BAJAJ
Distinctly Ahead

Troubleshooting Encyclopedia

TROUBLESHOOTING ENCYCLOPEDIA

For internal circulation and use by Bajaj Auto Ltd and dealers

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Contents

Introduction

Whenever customer visits service center his foremost expectation is that his vehicle is attended First Time Right (FTR).

Not being able to fix a problem 'First Time Right' leads to customer irritation, repeat visits, customer complaints and ultimately loss of business.

Analysis shows that most of the repeat visits & customer complaints are on account of 'errors' occurring while the repairs are being carried out in the workshop. This means 'Repairing Error' is a major contributor for customer complaints.

Troubleshooting encyclopedia is a logical, systematic search for the source of problem so that it can be solved & product can be made operational again.

The primary objective of Trouble Shooting Encyclopedia is to guide dealership staff for 100% FTR (First Time Right) by eliminating repair errors to achieve our objective of **Zero Repeat Jobs,**

Contents :

We have selected 25 nos. most commonly occurring issues in field & these are grouped in 3 chapters.

1. **Chapter I : Engine**
2. **Chapter II : Frame**
3. **Chapter III : Electrical**

The header page gives you information about contents & its page nos. It also gives you reference of SOP's to be followed during repairs.

The main page of each issue gives overview of all the possibilities leading to failure, in following pages individual possibility is explained in details as per the sequence given below -

- What to check
- How to check

General Precautions to be taken while doing repair work

- Symptoms observed while checking
- Most likely root causes in the sequence of probability of occurrence.
- Possible errors at workshop while doing repair work & it's effects.
- Do's & don'ts to be followed while doing repair work.
- To avoid damage to head of fasteners do not use over size or worn out tools.
- To avoid damage to painted parts, prevent spillage of battery acid & brake fluid.
- To avoid damage to machined surfaces & painted components, store the parts in a clean parts handling tray.
- To avoid warpage of mating / sealing faces, mounting bolts should be tightened in a criss-cross pattern.
- To avoid slippage of threads leading to components damage, do not over torque bolts, nuts or screws.
- Always install new gasket & O rings when reassembling.
- Always apply grease to the lip of seal before installing.
- Always replace circlips / cotter pins & radiator hose clamps with new ones.
- Take care not to excessively spread open circlips with tool during installing to prevent deformation.
- Always use appropriate special tool for opening & assembling parts to avoid damages.

General Precautions to be taken while doing repair work

- To avoid dust / muck entry inside the engine wash vehicle throughly before executing any repair work related to engine or otherwise this may lead to early failure of parts.
- Always use lint free cloth while handling engine parts.
- Always apply few oil drops between two moving parts to avoid dry run.
- Always blow high pressure compressed air through oil passage holes in reverse direction of flow of oil & ensure that the passages are clear.
- Always apply loctite to bolts, screws or nuts wherever recommended to avoid loosening & subsequent break down.
- Confirm proper seating of circlips by rotating them to avoid it from coming out.
- Do not tap engine components by hammer in order to avoid damage. Engine components are precisely machined.
- Do not fit extra electrical accessories otherwise wiring would get short & battery would get discharged.

Customer Awareness

Customer awareness to be developed on following points for trouble free performance of vehicle :

1) Regular Checks :

- Ensure battery electrolyte level between max - min. mark.
- Always ensure tyres are inflated to specified air pressure.
- Keep vehicle clean regularly.
- Ensure engine oil level between MAX. - MIN. mark.
- Ensure brake fluid level above MIN. mark.
- Do not ignore brake & engine oil leakage.
- Do not ignore worn out / cut tyre condition, if found replace immediately.
- Do not ignore fuel leakage.
- Ensure specified brake free play.

2) Vehicle usage :

- Do not drive vehicle above its rated payload.
- Do not drive vehicle with brake pedal partially pressed.
- Do not drive vehicle with clutch lever half pressed.
- Always ensure tyres are inflated to specified air pressure.
- Disconnect battery terminals, if vehicle is not being used for long time (more than 2 weeks)

Customer Awareness

- Do not press self start button continuously, wait for 5 secs. after each crank, this will help battery to recover.
- To take help of BAJAJ authorized workshop to bring vehicle to the workshop for repair if battery low icon is glowing or coolant icon starts blinking.
- To take help of BAJAJ authorized workshop to bring vehicle to the workshop for repair if coolant leakage is noticed through coolant system.
- Do not drive vehicle & bring the vehicle to BAJAJ authorized workshop if coolant level in expansion tank or engine oil level is found below MIN. mark. Take help of authorized service station to take vehicle in workshop for repair.

3) Vehicle maintenance (PM schedule / service at authorized locations) :

- Carry out periodic services as per schedule given in Owner's Manual at authorized service centers / dealers.
- Do not repair front fork inner pipe for bend removal & rear suspension for oil leakages in local workshop.
- Always fill fuel from reputed petrol pumps.
- Use DOT-3 / DOT-4 brake fluid for top up.
- Always insist for BGO engine oil for better engine performance.
- Always use pre-mixed coolant (Castrol - Radicool, Motul - Motocool expert) for top up.
- Lubricate 'O' ring type drive chain at every 500 kms by OKS make chain spray.
- Do not add additives in engine oil / petrol.

Customer Awareness

4) Accessories :

- Do not fit extra electrical accessories, otherwise wiring would get short & battery would get discharged. Few examples -
  - Remote / central locking system.
  - Extra & bigger size horns.
  - Musical brake light.
  - Buzzer.
  - Higher wattage Headlamp bulb.
  - Flasher operating all 4 side indicators simultaneously
- Do not replace fuse with higher capacity fuse.
- Never bypass fuse.
- Do not cut wiring conduit / wires midway.
- Never remove conduit from wiring harness.
- Do not repair wiring harness instead replace for safety.
- Do not ground any wire for checking current-spark.
- Wiring harness failure due any one of the reason mentioned above is not covered under warranty replacement.
- Do not fit splash guard in front of the engine.
- Do not fit accessories to carry extra load.

Customer Awareness

5) BAL warranty policy - (Fuel adulteration / local accessories fitment & vehicle maintenance as per PM schedule) :

Warranty is applicable for manufacturing defects with in a period of 2years or 30,000 kms whichever occurs earlier.

Warranty is not applicable to -

- Parts subjected to normal wear & tear like Clutch Plates, Brake Shoes, Chain, Sprockets, Fork Oil Seal, Spark Plug, Control Cables, Brake Pads.
- Replacement of bulbs, rubber components like grommets, 'O' rings, bellows & filters, packings, gaskets, fasteners etc.
- Parts of the vehicle that have been altered and modified or replaced in unauthorized manner like use of wider tyres, loud silencers etc and which in the sole judgement of the Bajaj Auto Limited affects its performance and reliability.
- Vehicles which are not being serviced at recommended dealers as per the service schedule described or which have not been operated or maintained in accordance with the instructions maintained in the Owner's Manual.
- Vehicles used for any competition or race and/or for attempting to set up any kind of record.
- Any failure arising due to use of adulterated or bad quality fuel. Parts affected due to bad fuel quality are not covered Under warranty.

Chapter I : Engine

High Fuel Consumption

Content

• Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Compression pressure • Idling speed / CO% checking • Vehicle washing • Silencer tail pipe cleaning • Auto choke checking • Carburettor cleaning • Air filter cleaning • Clutch cable free play • Brake play • Drive chain slackness • Drive chain lubrication	156 16 10 153 194 66 49 106 112 176 167

Sr. No	Description	Reference	Page / ser. cir. No.
	P.M. Encyclopedia	• Cylinder head de-carbonizing • Tappet setting	161 21
2.	Training Notes	• Piston ring wear & orientation - Pulsar 150/180 (Service Station Manual)	46
3.	Service Circular	---	---

High Fuel Consumption

What to Check	How to Check	Symptoms observations	What is the most likely cause

Whenever customer complains about high fuel consumption it is important to know how much he or she is expecting?
Explain to him or her the various factors influencing consumption of fuel.
The fuel consumption in actual driving condition will be about 20 to 25% lesser than the "Standard Test Condition"
because it depends on road conditions, traffic density, weather condition, driving habits, fuel filling errors & quality of fuel etc.

Precautions To Be Taken -
Petrol measuring jar of "BOROSIL MAKE or calibrated one".
Use funnel to avoid petrol spillage during filling.
Road test to be conducted as accurately as possible, with atleast 200 ml of petrol. Errors in calculating fuel consumption per liter would be multiplied 5 times.
Also note that digital speedometers show whole numbers & not in decimals, hence actual fuel average could be less by 4.5 kms.

Primary checks :

Fuel consumption.	Conduct fuel average test as received vehicle condition for 200 ml fuel on road or on MRTB.  	Fuel consumption more than average trend of a city.	• Idle RPM & CO% • Petrol leakage. • Silencer for clogging / rust • Throttle response -- Clutch performance • Driving habits / conditions. **Spark plug** • Spark plug electrode gap, fouling / worn out, colour & grade.

What to Check	How to Check	Symptoms observations	What is the most likely cause
			Carburettor - • Manual choke lever movement jammed. • Auto choke lever movement jammed. • TPS defective. • CO % not as per specified limit - air screw / V.C. screw setting incorrect. • 'e' clip position on jet needle of carburettor shifted to lower groove. • Carburettor air passages clogged. • Carburettor jet hole size increased. • Petrol overflow from carburettor. • Carburettor rubber duct cracked. • Carburettor hose clamps loose / screws missing. **Air filter -** • Air filter element clogged - More oil applied on foam. • Air intake duct clogged. **Clutch Cable -** • Clutch cable free play more than specifications. • Clutch cable routing not as per specifications. **Wheel -** • Front & rear wheel free rotation jammed. • Front brake cable in stretched condition. • Front & rear brake cam operation sticky / jammed. • Rear brake pedal operation sticky / jammed. • Tyre pressure less. • Drive chain slackness less than specifications. • Inadequate lubrication for drive chain.

