

Training Notes

pulsar
DTS-i

 **BAJAJ**
MOTORCYCLES



- 
- The Training Notes are a comprehensive training guide on service and maintenance operations and procedures to be followed by service personnel at authorised service centres and dealerships whilst attending to the Bajaj Pulsar 180.
 - The Training Note covers standard workshop procedures, simplified for easy learning and understanding for service technicians worldwide.

NOTICE

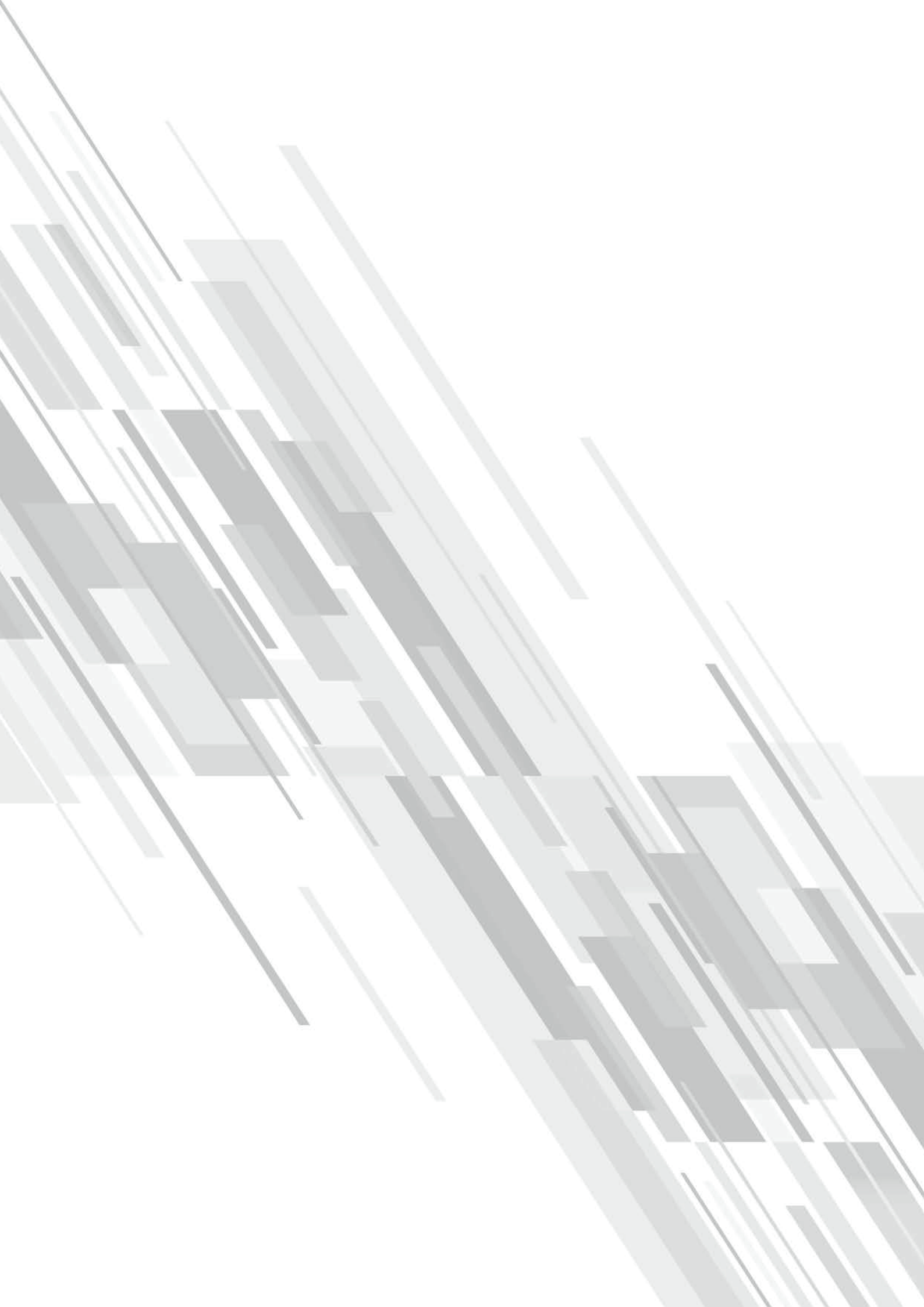
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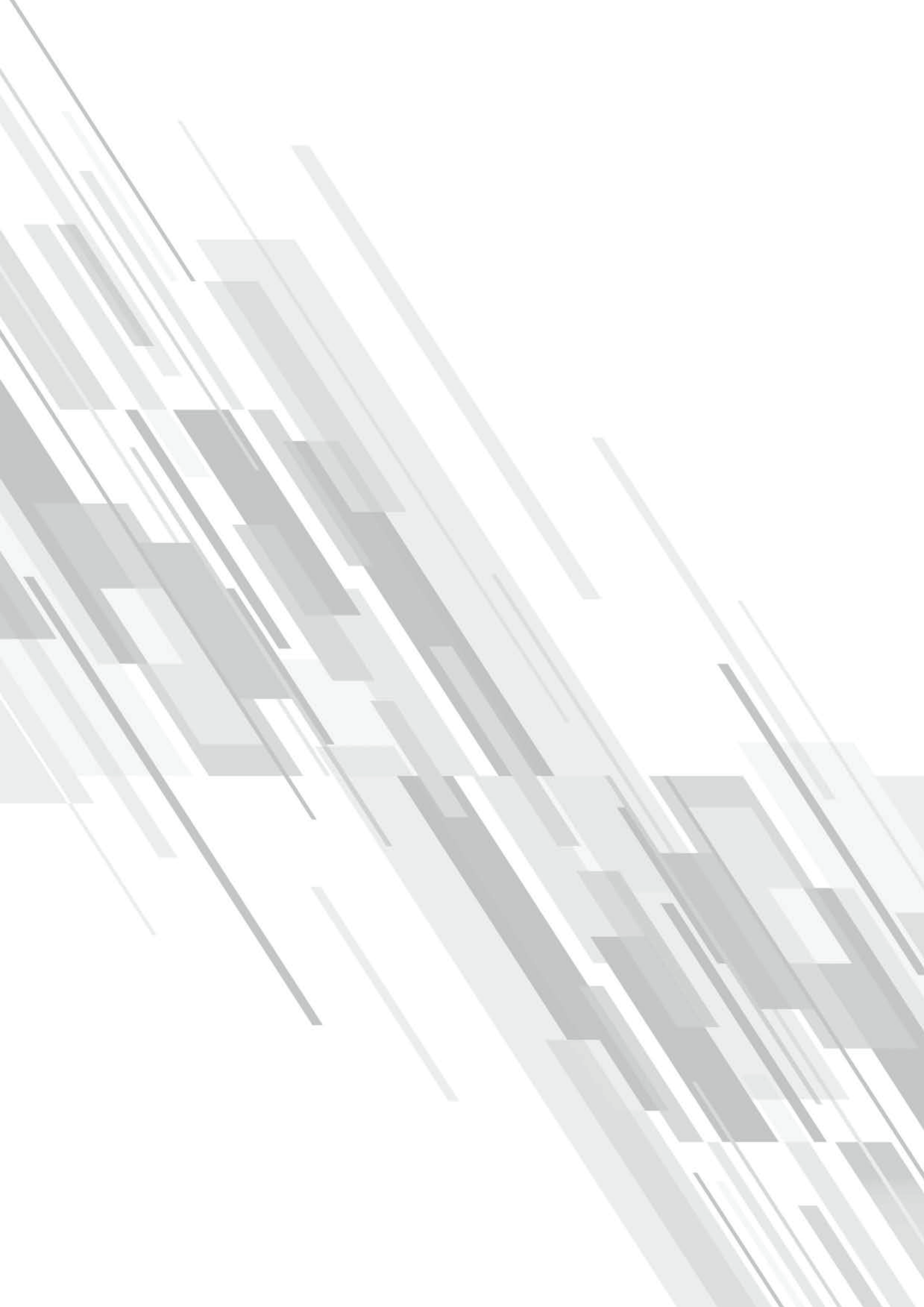
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Key Learning Points

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



CHAPTER 1

I Read I Learn

Identification

Read Before You Ride

Technical Specifications

Salient Features

Pre-Delivery Inspection Checklist

Periodic Maintenance & Lubrication Chart



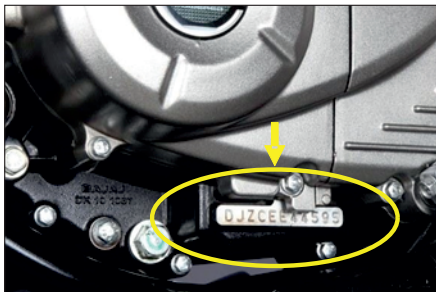
Identification

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



Frame Number Location

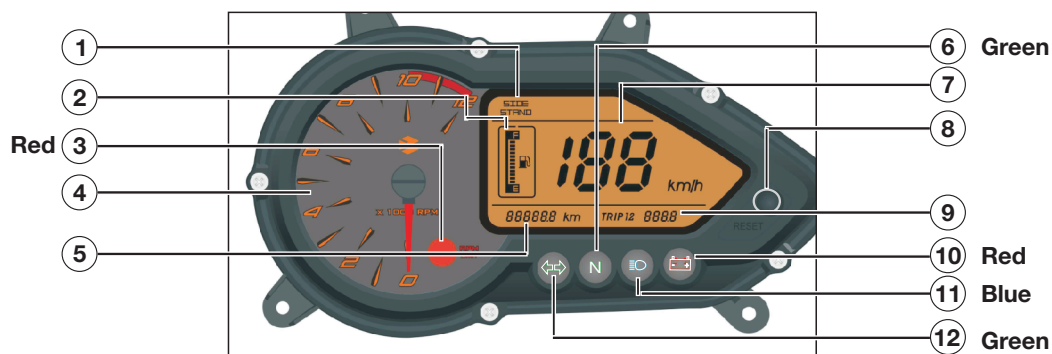
On LH Side of Steering Tube
(Alpha-Numeric - 17 Digits)



Engine Number Location

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

Instrument Cluster Information

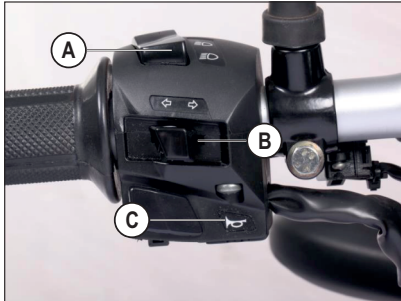


- | | |
|-------------------------------------|---|
| 1. Side Stand Indicator | : When Side stand is 'ON', the Side stand indicator will glow. |
| 2. Fuel Level Indicator | : Fuel level indicator shows available fuel in fuel tank. |
| 3. Reserve/ Engine Rev Indicator | : It glows when petrol level in tank reaches reserve level. It also blinks when engine RPM cross 9000 RPM mark. |
| 4. Tachometer Dial | : It shows engine speed in RPM. |
| 5. Odometer | : The Odometer shows the total distance that the vehicle has accumulated. |
| 6. Neutral Indicator | : When transmission is in Neutral & Ignition switch 'ON', Neutral indicator will glow. |
| 7. Speedometer | : Vehicle speed will be displayed digitally |
| 8. Trip Meter Reset Button | : Both trip meters can be reset to zero by pressing the button. |
| 9. Trip Meter | : The Trip meter shows the distance traveled since it was last reset to zero. |
| 10. Battery Indicator | : It indicates battery needs charging |
| 11. Hi Beam Indicator | : When Headlight is 'ON' & Hi beam is selected with engine running, Hi beam indicator will glow. |
| 12. Turn Signal Indicator (LH & RH) | : When Turn signal switch is turned to Left or Right, Turn pilot indicator - LH or RH will flash. |



Identification

Control Switches



Left Handle Bar Switches

A. Dipper Switch : when headlight is ON, High or Low beam can be selected with the dipper switch

☰○ : High Beam ☷○ : Low beam

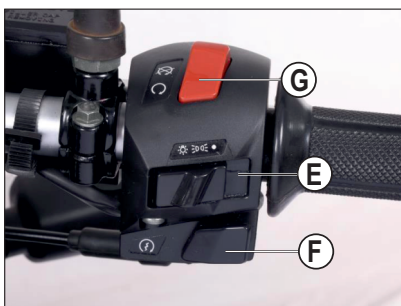
B. Turn Signal Switch : When the turn signal switch is turned to Left

(↵) or Right (↶) the corresponding turn signals flash on and off, To stop blinking push the switch in & release.



C. Horn Button : (🔊) Press Button for sounding horn.

D. Pass Switch : Press the switch to flash the head light. It is used to give signal to vehicles coming from opposite side while overtaking.



Right Handle Bar Switches

E. Head Light Switch : It has 3 positions.

● : All lamps 'OFF'.

☰☷ : While engine running, Tail lamp, Meter lamp and Pilot lamps will glow.

☀ : While engine running, Headlamp, Pilot lamp, Tail lamp, Meter lamps will glow.

⚠ Caution : While starting, ensure that Engine Kill Switch in 'ON' position. Keeping the kill switch in OFF Position Engine will not start.

F. Starter Button : Starter button operates the electric starter when clutch lever is pressed with transmission in any gear. It is recommended to start engine with transmission in neutral.

G. Engine Kill Switch : The engine kill switch is to stop the engine operations. During emergency, move the engine kill switch to the 'OFF' position

Steering cum Ignition Lock



Ignition Lock :

It is located between instrument cluster. It has three positions. The key can be removed from switch only in 'OFF' position.

Key Position	Function
OFF	Engine off. All Electrical circuits off
ON	Engine can be started in this Position by starter button.
P (Park)	Engine & all electrical off. Only Tail & Pilot lamp 'ON'.



Technical Specifications

Engine & Transmission

Type	:	Four stroke DTS-i, Natural air cooled.
No. of cylinders	:	One
Bore	:	63.50 mm.
Stroke	:	56.40 mm.
Engine displacement	:	178.60 cc
Compression ratio	:	9.5 ± 0.5:1
Idling Speed	:	1400 ± 100 rpm.
Max. net power	:	12.52 KW (17.02 Ps) @ 8500 RPM
Max. net torque	:	14.22 Nm @ 6500 RPM
Ignition System	:	Microprocessor controlled digital C.D.I.
Ignition Timing	:	10° BTDC at 1400 rpm, 25° BTDC at 3000 rpm.
Fuel	:	Unleaded petrol
Carburettor	:	UCAI-MIKUNI BS26, Side Drought, CV Type.
Spark Plug	:	2 Nos. Champion RG4HC (Resistive)
Spark Plug Gap	:	0.6 to 0.8 mm.
Lubrication	:	Wet sump, Forced.
Starting	:	Electric start.
Clutch	:	Wet, Multidisc type.
Transmission	:	5 speed constant mesh.
Primary Reduction	:	3.47 : 1 (66/19)
Gear Ratios:		
	1st gear	: 28.20 : 1 (36/13)
	2nd gear	: 18.31 : 1 (32/17)
	3rd gear	: 13.43 : 1 (29/21)
	4th gear	: 10.54 : 1 (26/24)
	5th gear	: 8.98 : 1 (24/26)
Final drive ratio	:	2.78 : 1 (39/14)

Chassis & Body

Frame Type	:	Double cradle.
Suspension		
	Front	: Telescopic Fr. fork with Antifriction bush (Stroke 130mm)
	Rear	: Trailing arm with coaxial hydraulic cum gas filled adjustable shock absorbers, and triple rate coil springs.
Brakes		
	Front	: Hydraulically operated disc type.
	Rear	: Mechanically expanding shoe and drum type.
Tyres		
	Front	: 90 x 90 x 17, 49 P (Tubeless)
	Rear	: 120 / 80 x 17, 61 P (Tubeless)
Tyre Pressure		
	Front	: 2.00 kg/cm ² (28.4 Psi)
	Rear Solo	: 2.00 kg/cm ² (28.4 Psi)
	Rear Pillion	: 2.15 kg/cm ² (30.5 Psi)
Rims (Alloy Wheels)		
	Front	: 1.85 x 17
	Rear	: 2.50 x 17
Fuel Tank Capacity	:	15 liters full
	:	3.2 liters Reserve
	:	2.0 liters Usable reserve



Technical Specifications

Controls

Steering	: Clip-on type handle bar
Accelerator	: Twist grip type on RH side of handle bar
Gears	: Left foot pedal operated
Clutch	: Lever operated on LH side of handle bar
Choke	: Push-Pull knob on carburettor
Brakes	Front : Lever operated on RH side of handle bar Rear : Pedal operated by right foot DC

Electricals

System	: 12 V (DC)
Battery	: 12V 9 Ah MF type.
Head Lamp	: 35/35 W-HS1
Pilot Lamp	: 5W - 2 Nos.
Tail/Stop lamp	: LED / LED
Turn signal lamp	: 10 W (2 Nos.)
Turn signal pilot lamp	: LED
Side stand indicator lamp	: LED
Hi beam indicator lamp	: LED
Neutral indicator lamp	: LED
Speedometer lamp	: LCD display
Rear number plate lamp	: 5 W
Horn	: 12V DC

Dimensions

Length	: 2035 mm
Width	: 750 mm
Height	: 1165 mm
Wheel Base	: 1350 mm
Turning Circle Radius	: 2500 mm (Minimum)
Ground Clearance	: 165 mm (Maximum)

Weights

Vehicle Kerb Weight	: 147 Kg.
Gross Vehicle Weight	: 280 Kg.

Performance

Climbing Ability	: 28% (16° Maximum)
------------------	---------------------

Notes :

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

Salient Features



PERFORMANCE

	Key Features	Advantages	Benefits
	4 stroke, DTS-i 180cc - 17.02 Ps - State-of-the-art features at the heart of digital biking: Digital Twin Spark Ignition, Digital DC CDI unit, TRICS-III, CV Carburetor - Controlled lubrication system. - DC ignition system - Bigger Exhaust TEC. - Bigger catalytic converter	- 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.	- Crisp Throttle response for consistent engine output for varying load and speed conditions at different levels of acceleration. More power, more mileage, ultimate refinement - Well refined engine and Optimum performance with more power.

STYLE

	Key Features	Advantages	Benefits
	- Brawny masculine looks - Stylish split seats 2 piece grab rail - Tank spoiler - Wolf-eyed head lamp - LED tail Lamp - Black styling - Clip-on handlebar - Thicker and pinched clamped fork	A bold assertive stance, Neat looks. Brains, brawn & definitely male.	The styling and looks that let you break free.

COMFORT

	Key Features	Advantages	Benefits
	- LCD Speedo Console - Self cancelling indicators - Thicker front fork and swing arm with needle roller bearing. - DC ignition system.	- Easy to read & understand digital speedo, odometer display with 2 trip meters having resetting facility & warning signal. - Self cancellation indicators - Telescopic front suspension with anti friction bush & supported with Nitrox shock absorber on rear.	- Excellent riding pleasure. - Feather touch self start. - Safe night riding.



Pre Delivery Inspection Care

PDI Check sheet common for all models			
Dealer's Name		Dealer's code	
Model		City	
Frame No		Date of PDI	
Engine No		PDI done by	
1. Check points before starting of the vehicle			
Check & correct the below check points before starting the vehicle			
To Check	Check for	☒ If Ok ☐ X If Not Ok	
Engine oil	Oil level between lower & upper mark / Top up if required		
Fuel tank / pipes	No leakage / Correct fitment		
Mirror	Fitment & adjustment to ensure clear rear view		
Coolant	Coolant level between MIN & MAX mark, top up if required in cold condition		
	Ensure no leakage		
Lock Operation	Steering cum Ignition lock, Seat lock, LH side cover lock, Petrol tank cap lock		
Battery	Terminal voltage 12.4 V D.C for MF battery		
	Tightness of battery terminals / cables / Petroleum Jelly application		
Tyre Pressure	Front: 28.4 PSI		
	Rear: 30.5 PSI (with Pillion)		
Brakes	Rear brake pedal free play 25 ~30 mm		
Clutch cable	Free play 2 ~3 mm		
Drive chain	Slackness 25 ~ 30 mm		
	Equal marking of chain adjusters on both side		
	No touching to chain case		
Fasteners (Check torque) Recommended torque wrench to be used for applying torque on nut - bolts as mentioned in PDI check sheet using reference torque chart given in Annexure 4. However if any major parts are required to be removed (Except side cover & seat) for accessibility of torque wrench, in those cases the tightness can be ensured using open end / ring spanner / box type spanner as applicable without removing those major parts	Engine foundation bolts Front & Rear only)		
	M8 :- 2.2 Kg.m M10 :- 2.4 Kg.m		
	Front axle nut - 8.0 ~ 10.0 Kg.m		
	Rear axle nut - 8.0 ~ 10.0 Kg.m		
	Swing arm shaft nut - 8.0 ~ 10.0 Kg.m		
	RSA Mounting top / bottom nut - Top & Bottom - 3.5 ~ 4.0 Kg.m		
	Front fork top bolts - 2.5 ~3.5 Kg.m		
	Front fork under bracket bolts - 1.8 ~ 2.0 Kg.m		
Rear sprocket mounting nuts - 3.0 ~ 3.2 Kg.m			



Pre Delivery Inspection Care

To Check	Check for	✓ If Ok	
		X If Not Ok	
2. Check points during / after starting the vehicle			
Check & correct the below check points during / after starting the vehicle			
Switch operation	RH & LH control switch, ignition switch, clutch switch & brake switch (Front & Rear)		
Horn	Ensure no distorted sound		
All Bulbs working	Headlight, Tail / Stop lamp, Side indicators, Speedo bulbs, Number plate lamp,		
Speedometer (As applicable)	Working of speedometer, Odometer, Trip meter, Fuel gauge , Clock		
	Working of all signal indicators icons (Neutral, Turn signal, High beam, Clock, Low battery indicator, Service reminder & Bajaj Logo)		
Headlamps	Focus confirmation		
3. Check points during Test ride			
Check & correct the below check points during Test ride			
Gear shifting	Smooth operation		
Drive-ability	Throttle response		
	Brake effectiveness - Front & Rear		
Engine noise	No abnormal noise		
Front fork / steering	Smooth working by pumping movement & smooth operation (No play / No Sticky movement)		
Oil leakages	Specify source of leakages		
4. Idling RPM / CO%			
Check & correct the below check points in engine warm condition			
Idling RPM	Check in warm up condition at 60° C (1400 ± 100 rpm)		
CO% Check	CO should be 1.5 ~2.5% in engine warm condition at idling rpm		
5. Visual inspection for dent, scratches, rust ...			
6. Clean the vehicle thoroughly before delivery to customer.			



Periodic Maintenance & Lubrication Chart

Sr No	PM check points	Recommended frequency								Remarks
		Service	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	500	4500	9500	14500	19500	24500	29500	
			~	~	~	~	~	~	~	
			750	5000	10000	15000	20000	25000	30000	
1	Clean the vehicle with water wash & dry completely			✓	✓	✓	✓	✓	✓	Gpuwtg"vq"r tgxgpvy cvgt"gpvt{ "lp" Petrol tank, Silencer & electrical parts. Use caustic free detergent for washing.
2	Engine oil (Bajaj DTSi 10000 oil) & engine oil filter*	C, R	R	Top-up	R	Top-up	R	Top-up	R	BGO DTSi 20W50 for models above 125cc.
3	Oil strainer	CL	CL		CL		CL		CL	Oil strainer cleaning at the time of oil change.
4	Body centrifugal filter **	CL	CL				CL			
5	Starter clutch (Dry Type) **	L		L	L	L	L	L	L	Use recommended Molycote Grease
6	Spark plug	CL,A,R			CL,A		CL,A		R	
7	Air cleaner element *** & cover 'O' ring	CL, R	CL	CL	CL	R	CL	CL	R	
8	In line paper filter Or fuel cock paper	R				R			R	
9	Fuel cock sediment bowl cleaning	CL				CL			CL	
10	Carburetor rubber duct	C,R					C,R			Check & replace if required
11	Fuel pipe	C,R	C	C	C	R	C	C	R	
12	Valve tappet clearance	C, A	C, A	C, A	C, A	C, A	C, A	C, A	C, A	
13	Non-Sealed drive chain cleaning & lubrication	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	. During 1st free service: Use lint free cloth for cleaning & SAE 90 oil for lubrication without removing chain from vehicle. If chain is excessively dirty, than chain has to be removed, cleaned using diesel & lubricated using molten IOC servo compound chain grease). . During all other services: Remove, clean using diesel & lubricated using molten IOC servo compound chain grease.
14	Sealed drive chain cleaning & lubrication	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	CL,L,A	. During regular service use OKS spray for chain cleaning, without removing chain from vehicle. . If chain is excessively dirty, than chain has to be cleaned by removing from vehicle. (Customer to apply OKS chain lube spray at every 500 kms)
15	Engine air breather tube	C	C	C	C	C	C	C	C	Replace if damaged
16	Silencer drain hole cleaning	CL	CL	CL	CL	CL	CL	CL	CL	
17	Silencer tail pipe cleaning **	CL		CL	CL	CL	CL	CL	CL	
18	Brake cam & brake pedal pivot pin	C,L,R	C	C,L,R	C,L,R	C,L,R	C,L,R	C,L,R	C,L,R	Use recommended AP grease.
19	Brake lining or pad -Check wear indicator	C,R	C,R	C,R	C,R	R	C,R	C,R	R	Replace brake shoes /brake pad at every 15000 Kms
20	Brake fluid level ** - top up / replace	C,A,R				C,A			R	Use recommended brake fluid (DOT3/DOT4).
21	Disc brake assly -- Check functionality, leakage or any other damage.	C			C		C		C	Replace if damaged
22	All cables & rear brake pedal -free play	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	



Periodic Maintenance & Lubrication Chart

Sr No	PM check points	Recommended frequency								Remarks
		Service	1st	2nd	3rd	4th	5th	6th	7th	
		Kms	500	4500	9500	14500	19500	24500	29500	
			~	~	~	~	~	~	~	
			750	5000	10000	15000	20000	25000	30000	
23	Battery electrolyte level, specific gravity	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	Not applicable for VRLA batteries
24	Wiring harness & Battery connections-routing, tie bands & clamps tightness.	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	C,A,T	
25	Ignition switch barrel cleaning & handle bar control switches contacts cleaning.	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	C,CL	Use recommended WD40 spray
26	Steering play	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
27	Steering stem bearing*** & Cap steering bearing(Plastic)**	C,CL,L,R			C,CL,L,R		C,CL,L,R		C,CL,L,R	Check & replace if damaged. Use HP Lithon RR3 grease for lubrication.
28	Main stand & side stand pin**	CL,L			CL,L		CL,L		CL,L	Use recommended AP grease.
29	Swing arm pivot pin (for non silent bush) **	L		L	L	L	L	L	L	Not applicable in case of needle roller bearing
30	All fasteners tightness	C,T	C,T	C,T	C,T	C,T	C,T	C,T	C,T	
31	Engine foundation silent bushes **	C				C			C	Replace if damaged
32	General lubrication-Clutch lever, front brake lever, kick lever.	L	L	L	L	L	L	L	L	Use recommended AP grease.
33	Idle speed / CO%	C,A	C,A	C,A	C,A	C,A	C,A	C,A	C,A	
34	Coolant level in expansion tank**	C,A	C,A	C,A	C,A	C,A	C,A	C,A	R	Use recommended 'Ready to use coolant'. Replace at every 30000 kms or 2 years (whichever occurs earlier)
35	Coolant hose damage/clamps/leakage**	C		C	C	C	C	C	C	Check & replace if required
36	Radiator fins**	C		C	C	C	C	C	C	Check & replace if required
37	Spoke tightening ** - Front & Rear	C,T	C,T	C,T	C,T	C,T	C,T	C,T	C,T	

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

** As applicable to model

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

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

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



Periodic Maintenance & Lubrication Chart

Importance of PM schedule execution

Preventive maintenance (PM) is scheduled maintenance activity aimed at the prevention of brake downs & failures. The primary goal of PM is to up keep health of product through out it's life.

PM Activity	Benefits
- Engine oil replacement / top up. - Engine oil filter replacement. - Oil strainer cleaning.	Better lubrication of engine components. Smooth functioning of engine parts.
- Idle speed & CO% setting. - Spark plug cleaning. - Air filter cleaning. - Fuel cock bowl cleaning. - Carburettor cleaning.	Better drive ability. consistency in mileage.
- Petroleum jelly application on battery terminals - Battery terminals connection tightening - Battery charge / condition checking by battery tester - Charging of battery on BAL recommended battery charger	Easy self start smooth functioning of DC system.
- Clutch free play setting - Accelerator free play setting - Front brake free play setting (applicable to drum brake) - Disc brake system checking	Smooth gear shifting, effective braking
- Drive chain ('Sealed Type') lubrication on vehicle - Drive chain (Sealed Type) overhaul - Drive chain slackness checking & adjustment	No chain noise issues. Optimum performance of drive chain.
- Wiring harness checking - Ignition switch contacts cleaning checking & cleaning - Clutch switch & brake switch contacts cleaning - Clutch switch & replace - Rear brake switch check & adjust	Smooth functioning of electrical controls.
General lubrication / greasing.	No noise / wear & tear of parts.
Fasteners tightening by torque wrench.	No vibration related issues.



