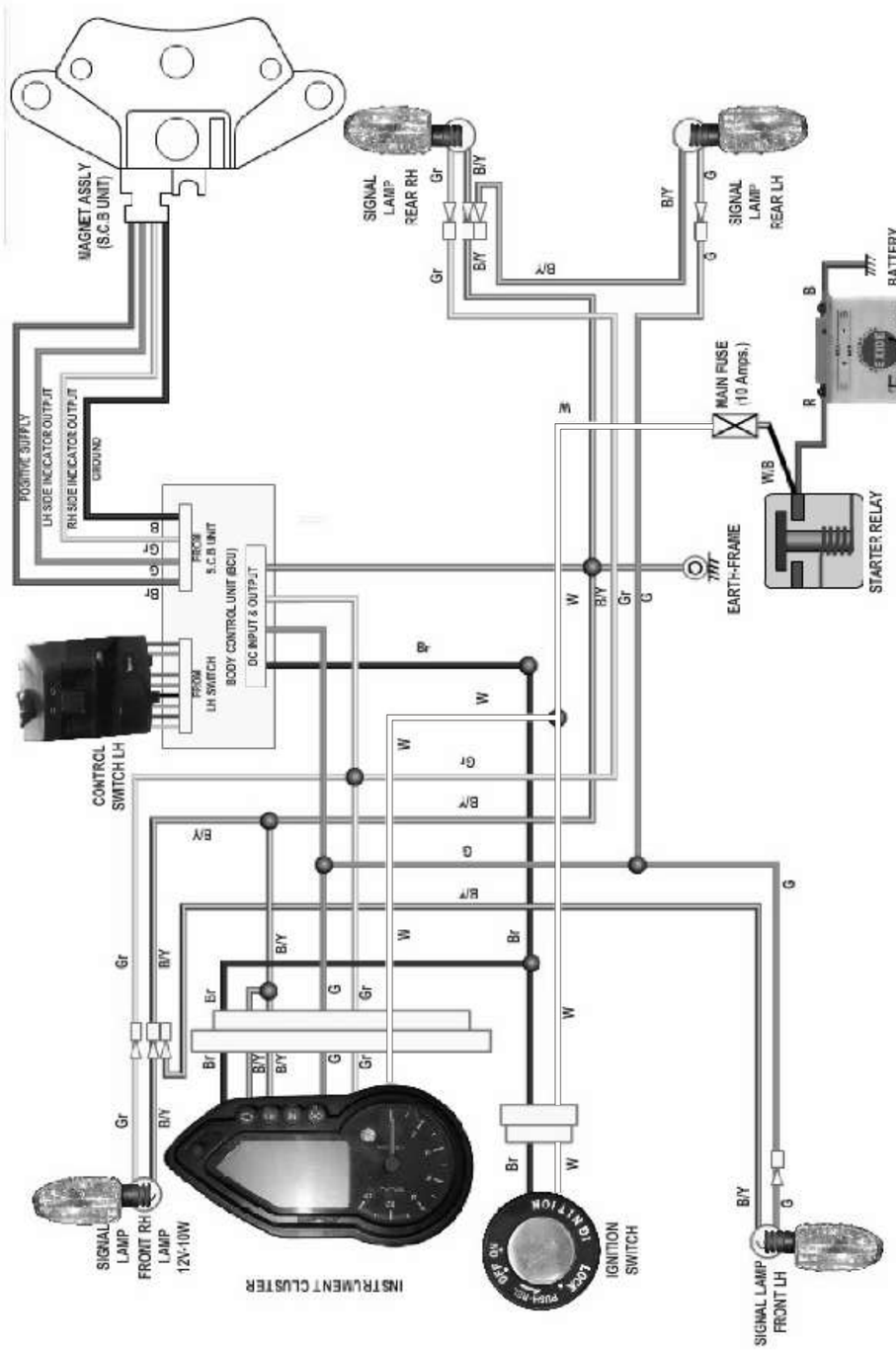
Brake Lamp Circuit



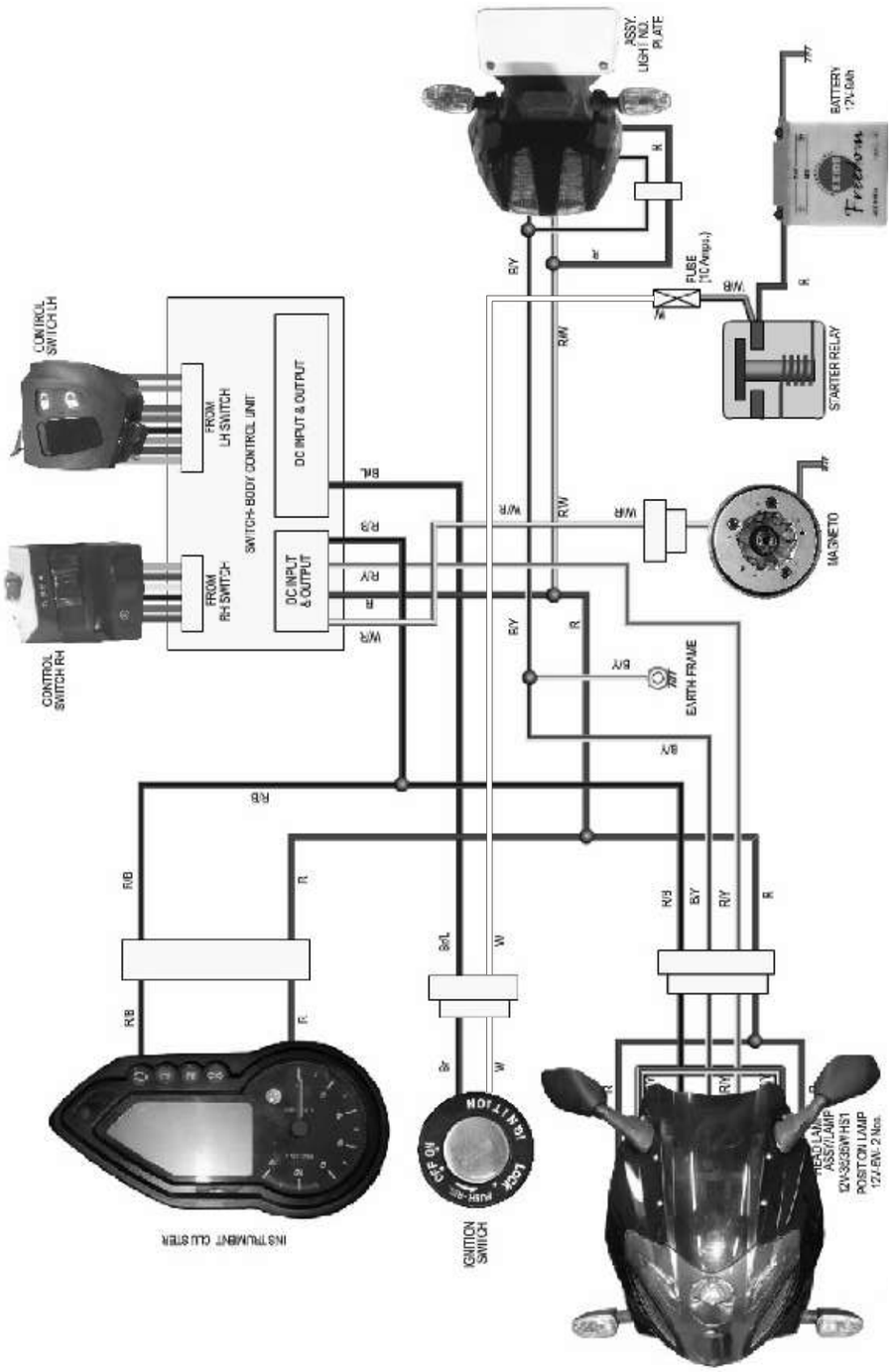
Horn Circuit



Side Indicator Circuit

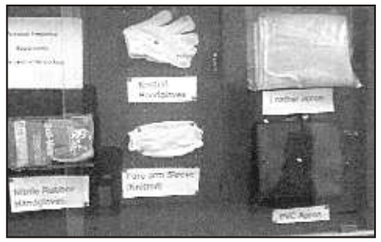


Lighting Circu



Chapter 7 Workshop Safety

Workshop Safety

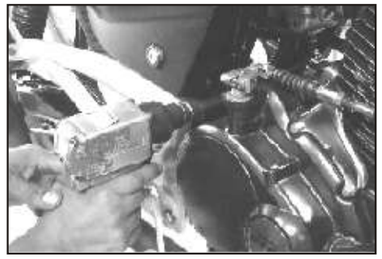


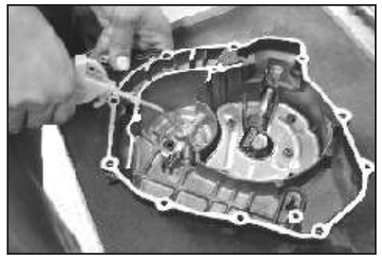
- o Technicians must put on shoes & dressing should not be very loose.
- o Technicians must use Personnel Protective Equipment (PPE) like - Hand Gloves
  - Mask
  - Safety Goggle
  - Ear Plug
- o Wear Nitrile Rubber Hand Gloves while handling petrochemicals like petrol, Oil, Kerosene etc.