What to Check	How to Check	Symptoms observations	What is the most likely cause
Driving habits & vehicle operating condition.	Discuss with customer & take a joint ride with customer.		• Driving with brake pedal partially pressed. • Driving with clutch cable half pressed. • Driving in crowded area. • Driving at too low / high speed. • Bad roads • Over loading of bike.
Secondary checks :			
Compression pressure.	Refer SOP.		Compression pressure found less than specifications after wet compression pressure test. **Cylinder head -** • Cylinder head gasket leakage / cut / torn. • Valve / valve seat pitting marks. • Valve bend. • Tappet clearance zero or less than specifications. • Cylinder head mounting bolts loose. • Cylinder head warpage out of specifications. • Spark plug fitment loose. Compression pressure found OK after carrying out wet compression pressure test. **Block piston assembly -** • Piston rings worn out - Block bore wear. • Piston rings jammed in piston ring grooves. • Cylinder block piston clearance out of specification. • Seizure / scoring marks on block piston.

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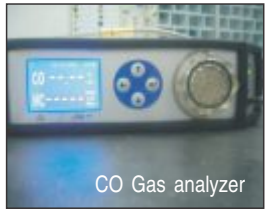
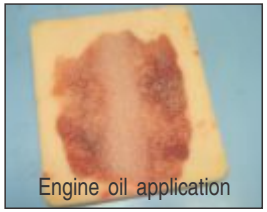
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
1.	**Primary checks :** Idling RPM & CO%.	By tachometer & co gas analyzer. Refer SOP.  	Idling RPM & Co% out of specifications.	• Idling RPM & CO not adjusted as per SOP. • Air foam filter clogged.   • Excess air through loose joints.	**Possible Errors :** • Excess application of oil on foam air filter. • Carburettor / manifold joint loose. **Effects of Error :** Wastage of petrol leads to high fuel consumption.	**For non SAI vehicles.** • Set idling RPM & CO% at engine oil temp. 60°C • Always use tachometer for engine RPM measurement. **For SAI vehicles.** • Set idling RPM & CO% at engine oil temp. 60°C • CO% to be confirmed by disconnecting & blocking SAI intake pipe by nylon plug. • Always use tachometer for engine RPM measurement. 	Do not set idling RPM at engine cold condition. • CO% not to be checked in SAI intake pipe connected condition with air filter. 

Idling RPM & CO% Specifications - Current models with SAI unit :-

CT100, CT100B, Platina 100, Discover 125, V15, V12, Pulsar 135, Pulsar 150, Pulsar180, Pulsar 220, Pulsar 200NS, Avenger 150, Avenger 220,

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

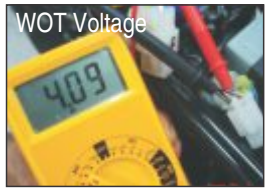
Idling RPM & CO% Specifications - Phased out models without SAI unit

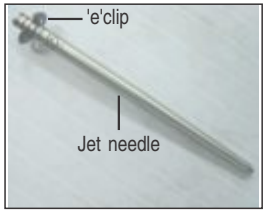
SN	Parameters	Discover 100	Discover 100T	Discover 125ST	Discover 125T	Discover 150	Pulsar 200AS	Pulsar 150AS
1	Idling RPM	1300 - 1500	1300 - 1500	1300 - 1500	1300 - 1500	1300 - 1500	1350 - 1450	1300 - 1500
2	CO%	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Petrol leakage - check fuel tank, fuel cock, fuel pipe, carburettor for leakage.	Visually	Fuel leakage.	• Welding failure / rusty fuel tank. • Rubber parts deteoration. • Adulterated fuel used.	**Possible Errors :** • Water entry in fuel tank. • Rubber parts not replaced as per PM schedule. **Effects of Error :** Wastage of petrol lead to high fuel consumption.		
3.	Silencer for clogging / rust.	By hearing engine firing sound (beats) & throttle response.	Abnormal silencer noise / poor throttle response.	Usage of bad quality fuel. Silencer inside parts rusty. Pebble / debris in silencer -- Mischief	**Possible Errors :** Silencer drain hole not cleaned by BAL recommended drain hole cleaning tool. Silencer tail end cap not used during vehicle washing.  Silencer tail end pipe for Pulsar 150/180 not cleaned as per SOP. **Effects of Error :** Silencer clogged.	Advise customer to fill petrol at reputed petrol pumps only. Refer SOP for vehicle washing & silencer tail pipe cleaning.  	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Throttle response - Clutch performance	Drive vehicle for 2~3 Kms & confirm whether vehicle speed matches with engine rpm. Also check effort / number of kicks required to start the engine in hot condition & whether engine starts after kicking.	Poor pickup High engine RPM as compared to vehicle speed. Very less kicking efforts & engine can not start by kicking.	Refer details given in clutch slippage chapter.	**Possible Errors :** **Effects of Error :**		
5.	Spark plug for electrode gap, colour, wear, fouling & grade.	Visually  	Spark plug gap more than specification Spark plug colour black & oily. Spark plug fouling & excessive electrode wear.	Spark plug cleaning & replacement not done as per PM schedule. Spark plug electrode gap setting wrong - gap set by use of hacksaw blade. 	**Possible Errors :** Spark plug gap setting done by judgment. **Effects of Error :** Spark plug with more gap, leads to poor startability, leading to fouling & causing high fuel consumption.	• Use wire gauge to set the electrode gap.  • Adhere to spark plug gap check & adjust schedule of PM. • Spark plug cleaning & replacement to be done as per PM schedule.	

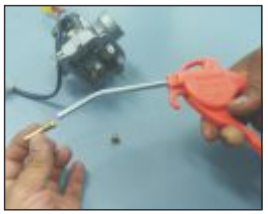
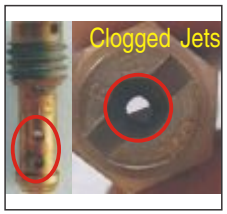
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Manual choke lever movement.	Check choke lever operation manually. 	Jammed choke lever movement.	Dust accumulation on choke lever / knob. Rubber grommet on push pull type choke knob torn causing dust entry. 	**Possible Errors :** Choke lever operation & rubber grommet not checked. **Effects of Error :** High fuel consumption due to choke ON / partly open position -- Rich air fuel mixture.	Explain customer about manual choke usage.	
7.	Auto choke plunger movement.	Check auto choke operation as per SOP. Refer SOP.	Auto choke plunger stuck up.	Auto choke plunger bend / sticky movement. 	**Possible Errors :** Auto choke functioning not checked during repairs. **Effects of Error :** Auto choke plunger stuck up causing high fuel consumption.	Always check auto choke functioning.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	Throttle position sensor (TPS).	Reed switch - Check continuity at POT & WOT position by multimeter.   Hall sensor - Check voltage values at POT & WOT position by multimeter.   	Readings on multimeter not as per specifications.	TPS defective.	**Possible Errors :** TPS not checked as per SOP during repairs. **Effects of Error :** High fuel consumption.	Always check TPS as per SOP in case of high fuel consumption issue.	

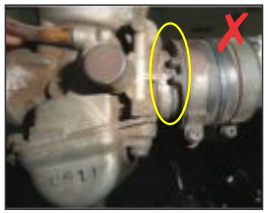
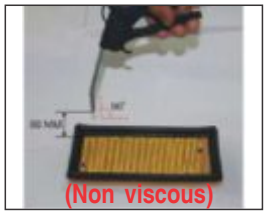
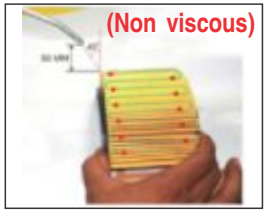
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	CO %	Check CO% with the help of CO gas analyzer. Refer SOP.	CO% is not as per specified range.	CO% less - Too lean air fuel mixture. CO% more - Too rich air fuel mixture.	**Possible Errors :** Carburettor setting done by judgment. **Effects of Error :** High fuel consumption.	Check CO% at engine warm condition before CAT.	
10.	'e' clip position on jet needle.	Dismantle carburettor and check visually.  	'e' clip position on 'Jet Needle' of carburettor shifted to lower groove form top than specified groove position.	Lack of knowledge.	**Possible Errors :** 'e' clip shifted to lower groove by technician. **Effects of Error :** More fuel supplied when 'e' clip position disturbed leading to high fuel consumption.	Ensure 'e' clip position is as per specified position model wise.	