Notes

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Key Learning Points

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



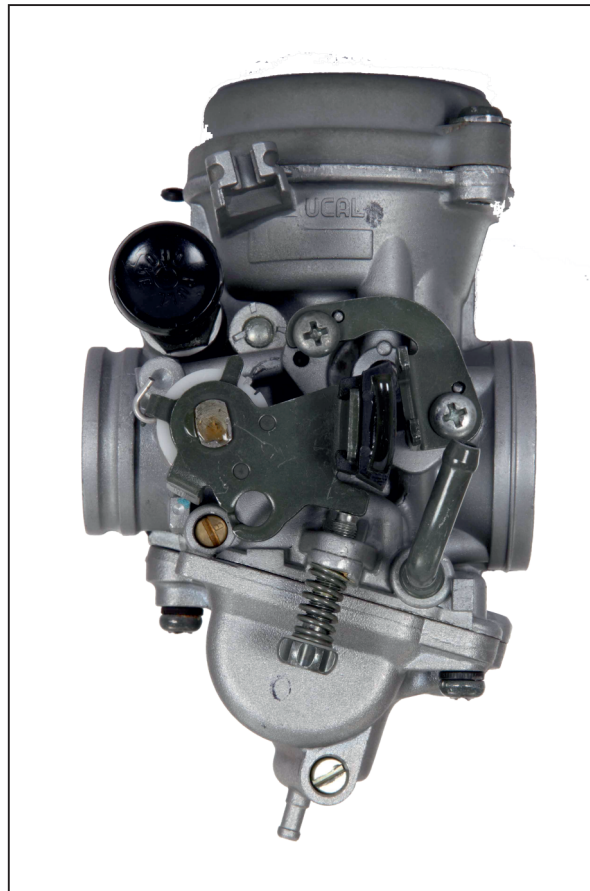
CHAPTER 2 Fuel System

Carburettor Specifications

CO Checking Procedure

Tune-Up for Optimum Mileage

Carburettor Specification



Item	Specification
Make	UCAL-Mikuni BS-26, CV type
Type	DJ-U4
Idling speed	1400 $\pm$ 100 rpm
VC Screw setting	2.5 $\pm$ 2 Turns
Main Jet	112.5
Jet needle marking	P-1
Jet needle e clip position.	2 nd from Top
Pilot jet	17.5
Starter jet	Fixed type
Choke	2 stage with push pull type mechanism (ON/OFF)

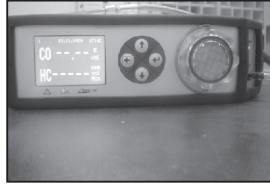
Fuel System



CO Checking Procedure

Readiness of CO Gas Analyzer

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

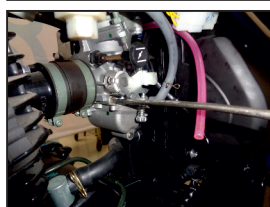


Carry out Span Check as per manufacturer's Recommendation to confirm the OK condition of the Equipment (If Span Check does not confirm the reading, then carry out Gas Calibration as per mfgs. recommendation). Set the Equipment display to Zero before taking the reading.

Readiness of the Vehicle

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

- Warm up the engine to its normal operating temp. by riding 5~6 Kms. (Engine Oil Temp. = 60°C).



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

- Screw in VC Screw completely. Engine should die down in this condition.

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

- Confirm the VC Screw setting as per specification.
- Set Idling speed to specified Idling 1400 $\pm$ 50 rpm. Raise the engine to moderate speed at no load condition for about 15 seconds. Then bring back to specified idling RPM.

Taking the Reading

- Remove M-5 bolt & aluminum washer fitted to the nozzle (12mm OD) shown in figure, of the connecting tube welded to the silencer pipe before CAT converter.



- Use a Silicon Rubber tube of approximately 300mm to fit onto the nozzle. Only a Silicon rubber tube should be used, as it has better high temp. resistance & will not deform / melt due to high temp. at the nozzle.



- Connect the other end of the Silicon Rubber tube to the flexible probe pipe of machine. Ensure that the inner diameter of Silicon tube perfectly matches with outer diameter of flexible probe pipe of Gas Analyzer.
- The Silicon rubber tube must fit snugly onto the nozzle to prevent any air / exhaust gas leakage.
- Note the CO / HC readings when the reading display stabilizes.

- As per Emission Norms the recommended CO% for 2 Wheelers is 3.5% at idling RPM. But CO% for Bajaj Vehicles, for best results in terms of fuel efficiency are different for different models. The ideal CO% is between 1.5 to 2.5% at idling RPM = 1400 $\pm$ 100.

- If the reading is shown excess or less than BAL specifications, try to achieve by adjusting VC Screw.

- Turning in VC Screw will lead to less CO% and turning out will lead to more CO%.

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

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

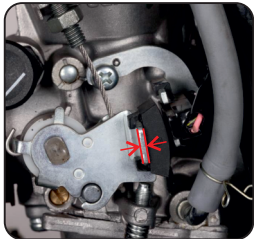
Important: For better performance, achieve CO% as recommended.

Recommended CO% value w.r.t. VC Screw and Idling RPM for Better Fuel Efficiency		
Model	Recommended CO%	Recommended Idling RPM
Pulsar 150	1.5% ~ 2.5%	1400 $\pm$ 100 rpm



Tune up for Optimum Mileage

Engine Tune up



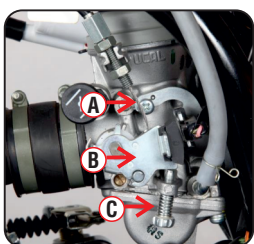
Reed Switch: Maintenance

- Magnet should not touch with reed switch.
- Gap between Magnet & Reed Switch should be 2 ~ 3 mm.
- Movement of throttle lever with magnet assly and Reed Switch fitted should be free.



Air Fiter

- Clean at every: 5,000 kms
- Replace at every: 15,000 kms



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.



Compression Pressure

- Standard Limit: 11 ~ 13kg/cm²
- Service Limit: 9 ~ 10kg/cm²



Reed Switch: Checking

- Keep throttle at zero position.
- On connecting multimeter to Reed Switch coupler it should show continuity.



Tappet Clearance

- Inlet Valve: 0.05mm
- Exhaust Valve: 0.10mm



Reed Switch: Checking

- When throttle is open and Reed Switch magnet crosses to straight edge of fix bracket of Reed Switch multimeter should show discontinuity.



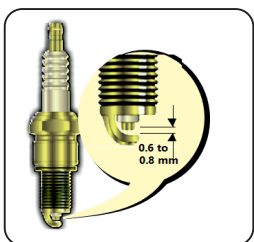
Carburetor

- Idling rpm: 1400 ± 100 rpm
- Jet Needle Clip Position : 2nd from top
- VC screw setting: 2.5 ± 2
- CO% : 1.5 ± 2.5%



TPS Inspection

- On De-acceleration, when of Reed Switch magnet re-coinsides with straight edge of fix bracket of Reed Switch multimeter should show continuity.



Spark Plug Inspection

- Spark Plug: CHAMPION RG4HC(Resistive)
- Spark Plug Gap: 0.6 to 0.8 mm
- Replace at every: 30,000 kms

Other Mandatory Checks

- Ensure no fuel leakage through fuel cock, fuel lines.
- Ensure free rotation of both wheels.
- Ensure correct tyre pressure
 - Front: 2.00 Kg/cm²(28.4 PSI)
 - Rear (Solo): 2.00 Kg/cm²(28.4 PSI)
 - Rear (Pillion): 2.15 Kg/cm²(30.5 PSI)
- Set control cable free play:
 - Clutch lever 2~3 mm.
 - Rear brake pedal 25~30 mm.
- Chain slackness : 25~35 mm.

Fuel System

Notes



Key Learning Points

- Appropriate Torque Application for Various Engine Components
- Engine Dismantling
- Understanding of Standard Limits and Service Limits for all Engine Components



CHAPTER 3 Engine & Transmission

Special Tools

Engine Dismantling

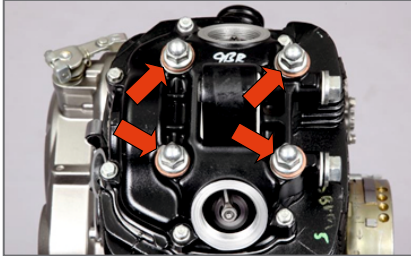
Tightening Torques - Engine

Service Data - Engine



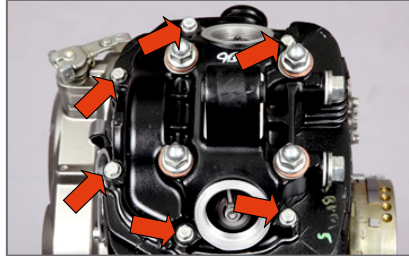
Tightening Torques

Cylinder Head Cover Bolts



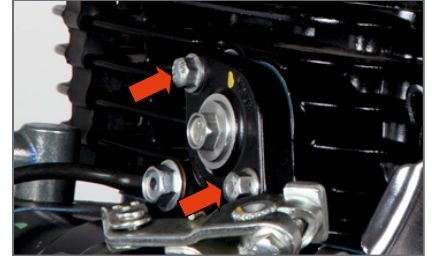
3.5 Kgm.

Cylinder Head Bolts (12 mm)



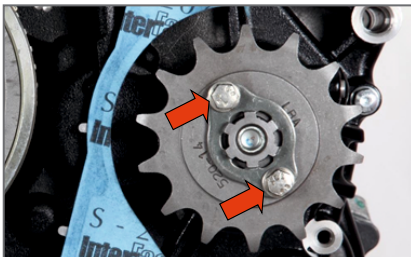
1.0 ~ 1.5 Kgm.

Chain Tensioner Mounting Bolts



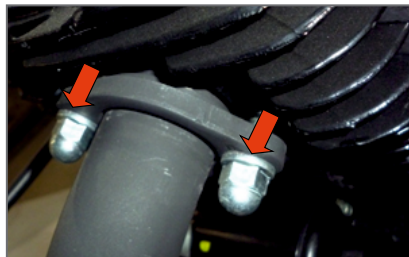
1.1 Kgm.

Output Sprocket Bolts



1.1 Kgm.

Silencer Mouth Flange Nuts



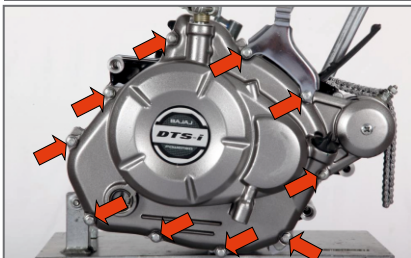
1.4 ~ 1.9 Kgm.

Silencer Bracket Bolts



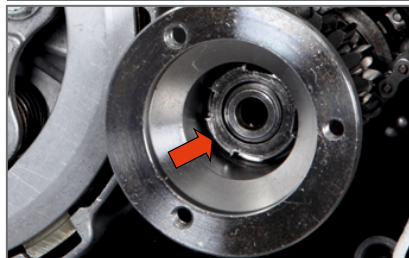
3.5 ~ 4.0 Kgm.

Clutch Cover Bolts



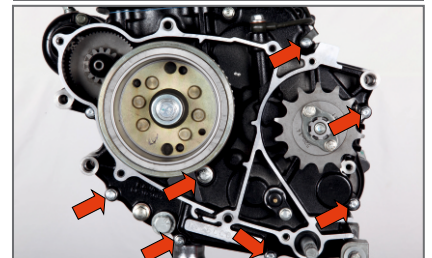
1.1 Kgm.

Centrifugal Oil Filter Nut



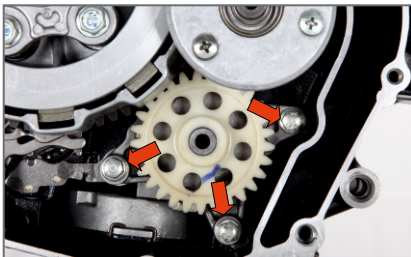
5.5 Kgm.

Crankcase Joining Bolts



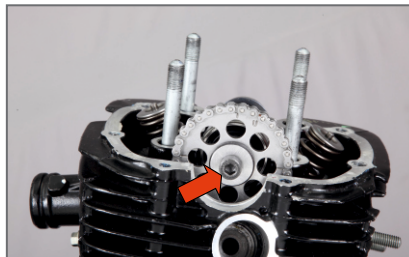
1.1 Kgm.

Oil Pump Bolts



1.1 Kgm.

Cam Sprocket Allen Bolt



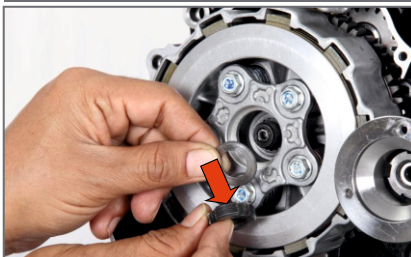
1.4 Kgm.

Magneto Cover Bolts



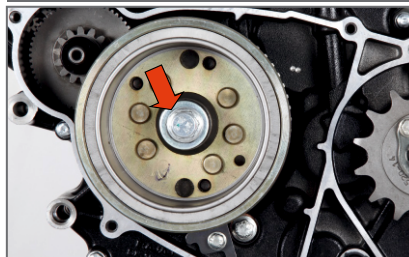
1.1 Kgm.

Clutch Nut (L.H. Thread)



7.0 Kgm.

Magneto Rotor Mounting bolt



4.5 Kgm.

Manifold Mounting Bolts



1.1 Kgm.

Engine & Transmission

Tightening Torques



Spark Plugs



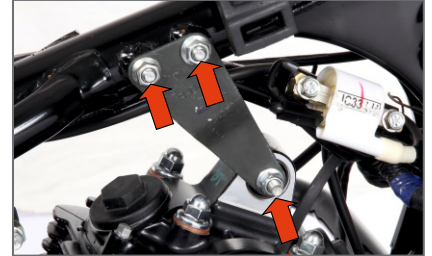
1.4 Kgm.

Engine Mounting Nut - Rear



M8 : 2.2 Kgm, M10 : 2.4 Kgm

Engine Mounting Nut - Front



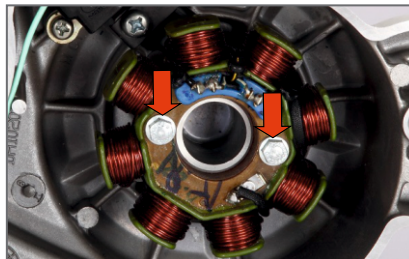
2.2 Kgm.

Drain Bolt



2.5 Kgm.

Stator Plate Bolts



1.1 Kgm.



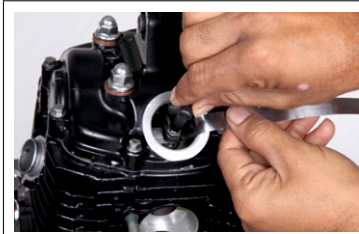
Service Limits

Compression Pressure



Std. Limit	11.0 ~ 13.0 Kg/cm ²
Serv. Limit	9.0 ~ 10.0 Kg/cm ²

Valve Clearance



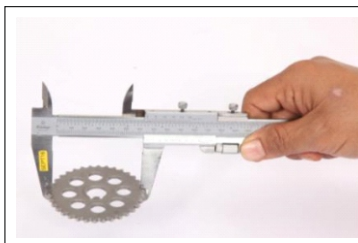
	Inlet	Exhaust
Std. Limit	0.05	0.10
Serv. Limit	0.03	0.08

Rocker Arm Shaft Dia.



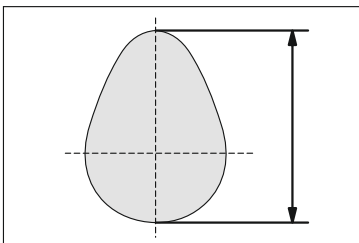
Std. Limit	7.994 ~ 8.0
Serv. Limit	7.98

Cam Sprocket Root Diameter



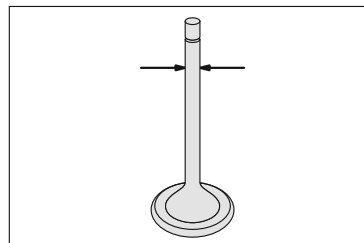
Std. Limit	61.165 ~ 61.285
Serv. Limit	61.1

Cam Height



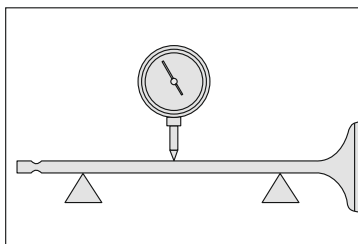
	Inlet	Exhaust
Std. Limit	31.3	30.2
Serv. Limit	31.1	30.8

Valve Stem Diameter



	Inlet	Exhaust
Std. Limit	4.483	4.464
Serv. Limit	4.63	4.444

Valve Stem Bend



Std. Limit	TIR 0.01
Serv. Limit	TIR 0.03

Piston Ring End Gap



	TOP	SECOND
Std. Limit	0.15~0.30	0.55
Serv. Limit	0.30~0.45	0.70

Steel Plate Thickness



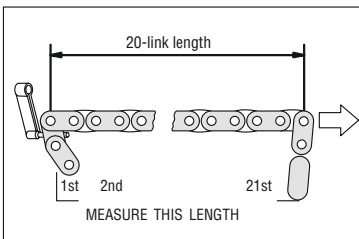
Std. Limit	1.60 ~ 1.70
Serv. Limit	1.55

Friction Plate Thickness



Std. Limit	2.9 ~ 3.1
Serv. Limit	2.75

Cam Chain 20 Links Length



Std. Limit	127.00 ~ 127.20
Serv. Limit	128.0

Cylinder Head Warp



Serv. Limit	0.05
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Engine & Transmission



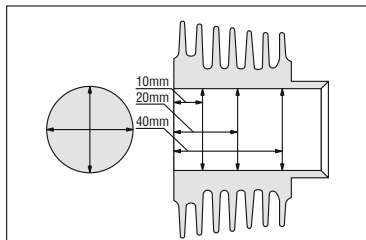
Service Limits

Piston Diameter



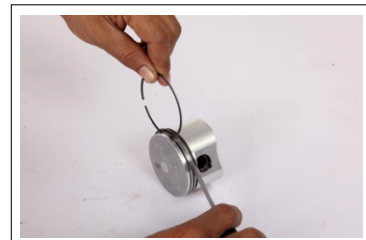
Std. Limit	63.500 ~ 63.508
Serv. Limit	63.475 ~ 63.481

Cylinder Inside Diameter



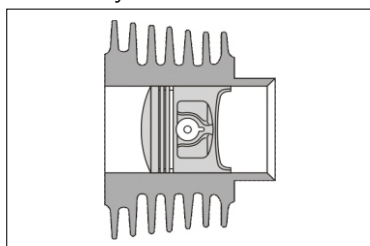
	Std. Limit
Group A	63.50 ~ 63.508
Group B	63.508 ~ 63.515

Piston Ring / Groove Clean.



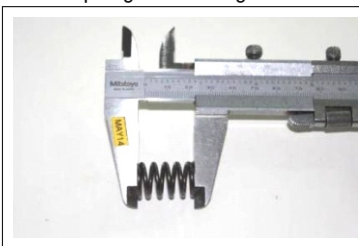
	TOP	SECOND
Std. Limit	0.02~0.06	0.01~0.05
Serv. Limit	0.16	0.15

Piston / Cylinder Clearance



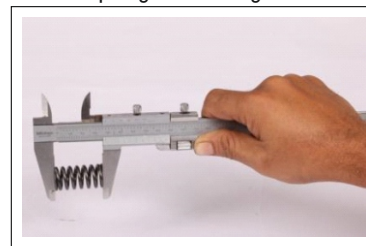
Std. Limit	0.019
Serv. Limit	0.039

Valve Spring Free Length



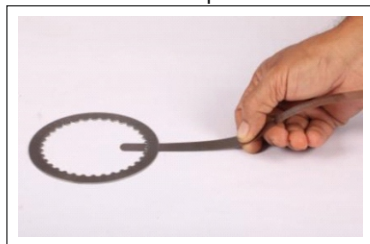
	Inner	Outer
Std. Limit	39.00	42.6
Serv. Limit	37.6	40.4

Clutch Spring Free Length



Std. Limit	37.0
Serv. Limit	35.0

Pressure Plate Warp



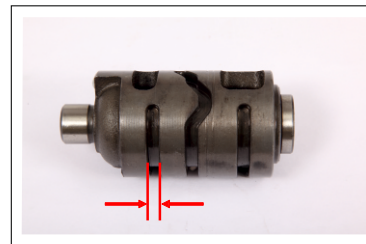
Std. Limit	0.2
Serv. Limit	0.3

Gear Shift Fork Guide Pin Dia.



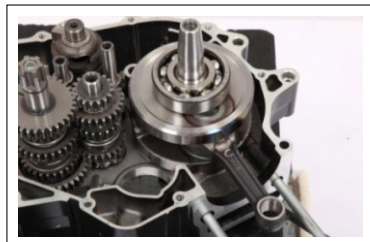
Std. Limit	4.49
Serv. Limit	4.40

Shift Drum Groove Width



Std. Limit	7.5
Serv. Limit	7.35

Crankshaft Run Out



Std. Limit	0.02 Max.
Serv. Limit	0.05

ALL DIMENSIONS ARE IN MM



Special Tools



Cam Sprocket Holder

Part No : 37 10DH 36

Application : For holding cap sprocket, during removal & refitting cam sprocket allen bolt.



Magneto Rotor Holder

Part No : 37 1043 06

Application : For holding rotor during removal & re-fitment.



Magneto Rotor Puller

Part No : 37 10DJ 32

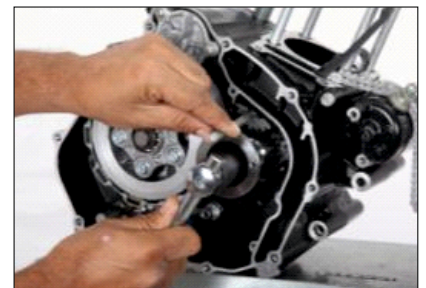
Application : To pull out the rotor from crankshaft assembly.



Primary Gear Holder

Part No : 37 10DJ 28

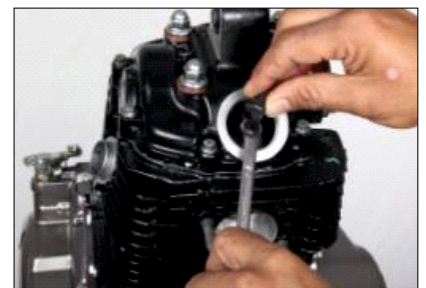
Application : To hold primary and secondary gear loosening / tightening the primary gear nut & special nut securing clutch.



Valve Tappet Adjuster

Part No : F4 1ZJW 33

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



Engine & Transmission

Special Tools



Bearing Extractor

Part No : 37 10DH 31

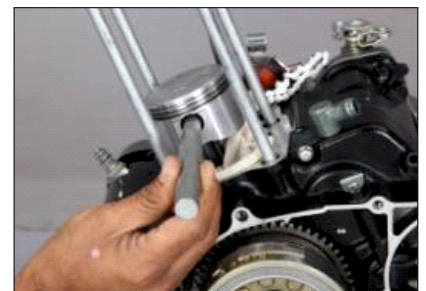
Application : To pull out main ball bearing from camshaft.



Drift Piston Pin

Part No : 74 9309 89

Application : To remove refit piston pin.



Adapter & Valve Spring Compressor

Part No : Adapter : 37 1031 08

Part No : Valve Spring Compressor :
37 1031 07

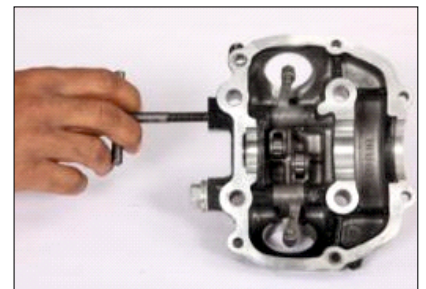
Application : To assemble / dismantle intake, exhaust valve by compressing spring in cylinder head.



Rocker Shaft Remover

Part No : 37 10CS 22

Application : To remove Rocker Shaft from cylinder head.



Output Sprocket Holder

Part No : 37 1030 53

Application : To hold output sprocket during removal & re-fitment.





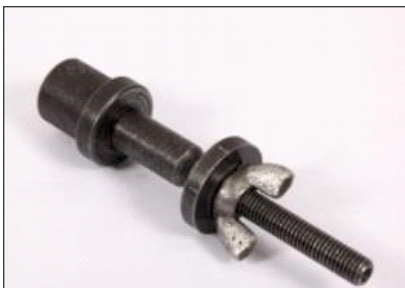
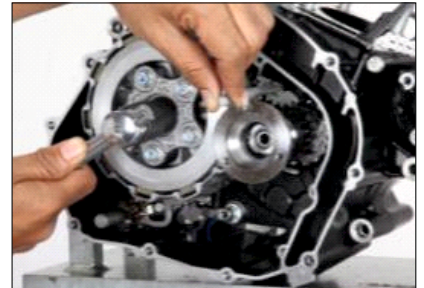
Special Tools



Socket for Clutch Nut

Part No : F4 1ZJA 54

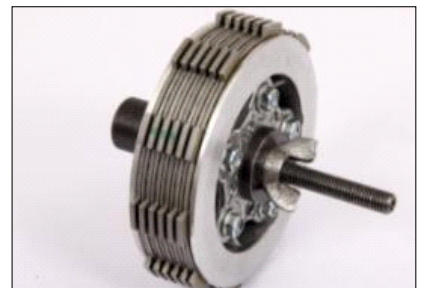
Application : To loosen / tighten special nut securing clutch.



Clutch Dismantling Tool

Part No : F4 1AJA 58

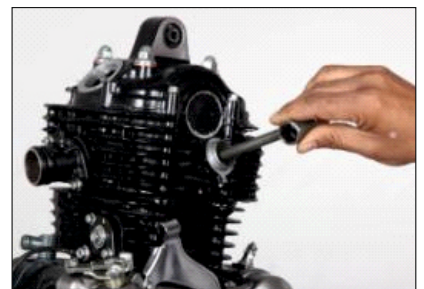
Application : To loosen & tighten the clutch nut.



Spark Plug Spanner

Part No : 37 1042 55

Application : For removing and refitting spark plug R.H. and L.H. side.



Spark Plug Sleeve Removing Tool

Part No : 37 1043 09

Application : For removing piston drift pin.



Engine & Transmission



Engine Dismantling

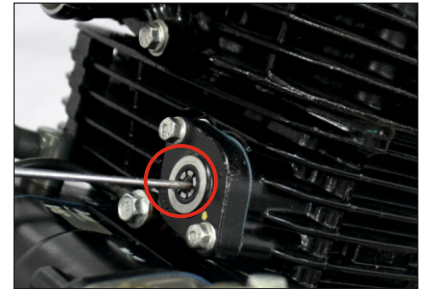
Top Side Dismantling

Clutch cover & Magneto cover are black colour



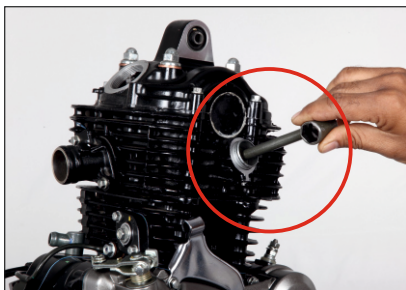
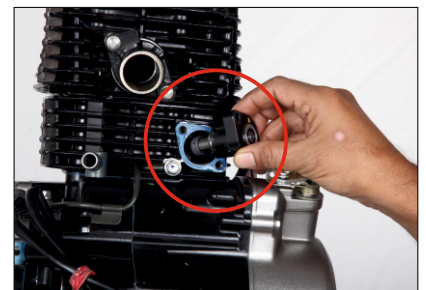
Remove

- Chain tensioner bolt with 10 mm T spanner.
- Rotate chain tensioner screw in clockwise direction to take plunger backward & lock it.



Remove

- Chain tensioner mounting bolts (2 nos.) with 10 mm 'T' spanner.
- Chain tensioner.
- Gasket.



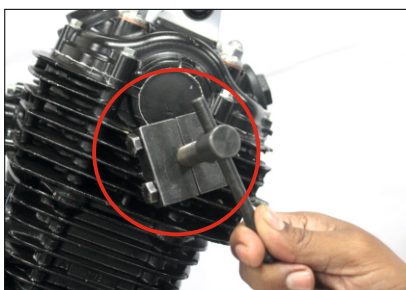
Remove

- Spark plug RH with spark plug removing spanner.