- o Precautions to be taken while handling MRTB Test
  - Take care that the vehicle is properly clamped in the clamping device, otherwise it may go back with a force and can injure the rider.
  - Keep yourself cool while taking tests. It is very necessary to be alert.
  - Mount the vehicle in the center of the rollers.
  - Fuel pipe should not touch heated part of the vehicle, it may cause fire.
  - Make sure to put on air blower while conducting test to avoid engine overheating.
  - Lock The Front Wheel Properly
  - Ensure that exhaust blower is running.
  - Wear Helmet
  - Wear ear plugs

- o Precautions to be taken while handling CO Gas Analyser
  - Use hand gloves for protection from hot silencer.
  - Use mask for protection from exhaust gases.
  - Ensure proper ventilation.

- o Fire Extinguisher
  - Install 'ISI' approved. Fire extinguishers - CO_2 gas cylinders.
  - Refill CO_2 before the gas expires.
  - Install Co_2 gas cylinder at appropriate place so that there is no obstruction / good accessability.





- o Safety Precautions while Operating Air Tools

  Air tools operate on compressed air supplied by the shop air system (Compressor & Air supply system).

  Observe the following safety related precautions when using an air tool.

  - It is advisable to fit a pressure regulator (FRL:- Filter Regulator Lubricator) in the pneumatic line which supplies air pressure to the air tool. It regulates the outlet pressure to @6.5 Kg/cm^2. This avoids the risk of personal injury.
  - Never use the blow gun to blow dust off your clothes and never point it at anyone. The air pressure can drive dust particles at high speed. These particles can penetrate into the flesh or eyes. High pressure air hitting on open wound can force air into the blood stream. This can result in death.
  - Never look into the air outlet of a pneumatic tool.
  - Never blow-clean brake or clutch parts. This could put asbestos dust particles into the air which are harmful to inhale. (These particles are cancerous - can lead to Cancer).

- o Hand Tools
  - Do not use worn out hand tools.

- o Calibration of Workshop Equipment
  - Calibrate all Workshop and M & T Equipment once in a year.

- o Avoid direct body contact with Petrol, Kerosene.

  Caution : Prolonged contact of used oil may cause cancer.

- o Waste Oil Disposal
  - Sell used oil to Government approved re-cycle agencies.
  - Collect used oil in oil disposer / barrel.
  - Don't throw oil into sewage line.
  - Don't spill oil on the floor.

o Precautions to be taken while handling Hydro-Electric Lift

- While raising / lowering the lifter bay ensure that vehicle is firmly hold on the lifter bay to avoid accident.
- After raising the lifter bay, lock the lift.
- Don't put leg/hand in between while raising / lowering the lifter Bay.

- **Safety Tips**

- Do not lower the lifter bay table without unlocking the mechanical lift lock.
- Do not keep your leg between the top and bottom frame while lowering the lifter bay.
- Do not work with loose clothing while working on the lifter bay.
- Do not keep hydraulic joints loose.
- Do not stand on the lifter bay's top, when it is being operated.
- Special care is to be adopted to avoid injuries if either leg or hand is entagled between.
- Keep off direct fire near the power pack.
- Avoid oil spillage around the working area for safety reasons.

o Brake Shoe Cleaning

- Don't inhale brake shoe lining dust. The dust could be Cancerous.

o Battery Acid Handling

- Use hand gloves.
- Wear Apron.
- Wear Safety Goggle
- Avoid contact of battery acid with skin
- Use plastic trays for keeping batteries while charging.
- Avoid Spillage of battery acid.

o Brake Fluid Handling

- Store brake fluid in sealed container
- Avoid contact of brake fluid with skin.
- Don't spill the brake fluid on painted components

o Electrical Wiring

- Carry out periodic checks & repairs
- Electrical board & Main Switch must be located such that they are easily accessible.