Carburettor e clip position from Top

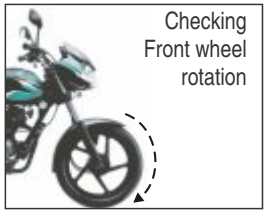
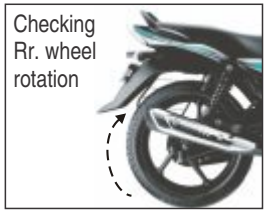
SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	e clip position	4th Groove	3rd Groove	2nd Groove	Single Groove	2nd Groove	Single Groove	Single Groove	Single Groove	Single Groove	Single Groove	2nd Groove	2nd Groove
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	e clip position	Single Groove	Not Applicable	Single Groove	Single Groove	Single Groove	Single Groove	Single Groove	Not Applicable	2nd Groove			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
11.	Carburettor air passages.	Dismantle carburettor and blow low pressure compressed air through the passages. 	Carburettor air passages clogged.	Carburettor passages clogged due to dust entry in carburettor or vehicle not used more than 25 days. (approx)  air passages clogged.	**Possible Errors :** Carburettor cleaning not done as per PM schedule. **Effects of Error :** Insufficient air mixing with fuel leads to rich mixture & high fuel consumption.	Always clean carburettor body air passages if clogged. Refer SOP.	
12.	Carburettor jet hole size.	Dismantle carburettor and check visually for jets clogging & orifice size increase, if any. 	Jet hole size increased. 	Carburettor jets clogged due to dust entry in carburettor bowl or vehicle not used more than 25 days. (approx) Carburettor jets orifice size increase. Non recommended jets fitted. 	**Possible Errors :** Carburettor cleaning not done as per SOP. **Effects of Error :** Rich mixture leads to high fuel consumption.	Replace carburettor jets if worn out.	Do not clean carburettor jets by steel wire.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Petrol overflow from carburettor.	Visual inspection	Petrol dripping on floor from carburettor overflow pipe.	Float pin rubber tip worn out. Dust / lint entrapment between float pin & it's seat. Float punctured. 	**Possible Errors :** Carburettor cleaning not done as per SOP. **Effects of Error :** Wastage of petrol lead to high fuel consumption.	Replace worn out parts.	
14.	Carburettor rubber duct condition.	Visual inspection.  Check for Crack	Not fitted properly. Rubber duct cut.	Rubber duct cut -- Natural deterioration / ageing. Not fitted properly -- Manual error.. 	**Possible Errors :** Lack of knowledge **Effects of Error :** Excess air & dust entry.	Replace rubber duct if found cracked / cut.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
15.	Carburettor hose clamps.	Visual inspection for clamp position & tightness by phillips head screw driver. 	Clamps not fitted on it's seat, loose fitment, clamp screw missing.	Manual error.  Rubber duct not fitted properly	**Possible Errors :** Lack of knowledge **Effects of Error :** Excess air & dust entry	Replace damaged camps.	
16.	Air filter element.	Visual inspection.   Excess oil soaked  Heavy dust deposition	Heavy dust accumulated on filter.	Air filter element not cleaned / replaced as per PM schedule.   (Non viscous)  (Non viscous)	**Possible Errors :** Lack of knowledge. **Effects of Error :** Rich air fuel mixture resulting in high fuel consumption.	Clean / replace air filter as per SOP & PM schedule. Refer SOP.	Do not clean viscous filter, (replace filter as per PM schedule)

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
17.	Air intake duct.	Visual inspection.	Clogged due to cloth kept beneath the seat	Lack of knowledge. 	**Possible Errors :** - **Effects of Error :** -		Explain customer not to keep cloth below the seat as it may block air intake passage.
18.	Clutch cable free play.	Check clutch lever free play with the help of scale. Std free play : 2~3 mm for all motorcycles Refer SOP. 	Clutch lever free play is out of specified limit.	Clutch cable free play setting wrong.-- Manual error. 	**Possible Errors :** Free play adjusted as per PM schedule in periodic service. **Effects of Error :** Partial engagement / disengagement of clutch leading to high fuel consumption.		
19.	Clutch cable routing.	Clutch cable routing as specified for every model. Check operating force by pressing clutch lever. 	More force required during operation of clutch lever	Stretched clutch cable due to wrong routing.  Jammed inner clutch cable due to water & dust entry through damaged rubber boot / PVC sleeve.	**Possible Errors :** Clutch cable routing & damages not checked. **Effects of Error :** No clutch cable free play leading to clutch failure & high fuel consumption.	Ensure correct routing of clutch cable. Always replace clutch cable complete if found damaged / jam.	Do not apply pressurized water jet on clutch cable.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
20.	Front & rear wheel for free rotation.	By rotating wheel by hand.  Checking Front wheel rotation  Checking Rr. wheel rotation	Wheel rotation not free.	Jammed piston movement in caliper for disc brake vehicles. Front brake inner free play / rear brake free play is less or zero in case of drum brake vehicles. Refer SOP.  	**Possible Errors :** • Brake free play setting not checked. • Mud / dust on brake pads & disc. **Effects of Error :** Brake remaining partially engaged resulting in high fuel consumption.		

Front & Rear Brake Free Play (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Front Brake	4 - 5	4 - 5	4 - 5	4 - 5	4 - 5	4 - 5	4 - 5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
2	Rear Brake	20 - 30	20 - 30	15 - 20	15 - 20	15 - 20	15 - 20	15 - 20	15 - 20	15 - 20	20 - 30	25 - 30	25 - 30
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Front Brake	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	4 - 5			
2	Rear Brake	20 - 25	Not Applicable	20 - 25	15 - 20	Not Applicable	20 - 30	25 - 30	Not Applicable	15 - 20			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
21.	Front brake cable routing.	Front brake cable routing as specified for every model.  Check operating force by pressing front brake lever. 	More force required during operation of front brake lever	Stretched clutch cable due to wrong routing. Front cable inner jam due water & dust entry through damaged rubber boot / PVC sleeve.	**Possible Errors :** Front brake cable routing not checked. **Effects of Error :** Wrong routing of front brake cable results in brake remaining partially engaged causing high fuel consumption.	Ensure correct routing of front brake cable. Always replace front brake cable complete if found damaged / jam.	Do not apply pressurized water jet on clutch cable.
22.	Front & rear brake cam.	Check by operating brake lever. 	More force required for operation of brake cam.	Brake cam is jammed / sticky. 	**Possible Errors :** Brake cam is running dry due to lack of grease application during periodic service. **Effects of Error :** Brake cam not operating freely causing brake binding & high fuel consumption issue.	Lubricate front brake cam if sticky / jammed by AP grease. Ensure front wheel is rotating freely.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
23.	Rear brake pedal operation.	Check by operating brake pedal. 	More force required during operation of brake pedal.	Brake pedal is jammed / sticky.	**Possible Errors :** Sticky / jammed brake pedal ignored. **Effects of Error :** Brake pedal remaining in partially operated condition causing brake binding & high fuel consumption.	Clean & lubricate rear brake pedal shaft if dry / sticky by AP grease.	
24.	Tyre pressure.	By tyre pressure gauge. 	Low air pressure in tyres.	Tyre pressure not checked.	**Possible Errors :** Ignorance **Effects of Error :** More rolling resistance resulting in high fuel consumption.	Explain customer about the importance of correct tyre pressure.	

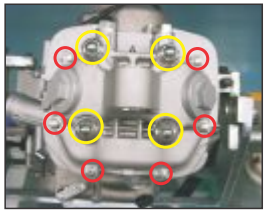
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
25.	Drive chain slackness.	Non O ring chain - by finger taking judgement of chain case marking. O ring chain - by scale. Refer SOP. 	Drive chain slackness less than specification which leads to more frictional losses.	Drive chain slackness not adjusted during service.	**Possible Errors :** • Drive chain slackness not adjusted during periodic service. • Drive chain slackness adjusted by judgment. **Effects of Error :** High fuel consumption due to less slackness of drive chain.	Always adjust drive chain slackness as per specification.	

Drive Chain Slackness (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Drive chain Slack.	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	25 - 30	25 - 35	25 - 35	25 - 35
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Drive chain Slack.	15 - 25	15 - 25	15 - 25	20 - 30	25 - 35	25 - 35	25 - 35	20 - 30	25 - 30			

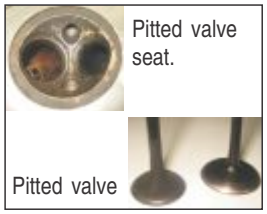
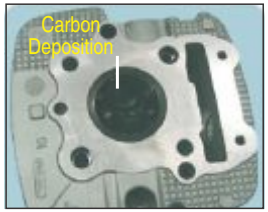
26.	Llubrication for drive chain.	Visual inspection for lubrication. 	Dry running drive chain leads to more frictional losses causing high fuel consumption.	Drive chain not lubricated as per PM schedule & PM SOP.	**Possible Errors :** **Effects of Error :** Dry running drive chain leads to more frictional losses causing high fuel consumption.	Always adhere to drive chain lubrication SOP & PM schedule. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
	Secondary checks :						
	Compression pressure.	Check compression with compression gauge. Refer SOP. 	Compression pressure not as per specifications.	If wet compression pressure value does not rise substantially than dry compression pressure value then check following points : • Cylinder head gasket leakage / cut / torn.  • Valve & valve seat pitting.  Pitted valve seat. Pitted valve  • Valve bent. 			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Valve clearance zero or less than specification. • Head mounting bolts loose.  • Cylinder head warpage.  • Spark plug fitment loose.			

Compression Pressure (in kg / cm^2)

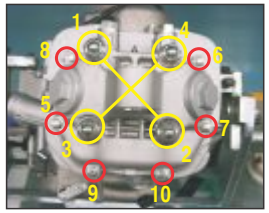
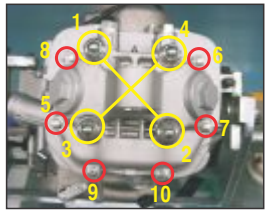
SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Compression Pressure	12.00 - 14.00	12.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	6.00 - 10.00	11.00 - 13.00
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Compression Pressure	11.00 - 13.00	11.00 - 13.00	11.00 - 13.00	12.00 - 13.00	11.00 - 13.00	6.00 - 10.00	11.00 - 13.00	10 - 12	12 - 13			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
27.	Cylinder head gasket.	Remove cylinder head and check the condition of cylinder head gasket visually. 	Cylinder head gasket cut / showing streak marks of combustion leakage.	Uneven tightening of cylinder head bolts.	**Possible Errors :** • Cylinder head bolts not tightened as per specified torque. • Criss-cross method of tightening of cylinder head bolts not followed. **Effects of Error :** High fuel consumption due to compression leakage from cylinder head gasket.		Do not reuse gasket.
28.	Valve / valve seat.	Valve leak test.   	Petrol leakage through valve & valve seat.	Pitting marks, carbon deposition on valve & valve seat.   Uneven wear of valve & valve seat. Valve seat loose in cylinder head casting.	**Possible Errors :** **Effects of Error :**	Replace cylinder head assembly in case valve seat found loose. Perform valve lapping as per SOP given in Refer SOP. 	Do not repair cylinder head locally.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
29.	Valve Intake & Exhaust.	Remove Intake & Exhaust valves from cylinder head and check valve visually as well as by rolling on surface plate. 	Bent Intake or exhaust valve.	Very less or zero valve clearance. Use of adulterated fuel.	**Possible Errors :** Valve clearance not adjusted as per specification i.e. too tight. **Effects of Error :** Due to bent valves compression leakage & high fuel consumption.	Replace valves if bent. Explain customer about the adverse effect of adulterated fuel & BAL warranty policy.	
30.	Tappet clearance.	By Feeler gauge in engine cold condition. Refer SOP. 	Tappet clearance not as per specifications. Refer SOP for Dominar 400 given in SSM	Manual error.	**Possible Errors :** Valve clearance not checked & adjusted in periodic service. **Effects of Error :** High fuel consumption.		Do not use worn out feeler gauge for valve clearance checking & setting.