Remove

- Sleeve grub screw with 2.5 allen key.
- Sleeve.



Using spark plug removing special tool

Remove

- Spark plug sleeve.
- Part No :- 37104309





Engine Dismantling

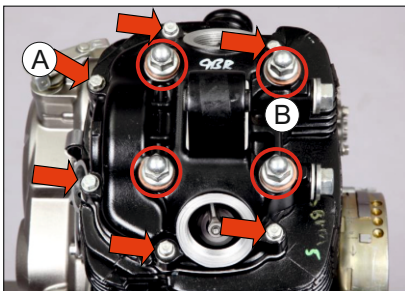


Remove

- Tappet cover bolts (2 nos) with 24 mm spanner.

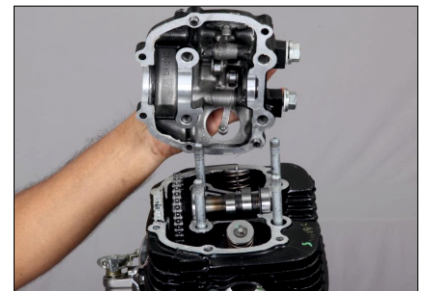


- Ensure that "T" mark on rotor is matching with crankcase LH mark. Also ensure the Tappet up down movement is present.



Remove

- Cylinder head cover mounting bolts as follows
 - 6 nos bolts with 8 mm spanner in criss-cross pattern (A).
 - 4 nos dome nut with 14 mm spanner in criss-cross pattern & take head cover along with rocker arms (B).

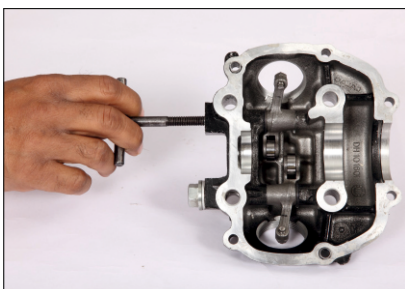


Cylinder Head Cover Dismantling



Remove

- 2 bolts on cylinder head cover 16 mm spanner.
- 2 (nos) dowel pins.



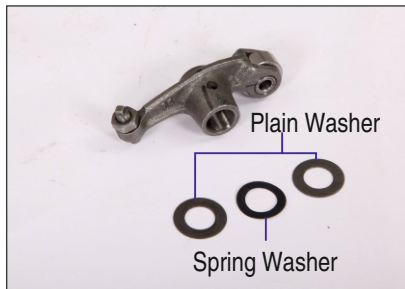
Remove

- Rocker arm shafts with special tool.
- Take out rocker arms.

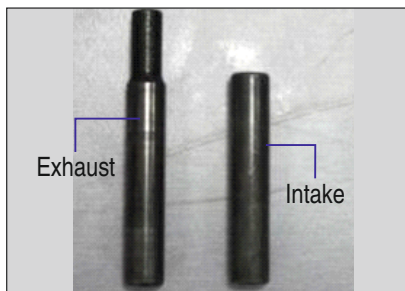
Engine & Transmission



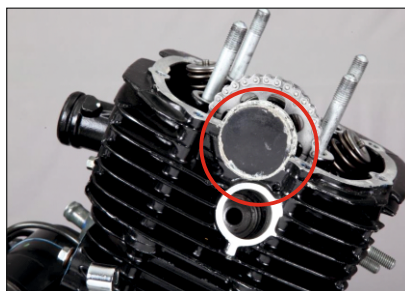
Engine Dismantling



- Ensure the fitment of one spring washer & 2 nos plain washer while fitment of rocker arm.

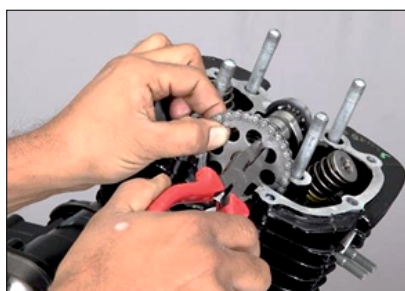


- Length of Intake : 68.6mm
- Length of Exhaust : 52.5mm



Remove

- Rubber cap.
- Cam sprocket mounting bolt with 5 mm allen key using cam sprocket holder tool.
- Take out cam sprocket bolt & spacer.



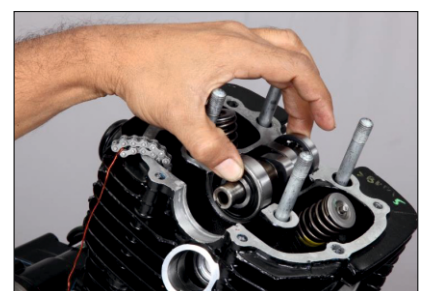
Remove

- Cam sprocket and tie cam chain with copper wire.



Remove

- Cam sprocket collar.
- Cam shaft assembly.



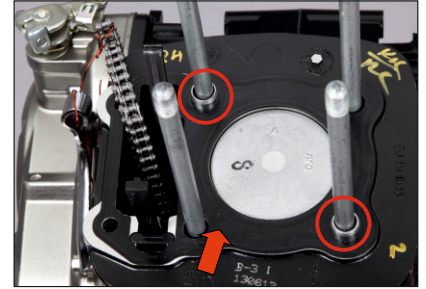


Engine Dismantling



Remove

- Cylinder head assembly.
- Dowels (2 nos).
- Cylinder head gasket.

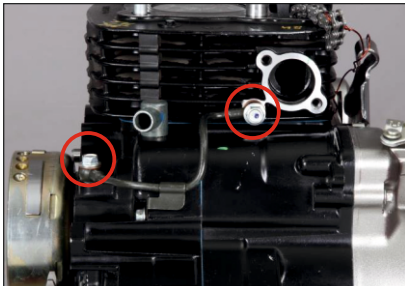


Cylinder Head Dismantling



- Using valve spring compressor Remove
 - Collets
 - Retainers
 - Valve springs
 - Valve
 - Oil seals
 - Valve spring seats

Cylinder Block Dismantling



Remove

- Oil pipe mounting bolt on cylinder block with 10mm 'T' spanner.



Remove

- Cylinder block.



Remove

- Circlip using small screw driver.
Skill Tip : Cover crankcase bore by clean cotton cloth while dismantling piston circlip / snap ring.

Engine & Transmission



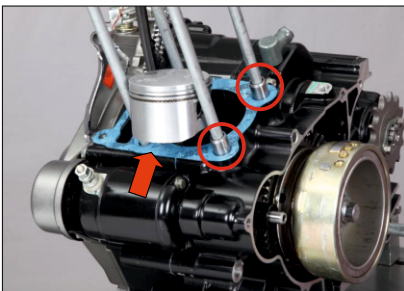
Engine Dismantling



Using piston pin drift special tool

Remove

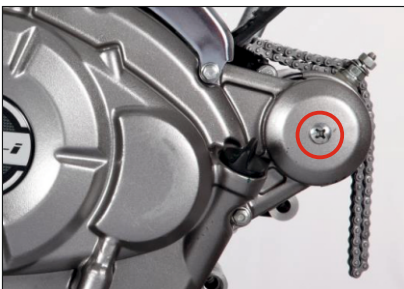
- Piston pin.
- Piston.



Remove

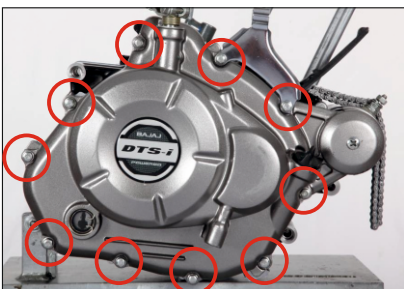
- Dowels (2 nos).
- Gasket.

Clutch Side Dismantling



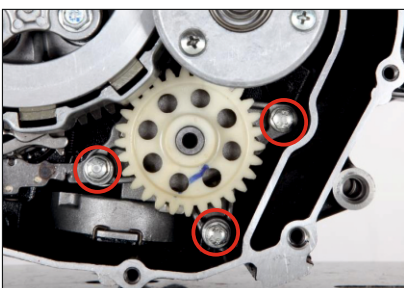
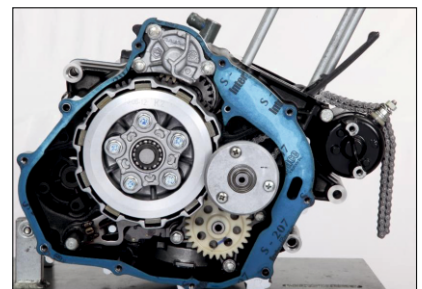
Remove

- Starter motor cover screw with phillips head screw driver.
- Take out starter motor cover.



Remove

- Clutch cover mounting bolts (12 nos) with 8 mm 'T' spanner in criss cross pattern.
- Dowels (2 nos).
- Gasket.
- Clutch cover.

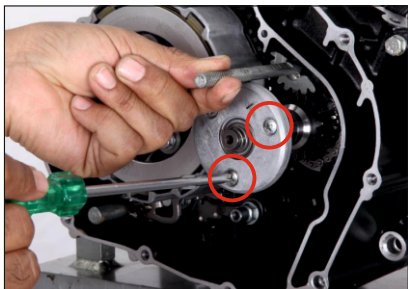


Remove

- Oil pump mounting bolts (3nos) with 8 mm T spanner.
- Take out oil pump assembly.



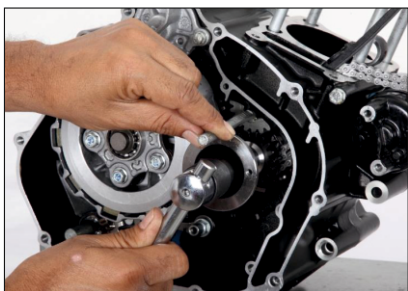
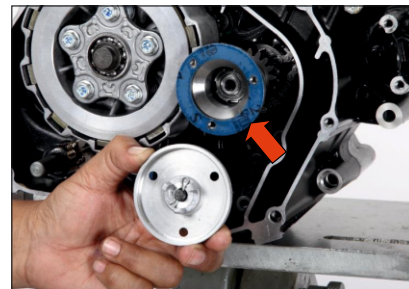
Engine Dismantling



Using Primary gear holder special tool Remove

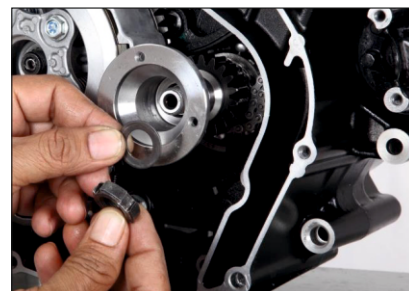
- 3 phillips head screws
- Centrifugal oil filter cover
- Gasket

Note: Some amount of oil is trapped in cover and body of centrifugal oil filter, this oil should be drained into the oil tray.



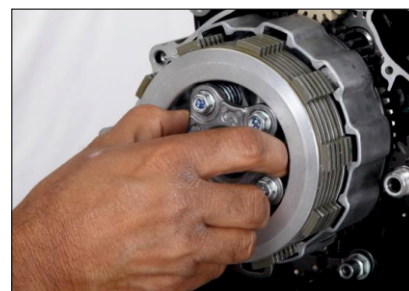
Remove

- Centrifugal filter nut.
- Belleville washer.
- Centrifugal filter.



Remove

- Clutch nut.
- Belleville washer.
- Clutch stack complete.



Remove

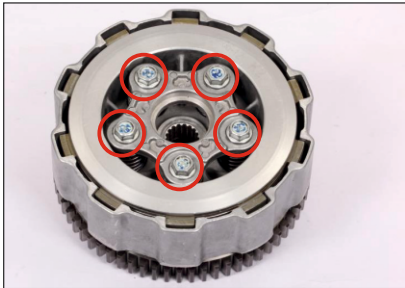
- Spacer.
- Clutch housing complete.



Engine & Transmission



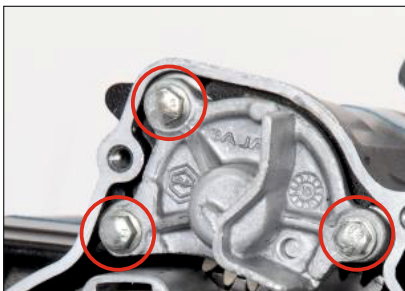
Engine Dismantling



Using clutch dismantling special tool,

Remove

- Bolts (5 nos)
- Clutch holder
- Spring clutch (5 nos)
- Clutch center
- Friction plates & Clutch Plates
- Plate clutch pressure



Remove

- Balancer idler gear cover mounting bolts (3 nos) with 8 mm "T spanner".
- Take out balancer idler gear cover.



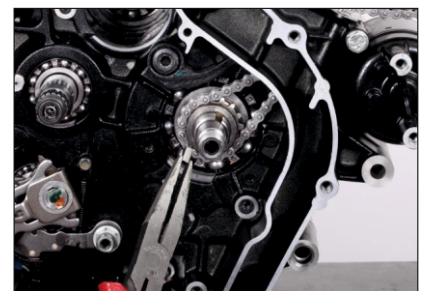
Remove

- Balancer idler gear cover.
- Washer.



Remove

- Primary gear.
- key.



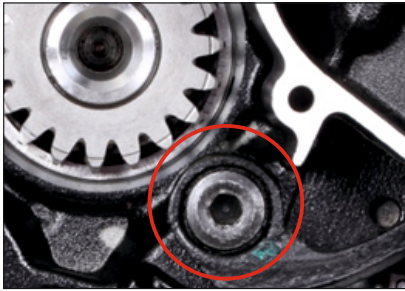
Remove

- Cam chain.
- Cam driving sprocket.



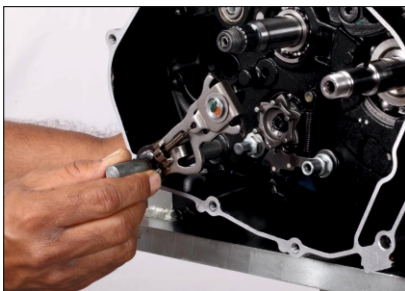
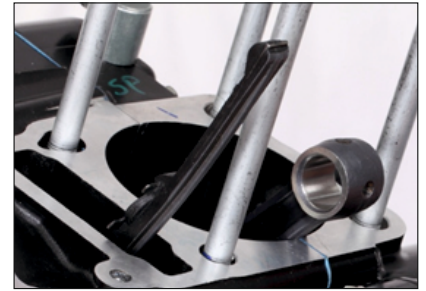


Engine Dismantling



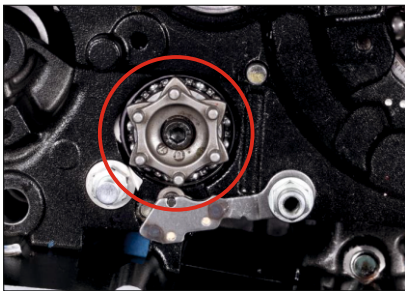
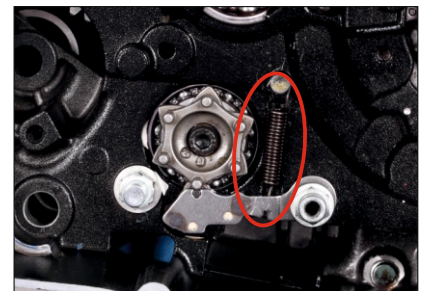
Remove

- Chain guide mounting bolt with 5 mm allen key.
- Take out chain guide.



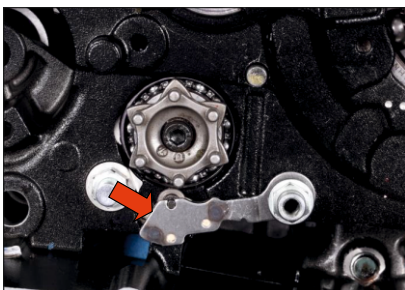
Remove

- Lever complete gear shift.
- Spring stopper gear shifter drum

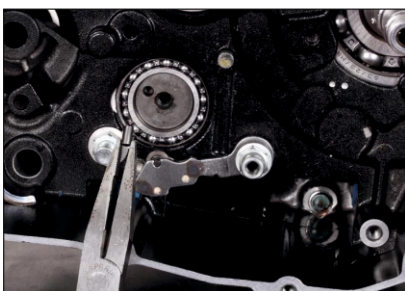
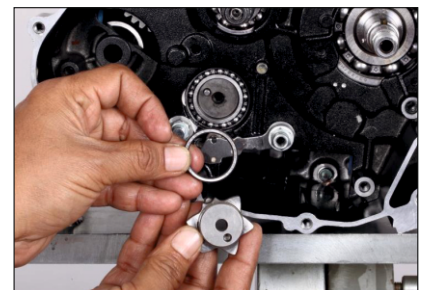


Remove

- Guide gear shifter mounting bolt with 5 mm allen key.



- Press stopper gear shifter drum.
- Take out guide gear shift along with washer.



Remove

- Guide pin.
- Stopper gear shifter drum mounting nut with 12 mm spanner.
- Take out stopper gear shifter drum.

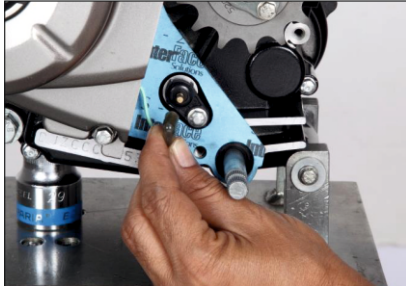


Engine & Transmission



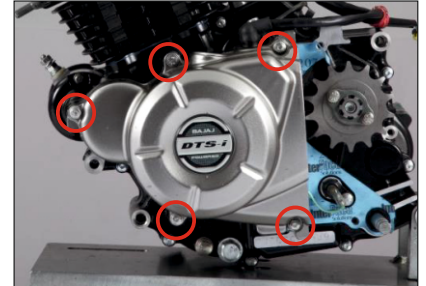
Engine Dismantling

Magneto Cover Dismantling



Remove

- Neutral switch connection.
- Magneto cover mounting bolts (5 nos) with 8mm 'T' Spanner in criss-cross pattern.
- Take out magneto cover.



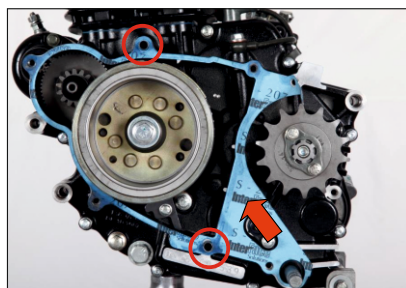
Remove

- Pickup coil mounting screw (2 nos) with phillips head screw driver.
- stator plate mounting bolts (3 nos) with 4 mm allen key.
- Take out stator plate.



Remove

- Stator plate wiring branch guide plate mounting screw with phillips head screw driver.
- Stator wiring branch grommet.
- Neutral switch wire.
- Grommet from magneto cover.
- Take out stator plate assembly.



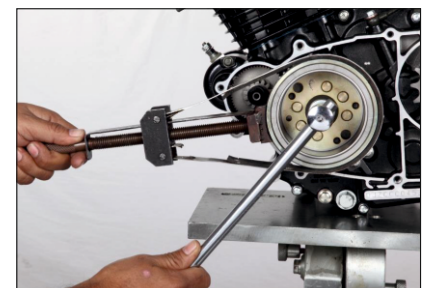
Remove

- Dowels (2 nos).
- Gasket magneto cover.

Using magneto rotor holding special tool

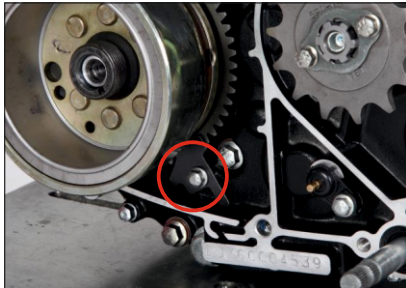
Remove

- Rotor mounting bolt with 14 mm spanner.





Engine Dismantling



Remove

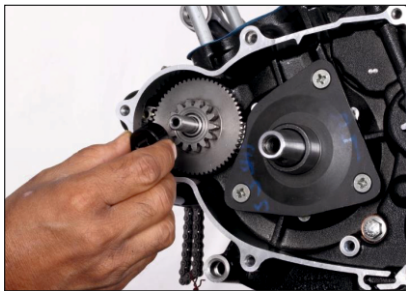
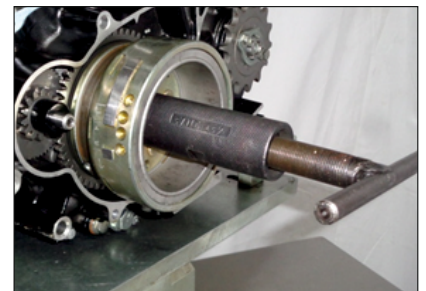
- Gear starter clutch guide plate mounting bolt with 8 mm T spanner.
- Take out gear starter clutch guide plate.



Using magneto rotor puller

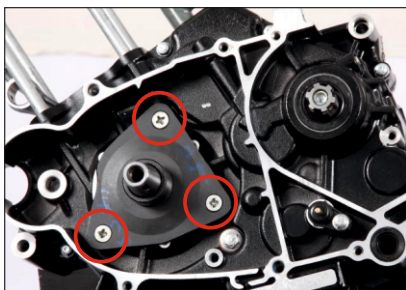
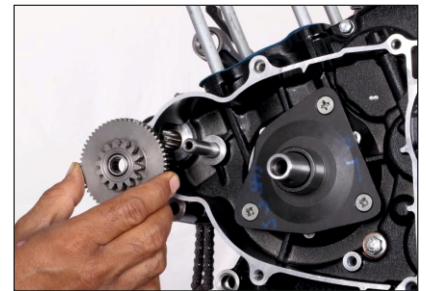
Remove

- Magneto rotor along with one way clutch.



Remove

- Bush starter counter gear shaft.
- Take out starter counter assembly.



Remove

- Guide starter assembly mounting screw (3 nos) with phillips head screw driver.
- Take out guide starter assembly.

Crankcase Splitting



Using output sprocket holder special tool

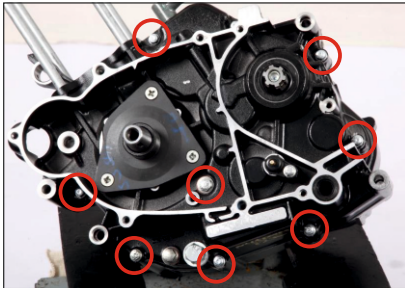
Remove

- Out put sprocket mounting bolts (2 nos) with 8 mm T spanner.
- Take out output sprocket along with plate drive sprocket.



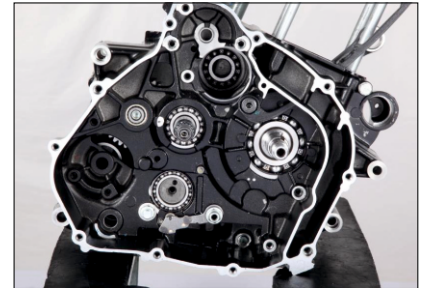
Engine & Transmission

Engine Dismantling



Remove

- Crankcase LH side mounting bolts (8 nos) with 8 mm & 10 mm T spanner in criss-cross pattern.
- Crankcase RH side mounting bolts 10 mm T spanner in criss-cross pattern.



- Take out crankcase RH

Remove

- Crankshaft assembly



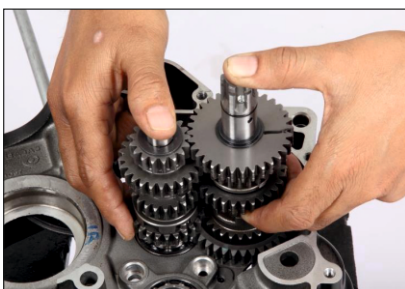
Remove

- Input & Output shaft gear shift fork.
- Drum complete gear shift.



Remove

- Input fork gear shift.
- Output fork gear shift (2 nos).



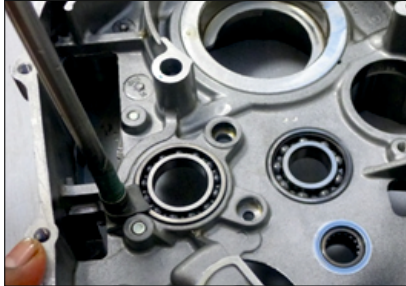
Remove

- Input & output shaft with gears.



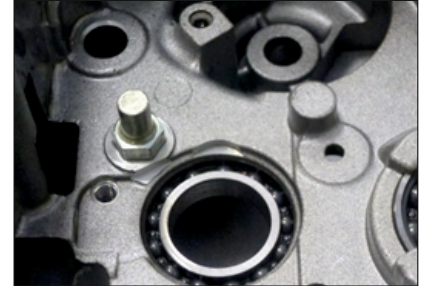
Engine Dismantling

Crankcase RH Dismantling



Remove

- Gear change drum bearing guide plate mounting bolt with 8 mm T spanner.
- Stopper with 12 mm spanner.



Using bearing driver set

Remove

- Gear change drum bearing & Input shaft bearing.



Crankcase LH Dismantling



Remove

- Collar output shaft.
- Output shaft oil seal.

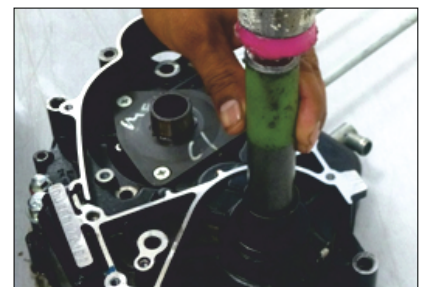


Remove

- Circlip.

Using bearing driver set

- Output shaft bearing.

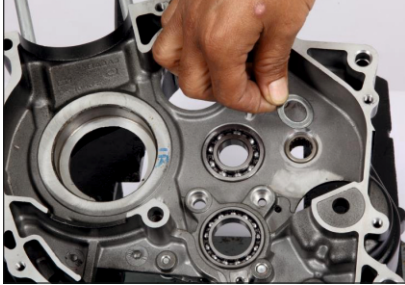


Engine & Transmission

Engine Dismantling



Crankcase LH Dismantling



Remove

- Lever complete gear shift oil seal.

Using body balancer bearing puller special tool

- Body balancer bearing



Using input shaft bearing extractor

Remove

- Input shaft bearing.



Notes

[illegible]

Key Learning Points

- Appropriate Torque Application for Various Frame Components
- Understanding of Standard Operating Procedure
- Understanding of Standard Limits and Service Limits for all Frame Components



CHAPTER 4

Frame & Suspension

Tightening Torques - Chassis

Service Data - Chassis

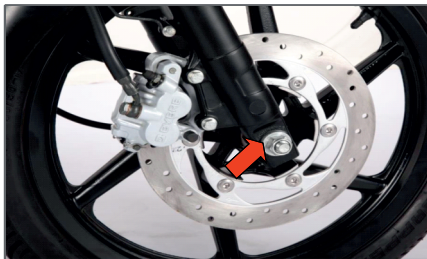
Special Tools

Working of Nitrox Rear Suspension



Tightening Torques - Chassis

Front Axle Nut



8.0 ~ 10.0 Kgm

Rear Axle Nut



8.0 ~ 10.0 Kgm

Torque Rod Nut



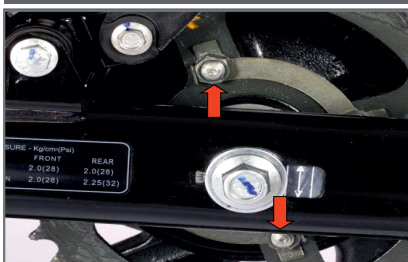
3.0 ~ 4.0 Kgm

Rear Sleeve Nut



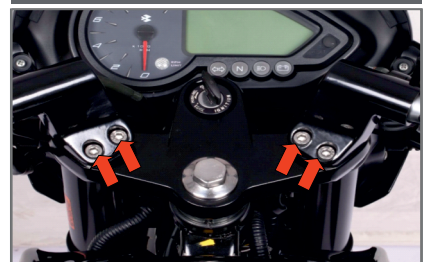
7.0 ~ 8.0 Kgm

Rear Sprocket Mounting Nut



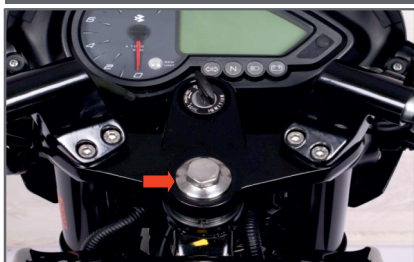
3.0 ~ 3.2 Kgm

Handle Bar Holder Bolts



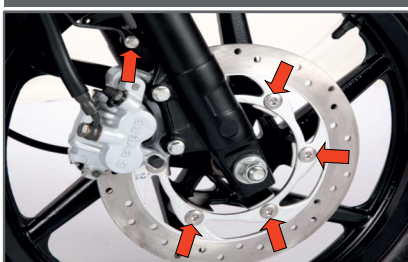
2.0 ~ 2.2 Kgm

Steering Center Nut (Slotted)



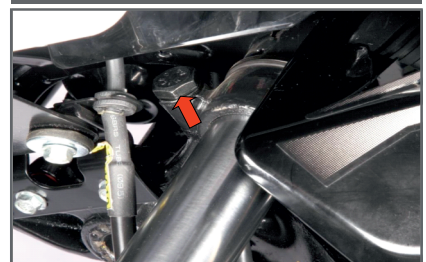
5.0 Kgm

Brake Disc Allen Bolts



2.6 ~ 3.2 kgm

Fork Under Bracket Bolts



1.8 ~ 2.0 kgm

R.S.A. Mounting Nut Upper



3.5 ~ 4.0 kgm

Swing Arm Shaft



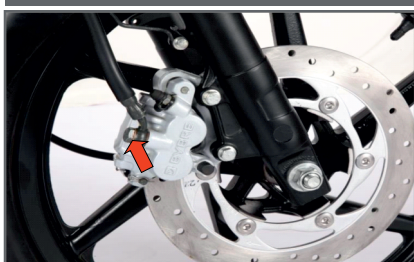
8.0 ~ 10.0 kgm

R.S.A. Lower Bolt



3.5 ~ 4.0 kgm

Banjo Bolt Caliper



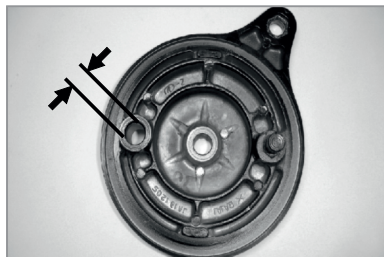
2.2 ~ 2.8 kgm

Frame & Suspension

Service Data - Chassis

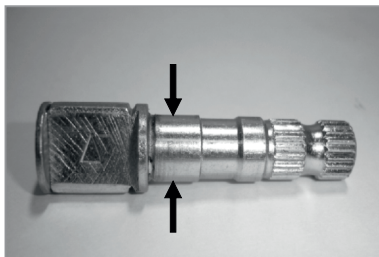


Brake Panel Cam Hole Dia.