Tappet Clearance (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Intake Valve	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
2	Exhaust Valve	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Intake Valve	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03 - 0.07	0.05			
2	Exhaust Valve	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.08 - 0.12	0.10			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
31.	Cylinder head mounting bolts.	Confirm torque value using torque wrench.	Torque value found less than specifications.	Cylinder head bolts tightened using ring spanner & torque value not confirmed.	**Possible Errors :** • Cylinder head bolts not tightened as per specified torque. • Criss-cross method of tightening of cylinder head bolts not followed. **Effects of Error :** High fuel consumption due to compression leakage from cylinder head gasket.	Always tighten cylinder head bolts as per specified torque & in criss-cross method. 	
32.	Cylinder head warpage.	Put cylinder head machined side on surface plate & check warpage by feeler gauge. 	Warpage is more than specification.	Uneven tightening of cylinder head bolts.	**Possible Errors :** • Cylinder head bolts not tightened as per specified torque. • Criss-cross method of tightening of cylinder head bolts not followed. **Effects of Error :** High fuel consumption due to compression leakage from cylinder head gasket.	Always tighten cylinder head bolts as per specified torque & in criss-cross method. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
33.	Spark plug fitment.	Confirm torque value using torque wrench.	Torque value found less than specifications.	Spark plug tightened using ring spanner & torque value not confirmed.	**Possible Errors :** • Spark plug not tightened as per specified torque. **Effects of Error :** High fuel consumption due to compression leakage from spark plug threading.	Always tighten spark plug as per specified torque.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
34.	Piston rings	Insert piston rings in new cylinder block & check end gap with feeler gauge. 	Piston ring end gap more than specification.	• Use of adulterated fuel. • Contaminated engine oil. • Use of non recommended engine oil. • Oil not replaced as per PM schedule. • Oil starvation. • Oil strainer / centrifugal filter not cleaned. • Engine oil filter not replaced as PM schedule. • Dust entry. • Wrong grouping of block & piston. • Natural wear & tear.	**Possible Errors :** • At the time of new vehicle delivery adverse effect of adulterated fuel & BAL Warranty policy was not explained to customer by dealer. • Oil not replaced as per PM schedule. • Poor adherence to preventive maintenance SOP & schedule. **Effects of Error :** • Smokey exhaust. • High oil consumption. • Abnormal noise.	• Fill petrol from reputed petrol pumps • Replace engine oil as per recommended grade & PM schedule. • Replace piston rings in a set, if worn out. • Block & piston to be assembled of same group. • Early detection of abnormality to be captured by monitoring engine oil drain qty before oil top up or refill -- Oil consumption @ 30 ml per 1000 kms run. (@50 ml to 70 ml per 1000 km run for Dominar 400.) Refer SOP.	Only if piston rings are worn out then do not replace complete block piston assly.
	Piston rings free movement	By rotating piston rings in groove. 	Piston rings movement sticky / jammed & heavy carbon deposition.				

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
	Cylinder block piston clearance.	Check 'Cylinder Block Piston Clearance' with the help of micrometer & bore gauge. Check condition of cylinder block & piston visually	Cylinder block piston clearance out of specification.	Seizure / deep scoring marks on cylinder block wall / piston skirt due to - • Lack of lubrication. • Dust entry.			

SOP for Checking Cylinder-Piston Clearance:

- Mark a point 7mm above the base line on piston skirt from LH & RH side. Measure piston diameter at marked points by micrometer.
- Set Micrometer to reference reading equal to rounded off piston diameter reading.
- Set Bore gauge dial to zero for reference reading set in micrometer.
- Measure cylinder bore dia at 3 positions - top, middle & bottom by inserting set bore gauge.
- Derive cylinder bore diameter - if dial pointer moves in clockwise direction, subtract the reading from reference reading & vice versa. Take average of 3 readings.
- Subtract piston diameter from bore diameter to derive clearance.

Cylinder Piston Diameter & Clearance (in mm)

SN	Parameters		CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Piston Cylinder	Standard Limit	0.028 - 0.040	0.028 - 0.040	0.030 - 0.50	0.027 - 0.049	0.030 - 0.50	0.027 - 0.049	0.027 - 0.049	0.030 - 0.050	29 - 53	0.027-0.049	0.019-0.039	0.019-0.039
	Clearance	Service Limit	0.090	0.090	0.100	0.100	0.100	0.100	0.100	0.100	0.06	0.100	0.090	0.090
SN	**Parameters**		**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Piston Cylinder	Standard Limit	0.030 - 0.049	0.030 - 0.049	0.030 - 0.049	0.019 - 0.039	0.029 - 0.049	0.019	0.029 - 0.049	0.060 - 0.075	0.028-0.052			
	Clearance	Service Limit	0.100	0.100	0.100	0.090	0.100	0.039	0.100	0.115	0.100			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
	Seizure / scoring marks on block piston.	Visual Inspection. 	Seizure/ Scoring marks on piston and cylinder block.	• Lack of lubrication. • Dust entry. Refer chapter 'engine' Sr. 3 for "Engine emits blueish white smoke".			

Engine emits Black Smoke

Content **Page No.**

- Reference for SOP.

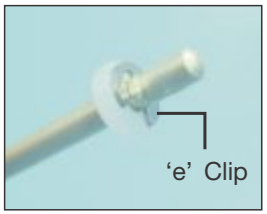
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Idling speed / CO% checking • Auto choke checking • Carburettor cleaning • Air filter cleaning	16 194 66 49
2.	Training Notes	---	---
3.	Service Circular	---	---

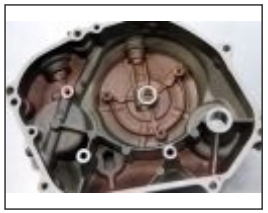
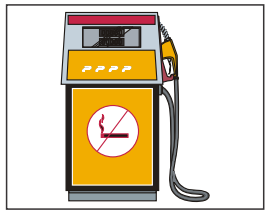
Engine emits Black Smoke

What to Check	How to Check	Symptoms observations	What is the most likely cause
Smokey exhaust (Black smoke) confirmation.	Drive vehicle for 4~5 kms.	Black smoke emitted by engine.	1. Rich air fuel mixture 2. Fuel adulteration.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Rich air fuel mixture - CO% checking.	Refer SOP.  CO gas analyzer	Co % abnormally high.	• Foam air filter element clogged.  • Excess oil application on foam filter.  • Paper filter element clogged. 	**Possible Errors:-** • Air filter not cleaned during PM service. (activity skipped) • Excess oil applied on foam filter	• Clean air filter element as per SOP. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Punctured float  Punctured Float • Float movement sticky. • Worn out jets. • Worn out jet needle. 	• Carburettor jet cleaned by steel wire which increases orifice size • Worn out / damaged parts ignored.	• Clean carburetor jets by low pressure compressed air (2 bar). • Clean carburetor jet with copper wire strand. • In case carburetor passage & jets not getting cleaned by compressed air then soak all carburetor sub parts in acetone for 4 hrs (Except float). • Replace worn out jets. • Use carburettor cleaner for cleaning jets.  **Part No. : 36001056** • Replace worn out jet needle. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Jet needle e clip fitted in lower groove.  	• Wrong positioning of e clip ignored.	• Ensure e clip position as per standard.	
				• Auto choke plunger movement jammed in carburettor body. 	• Auto choke plunger operation not checked as per SOP.	• If auto choke plunger movement is jammed, clean auto choke OD & carburettor ID with petrol. If plunger movement is still found jammed then replace auto choke assembly. Refer SOP. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Fuel adulteration.	Visually & by checking odour of fuel.  	Clutch cover & engine crankcase color found reddish brown.	Customer has filled fuel from non reputed petrol pump.	**Possible Errors :** BAL Warranty policy not explained to customer by dealer at the time of new vehicle delivery & adverse effect of adulterated fuel. **Effect of Error :** Smokey exhaust	Advice customer to fill fuel from reputed fuel pumps only. 	

Engine emits Blueish White Smoke

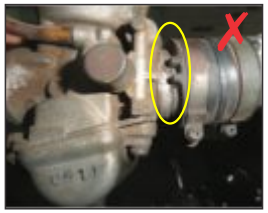
Content **Page No.**

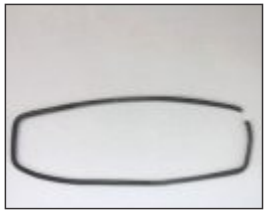
- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Fuel cock sediment bowl cleaning • Carburettor float chamber cleaning • Cylinder head de-carbonizing • Compression pressure	60 69 161 156
2.	Training Notes	• Piston ring wear & orientation - Pulsar 150/180 (Service Station Manual)	46
3.	Service Circular	---	---

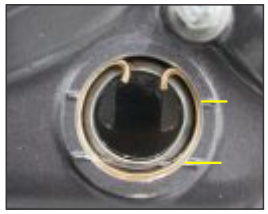
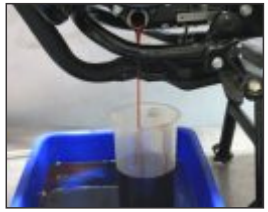
Engine emits Blueish White Smoke

What to Check	How to Check	Symptoms observations	What is the most likely cause
Smokey exhaust (White smoke) - Engine kill test.	Warm up the engine & keep engine idling. Block intake duct of air filter box by wet cloth - engine should die down.	Engine not getting off within 30 sec.	Dust entry inside the cylinder block piston due to following reasons resulting in wear / scoring of engine parts leading to smokey exhaust. • Air leakage from Intake joints. • Air filter element torn. • Air filter cover 'O' ring cut / deformed / missing. • Air filter cover bolts missing / broken / loose. • Carburettor rubber duct crack / clamps loose / mismatching of carburettor, duct & filter groove. • Carburettor & rubber duct joint partly open. • Manifold 'O' ring cut / deformed / missing. • Engine air breather tube cracked/ clamp missing.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1	Air entry through intake system sealing area.	Perform engine kill test. Air filter intake duct blocking by wet cloth.  Ensure carburettor rubber duct is intact. 	Engine not getting off within 30 sec.	Excess air entry through loose, broken, mis-alligned joints of air intake system. Air filter box cover screw missing.  Carburettor & rubber duct joint partly open.  Carburettor rubber duct cracked. 	**Possible Errors :** Source for air leak not identified & sealed during service. **Effect of Error :** Unfiltered air entry through weak joints resulting in early wear & tear of engine parts and scoring of block piston assembly, smokey exhaust.	Ensure following points in servicing as per PM schedule. • Air filter Intake / outlet rubber duct sealing. • Condition of air filter element & application of oil on foam filter. • Air filter cover 'O' ring for cut / deformed / missing. • Air filter cover bolts for missing / broken / loose. • Carburettor rubber duct for no crack / clamps loose. • Firm joint of carburettor & rubber duct. • Manifold 'O' ring for cut / deformed / missing. • Engine air breather tube for cracked / clamp missing. Timely replacement of rubber parts, sealing of joints can save huge replacement cost of engine parts.	Do not ignore any abnormality. Do not check CO / adjust carburettor if idling rpm not stable.

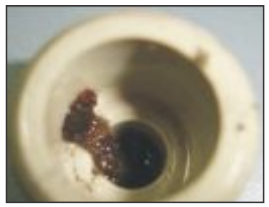
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				Carburettor rubber duct clamps loose.  Engine breather tube cracked.  Air filter element torn.  Air filter cover 'O' ring cut / deformed. 		

What to Check	How to Check	Symptoms observations	What is the most likely cause
Smokey exhaust (White smoke) - Road test for confirmation.	Drive vehicle for 4~5 kms.	White smoke emitted by engine.	1. Engine oil level less & use of non recommended engine oil grade. 2. Dust in fuel cock & carburettor sediment bowl. 3. Valve oil seal damage / tilted & loose fitment on valve guide. 4. Valve guide cracked / loose fitment in cylinder head. 5. Cylinder block piston seizure / scoring marks. 6. Piston ring wear / Piston rings end gap more / jam rotation in groove. 7. Internal casting porosity of cylinder block & cylinder head. 8. Jammed movement of piston pin in piston pin bore or connecting rod small end. 9. Height difference of both crankcases resulting in step at block resting machined face. 10. Air filter related all points (Refer Page No. - 36 & 37)

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Engine oil level	Check oil level through inspection oil window.  Measure engine oil quantity by draining. 	Engine oil less than 650 ml, black colour & oil burning odour.	• Oil leakage externally. • Oil consumption high due to excess burning. 	**Possible Errors :** Oil leakage / excess oil consumption root cause not rectified while repairs / servicing. Engine oil level not checked during service. Engine oil replacement frequency ignored. **Effects of Error :** • Engine oil level out of specs. resulting in clutch plates burning. • Engine seizure.	• Always use BAJAJ Genuine engine oil of recommended grade & quantity. Bajaj Genuine Oil  • If there is oil leakage from engine repair it immediately. • Always check engine oil quantity by draining to confirm oil consumption qty.	Do not use non recommended engine oil. Don't top up engine oil without measuring oil drain quantity.

Engine Oil Drain & Refill and Overhaul (in ml)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Drain & Refill	900	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2	Overhaul	1000	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Drain & Refill	1200	1200	1200	1200	1150	1000	1150	1500	1000			
2	Overhaul	1400	1400	1400	1400	1300	1100	1200	1800	1100			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Dust in fuel cock & carburettor sediment bowl.	Visual inspection. Refer SOP.  	Dust in sediment bowl.	Dust in petrol storage tank of fuel pump.	**Possible Errors :** Fuel cock & carburettor sediment bowl not cleaned as per PM schedule. **Effects of Error :** Smokey exhaust		
3.	Valve oil seal.	Visual inspection.  Valve Oil Seal fitted in tilted condition	Valve seal damage. Valve oil seal not fitted. Valve oil seal fitment tilted. Valve oil seal lip worn out. Valve oil seal fitment loose on valve guide.	Assembly error Assembly error Assembly error Natural wear & tear. Valve guide machining under size or valve oil seal oversize.	**Possible Errors :** - **Effects of Error :** -	Replace cylinder head assembly even if new valve oil seal found loose on valve guide.	Do not reuse valve oil seal.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Valve guide.	Visual observation. 	Valve guide cracked damage at oil seal resting face. Valve guide fitment loose in cylinder head casting.	Valve guide cracked while pressing in cylinder head or valve spring compression tool adopter slipped. Machining error.	**Possible Errors :** - **Effects of Error :** -	Replace cylinder head assembly in case valve guide found cracked / chipped off / loose fitment.	Do not repair cylinder head locally.
5.	Cylinder block piston seizure / scoring marks.	Check compression with compression gauge. Refer SOP.	Wet compression test reading increases substantially as compared to dry compression test reading.	• Piston rings worn out. • Cylinder block piston seizure / scoring mark.	**Possible Errors :** - **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Piston ring wear.	Insert piston rings in new cylinder block & check end gap with feeler gauge. 	Piston ring end gap more than specification.	• Use of adulterated fuel. • Contaminated engine oil. • Use of non recommended engine oil. • Oil not replaced as per PM schedule. • Oil starvation. • Oil strainer / centrifugal filter not cleaned. • Engine oil filter not replaced as PM schedule. • Dust entry. • Wrong grouping of block & piston. • Natural wear & tear.	**Possible Errors :** • At the time of new vehicle delivery adverse effect of adulterated fuel & BAL warranty policy was not explained to customer by dealer. • Oil not replaced as per PM schedule. • Poor adherence to preventive maintenance SOP & schedule. **Effects of Error :** Smokey exhaust.	• Fill petrol from reputed petrol pumps • Replace engine oil as per recommended grade & PM schedule. • Replace piston rings in a set, if worn out. • Block & piston to be assembled of same group. • Early detection of abnormality to be captured by monitoring engine oil drain qty before oil top up or refill -- Oil consumption @ 30 ml per 1000 kms run. (@50 ml to 70 ml per 1000 km run for Dominar 400.) Refer SOP.	Only if piston rings are worn out then do not replace complete block piston assembly.
	Piston rings freeness in groove.	By rotating piston rings in groove. 	Piston rings movement sticky / jammed & heavy carbon deposition.				

Piston Ring End Gap (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Top 1	0.20 - 0.35	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.10 - 0.25	0.15 - 0.30	0.15 - 0.30
2	Top 2	0.35 - 0.50	0.25 - 0.40	0.40 - 0.60	0.40 - 0.60	0.40 - 0.60	0.40 - 0.60	0.40 - 0.60	0.25 - 0.45	0.30 - 0.45	0.30 - 0.45	0.30 - 0.45	0.30 - 0.45
3	Oil Ring	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Top 1	0.15 - 0.030	0.15 - 0.030	0.15 - 0.030	0.10 - 0.25	2.20 - 0.35	0.15 - 0.30	0.20 - 0.35	0.20 - 0.35	0.1 - 0.25			
2	Top 2	0.030 - 0.050	0.030 - 0.050	0.030 - 0.050	0.40 - 0.60	0.50 - 0.65	0.30 - 0.45	0.50 - 0.65	0.40 - 0.55	0.15 - 0.30			
3	Oil Ring	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.20 - 0.70	0.2 - 0.7	0.2 - 0.7			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Internal casting porosity in cylinder block & cylinder head.	Visual Inspection.	Internal casting porosity which is opening in combustion chamber.	Casting defect.	**Possible Errors :** - **Effects of Error :** -	Replace block piston assly or cylinder head as applicable.	
8.	Movement of piston pin in piston pin bore or connecting rod small end.	Visual inspection & by sliding piston pin in piston & connecting rod.  	Piston pin sliding movement jammed & overheating marks.	• Contamination of oil. • Oil starvation. • Dust / burr entrapment.	**Possible Errors :** • Oil not replaced as per PM schedule. • Poor adherence to preventive maintenance SOP & schedule. **Effects of Error :** Smokey exhaust		
9.	Height difference of both crankcases.	By feeling with the nail. 	Height difference (step) at block resting machined face.	Machining error or crankcase dowels not fitted.	**Possible Errors :** Lack of knowledge. **Effects of Error :** Smokey exhaust	Ensure dowels fitment for crankcase. Even after dowel fitment if step observed replace crankcase.	

Gear Shifting Hard

Content **Page No.**

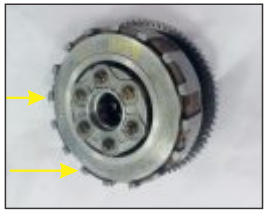
- Reference for SOP.