Std. Limit	14.0 ~ 14.03
Ser. Limit	14.15

Brake Cam Front Diameter



Std. Limit	13.95 ~ 13.98
Ser. Limit	13.88

Front Brake Pad Thickness



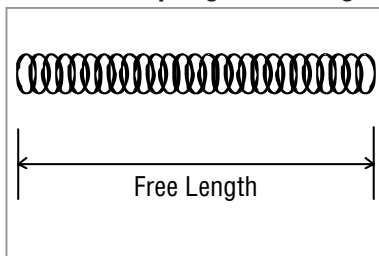
Std. Limit	7.4
Ser. Limit	3.8

Brake Shoe Rear Liner Thickness



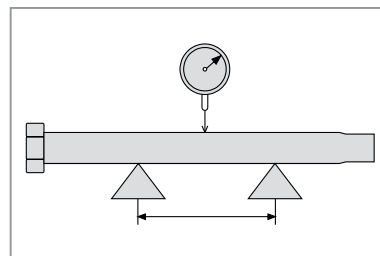
Std. Limit	3.85 ~ 4.15
Ser. Limit	2.0

Front Fork Spring Free Length



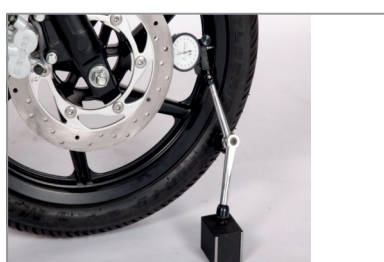
Std. Limit	373.0
Ser. Limit	368.0

Axle Run Out



Std. Limit	TIR 0.1 or Less
Ser. Limit	TIR 0.2

Axial Wheel Run Out



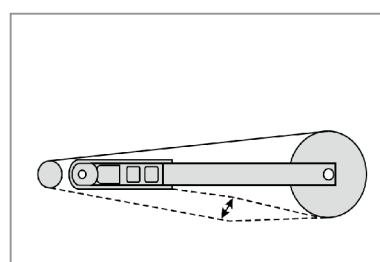
Std. Limit	TIR 1.0 or Less
Ser. Limit	2.0

Radial Wheel Run Out



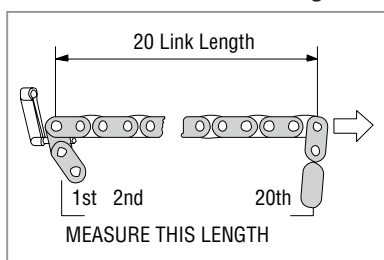
Std. Limit	TIR 0.8 or Less
Ser. Limit	2.0

Drive Chain Slack



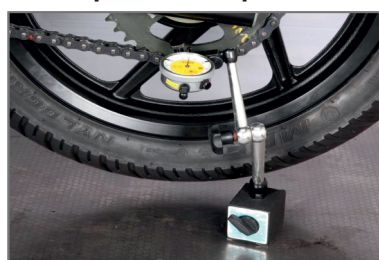
Std. Limit	25 ~ 35
Ser. Limit	40 ~ 45

Drive Chain 20 Link Length



Std. Limit	259.0
Ser. Limit	307.0

Rear Sprocket Warp



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

Tyre Tread Depth

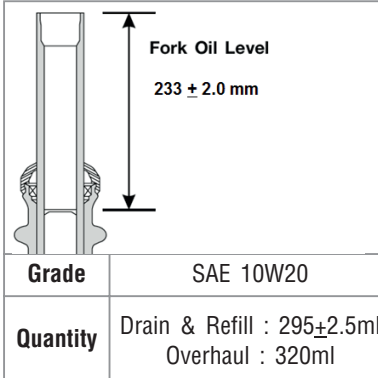


Std. Limit	Rear : 7.3, Front : 5.0
Ser. Limit	Rear : 2.0, Front : 1.0



Service Data - Chassis

Front Fork Oil



Notes

This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings present.

Frame & Suspension

Special Tools



Details of Exclusive Special Tool

For carrying out repairs / overhauls, these 4 new special tools were developed earlier exclusively for Pulsar 150



Front Fork Oil Seal Driver

Part No : 37 1830 07

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



Special Tool to Remove Anti-Friction Bush

Part No : 37 1041 95

Application : To remove anti-friction & oil seal from front fork outer pipe.



Stem Bearing Driver

Part No : 37 1830 05

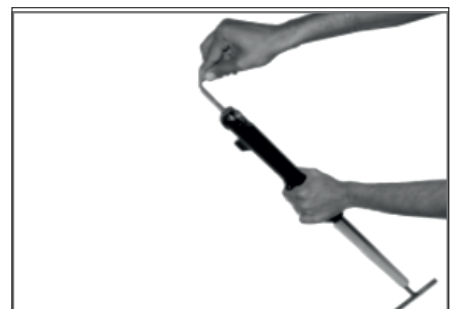
Application : To fit bearing race on fork under holder bracket.



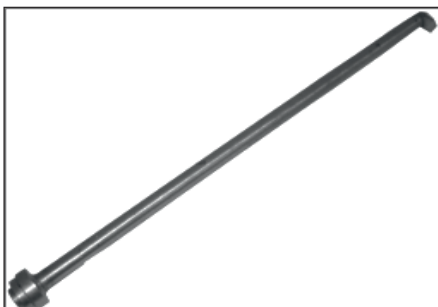
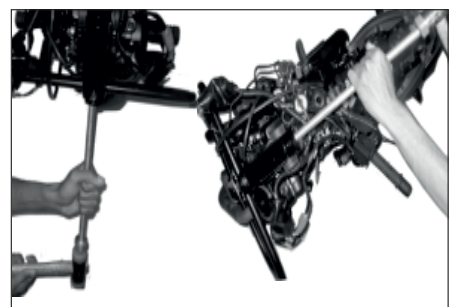
Front fork cylinder holder handle with adapter

Part No : 37 1830 06

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



Special Tools

**Steering Slotted Nut Special Tool****Part No :** 37 0043 02**Application :** To remove / tighten steering slotted nut.**Bearing Puller****Part No :** 74 9309 93**Application :** For removing & fitting needle roller bearing in swing arm**Installer Upper & Lower Bearing Race Frame****Part No :** 37 1801 06**Application :** To install upper & lower steering races / cones into their seats inside frame.**Steering Cone Remover****Part No :** 37 1805 06**Application :** To remove steering cones from frame.

Frame & Suspension



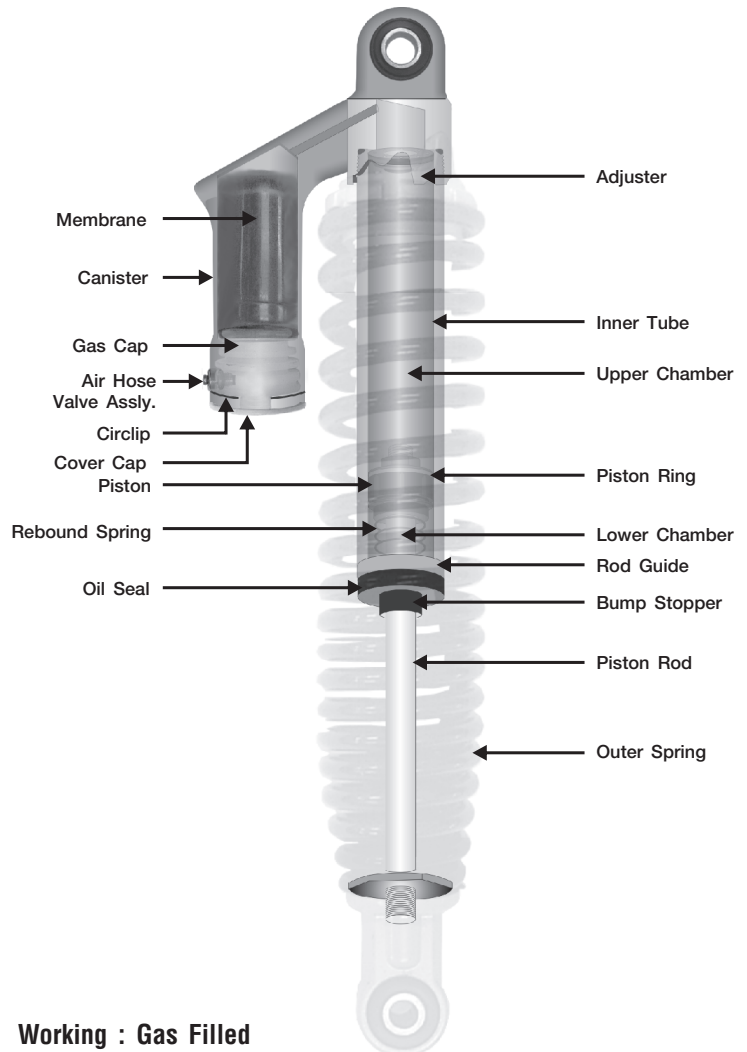
Working of Nitrox Rear Suspension

Function

- To suspend rear wheel to the frame with the help of swinging trailing arm.
- To allow rear wheel to travel up and down by absorbing shocks while passing through ditches / bumps (comfortable ride for the rider and pillion rider).
- To provide stability while graduating turns.

Advantage

The gas filled shock absorber enhances the dampening performance by eliminating the formation of foam. The foam formation is eliminated by the nitrogen gas filled inside the canister. The nitrogen gas is filled in canister at a pressure which is 8 times greater than atmospheric pressure.



Working : Gas Filled Compression Stroke

In gas filled shock absorber, oil is completely filled in inner, outer tube and canister. Nitrogen gas is filled in membrane at a pressure of $6.5 \sim 7.5 \text{ Kg/cm}^2$.

During this stroke, oil flows freely from 'Upper Chamber' to 'Lower Chamber' through piston valve. Simultaneously oil also flows to canister assembly through base valve and compresses the membrane filled with nitrogen gas.

At the end of the compression stroke, bump stop rubber takes load and avoids hitting of lower eyelet mounting against outer tube.



Working of Nitrox Rear Suspension



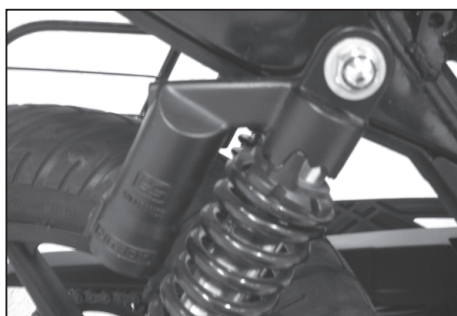
Working : Gas Filled

Extension Stroke

During this stroke, oil in canister starts returning to upper chamber through base valve without any resistance due to expansion of membrane.

Simultaneously, oil from lower chamber will flow slowly into upper chamber with resistance due to piston valve.

At the end of extension stroke, rebound spring avoids hitting of piston rod assembly complete against rod guide.



Procedure for gas checking and Refilling

- Remove the Phillips-headed small screw and 'O' ring.
- Clamp the cylindrical guide clamp on to the canister keeping the rubber plug in the center to support the syringe needle insertion and keeping in position.
- Hold the pump as shown and pierce the syringe needle into the center of rubber plug.
- The molded needle adaptor will rest into the clamped cylindrical guide
- Read the gas pressure on the dial gauge. If the gas pressure is below 6.5 Kg/cm² refill the air by pumping, keeping the needle in as it is condition without removal. As the natural air consists of 71% of nitrogen it will serve the purpose.
- To fill the air into the canister, apply full stroke of pump as shown; otherwise air will not get inflated into the pump.
- Keep on pumping the air unless you get 7.5 kg/cm² on the gauge
- Pull out the air pump along with needle carefully and take out the guide clamp
- Finally fix the phillips headed screw with 'O' ring.

In current produced pulsars Nitrox RSA is at bottom side & Air filling is not recommended in these rear shock absorbers.

Frame & Suspension

Notes



Key Learning Points

- Battery: Charging process & maintenance

- Checking & inspection of all electrical components

- Electrical circuit diagrams



CHAPTER 5 Electricals

- Battery
- Electrical Checking Procedure
- Starter Motor
- Battery - Dos & Don'ts
- SOP for Checking Battery Charge Condition
- Dos & Don'ts
- Electrical Circuit Diagrams

Battery



Technical Specification :

• Type & Capacity	Pulsar 150 - 12V - 7 AH
• Specific gravity of electrolyte for initial filling of new battery	1.24 for use above 10°C
• Specific gravity of electrolyte for initial filling of new battery	1.28 for use below 10°C
• 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°C and 1.28 at room temp. for use below 10°C).
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

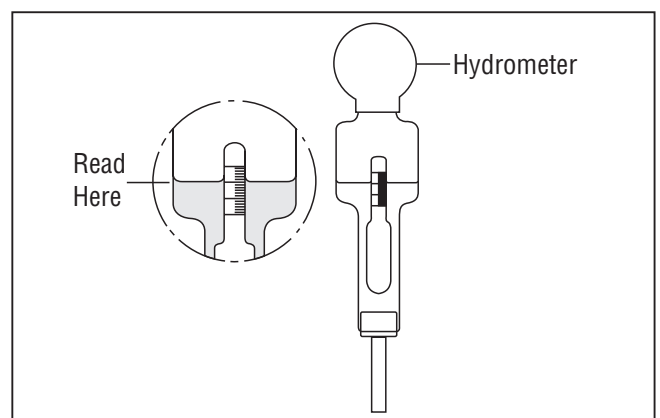
The charge condition of the individual cell can be checked by measuring Sp. gravity of electrolyte in that cell. The specific gravity of electrolyte can be checked by using Hydrometer having small diameter spout.

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 (earthing) terminal" at last.
- e. Clean battery terminals and cable connections. Smea r them with petroleum jelly to avoid corrosion.
- g. Check that the battery cable connections are firm and 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 charged procedure is as follows :

- Remove battery from vehicle
- Clean battery thoroughly
- Remove gang bar strip.

Electricals

Battery



- Top up level with distilled water to max level when the 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 special 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.

- Always keep the battery clean and dry.
- 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 (say more than a month) then Non Use Maintenance should be carried out as follows otherwise the battery may get sulphated and permanently damaged.

- Remove the battery from vehicle.
- Maintain electrolyte at 'Upper Level'.
- During off service period, battery should be charged once a month or if the battery DC voltage drops below 12.3 V.
- Keep the battery fully charged.
- Store the battery in cool, dry place.
- 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 :

- Undercharging.
- Standing in a partially or completely discharge condition for long time.
- 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.
- Adding acid : If acid is added to a cell in which sulphation exists the condition will be aggravated.
- High specific gravity : If specific gravity is higher than the recommended value, then sulphation may occur.
- High temp.: High temperature 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 1 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

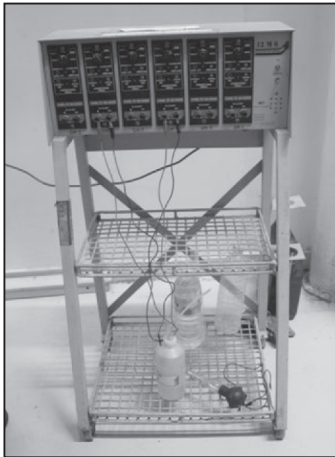
Specific gravity check: - Whether battery is fully charged or partially charged, it will always show same "no load voltage" of 12 volts or more (unless battery cells are damaged due to sulphation etc). But specific gravity of the fully charged battery and partially charged battery will be different. 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 correct indication of state of charge of battery on load conditions.

Battery



6 Channel Battery Charger



- Make
- Model

Teknikraft

12M6, with stand

Suitable for charging 6 batteries

(2.5Ah/5Ah/7Ah/9Ah)

Constant current type having 0.25 Amp.

/0.5 Amp./0.7 Amp./0.9 Amp. current

settings.

Electricals

Battery



Checking Condition of Battery



For checking condition of battery, load tester as per following specifications is to be used :

Make Midtronics
Model PBT50

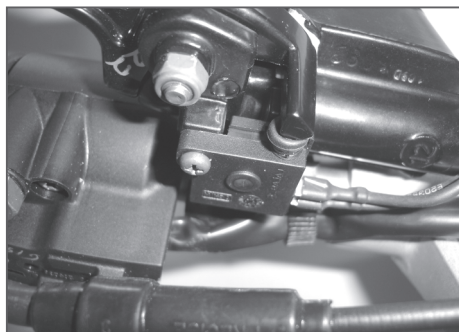


Procedure for checking battery condition

- Disconnect battery +ve & -ve terminals.
- Confirm battery type & reference no.
- Connect load tester's Red & Black cable to battery +ve & -ve terminal respectively.
- Press test button.

LED Indication	Status	Result	Action
Green LED glowing	OK	Battery is fully charged	Battery can be used on the vehicle.
Green & Yellow LED glowing	OK / LOW	Battery is partially discharged.	Charge the battery on battery charger
Yellow LED glowing	LOW	Battery is discharged & needs charging	Charge the battery on battery charger
Red LED glowing	7	Not OK	•Try charging on charger.
			•Observe for half an hour if charger gives indication of 'bad battery', then discontinue charging and scrap the battery.
			•If there is no bad battery indication then continue charging till charging is over.
			•Again test battery condition using PBT 50 load tester. If result is OK, then put the battery on vehicle.

Electrical Checking Procedures

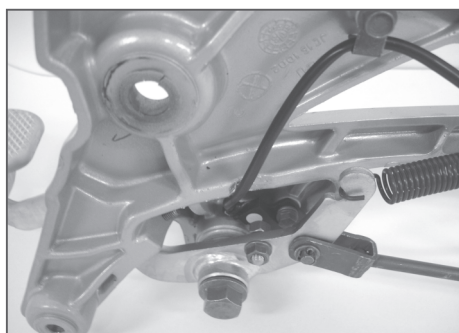


Switches :

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.

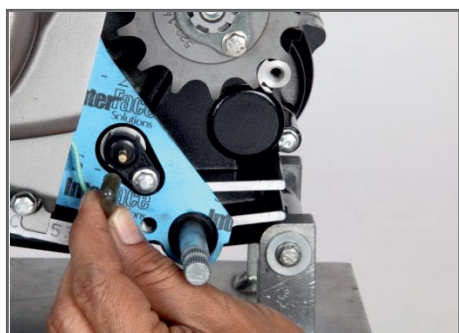
	Brown	Blue
Lever Pressed	● ————— ●	● ————— ●
Lever Released	●	●



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.

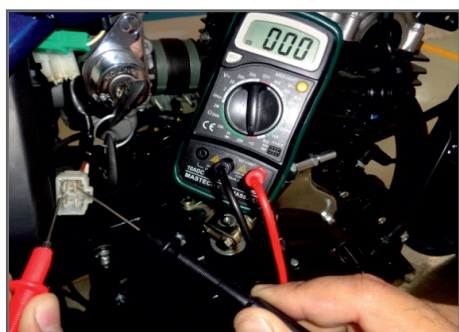
	Brown	Blue
Lever/Pedal Pressed	● ————— ●	● ————— ●
Lever/Pedal Released	●	●



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	Earthing
'ON' (Vehicle in neutral)	● ————— ●	● ————— ●
'OFF' (Vehicle in gear)	●	●

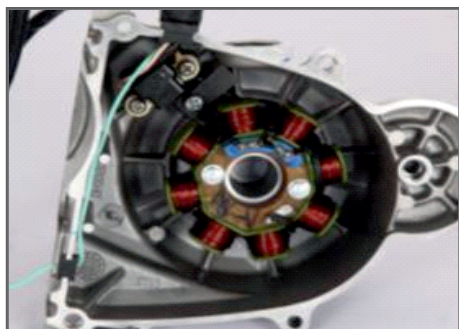


Ignition Switch :

	Brown/Blue	White
'OFF'	●	●
'ON'	● ————— ●	● ————— ●



Electrical Checking Procedures



Stator Plate Coils Inspection :

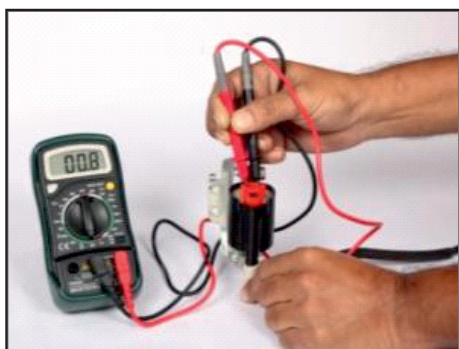
- Disconnect stator plate coupler
- Set multi meter on ohm range. (Ohm Meter)

Pickup Coil Resistance :

Range	Connections		Reading
2 K Ohm	Meter +ve	Meter -ve	215 $\pm$ 20 ohm
	White/Red	Black/Yellow	

Battery Charging Coil :

Range	Meter +ve	Meter -ve	Reading
200 Ohms	Blue/White	Blue/White	0.9~1.1 W at 25°C



H. T. Coil Resistance Checking

Measuring & Testing Equipment : Multimeter

- Measure the primary winding resistance as follows

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	0.3 ~ 0.5 Ohms at 25°C
	White / Yellow	Black / Yellow	

- Measure the secondary winding resistance as follows
- Remove the plug cap by turning it counter clockwise.

Meter Range	Connections		Standard Value
20 K Ohms	Meter +ve	Meter -ve	4.5 ~ 5.5 K Ohms at 25°C
	White / Yellow	Black / Yellow	

- If the value does not match as per, specifications replace the coil.
- If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform then check spark output of HT coil using CDI / HT coil tester.

H. T. Coil Spark Output Checking

S.N.	LED Status	Spark Status	Conclusion
1.	Glow	Continuous Bluish Spark	Ignition system is OK
2.	Glow	No Spark	HT Coil / Spark plug / Plug cap may be defective
3.	Glow	Intermittent Spark	HT Coil / Spark plug / Plug cap may be defective
4.	Does not Glow	No Spark	Check pick up coil & Exciter coil if found OK then replace CDI



Electrical Checking Procedures



Fuse :

Main Fuse Inspection (Capacity = 15 Amp) / Secondary Fuse Inspection (Capacity = 10 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, and then replace it with a new fuse of proper amperage.

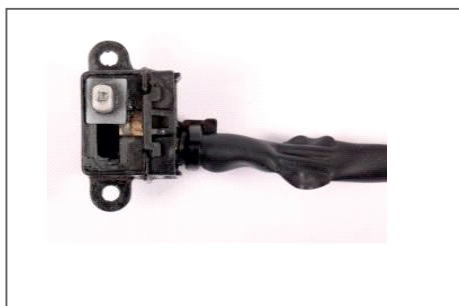
Caution : When replacing a fuse be sure the new fuse matches the specified fuse rating for that circuit. Installing of a fuse with a higher rating may cause damage to wiring and components.



Relay :

Solenoid Relay (Inspection Using Multi meter)

Coil Resistance	Meter +ve	Meter -ve	Reading
X 200 Ohm	Red/Yellow	Black	3.8 ± 2.0 Ohm



Clutch Switch :

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

Meter Range	Light Green	Yellow / Green	Black /Yellow
OFF - Clutch lever not pressed	● —	— ●	●
ON - Clutch lever pressed	●	● —	— ●

Electricals



Electrical Checking Procedures



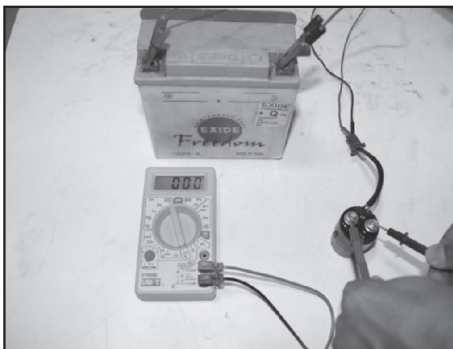
Starter Relay Coil Resistance Checking

Measuring & Testing Equipment : Multimeter

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	3.9 Ohms $\pm$ 10%
	Starter Relay Coil Red - Yellow Wire	Starter Relay Coil Black Wire	

SOP :

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



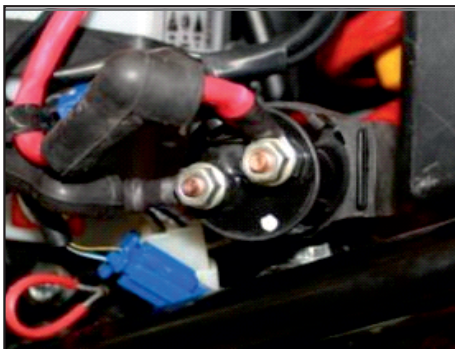
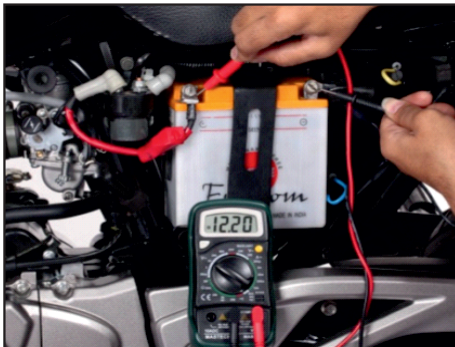
Starter Relay Continuity Checking

Measuring & Testing Equipment : Multimeter

SOP :

- Connect external 12V DC supply to starter relay coil terminals.
- 'Tuk' sound will be heard.
- Set multimeter on continuity mode.
- Connect multimeter at to relay contact terminals.
- Continuity (beep sound) indicates starter relay is OK.

Electrical Checking Procedures



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	Connection		Specification 4000 + 25 RPM
25 V DC	Meter +ve Battery +ve terminal	Meter -ve Battery -ve terminal	14.3 ~ 14.7 Volts

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
10 A DC	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.

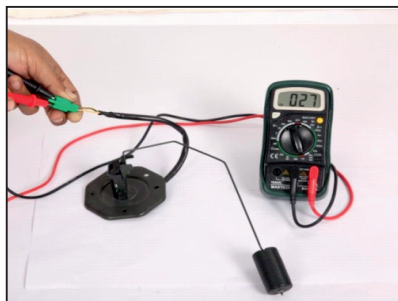
Electricals

Electrical Checking Procedures



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	93~101 Ohm	0 Bar
Reserve	2.8 Liter	67~77 Ohm	2 Bars
Just Above Reserve	3.5 Liter	58~62 Ohm	3 Bars
Half Tank	4.5 Liter	36~44 Ohm	4 Bars
Full Tank	8.5 Liter	6~10 Ohm	6 Bars

Note: Before checking the above, please confirm

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



Horn

Measuring & Testing Equipment : DC Clamp Meter

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

SOP :

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



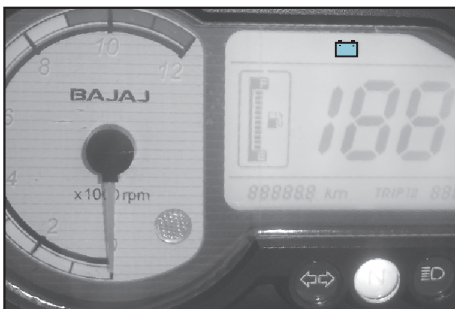
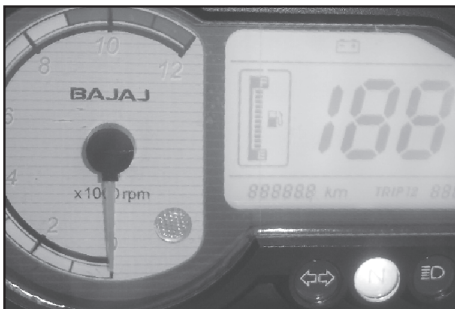
Electrical Checking Procedures



Speedometer Console : The speedometer has a wide Digital LCD screen with a orange backlit display mode for superb visibility of display during night riding condition.