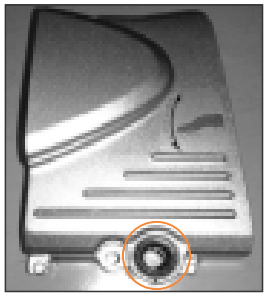
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Clutch cable free play • Engine oil top up / replacement	106 27
2.	Training Notes	• Friction plate thickness & pressure plate warpage - Pulsar 150/180 (Service Station Manual)	96,100, 101
3.	Service Circular	• Gear change shaft checking	Ser/ Gen/ 08

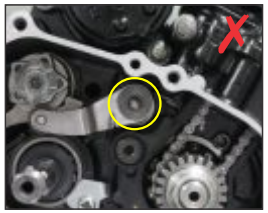
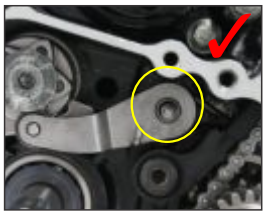
Gear Shifting Hard

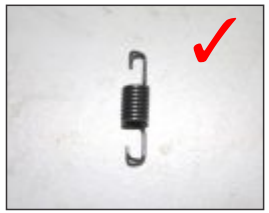
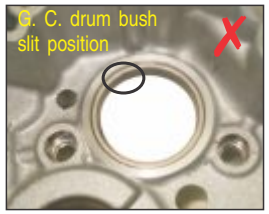
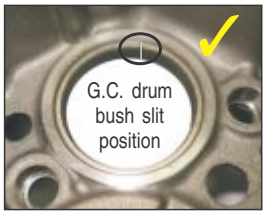
What to Check	How to Check	Symptoms observations	What is the most likely cause
Gear shifting operation.	Drive vehicle in crowded area in all gears by pressing clutch lever fully & operating gear shifting lever as per model wise gear shifting pattern.		1. Clutch lever free play more than specification. 2. Clutch lever sticky / jammed. 3. Clutch dragging, friction plate wear. 4. Gear change shaft not rotating freely. 5. Gear change shaft - Bend / Sticky / Wear of lever. 6. Jammed movement of inhibitor complete gear shift return. 7. Gear change shaft spring weak (Less tension) 8. Jammed rotation of gear change drum. 9. Jammed movement of fork shift on its shaft. 10. Gear shift lever torsion spring open end not rested on holding lug. 11. Cam change drum allen bolt loose. 12. Burr on Input / output shaft splines. 13. Gear dog engagement improper. 14. Clutch cable inner movement sticky / jam. 15. Push rod movement sticky, clutch cover lever movement sticky. 16. Driving habit of customer.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Clutch lever free play	Press the clutch lever & measure the play by scale / free play setting gauge. Refer SOP. 	• Excess clutch lever free play. Clutch cable free play 2 - 3 mm for all models.	Clutch free play checking ignored in PM service.	**Possible Errors :** Scale / gauge not used during free play adjustment & free play set by judgement. **Effects of Error :** Gear shifting hard.	Always use scale / free play setting gauge during the free play adjustment.	
2.	Clutch lever movement.	Check operation by pressing the clutch lever. 	Clutch lever operation hard & not operating fully.	• Dust / water entry in cable due to cracked rubber boot.  • Wrong clutch cable routing. 	**Possible Errors :** Cracked rubber boot ignored during repairs / Periodic service. **Effects of Error :** Gear shifting hard.	• Always replace clutch cable if outer is found cut. • Apply AP grease for the clutch lever lubrication. 	• Don't change the cable routing. • Don't apply oil for cable lubrication. 

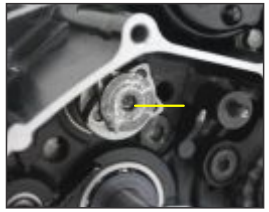
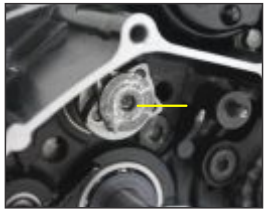
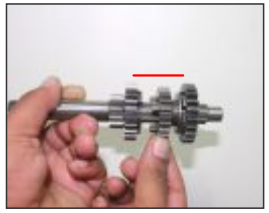
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Clutch lever lubrication not done during the PM service. 			
3.	Clutch dragging, friction plate wear.	Warm up the vehicle by running it for 4~5 Kms briskly. Put vehicle on the main stand so that rear wheel is above the ground level. Start engine & put 1st gear by pressing clutch lever completely. In this condition apply & release the rear brake. If rear wheel rotates, this confirms that clutch is dragging. 	Rear wheel rotates while performing clutch drag test as per SOP.	• Usage of high viscosity engine oil. • Excess engine oil level.  • Sticky movement of friction plate inside the clutch housing due to damaged slots of clutch housing 	**Possible Errors :** • Engine oil level topped-up without measuring drain oil quantity. • Non recommended engine oil used. • Friction plate thickness & steel plates warpage not checked as per SOP. **Effects of Error :** Clutch dragging.	• Always top-up engine oil after measuring drain oil quantity. Refer SOP. • Always use Bajaj genuine oil. 	Never dismantle / assemble clutch without thrust plate aligner. 

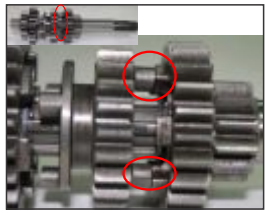
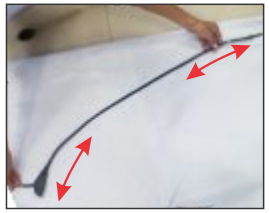
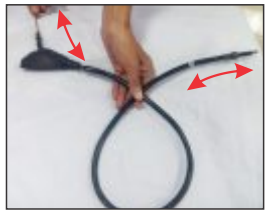
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Friction & steel plate warpage more than service limit. 		• Replace friction plates in set & use genuine parts.  • Assemble steel plates in sequence. Either plain or rough surface of all steel plates should face in one direction only. • Always soak the friction plates in engine oil for at least 30 min. before assembly.	
4.	Gear change shaft movement	Check free rotation by removing the generator cover / small chain cover. 	Gear change shaft not rotating freely.	• Needle roller bearing not lubricated by AP grease. • Oil seal cut / cracked. 	**Possible Errors :** **Effects of Error :**	Always lubricate needle roller bearing of small chain cover by A.P. grease. 	

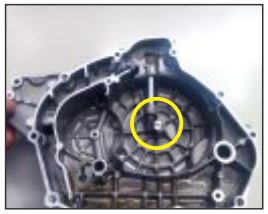
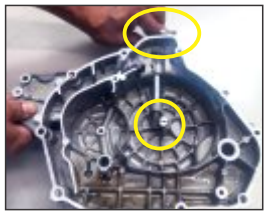
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Gear change shaft.	Check bend by using magnetic V block & dial gauge with magnetic stand - Refer SOP. 	Gear change shaft - Bend. Sticky. Not rotating freely. Lever worn out. 	Manufacturing defect. Bend > 30 microns.	**Possible Errors :** Gear change shaft not checked as per SOP. **Effects of Error :** Gear shifting hard.	Adhere to visual & dimensional checking SOP.	
6.	Movement of inhibitor complete gear shift return.	Check for - • Free rotation of rollers.  • Free movement of inhibitor complete gear shift return. 	Jammed rollers.	Wrong fitment of collar washer. 	**Possible Errors :** Correct fitment of collar washer not checked during the assembly. **Effects of Error :** Gear shifting hard.	Fit collar washer of inhibitor complete gear shift return such that collar faces in outward direction. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Gear change shaft spring.	Check by operating the lever by hand & taking a feel. 	Gear change shaft spring stiffness found less.	Gear change shaft spring not checked for stiffness. 	**Possible Errors :** **Effects of Error :**	Replace gear change shaft spring if spring stiffness found less.	
8.	Rotation of gear change drum.	Rotate the drum by hand & feel the freeness. 	Gear change drum rotation sticky / jammed.	• Gear change drum bearing rotation sticky / jammed.  • Antifriction bush press fitted in crankcase in wrong position. 	**Possible Errors :** Free rotation of gear change drum bearing not checked. **Effects of Error :** Gear shifting hard.	• Always clean bearing of gear change drum by kerosene & nylon brush and lubricate by engine oil. • Always fit gear change drum bush in crankcase such that its slit side remains vertically upward. Its top face should be 0.5 mm below the crankcase surface. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	Movement of fork shift on its shaft.	Check the fork shift movement on the shaft. 	Shaft fork shift movement jammed.	Lack of lubrication.	**Possible Errors :** Free movement of shaft fork shift not checked while assembling. **Effects of Error :** Gear change hard.	Smear engine oil on shaft fork shift before assembly. 	
10.	Gear shift lever torsion spring open end not resting on holding lug.	Check - open end should rest on holding lug.	Open ends are not resting on holding lug.	Assembly error - manual error.	**Possible Errors :** - **Effects of Error :** -	Always ensure the correct fitment of torsion spring.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
11.	Cam change drum allen bolt.	Check cam drum change allen bolt for looseness. 	Cam drum change allen bolt loose.	Cam drum change allen bolt not tightened during repair. 	**Possible Errors :** • Loctite thread locker not applied during the fitment of cam drum change allen bolt. • Cam drum change allen bolt Torque values not confirmed. **Effects of Error :** Gear shifting hard	• Always apply Loctite thread locker during the fitment of cam drum change allen bolt.  • Always use torque wrench for tightening cam drum change allen bolt. 	
12.	Input / output shaft splines.	Check for free sliding movement of gear over the shaft. 	Burr inside the input / out put shaft splines.	Manufacturing defect.	**Possible Errors :** **Effects of Error :**	Always check for any foreign particles inside the splines of input / out put shaft.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Gear dog engagement	Feel by engaging the gear. 	Gears not shifting smoothly.	• Uneven wear of gear dog.  • Gear dog bend. • Burr on the gear dog.	**Possible Errors :** Free engagement of gear dog not checked before assembling. **Effects of Error :** Gear shifting hard	Always ensure the free engagement of gear dog.	
14.	Clutch inner cable movement.	Clutch inner cable free movement checking procedure as shown in photograph.  	Clutch inner cable not moving freely.	• Clutch inner cable strands broken. • Clutch outer cable cracked / broken. • Dirt / Dust in clutch cable.	**Possible Errors :** Torn clutch lever rubber boot ignored. **Effects of Error :** Clutch cable movement jam resulting in gear shifting hard.	• Always ensure clutch lever rubber boot is in good condition. • Always ensure clutch inner cable free movement.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
15.	• Push rod movement. • Clutch cover lever movement.	Visual checking of Up down movement of push rod as per clutch release shaft rotation  Visual checking of circular movement of Clutch release shaft. 	Push rod movement jam. Clutch cover lever movement jam	• Push rod movement jam due to contaminated engine oil. • Engine oil not replaced as per periodic maintenance schedule. • Machining error or casting blow holes.	**Possible Errors :** periodic maintenance schedule not adhered. **Effects of Error :** Gear shifting hard or friction plate burning.		
16.	Driving habit of customer.	By observing customer's driving style.	Customer is not pressing clutch lever fully while shifting gears.	Lack of awareness.	**Possible Errors :** Shifting gears without fully pressing clutch lever. **Effects of Error :** Clutch plates may burn leading to gear shifting hard		Never shift gears in clutch lever half pressed condition.

Clutch Slippage

Content **Page No.**

- Reference for SOP.

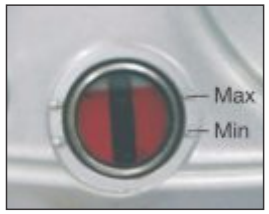
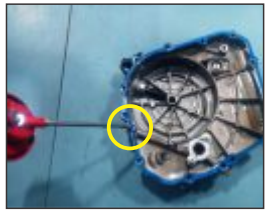
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Clutch cable free play • Clutch plate replacement	106 97
2.	Training Notes	---	---
3.	Service Circular	---	---

Clutch Slippage

What to Check	How to Check	Symptoms observations	What is the most likely cause
Clutch slippage confirmation.	Drive vehicle for 2~3 Kms & confirm whether vehicle speed matches with engine rpm. Also check effort required to start engine in hot condition & whether engine starts after kicking.	Poor pickup High engine RPM as compared to vehicle speed. Very less kicking effort & engine can not be started by kicking.	1. Clutch inner cable free play less than specification. 2. Clutch inner cable movement sticky / hard. 3. Engine oil level less & use of non recommended engine oil grade. 4. Friction plates worn out. 5. Pressure plate warpage out of specification. 6. Jammed movement of pressure plates in hub clutch. 7. Clutch spring free length less than specification. 8. Clutch release mechanism sticky / jammed. 9. Clutch bearing play excessive. 10. Abnormal wear of hub clutch. 11. Abnormal wear of wheel clutch. 12. Jammed movement of wheel clutch & hub clutch. 13. Clutch holder plate warpage. 14. Clutch holder ID undersize. 15. Holder plate freeness on wheel clutch. 16. No axial float for Input shaft.
Clutch drag.	Warm up the engine, put vehicle on main stand with engine running -- Check for rear wheel rotation with clutch lever pressed in 1st gear.	Rear wheel rotating at clutch lever pressed position.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Clutch inner cable free play.	Press the clutch lever till actuating force is felt & measure the clutch inner cable play by scale / free play setting gauge. Refer SOP. 	No / very less clutch lever play. Clutch cable free play 2 - 3 mm for all models.	No / very less clutch inner cable play - Free play adjustment error. (manual error). Clutch cable routine wrong -- Manual error. 	**Possible Errors :** Clutch inner cable free play set by judgment. Clutch cable routine not checked in servicing. **Effects of Error :** No / very less clutch inner cable play resulting in friction / clutch plate burning which leads to clutch slippage / kick slippage.	Always use scale / free play setting gauge during the free play adjustment. Check & correct clutch cable routine in servicing. Follow clutch cable std routine at the time of leg guard fitment at PDI stage.	
2.	Clutch inner cable movement	Check clutch lever operation by pressing & releasing the clutch lever 	Clutch lever operation hard.	• Dust / water entry in clutch cable. • Clutch cable routine wrong -- Manual error.  • Greasing for clutch lever not done as per PM schedule. 	**Possible Errors :** • Application of oil for clutch inner cable lubrication. • Clutch cable outer PVC sleeve cut. • Clutch cable routine not checked in servicing. • Cut / missing rubber boot not fixed in servicing. **Effects of Error :** Clutch lever operation hard & clutch plates burning.	Apply AP grease for the clutch lever lubrication. 	• Don't lubricate clutch cable inner by oil. • Don't alter the cable routing.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
			Clutch lever operation hard.	• Rubber boot of clutch lever cracked / missing.  • Lever mounting bolt over tightened.  • Clutch inner cable few strands broken. 		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Engine oil level	Check oil level through inspection oil window.  Measure engine oil quantity by draining.  Oil grade can be confirmed by comparative judgment of oil viscosity with new recommended oil & also by discussing with customer for earlier oil change details & replacement cost.	Engine oil less than 650 ml, black colour & oil burning odour.	• Oil leakage externally. • Oil consumption high due to excess burning.  • Recommended oil grade & replacement frequency not followed as per PM schedule.	**Possible Errors :** Oil leakage / excess oil consumption root cause not rectified while repairs / servicing. Engine oil level not checked during service. Engine oil replacement frequency ignored. **Effects of Error :** Engine oil level out of specs. resulting in clutch plates burning.	• Always use BAJAJ Genuine engine oil of recommended grade & quantity. Bajaj Genuine Oil  • If there is oil leakage from engine repair it immediately. • Always check engine oil quantity by draining to confirm oil consumption qty.	Do not use non recommended engine oil. Don't top up engine oil without measuring oil drain quantity.
	Lubrication passage	• Pressurized oil flow by using oil can. 	• Lubrication oil not coming out from other end due to blockage of passage	• Lubrication oil passage blocked due to dirt / dust / foreign material entrapped in lubrication oil passage.	**Possible Errors :** Lubrication oil flow not checked. **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Friction plates.	Check the Friction plate thickness by vernier caliper. 	Friction plate thickness less than specification.	• Friction plate burnt.  • Low engine oil level.  • Vehicle driven with clutch lever half pressed.	**Possible Errors :** Engine oil level not checked during service. Engine oil leakage not rectified. No free play of clutch cable. **Effects of Error :** **Friction** plates burning.	• Before assembly soak friction plates in engine oil for about 30 min. • Replace friction plates in a set. Refer SOP.	Educate customer do not to drive the vehicle in clutch release half position. Ensure engine oil level in between Max & Min level through oil glass window.
5.	Pressure plate warpage	By feeler gauge. Refer SOP. 	Clutch plates (pressure plates) warpage more than 0.1 mm.	Machining error or mis handling of part.	**Possible Errors :** **Effects of Error :**		

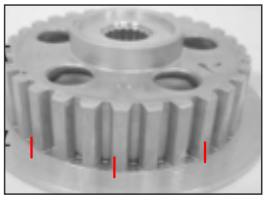
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Movement of pressure plates in hub clutch.	By inserting pressure plates in hub clutch. 	Pressure plates sliding movement sticky.	• Splines of hub clutch damaged.  • Pressure plates slots damaged / bend. 	**Possible Errors :** - **Effects of Error :** -	Always check wheel clutch slots for dent / damages.	

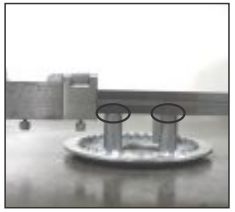
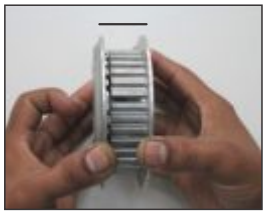
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Clutch spring free length.	Check the clutch spring free length by vernier caliper. Refer SOP. 	Spring length out of specification.	Spring length less -- Spring set. Spring length more -- Different length spring used.	**Possible Errors :** Spring length not measured. **Effects of Error :** -	• Always use the thrust plate aligner tool during the dismantling / assembling.  • Measure spring free length & confirm with specification.	