This entire speedo console houses following :

- A large analogue tachometer with self check mechanism.
- A red LED indicator showing low fuel level (Reserve-3.6 Lit) inside the fuel tank.
- Digital Displays for - linear speed in Kmph.
 - Odometer
 - Trip meter (Unique facility of resetting the trip meter 1 and 2 respectively)
- A row of indication LED displaying functioning of
 - Neutral Light
 - High beam
 - Turn signal
 - Side stand on indication



Additional battery charge status indication system is provided. The glowing of this icon indicates

Low Battery Voltage

Please ignore battery icon during cranking as Battery Voltage drops < 11.9 V during cranking



A unique Day-Night mode functioning feature is provided it means the LED glows intensely in day time and in evening and night time LED glows dim. This feature is provided for riders convenience and Safety.

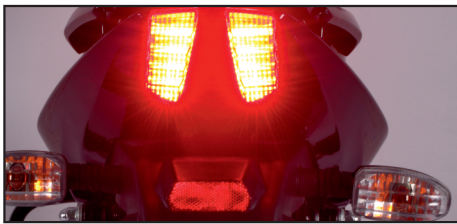
Maintenance :

- Do not apply pressurized water jet on speedo console.
- Speedo console should not be kept inverted.
- Ensure no scratches / breakage of glass of speedo console
- Ensure Speedo console coupler is firmly fitted.
- Try to park the vehicle in shadow & avoid direct facing to sun rays.

Note :

The speedometer console has a unique built in memory logic function which stores on the data in its memory even if DC supply is disconnected.

Electrical Checking Procedures



Tail LED Lamp :

The illumination for Tail lamp and Brake lamp are done through 2 rows of LED's each. These are high intensity LED's.

The main advantage of these LED's is that;

- They consume very less power. i.e LED consumes 3W power against 21 W power of a conventional brake lamp.
- Life of LED is infinite.
- Light output is equivalent to that of a bulb.
- With this tail LED lamp battery discharge possibility is very minimum in case of a brake switch short condition.

When you operate light control switch to glow, the intensity is low. As soon as you operate brake switch the brightness of LED increases to show you bright light.

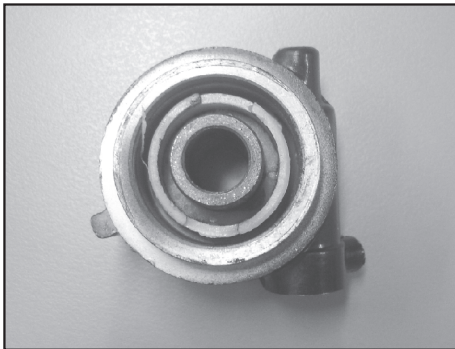
This changeover of intensity is maintained with the help of electronic circuit placed inside Tail Lamp Console assly and is a totally sealed unit.

Electrical Checking Procedures



Vehicle Speed Sensor

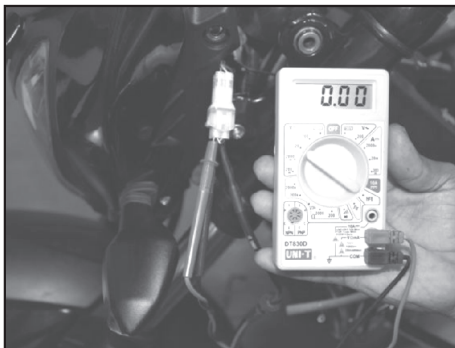
- Non contact Wheel Sensor - In LCD speedo console there are no moving parts as wheel speed is sensed through a non contact hall effect sensor. The hall sensor is an electronic switch which operates due to magnetic field. The sensor has 3 wires - Supply, Earth & Output. This sensor converts one rotation of front wheel into 8 pulses & these are transmitted to digital speedometer through a sensor cable.



Do's & Don'ts

- Do not apply pressurized water jet on vehicle speed sensor.
- Handle wheel sensor carefully while working on front brake drum related repairs.
- Ensure sensor cable is intact & not fouling with any other part.
- Speed sensor should not physically touch to magnetic ring.

Note: Gap between speed sensor & magnetic ring must be : max 4 mm & min - 0.5 mm. Ensure intact condition of 'O' Ring for speed sensor. Use correct size 'O' Ring in case of replacement.



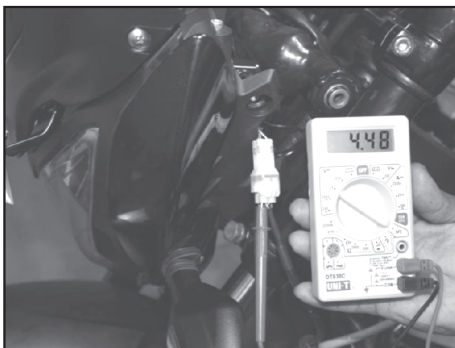
SOP for checking wheel sensor

Measuring & Testing Equipment : Multimeter

1. Set multimeter to 20 VDC
2. Connect multimeter to 4 pole coupler of wheel sensor as per table given below.

Multimeter +ve	Blue-White wire
Multimeter -ve	Black-Yellow wire

3. Switch ON ignition switch
4. Rotate front wheel slowly, mark on the tyre for identification and to ensure that one rotation is complete.
5. In one rotation of front wheel, 8 pulses are generated per revolution. The reading on multimeter will vary between 4~4.5 VDC & 0VDC 8 times.
- 6 Conclusion -



Wheel Sensor OK	If 8 times reading on multimeter varies between 4 ~ 4.5 VDC and 0 VDC in one rotation of front wheel.
Wheel sensor Faulty	If reading on multimeter does not vary & remains continuously in the range of 4~4.5 VDC
	If reading on multimeter does not vary & remains continuously in the range of 0VDC.

Electricals

Electrical Checking Procedures



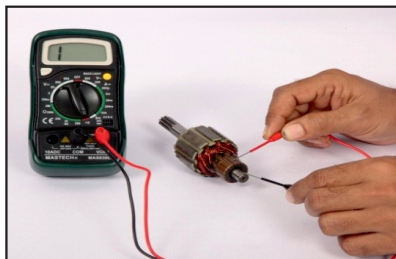
Starter Motor - Current Drawn

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	30 ~ 38 Amps Spark Plug Caps removed (Measured at 27°)

SOP :

- Disconnect 2 spark plug caps
- Switch 'ON' Ignition switch & kill switch.
- Select range & set clamp meter zero reading.
- Encircle red input wire of starter motor into the clamp meter jaws.
- Crank the engine for 3 seconds .
- Observe the cranking current displayed on clamp meter.



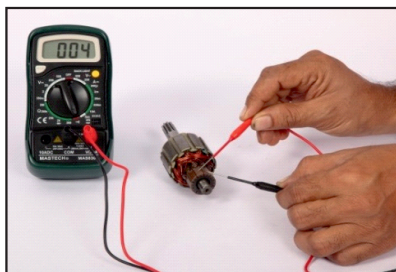
Starter Motor Armature

Measuring & Testing Equipment : Multimeter

Meter Range	Connections		Standard Value
Continuity mode	Meter +ve	Meter -ve	No continuity is shown
	Commutator segment	Shaft	

SOP :

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



Measuring & Testing Equipment : Multimeter

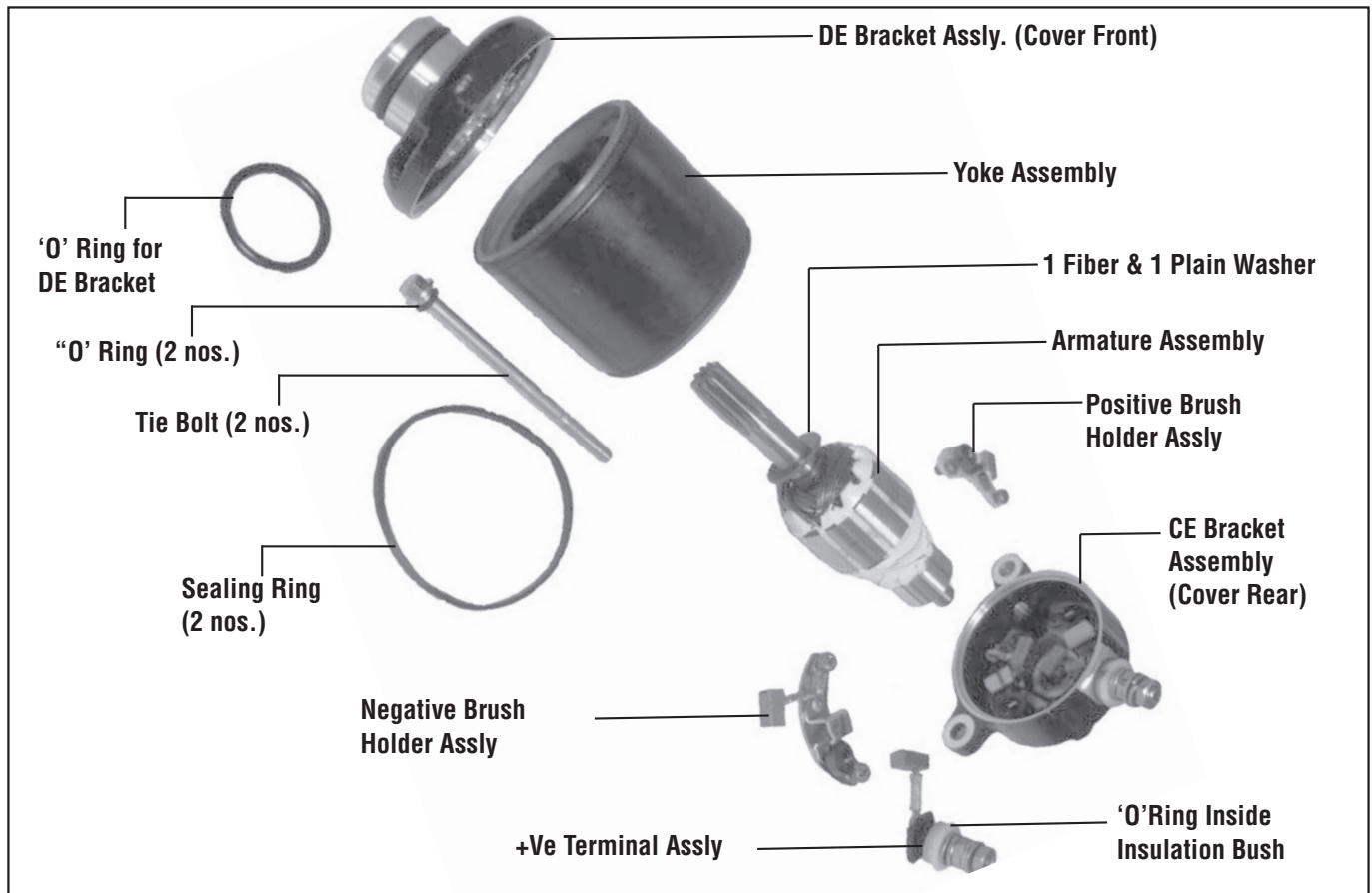
Meter Range	Connections		Standard Value
Continuity Mode	Meter +ve	Meter -ve	Continuity is shown
	Any segment on commutator	Adjacent segment on commutator	

SOP :

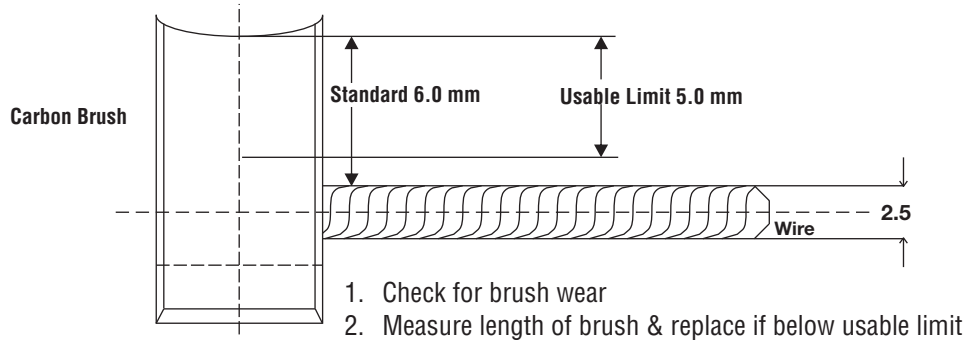
- Dismantle starter motor & take out armature
- Check continuity between each pair of adjacent segments on commutator.
- Replace armature if 'No' continuity is shown between any two adjacent pair of commutator segments.



Starter Motor



Service Limit of Starter Motor Carbon Brush



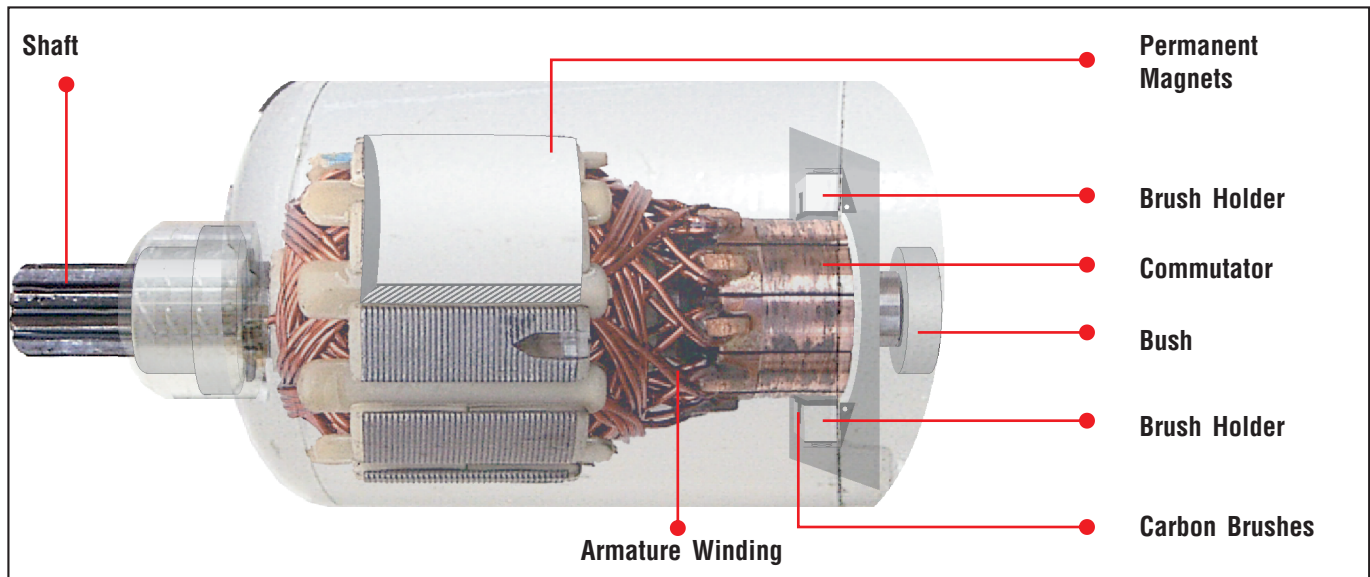
Periodic Maintenance (After warranty period)

- Check, Inspect & if required Replace carbon brushes, Springs at every 15,000 Kms
- Remove carbon particles from commutator slots.
- Clean commutator segments.
- Lubricate brass bush by 2 ~ 3 drops of Servo 32 oil & NR Bearing by high temperature-high speed OKS410 grease
- Check as per SOP the continuity between 2 adjacent segments of commutator with the help of Multimeter.
- Replace Yoke Sealing Rings & tie bolt 'O' Rings whenever starter motor is dismantled.

Note : Do not dismantle starter motor within warranty period.

Electricals

Starter Motor



Do's

- Remove carbon particles from commutator slots by sharp blade / knife.
- Clean commutator segments by soft cloth.
- Lubricate brass bush by 2~3 drops of Servo 32 oil & NR Bearing by high temperature-high speed OKS410 grease .
- Clean the carbon particles deposited inside the rear end cover.
- Remove all accumulated rust particles by paper.
- Ensure firm connection of Red wire of starter motor
- Replace the Yoke sealing Rings if worn out / broken.
- Ensure the +ve brush holder assly securing nut is fully tight.
- Use correct capacity and fully charged battery.
- Starter switch should be released immediately once the engine starts.
- Assemble Starter Motor front cover such that the mark on it matches with 2 marks on body. Assemble rear cover such that mark on it matches with 1 mark on body. Otherwise motor will rotate in reverse direction due to reverse polarity of magnets. This will give cranking trouble.
- Replace Yoke Sealing Rings & tie bolt 'O' Rings whenever starter motor is dismantled.
- Put few drops of oil on starter motor front cover 'O' ring before assembling starter motor.



Don'ts

- Do not drop down the motor.
- Don not Clean Commutator segments by polish paper.
- Do not wash or clean the armature and carbon with kerosene or petrol.
- Do not hit the motor body by hammer or screw driver as it will lead to magnet breakage.
- Do not use worn out / broken sealing rings of Yoke assly as this would lead to water entry.
- Do not direct pressurized water jet on motor body during washing.
- Do not crank the engine continuously in case the engine does not start. Analyze the cause and correct. Otherwise battery will get drained and the starter motor will get damaged.
- Do not energize the starter motor when the engine is running. Serious damages will occur to the drive mechanism.
- Don't press starter switch more than 3 seconds. After 3 successive cranking, if engine doesn't start, wait 15 ~ 20 seconds for battery to recover & then crank for next cycle.

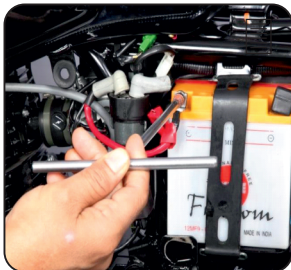
Do's & Don'ts



Battery

Do's


- Apply petroleum jelly to poles / terminals.



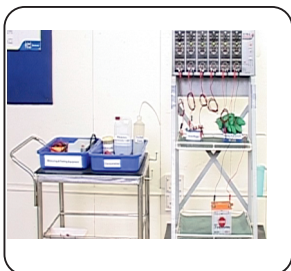
- Use proper tools.



- Use only distilled water to top up battery.



- Always maintain electrolyte level between maximum & minimum level marks.



- Always charge battery by constant current method with the help of specified charger.

Don'ts


- Do not apply grease to poles / terminals.



- Do not hammer battery terminals.



- Do not use mineral water, drinking water to top up battery.



- Do not increase the level of electrolyte beyond maximum level mark otherwise it would overflow through Vent Mechanism & damage other parts.



- Do not quick charge battery by current higher than specified current.
- Constant voltage charging method must be strictly avoided.
- Do not use local make battery charger.

Electricals

Do's & Don'ts



Battery

Do's



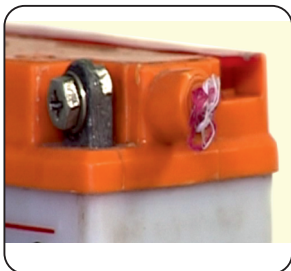
- Check open circuit voltage by multi meter.



- Always maintain battery top cover clean and dry. Always keep Vent Mechanism area clean & clear.

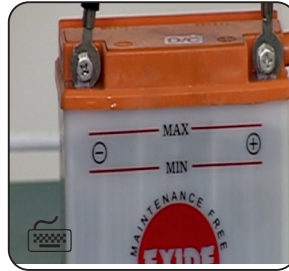


- Keep battery terminal posts clean & tighten cables firmly.

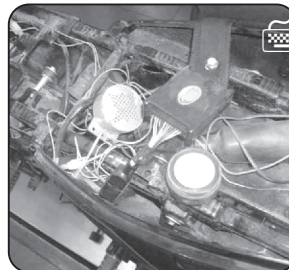


- Ensure the vent is free from dirt, dust & grime.

Don'ts



- Do not short circuits the poles.

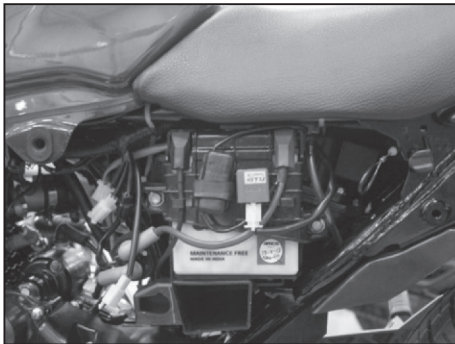


- Do not fit extra electrical accessories (Tampering of wiring for fitting buzzer etc.) other wise wiring would get short & battery would get discharged. This will shorten the life of battery.

SOP for Checking Charge Condition of Battery



- Ensure Ignition switch of the vehicle is in OFF position.



- Disconnect battery terminals. Always remove negative wire first, then remove positive wire



- Confirm battery type,& check for reference no. printed on the back side of the instrument



Connect Battery tester clamps to battery terminals, observing correct polarities.

- Connect + ve & - ve wire clamps of Battery to +ve & -ve terminals of the Battery tester.

Electricals

SOP for Checking Charge Condition of Battery



- Confirm display indication on LCD.
- Clamps connection is not firm, remove dirt, dust, rust if any from battery terminals.



- Battery voltage is less than 8VDC.
- Internal disconnection of battery terminal



- This is reference no. typed when used last time. Set correct reference no. of battery to be tested using UP/DOWN keys & reference no. chart printed on back side of the instrument.

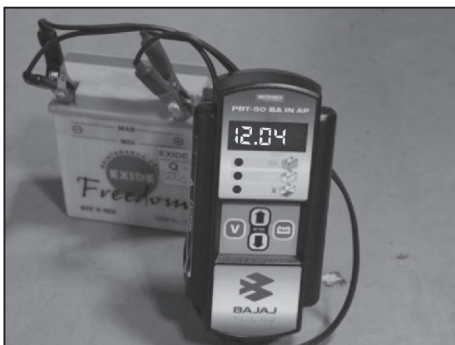


- Push "TEST" button for checking condition of battery tester
- Voltage indication & Green LED is glowing-Battery is OK & can be used on vehicle.

SOP for Checking Charge Condition of Battery



- Voltage indication and green & yellow LED's are glowing-Battery is partially charged. Charge the battery using Metafab make VRLA battery charger



- Voltage Indication & yellow LED is glowing-Battery is discharged. Charge the battery using Metafab make VRLA battery charger



- Voltage indication & red LED is glowing-Battery is deep discharged. Charge battery on Metafab VRLA battery charger for 30 minutes. If battery can not be charged, BAD battery indication will be displayed on charger & battery needs to be disposed off, If no such indication is displayed then continue charging till charging is over.

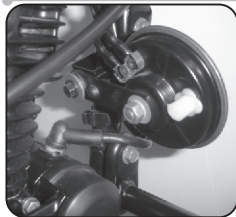
Electricals

Do's & Don'ts



HORN

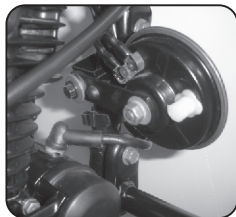
Do's



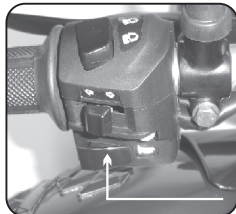
Ensure that horn is firmly fitted on frame



Ensure that horn is free from dust and mud accumulation.



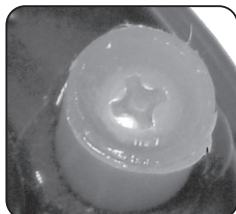
Ensure that horn wires are intact.



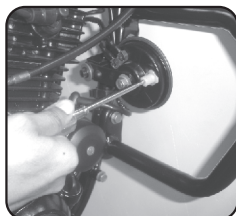
Ensure that horn switch button is operating freely.



Ensure that battery is fully charged.



- Adjust horn by phillips screw driver
 - without removing silicon sealant from the adjustment screw.
 - by rotating the 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



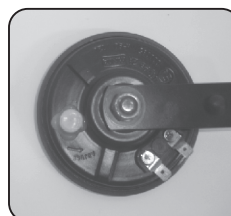
Do not apply pressurised water jet directly on horn resonator.



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.



Do's & Don'ts

IGNITION SYSTEM

Do's



- 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 0.7~0.8mm by feeler gauge.
- Replace spark plug at every 30,000 kms.
- Check for firm fitment of spark plug in cylinder head - Tightening torque 1.3 ~ 1.5 Kgm.
- Ensure H.T. cable secondary connection is firmly fitted in spark plug cap and H.T. coil.
- Check that CDI coupler is tightly fitted.
- Ensure that magneto coupler is firmly fitted.
- Always use a right size socket during removal and re-installation of spark plug.
- During periodic service make use of spark plug cleaning machine to clean spark plug electrodes & check proper functioning of both the spark plugs.

Don'ts

- Do not replace spark plug by non recommended one (different heat range).
- Do not replace CDI by local make or different make.
- Never short circuit H.T. coil primary wire to ground. It could lead to CDI failure.
- 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.

Electricals



Do's & Don'ts

LIGHTS

Do's

- 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

Do's

- 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.

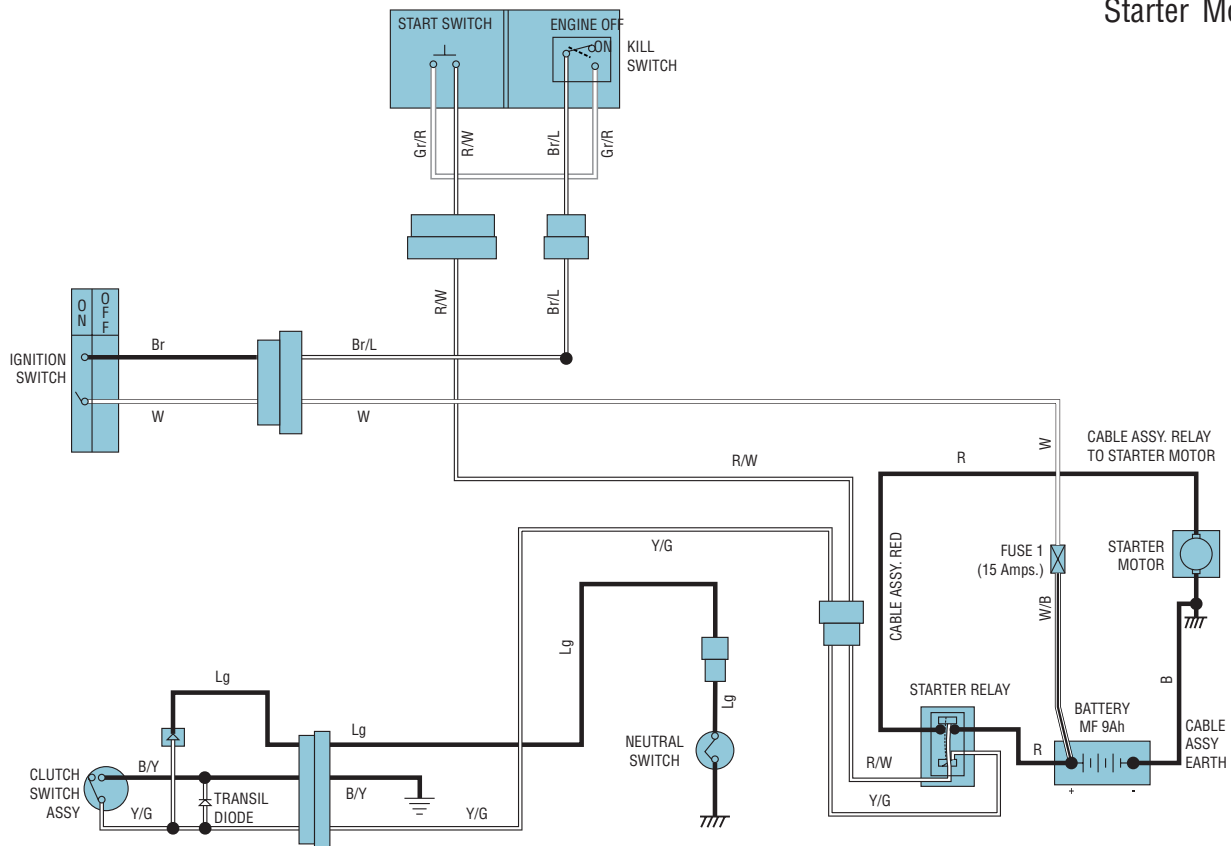
Don'ts

- 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.

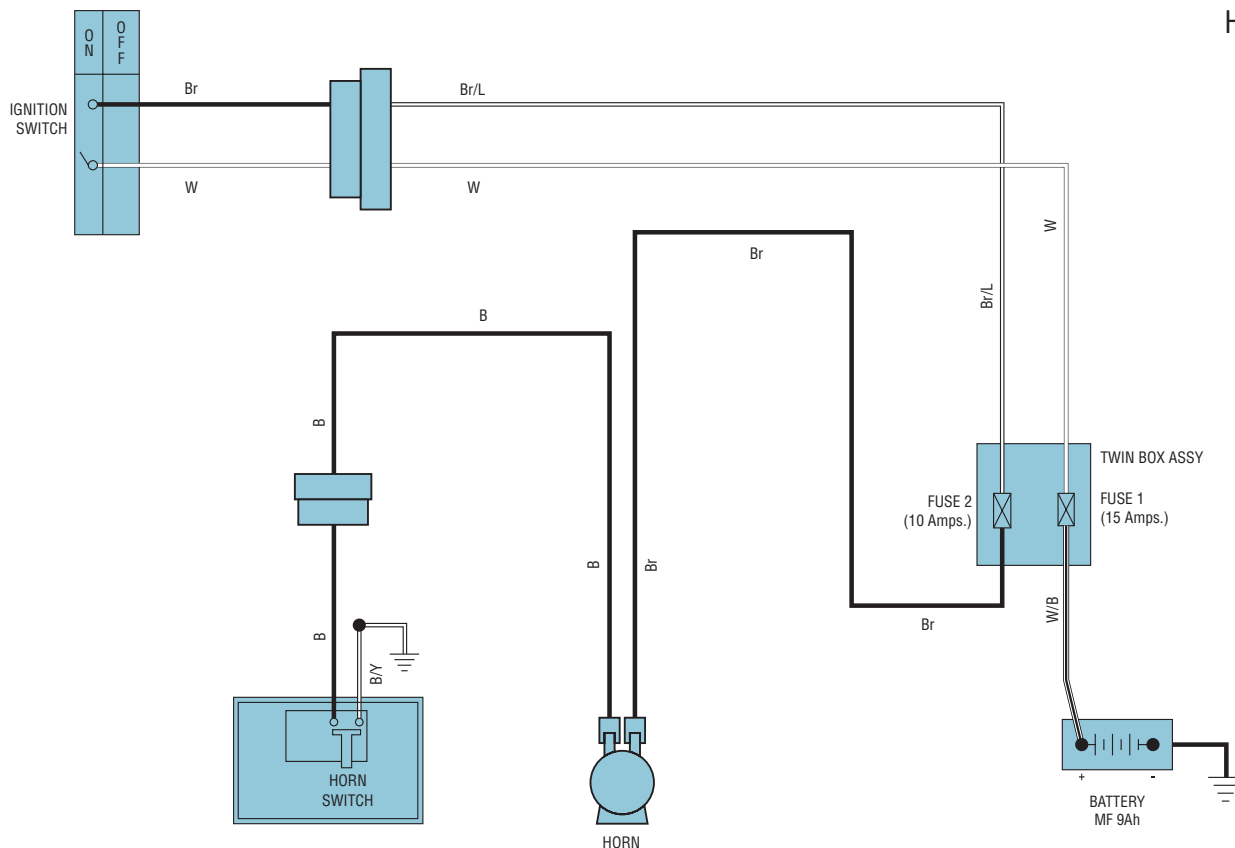
Electrical Circuit Diagrams



Starter Motor Circuit



Horn Circuit

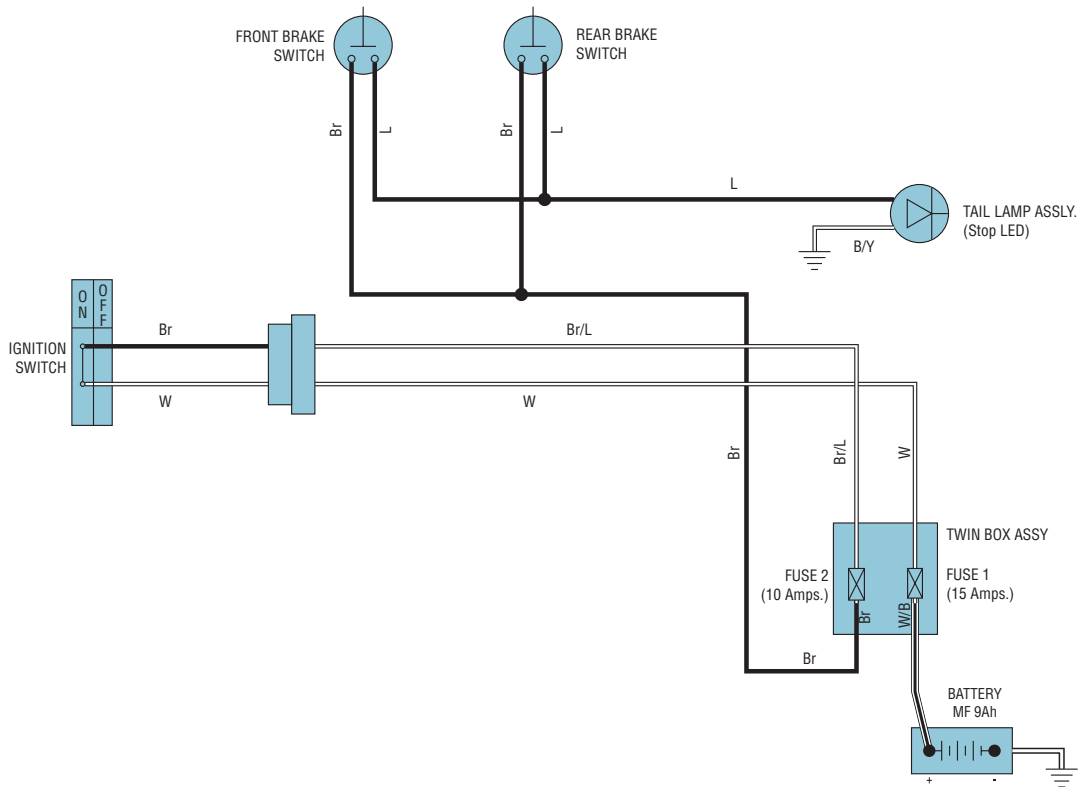


Electricals

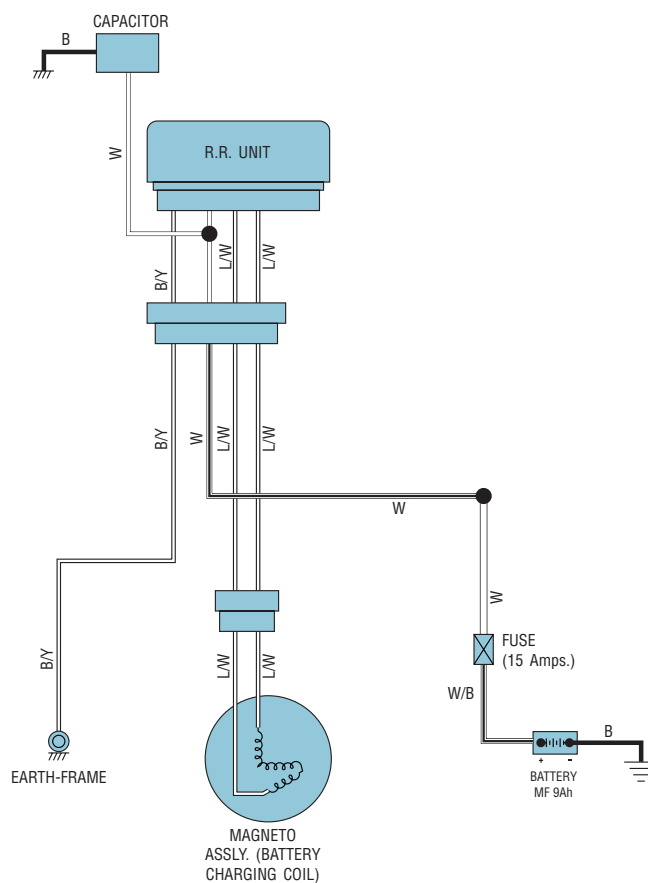
Electrical Circuit Diagrams



Brake Light Circuit



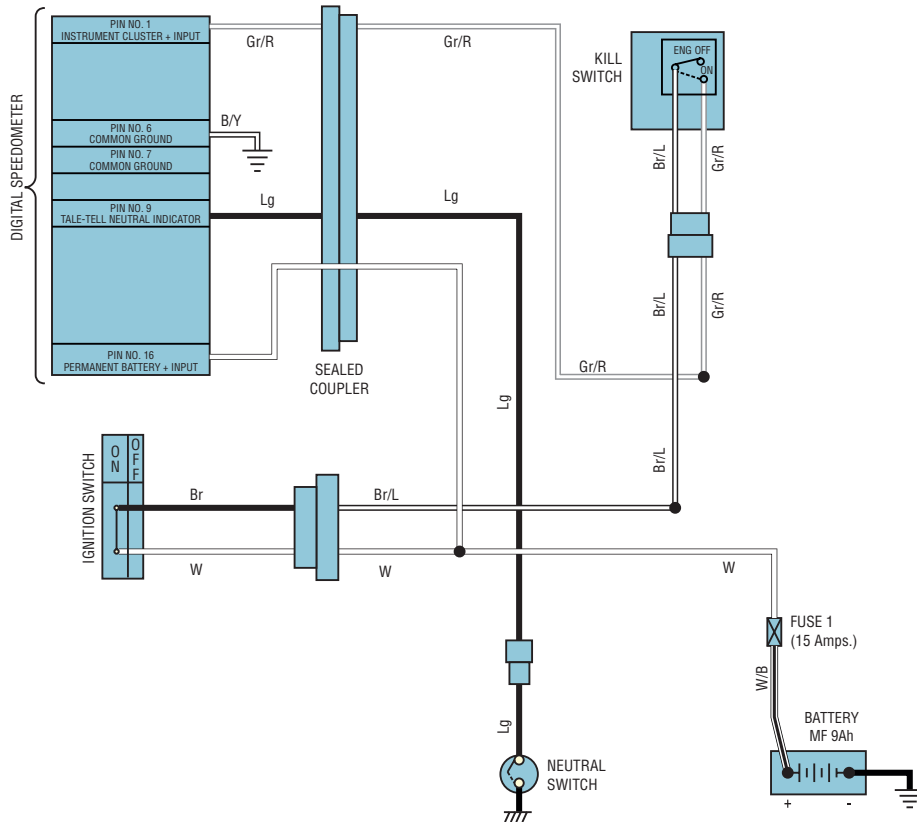
Battery Charging Circuit



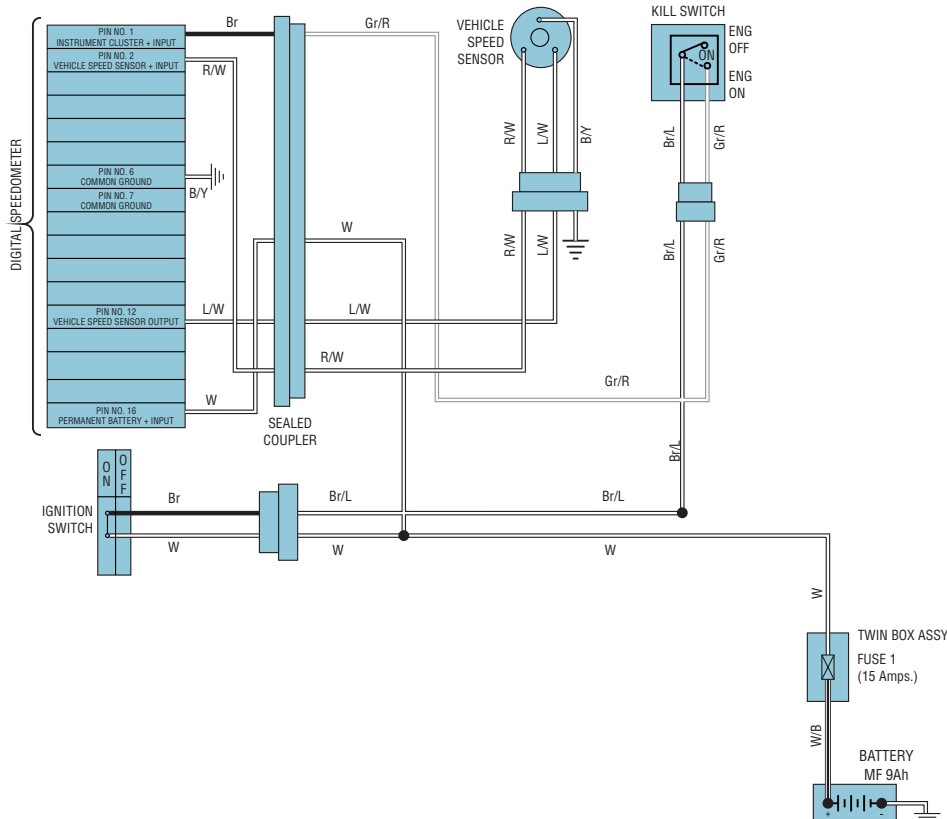
Electrical Circuit Diagrams



Neutral Lamp Circuit



Vehicle Speed Sensor Circuit

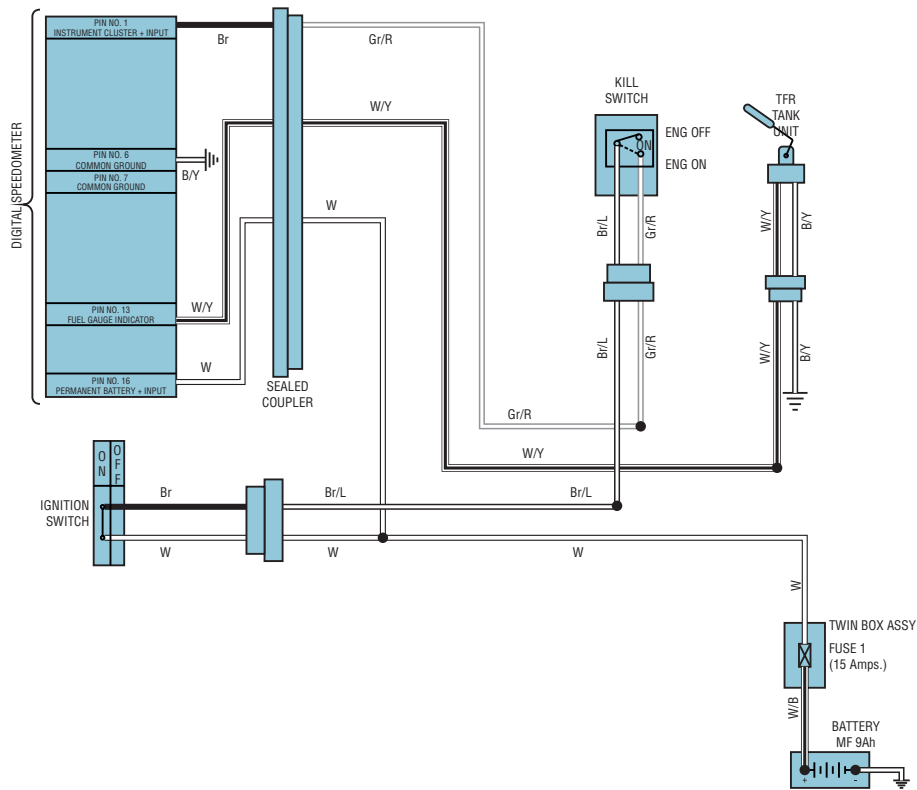


Electricals

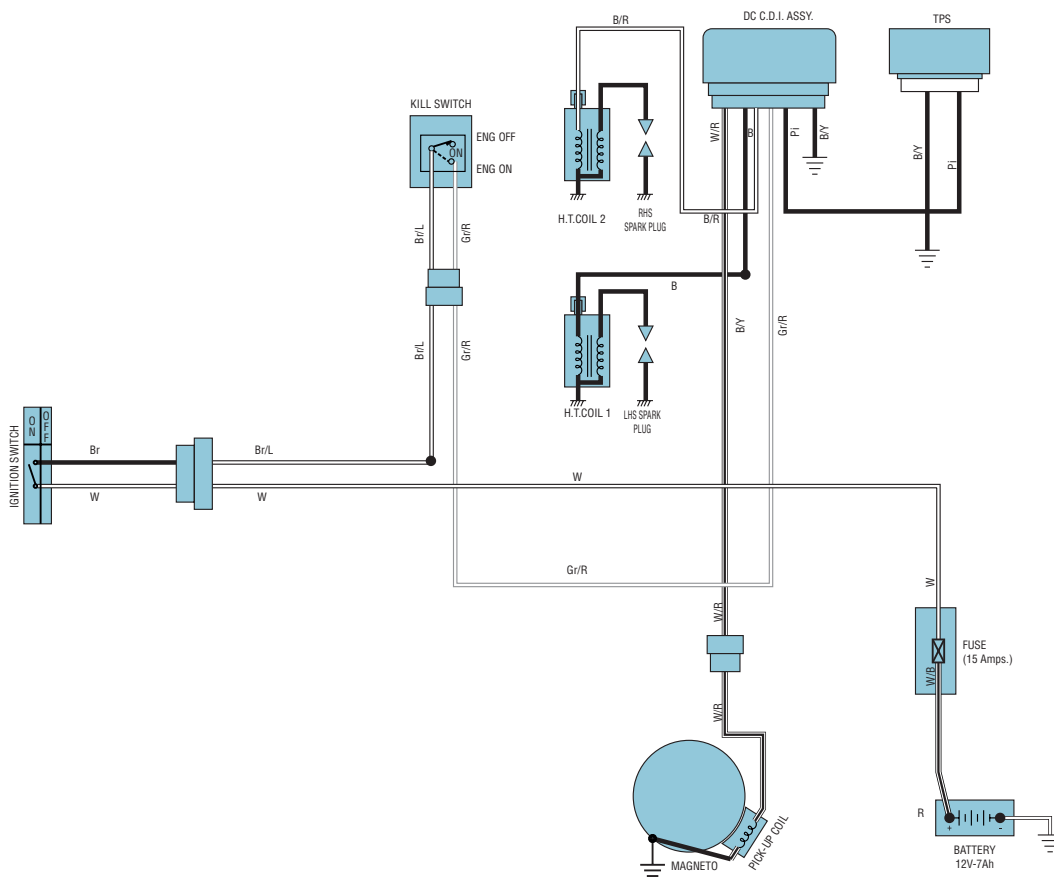
Electrical Circuit Diagrams



Fuel Gauge Circuit



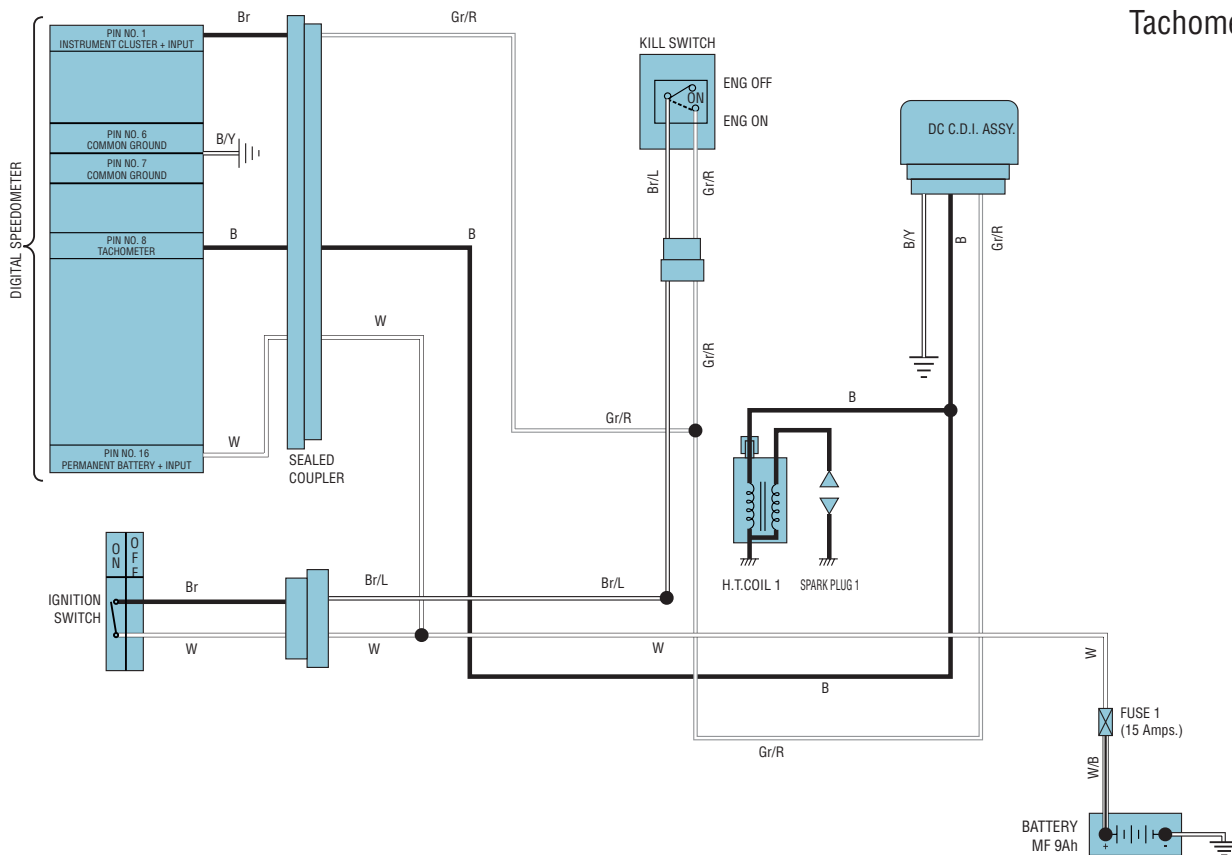
Ignition Circuit



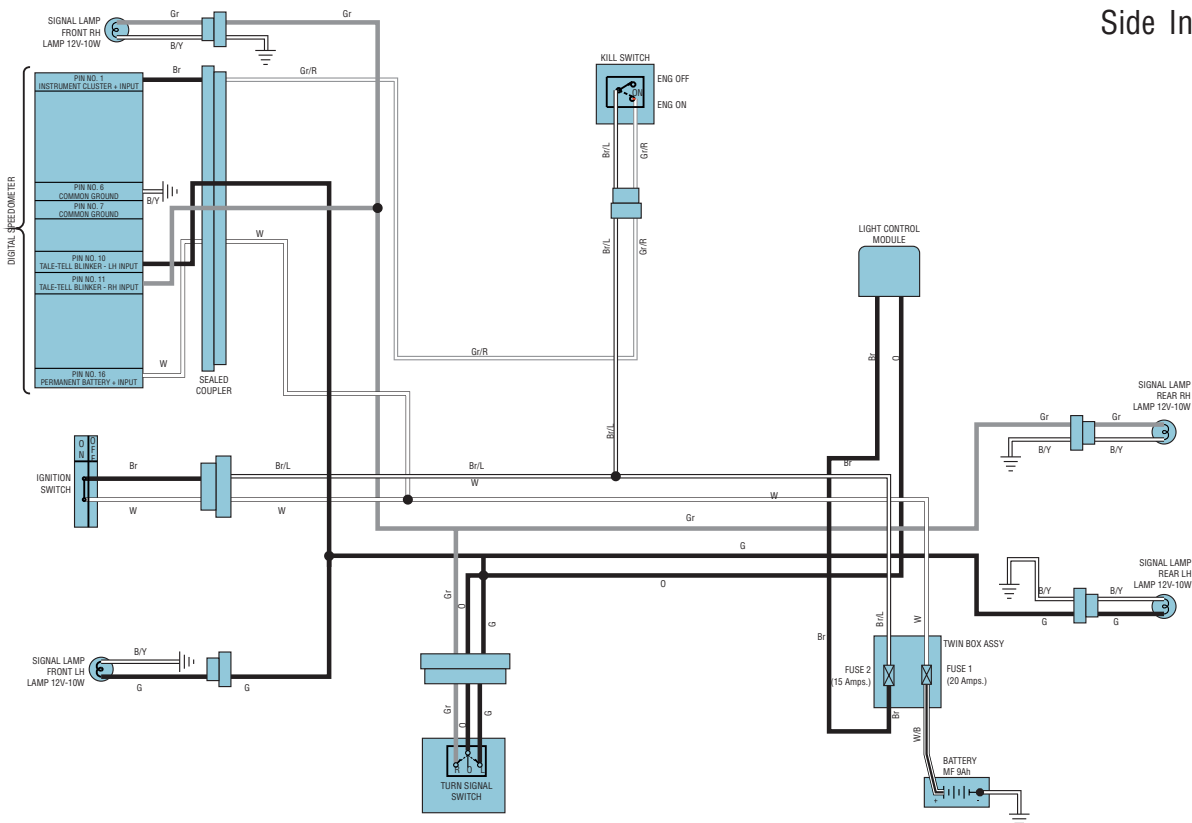
Electrical Circuit Diagrams



Tachometer Circuit



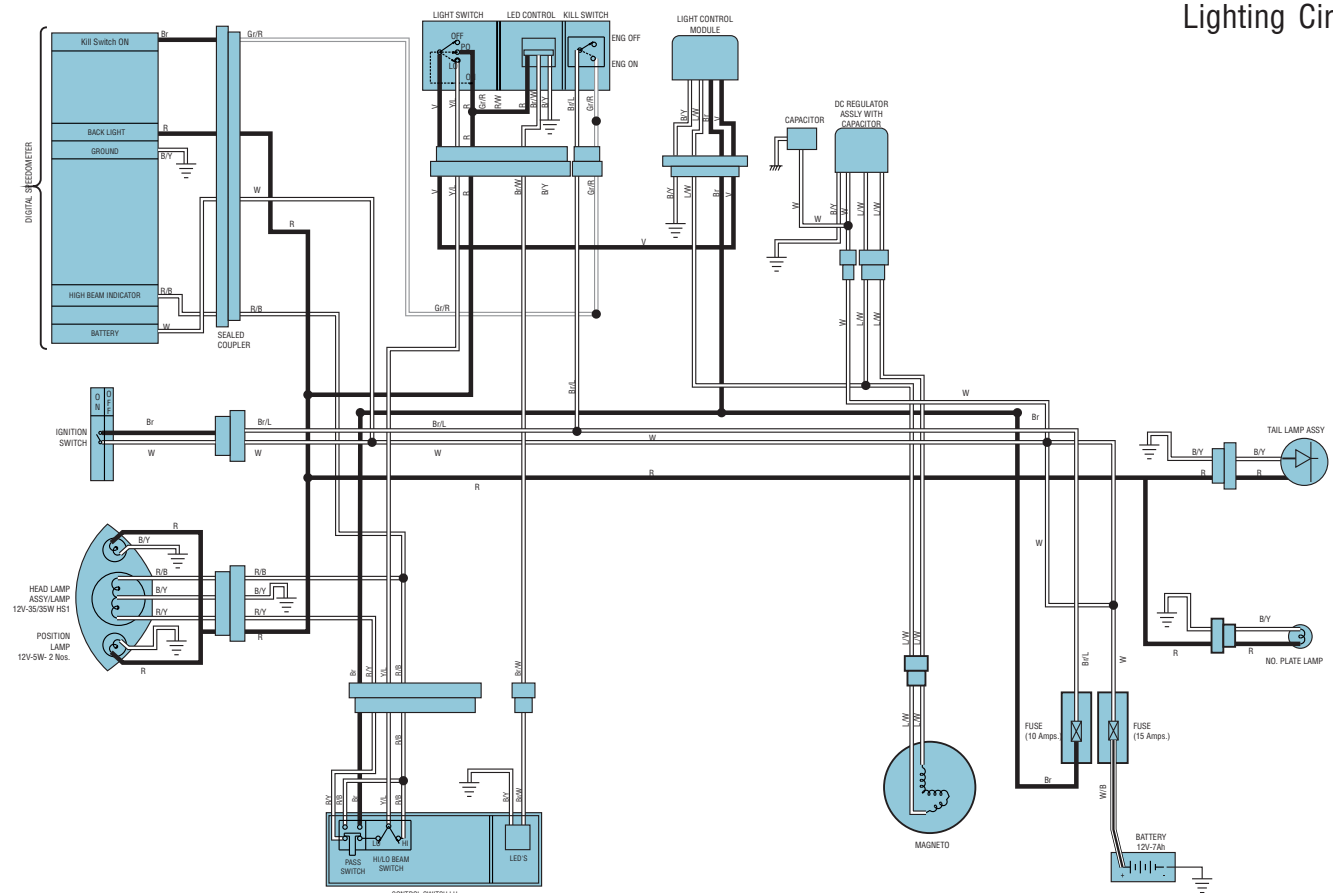
Side Indicator Circuit



Electrical Circuit Diagrams



Lighting Circuit



Notes





CHAPTER 6

BS IV changes (Wherever applicable)

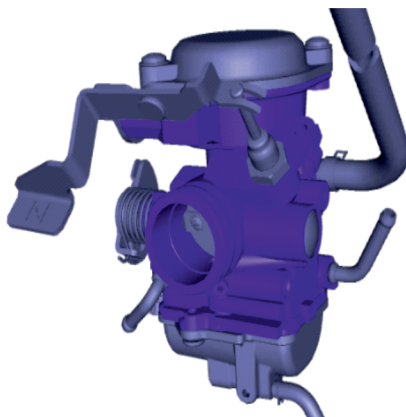
- Revised Technical Specifications
- Revised Periodic Maintenance & Lubrication Chart
- Revised Pre - Delivery Inspection Checklist
- Revised Torque Values
- Revised Service Limits
- SAI Parts
- Secondary Air Induction (SAI) System
- Evap Parts
- Evap Location & Working
- Electrical Circuit Diagrams



Revised Technical Specifications

Parameter	Specifications	
	Pulsar 180	Pulsar 180 BS IV
Brake	Rear – Drum Brake, dia 130 mm	Rear – Disc Brake , 230 mm dia disc
Tyre Pressure – Rear Solo	28.4 PSI (2.000 Kg / cm ²)	30 PSI (2.10 Kg / cm ²)
Tyre Pressure – Rear Pillion	30.5 PSI (2.15 Kg / cm ²)	32 PSI (2.25 Kg / cm ²)
Width	750 mm	765 mm
Height	1165 mm	1115 mm
Wheelbase	1350	1345 mm
Choke	Push-Pull type	Lever type
TPS	With TPS	Without TPS

Carburetor Specification :-

Parameter	Specification	
Make	UCAL	
CO% - With SAI	< 1 %	
Idling RPM - With SAI	1350 – 1450 RPM	
CO% - Without SAI	4.5 % - 5.5 %	
Idling RPM - Without SAI	1300 – 1400 RPM	
Choke	Manual	

BS IV changes (Whenever applicable)

Revised Periodic Maintenance & Lubrication Chart



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

Revised Periodic Maintenance & Lubrication Chart



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

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

** As applicable to model.

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

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

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

BS IV changes (Whenever applicable)



Revised Pre-Delivery Inspection Checklist

PDI Check sheet Common for all models (Torque Values given for Pulsar 180 BS IV)			
Dealer's Name		Dealer's code	
Model		City	
Frame No		Date of PDI	
Engine No		PDI done by	
1. Check points before starting of the vehicle			
Check & correct the below check points before starting the vehicle			
To Check	Check for	✓ If Ok	
		X If Not Ok	
Engine oil	Oil level between lower & upper mark / Top up if required		
Fuel tank / Pipes	No leakage / Correct fitment		
Mirror	Fitment & adjustment to ensure clear rear view		
Coolant	Coolant level between MIN & MAX mark, top up if required in cold condition		
	Ensure no leakage		
Lock Operation	Steering cum Ignition lock, Seat lock, LH side cover lock, Petrol tank cap lock		
Battery	Terminal voltage 12.4 V D.C for MF battery & 12.8 V DC for VRLA Battery using battery tester		
	Tightness of battery terminals / cables / Petroleum Jelly application		
Tyre Pressure	Front : 1.75 Kg / cm ² (25 PSI)		
	Rear (with pillion) : 2.25 Kg / cm ² (32 PSI)		
Brakes	Brake lever free play 4 ~ 5 mm (For drum brake only)		
	Brake pedal free play (For drum brake only)		
Clutch / throttle cable	Free play 2 ~3 mm		
Drive chain	Slackness 20 ~ 25 mm		
	Equal marking of chain adjusters on both side		
	No touching to chain case		



Revised Pre-Delivery Inspection Checklist

Fasteners (Check torque) Recommended torque wrench to be used for applying torque on nut - bolts as mentioned in PDI check sheet using reference torque chart given in Annexure 4. However if any major parts are required to be removed (Except side cover & seat) for accessibility of torque wrench, in those cases the tightness can be ensured using open end / ring spanner / box type spanner as applicable without removing those major parts	Engine foundation bolts	
	Front mounting bolts : 2.0 ~ 2.2 Kg.m (19.6 ~ 21.6 N.m)	
	Rear mounting bolts : 2.0 ~ 2.2 Kg.m (19.6 ~ 21.6 N.m)	
	Front axle nut : 8.0 – 10.0 Kg.m (78.5 – 98.1 N.m)	
	Rear axle nut : 8.0 – 10.0 Kg.m (78.5 – 98.1 N.m)	
	Swing arm shaft nut : 8.0 – 10.0 Kg.m (78.5 – 98.1 N.m)	
	RSA Mounting nut Top / Bottom : 3.2 – 3.5 Kg.m (31.4 – 34.3 N.m)	
	Front fork top bolts : 2.0 – 2.2 Kg.m (19.6 – 21.6 N.m)	
	Front fork under bracket bolts : 3.0 – 3.2 Kg.m (29.4 – 31.4 N.m)	
2. Check points during / after starting the vehicle		
Check & correct the below check points during / after starting the vehicle		
Switch operation	RH & LH control switch, ignition switch, clutch switch & brake switch (Front & Rear)	
Horn	Ensure no distorted sound	
All Bulbs working	Headlight, Tail / Stop lamp, Side indicators, Speedo bulbs, Number plate lamp,	
Speedometer	Working of speedometer, Odometer, Trip meter, Fuel gauge , Clock	
	Working of all signal indicators icons (Neutral, Turn signal, High beam, Clock, Low battery indicator, Service reminder & Bajaj Logo)	
Headlamps	Focus confirmation	
3. Check points during Test ride		
Check & correct the below check points during Test ride		
Gear shifting	Smooth operation	
Drive-ability	Throttle response	
	Brake effectiveness - Front & Rear	

BS IV changes (Whenever applicable)



Revised Pre-Delivery Inspection Checklist

Engine noise	No abnormal noise	
Front fork / steering	Smooth working by pumping movement & smooth operation (No play / No Sticky movement)	
Oil / Coolant leakages	Specify source of leakages	
4. Idling RPM / CO%		
Check & correct the below check points in engine warm condition		
Idling RPM	Check in warm up condition at 60° (SAI connected 1350 – 1450 RPM & SAI disconnected 1300 – 1400 RPM)	
CO % Check	CO Check in engine warm condition at idling RPM (SAI connected < 1% & SAI disconnected 4.5 % – 5.5 %)	
5. Visual inspection for dent, scratches, rust ...		
6. Clean the vehicle thoroughly before delivery to customer.		

Note :- If performance related issue is observed in vehicle, then carry out Idling RPM & CO% Check activity.



Revised Torque Values & Service Limits

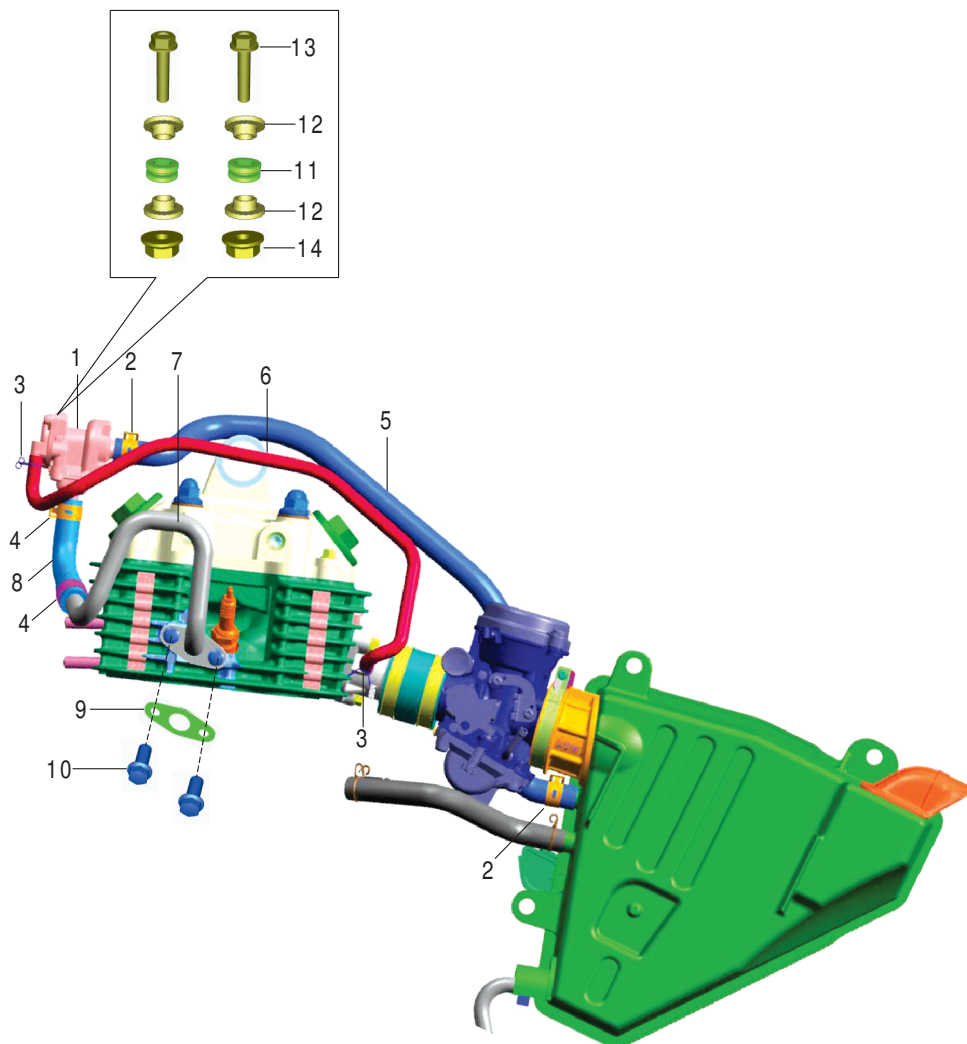
Parameter	Pulsar 180 BS IV	
	Kg.m	N.m
Rear Sprocket Mounting nuts	3.2 – 3.8	31.4 – 37.3
Handle Bar Holder bolts	2.2 – 2.5	21.6 – 24.5
Fork Center Nut	5.0 – 5.2	49.1 – 51.0
Fork Pipe Top side bolts	2.0 – 2.2	19.6 – 21.6
Fork underbracket Bolt	3.0 – 3.2	29.4 – 31.4
RSA Mounting Nut – Upper & Lower	3.2 – 3.5	31.4 – 34.3
Disc Mounting Bolts – Front & Rear	1.0 – 1.2	9.8 – 11.8

REVISED SERVICE LIMITS

Parameter	Standard Specification	Service Limit
Disc pad thickness – Rear	6.5 mm	3.3 mm
Brake disc thickness - Rear	4.0 mm	3.5 mm
Drive Chain Slackness	20.0 – 25.0 mm	30.0 – 35.0 mm
Drive Chain 20 Links length	314.4 mm	320.7 mm

BS IV changes (Whenever applicable)

SAI Parts

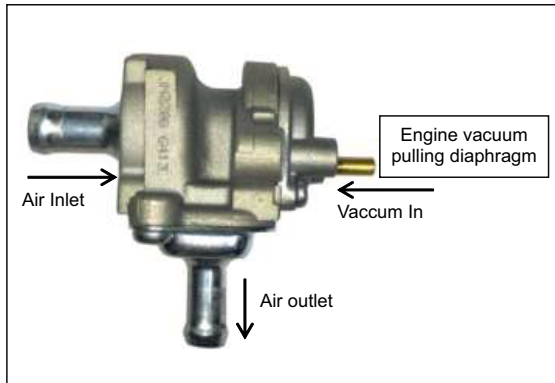


S. N.	Description	Qty.
1	SAI Unit	1
2	Clamp SAI Pipe	2
3	Clamp	2
4	Clamp Hose SAI	2
5	Tube SAI Air Filter	1
6	Hose SAI Unit To Manifold	1
7	Metal Pipe With Flange SAI	1
8	Hose SAI Unit To SAI Pipe	1

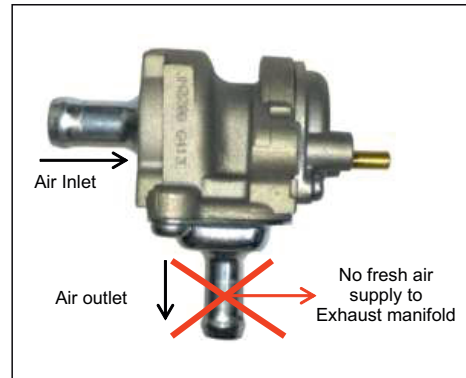
S. N.	Description	Qty.
9	Gasket Metal Pipe With Flange SAI	1
10	Flanged Bolt	2
11	Grommet SAI Unit	2
12	Sleeve SAI Unit	4
14	Bolt Flanged	2
15	Nut Hex Flanged	2



Secondary Air Induction (SAI) System



ON Acceleration



ON De-acceleration

Function:

To reduce the concentration of exhaust gases in exhaust system thus reducing the emission.

Construction:

- Consists of diaphragm valve and reed valve.
- Connected to air filter assembly, exhaust valve passage in the cylinder head and intake manifold.

Working:

On Acceleration

During the exhaust phase of the engines operation, exhaust gases enter the exhaust system at high velocity.

This Causes a drop in the pressure which enables the reed valve to open.

- Fresh and filtered air from air filter is inducted in the exhaust passage, just after the valve.
- The oxygen in the air enables 'CO' to further oxidize and convert into 'CO₂' & HC into H₂O. Thus CO (%) & HC (ppm) at the Silencer tail end is reduced. This results in reduction of exhaust emission.
- The reed valve opening and closing is based on pressure in the exhaust system.

On De-acceleration

When throttle is closed, some amount of fuel particles get discharged into the exhaust. If air is injected into the Exhaust system at this point of time, these fuel particles can get ignited. This causes after burn or misfiring sound in the exhaust system.

- To avoid this, air flow is momentarily stopped by closure of the diaphragm in the injection valve during de acceleration.

How Diaphragm Works:

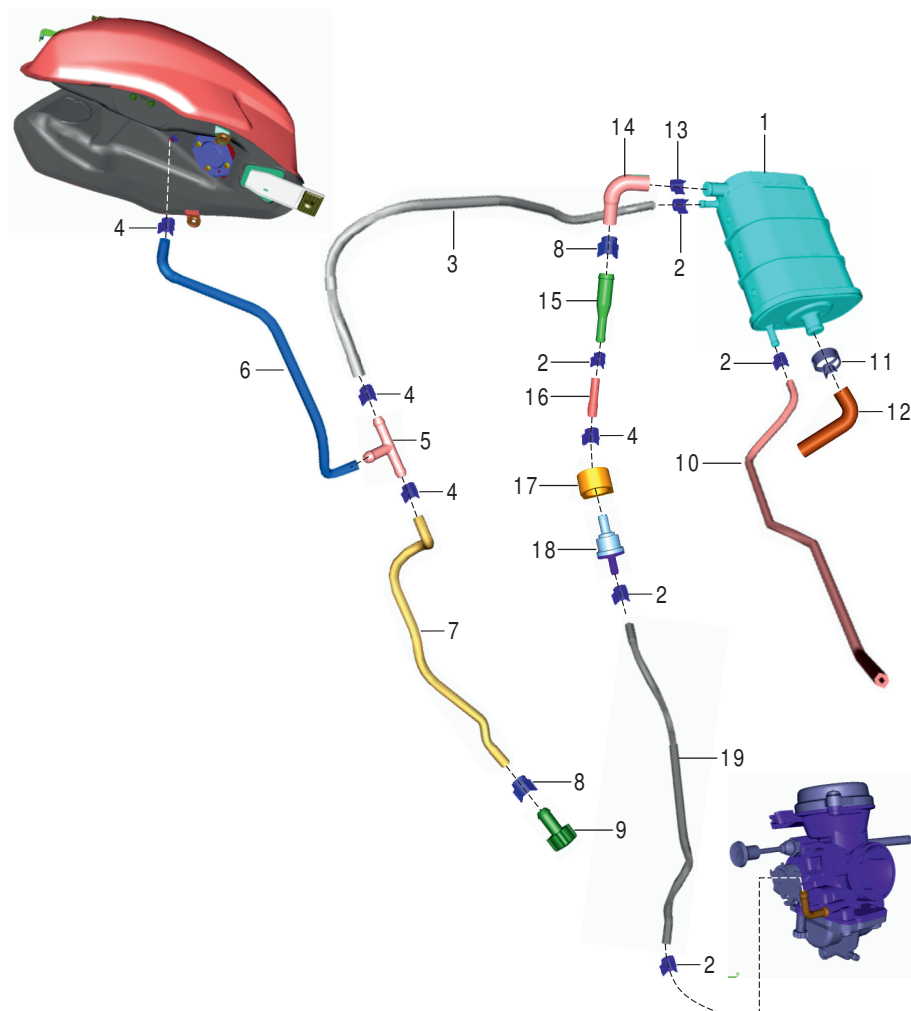
- Diaphragm is connected to inlet manifold.
- On de-acceleration vacuum increases in the manifold.
- This pulls the diaphragm against the spring tension and restricts the air flow.
- Once the vacuum reduces the diaphragm opens due to spring tension and air starts flowing.

Advantages:

- Reduced emission of Carbon Monoxide & Hydro Carbons.
- Environment friendly vehicle.

BS IV changes (Whenever applicable)

Evap Parts

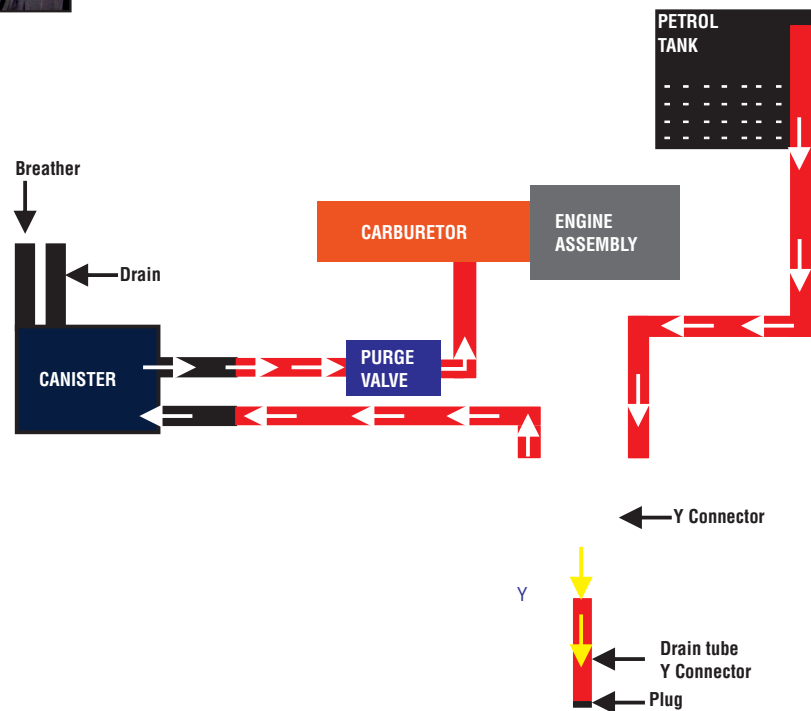
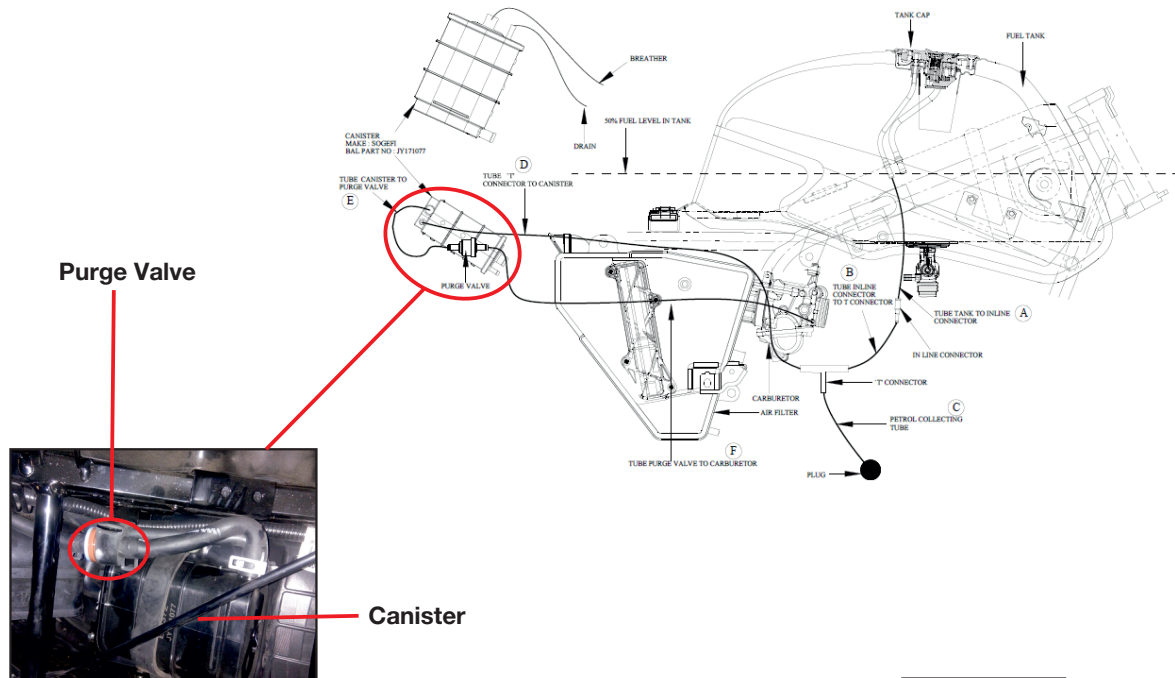


S. N.	Description	Qty.
1	Canister	1
2	Spring Band Clamp 9 x 8.4	5
3	Tube T Connector To Canister	1
4	Spring Band Clamp 11.5 X 8.4	4
5	Connector For Breather And Vapor Tube	1
6	Tube Tank To T Connector	1
7	Tube Condensate Fuel Drain	1
8	Spring Band Clamp 13 x 12	2
9	Plug Fuel Drain	1

S. N.	Description	Qty.
10	Tube Canister Drain	1
11	Clamp - Canister Breather	1
12	Tube Canister Breather	1
13	Spring Band Clamp 15 x 10	1
14	Tube Canister To Connector	1
15	Connector Tube EVAP	2
16	Tube Connector To Purge Valve	1
17	Grommet Purge Valve	1
18	Valve Purge	1
19	Tube Purge Valve To Carburetor	1



Evap Location & Working



Working of EVAP -

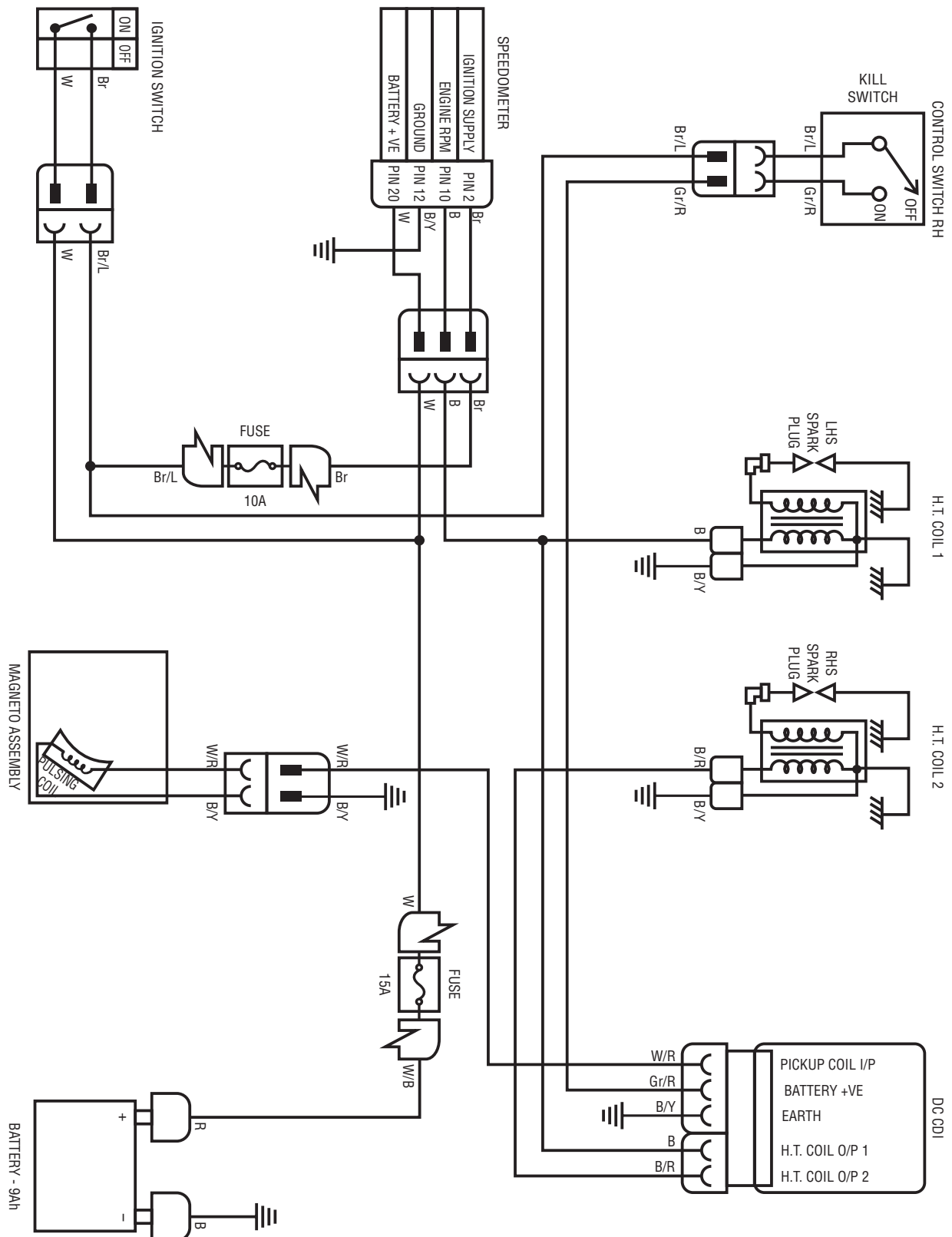
1. Petrol vapours from petrol tank reaches canister assembly through Y connector
2. Vapours are absorbed in canister & while engine running vapours are sucked in engine through purge valve (one way type)
3. Excess vapours in canister are released to atmosphere (Rare case)
4. Life of canister is approx. equal to vehicle life.

BS IV changes (Whenever applicable)

Electrical Circuit Diagrams



Ignition Circuit + Tachometer Circuit



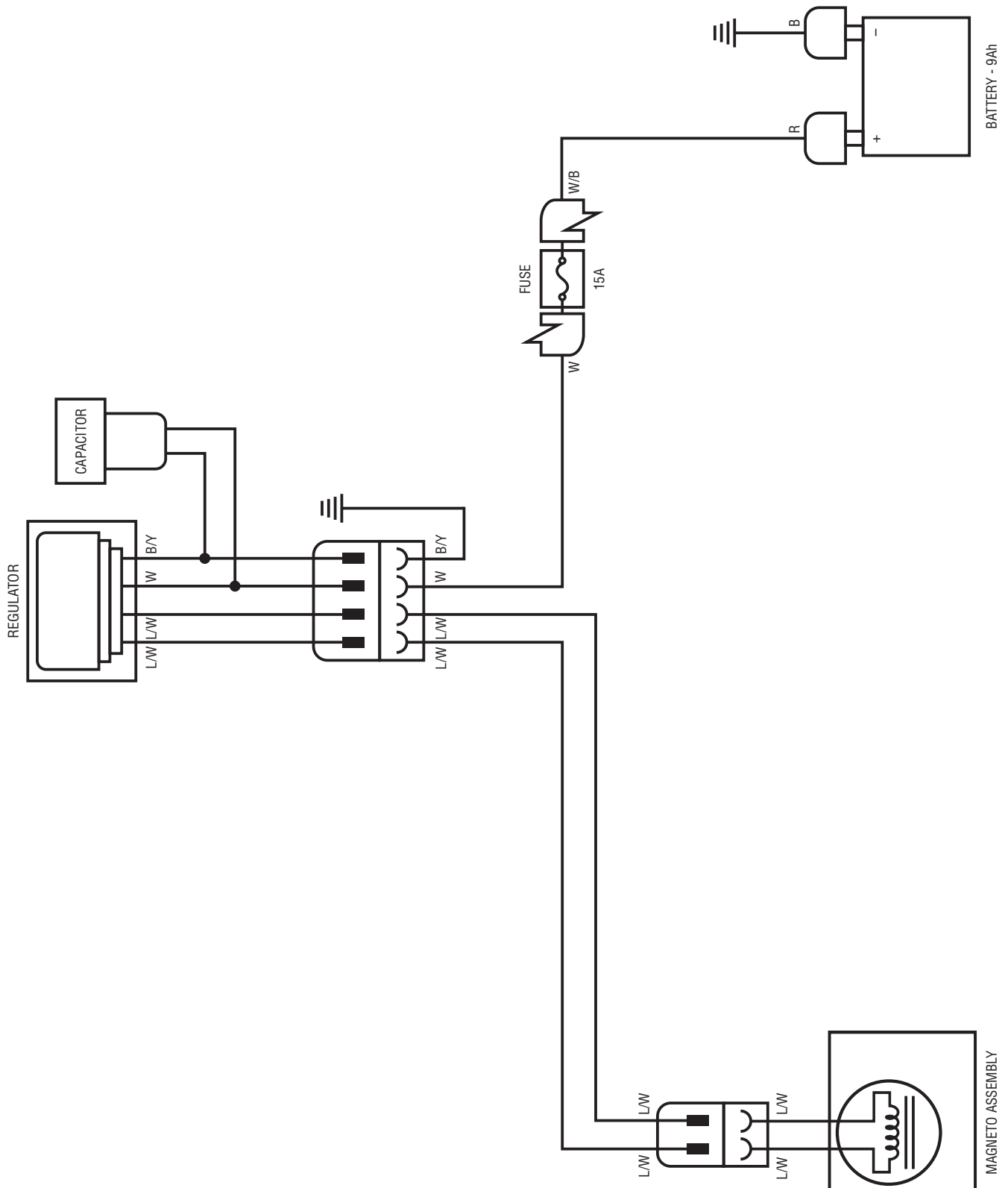
[illegible]

BS IV changes (Whenever applicable)

Electrical Circuit Diagrams



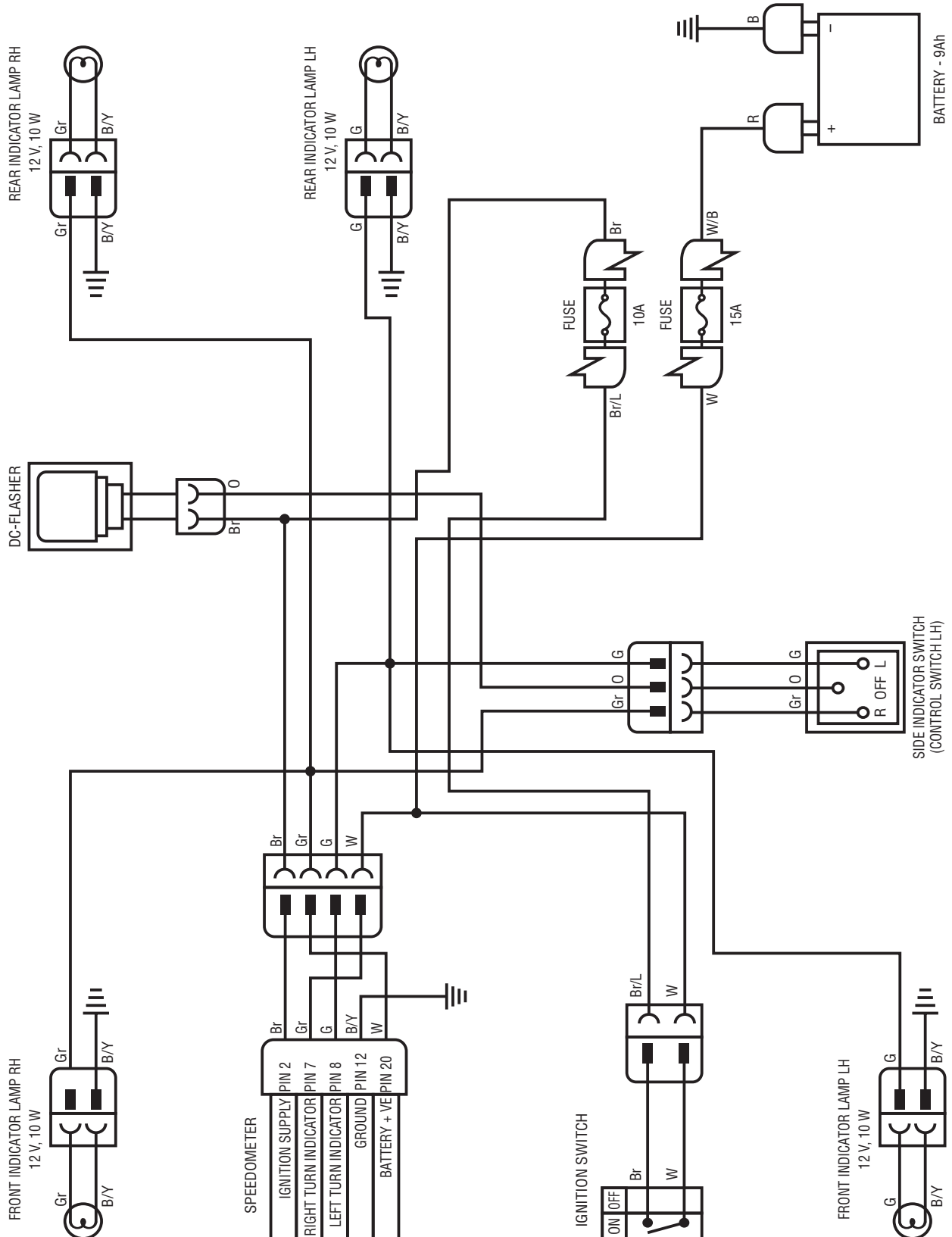
Battery Charging Circuit



Electrical Circuit Diagrams



Side Indicator Circuit

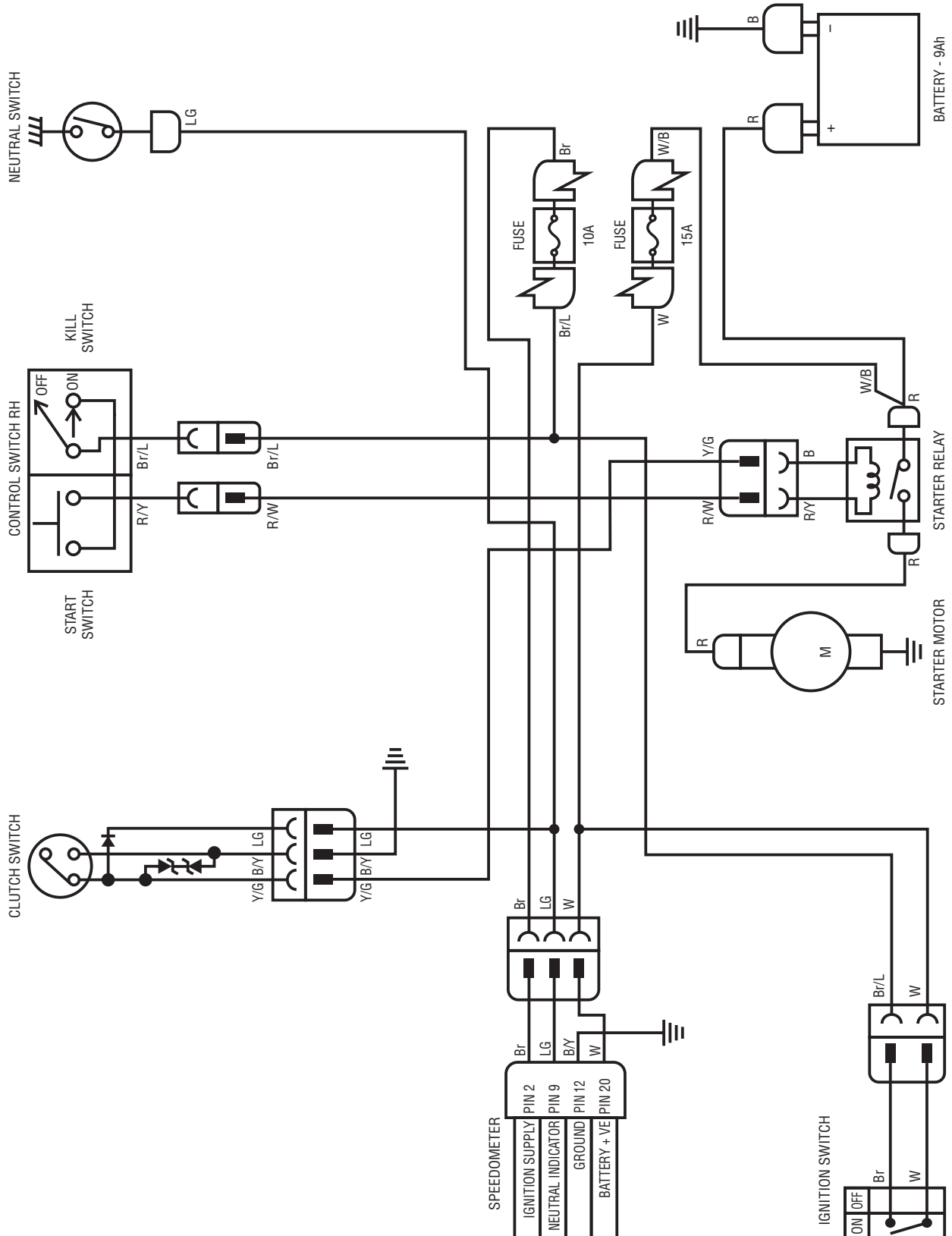


BS IV changes (Whenever applicable)

Electrical Circuit Diagrams



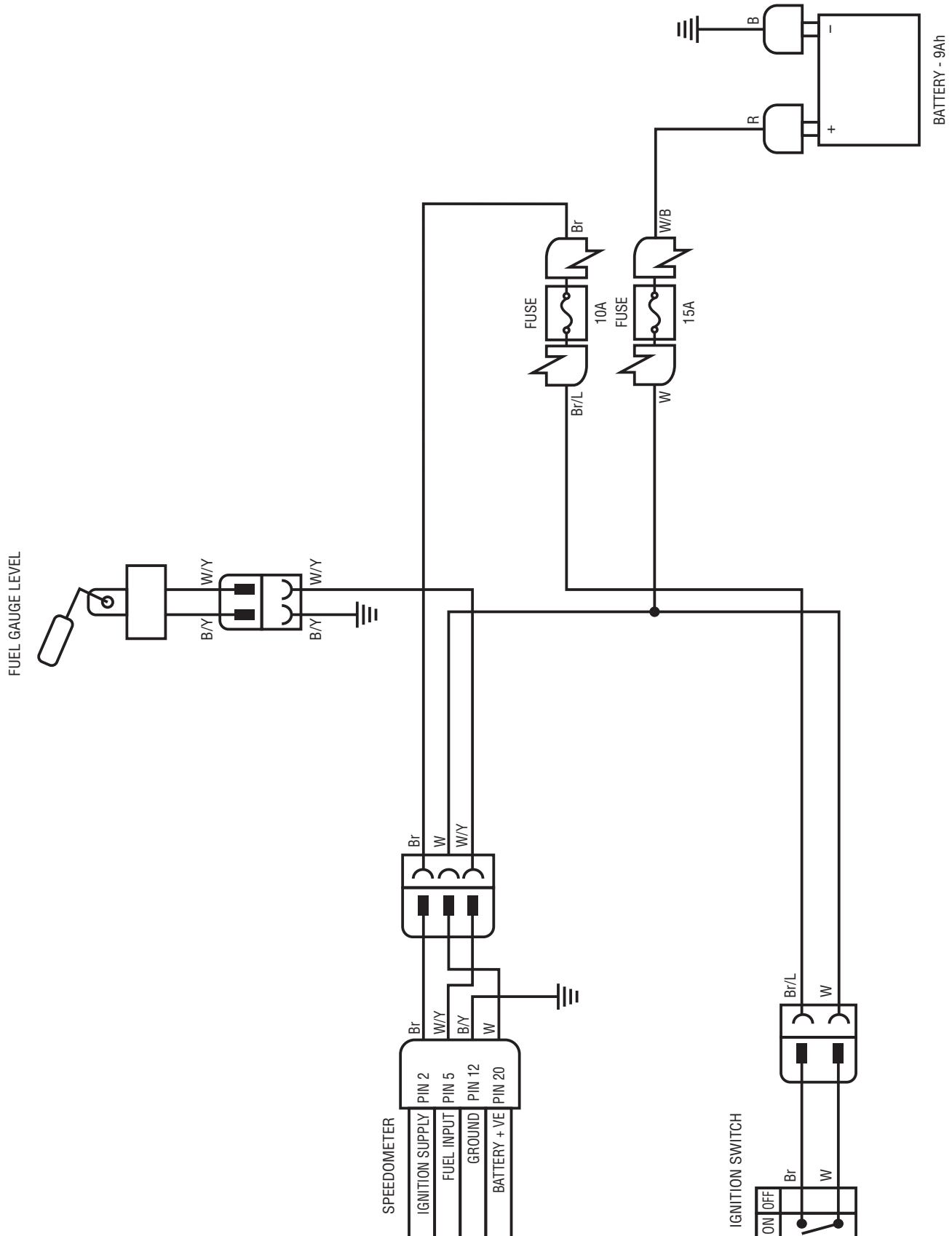
Starter Motor Circuit



Electrical Circuit Diagrams



Fuel Meter Circuit

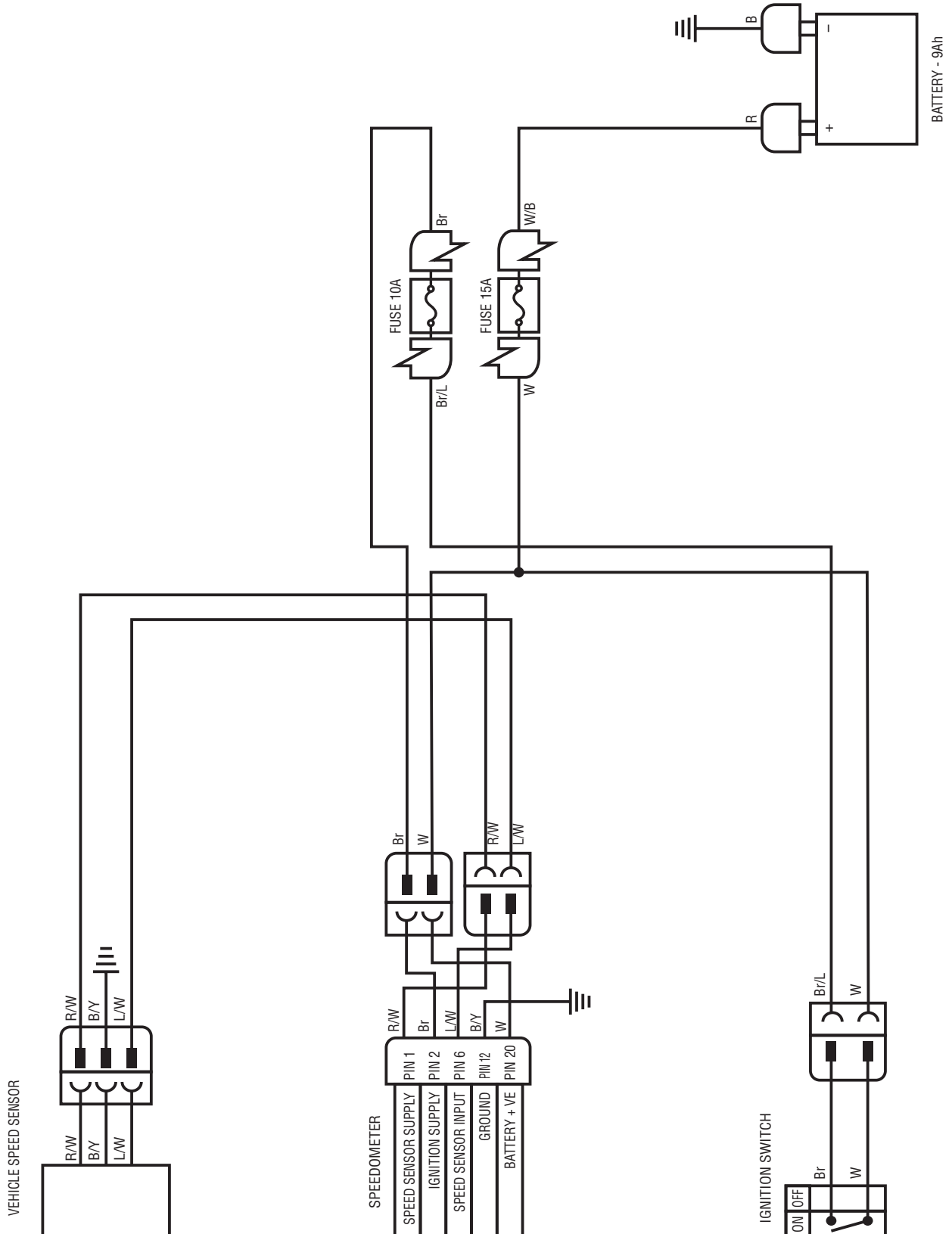


BS IV changes (Whenever applicable)

Electrical Circuit Diagrams



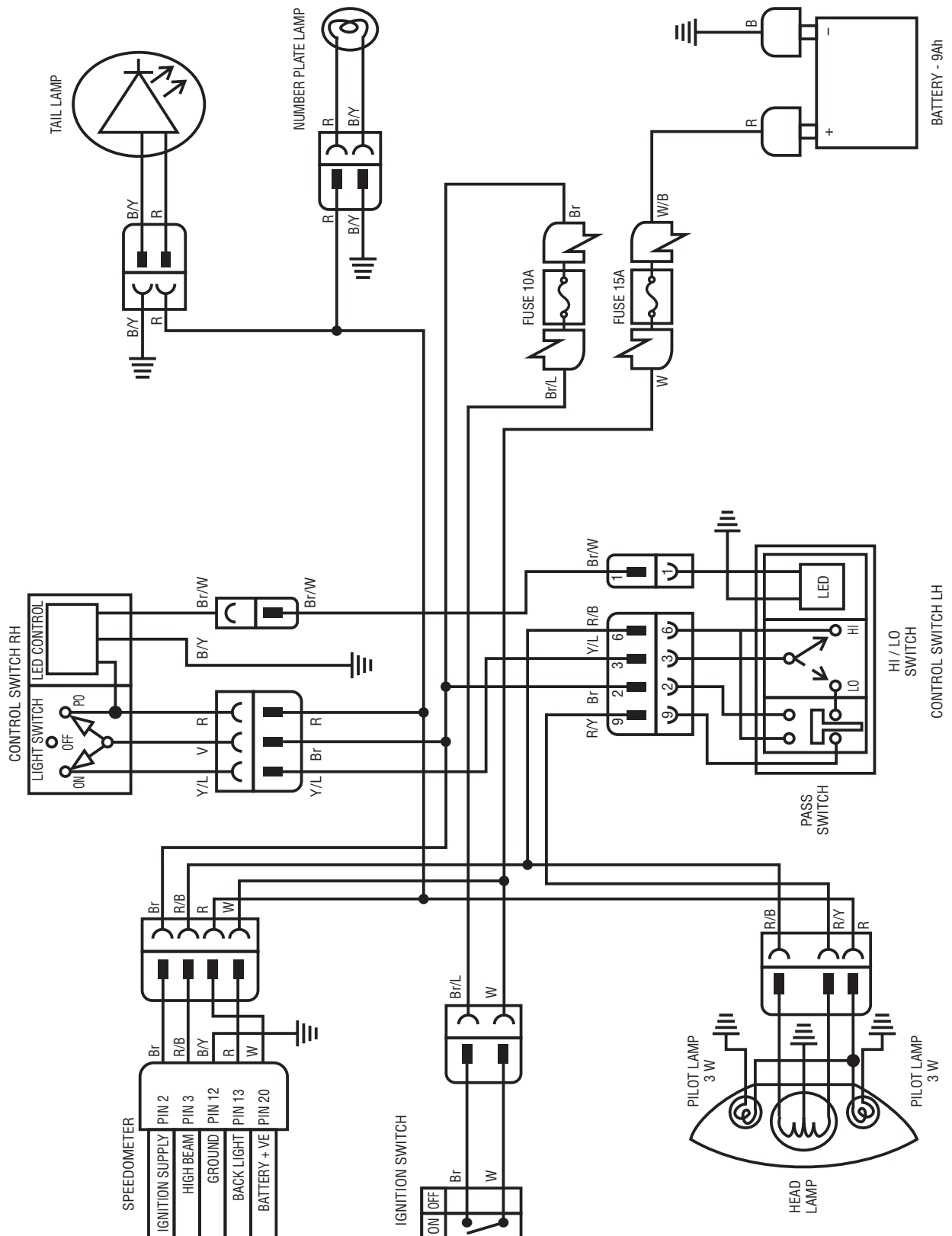
Vehicle Speed Sensor Circuit



Electrical Circuit Diagrams



Lighting Circuit

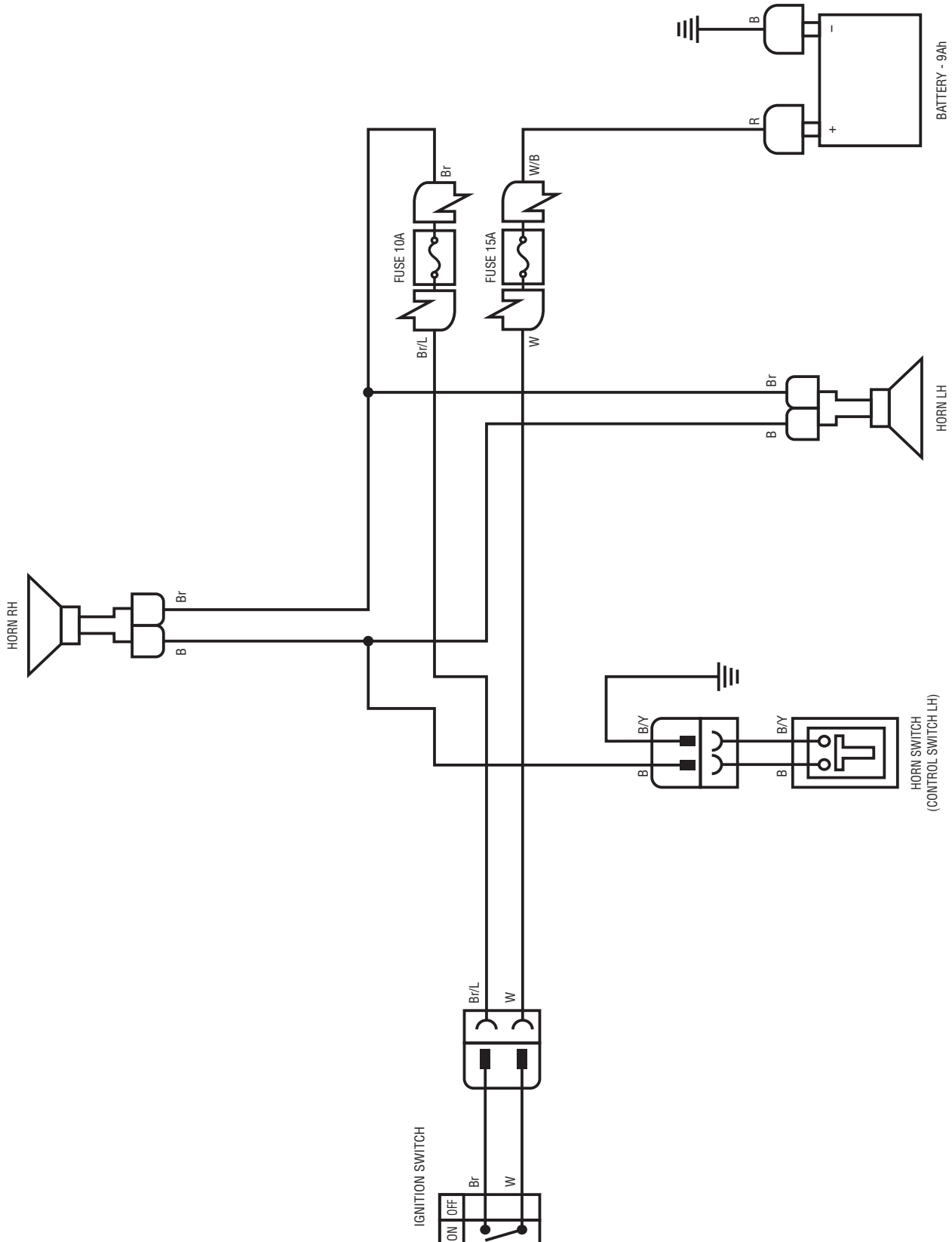


BS IV changes (Whenever applicable)

Electrical Circuit Diagrams



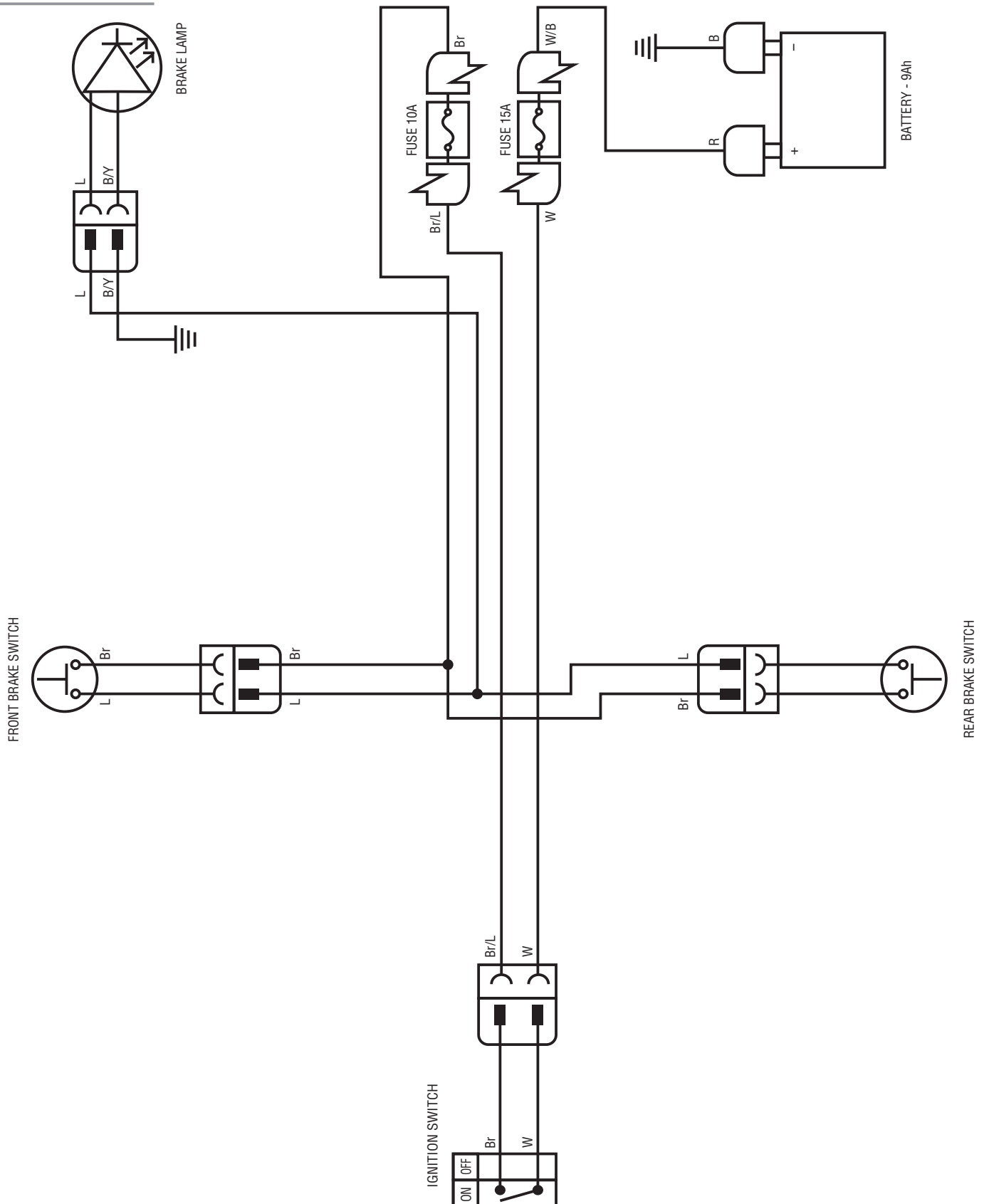
Horn Circuit



Electrical Circuit Diagrams



Brake Lamp Circuit



pulsar
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