Clutch Spring Free Length (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Free length	26.4 - 27	26.70	25.50	25.50	25.50	25.50	25.50	41.50	25.50	35.90	37.00	37.00
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Free length	38.40	38.40	38.40	44.00	30.00	37.00	37.00	52.10	25.5			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	Clutch release mechanism	Check clutch lever operation by pressing & releasing the clutch lever. 	Clutch lever operation hard & lever release slowly.	• Check clutch release shaft for bend / outer dia size.  • Check clutch cover for inner dia of release lever's parent hole.  • Check condition of rack & teeth of release shaft.  	**Possible Errors :** Machining error. **Effects of Error :** Sticky / jammed operation of clutch release mechanism resulting in clutch plates burning.	• Identify defective part by comparing new part available in spares stock & replace it. • Apply engine oil on clutch release shaft for initial lubrication before assly. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	Clutch bearing play.	Hand feel, compare with new part available in spares. 	Bearing play excess.	Oil contamination or abnormal pressure on bearing.	**Possible Errors :** Low oil level, use of non recommended oil, bearing jammed in clutch holder ID. **Effects of Error :** Repeat complaint of clutch plates burning.	Replace clutch bearing.	
10.	Wear of hub clutch.	• Check the surface visually (hub clutch face against which friction plate butt). 	Deep scoring marks on hub clutch face against which friction plate butt.	Machining error of hub clutch. Use of non genuine friction plates.	**Possible Errors :** - **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	✗ Don't's
11.	Wear of wheel clutch.	• Check the surface visually (wheel clutch face against which clutch plate butt) • Wheel clutch dog height. • Wheel clutch dog flatness at clutch holder butting face.  	Deep scoring mark on hub clutch face against which clutch plate butt. Wheel clutch height out of specification. 	• Likely cause as mentioned in sr. no 1~6. • Machining error. • Machining error.	**Possible Errors :** - **Effects of Error :** -		
12.	Movement of wheel clutch & hub clutch.	Insert wheel clutch splines in hub clutch splines & check for sliding action without any stickiness / jamming. 	Jammed sliding movement.	Splines of wheel clutch / hub clutch are damaged. 	**Possible Errors :** Wheel clutch slots / splines not checked for dent / damage. **Effects of Error :** Repeat complaint of clutch plates burning.	Check splines of wheel clutch & hub clutch for free movement.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Clutch holder plate warpage.	By feeler gauge. 	Holder plate for warpage.	Machining error or mis handling of part.	**Possible Errors :** - **Effects of Error :** -	Replace holder plate.	
14.	Clutch holder ID.	Measure bearing seat dia at 3 different points by vernier caliper & compare with new part available in spares. 	Clutch holder ID for bearing under size.	Machining error or embedded aluminium burr.	**Possible Errors :** - **Effects of Error :** -	Clutch holder ID found undersize replace clutch holder.	
15.	Holder plate freeness on wheel clutch.	By rotating holder plate on wheel clutch lugs. 	Rotation not free.	Wheel clutch lugs damage / bent / dent in assembly.	**Possible Errors :** Wheel clutch lug bent or less clearance between holder plate & wheel clutch lug. **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
16.	Axial float for Input shaft.	Visual inspection 	No axial float for Input shaft.	Crankcase bearings not fitted properly in crankcase.	**Possible Errors :** • Recommended Bearing driver not used. **Effect of Errors :** • No axial float for input shaft resulting in clutch slippage.	Always used bearing driver set while fitting bearings in crankcase. 	

Clutch Juddering

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Clutch cable free play • Clutch plate replacement	106 97
2.	Training Notes	---	---
3.	Service Circular	---	---

Clutch Juddering

What to Check	How to Check	Symptoms observations	What is the most likely cause
Clutch judder confirmation.	Start the engine, press clutch lever completely, put engine in 1st gear & release clutch lever smoothly.	Vehicle gives jerks while releasing clutch lever.	1. Clutch inner cable movement sticky / hard. 2. Clutch bearing play excessive. 3. Holder plate warpage. 4. Pressure plate warpage out of specification. 5. Friction plate warpage & thickness out of specification. 6. Sticky / jammed movement of clutch plate in clutch housing. 7. Clutch release mechanism sticky / jammed. 8. Clutch spring free length out of specification. 9. Sticky / jammed rotation of clutch housing in bush. 10. Jammed movement of wheel clutch & hub clutch. 11. Jammed movement of pressure plate in hub clutch. 12. Clutch holder ID undersize. 13. Wheel clutch leg flatness uneven. 14. Shaft clutch release assembly slot face machining uneven. 15. Plunger surface flatness uneven.

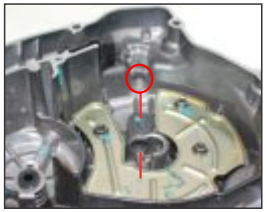
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Clutch inner cable movement	Check clutch lever operation by pressing & releasing the clutch lever. Refer SOP. 	Clutch lever operation hard.	• Dust / water entry in clutch cable. • Clutch cable routine wrong -- Manual error. • Greasing for clutch lever not done as per PM schedule. • Rubber boot of clutch lever cracked / missing.  • Lever mounting bolt over tightened.  • Clutch inner cable few strands broken. 	**Possible Errors :** • Application of oil for clutch inner cable lubrication. • Clutch cable outer PVC sleeve cut. • Clutch cable routine not checked in servicing. • Cut / missing rubber boot not fixed in servicing. **Effects of Error :** Clutch lever operation hard & clutch plates burning.	Apply AP grease for the clutch lever lubrication. Always replace clutch cable if outer is found cut / permanent set. Always ensure rubber boot for clutch lever.	• Don't lubricate clutch cable inner by oil. • Don't alter the cable routing.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Clutch bearing play.	Hand feel, compare with new part available in spares. 	Bearing play excess.	Oil contamination or abnormal pressure on bearing.	**Possible Errors :** Low oil level, use of non recommended oil, bearing jammed in clutch holder ID **Effects of Error :** Repeat complaint of clutch plates burning.	Replace clutch bearing. Educate customer to not to drive vehicle with clutch lever partially pressed.	
3.	Holder plate warpage.	By feeler gauge. 	Holder plate for warpage.	Machining error or mis handling of part.	**Possible Errors :** - **Effects of Error :** -	Replace holder plate.	
4.	Pressure plate warpage	By feeler gauge 	Clutch plates (pressure plates) warpage more than 0.1mm	Machining error or mis handling of part.	**Possible Errors :** - **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Friction plate warpage & thickness.	• By feeler gauge  • Check the friction plate thickness by vernier caliper. 	Friction plate thickness less than specification,.	Friction plate burn out.	**Possible Errors :** • Engine oil level not checked during service. • Engine oil leakage not rectified. • Clutch lever Free play not adjusted during PM. **Effects of Error :** Friction plate wear / burning.	• Before assembly soak friction plate in engine oil for about 30 min. • Replace friction plate in a set. Refer SOP.	Educate customer do not to drive the vehicle in clutch release half position.

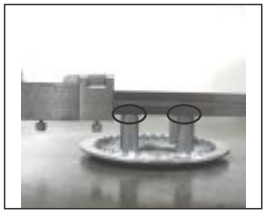
Friction Plate Thickness (in mm)

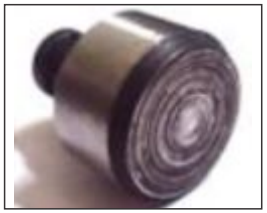
SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Friction Plate Thk.	2.90 - 3.05	2.95 - 3.05	2.95 - 3.05	2.95 - 3.05	2.95 - 3.05	2.95 - 3.05	2.95 - 3.05	2.90 - 3.05	2.90 - 3.00	2.90 - 3.00	2.90 - 3.10	2.90 - 3.10
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Friction Plate Thk.	3.00	3.00	3.00	3	2.9 - 3.1	2.90 - 3.10	2.90 - 3.10	2.92 - 3.08	2.9 - 3.0			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Movement of clutch plate in clutch housing.	Check the movement of friction plate inside the clutch housing slots. 	Sticky / jammed movement of friction plate inside the clutch housing.	Burr inside the clutch housing slots / housing damage.	**Possible Errors :** Free movement of friction plate inside the clutch housing not checked. **Effects of Error :** Clutch juddering.	• Always check for the free movement of friction plate inside the clutch housing. • Always replace genuine parts.	
7.	Clutch release mechanism	Check clutch lever operation by pressing & releasing the clutch lever. 	Clutch lever operation hard & lever release slowly.	• Check clutch release shaft for bend / outer dia size.  • Check clutch cover for inner dia of release lever's parent hole. 	**Possible Errors :** Machining error. **Effects of Error :** Sticky / jammed operation of clutch release mechanism resulting in clutch plates burning.	• Identify defective part by comparing new part available in spares stock & replace it. • Apply engine oil on clutch release shaft for initial lubrication before assly.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
	• Clutch lever spring	Visual inspection.	Clutch lever spring broken.	Manufacturing defect.  			
8.	Clutch spring free length.	Check the clutch spring free length by vernier caliper. Refer SOP. 	Spring length out of specification.	Spring length less -- Spring set. Spring length more -- Different length spring used.	• Always use the Thrust plate aligner tool during the dismantling / assembling. • Measure spring free length & confirm with specification.		
9.	Rotation of clutch housing in bush.	Check free rotation / sliding movement of clutch housing on bush. 	Stick / jammed rotation of clutch housing over the bush.	Bush got seized inside the clutch housing.	**Possible Errors :** Entrapment of burr between bush & clutch housing ignored. **Effects of Error :** Clutch juddering. Clutch not disengaging.	• Replace engine oil & oil filter as per PM schedule. • Always use engine part handling trays for keeping dismantled engine components. • Ensure over all engine cleanliness.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
10.	Movement of wheel clutch & hub clutch.	Insert wheel clutch splines in hub clutch splines & check sliding without stickiness / jamming. 	Sliding movement jammed.	Splines of wheel clutch / hub clutch are damaged. 	**Possible Errors :** Wheel clutch slots / splines not checked for dent / damage. **Effects of Error :** Repeat complaint of clutch plates burning.	Check splines of wheel clutch & hub clutch for free movement.	
11.	Movement of pressure plate in hub clutch.	By inserting pressure plates in wheel clutch. 	Pressure plates sliding movement sticky.	• Splines of wheel clutch damaged.  • Pressure plates slots damaged / bent. 	**Possible Errors :** - **Effects of Error :** -	Always check wheel clutch slots for dent / damages.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
12.	Clutch holder ID	Measure bearing seat dia at 3 different points by vernier caliper & compare with new part available in spares. 	Clutch holder ID for bearing under size.	Machining error or embedded aluminium burr.	**Possible Errors :** - **Effects of Error :** -	Clutch holder ID found undersize replace clutch holder.	
13.	Wheel clutch leg flatness.	Check flatness of wheel clutch leg at clutch holder plate resting area. 	Wheel clutch lug flatness not uniform at clutch holder plate resting area.	Machining error.	**Possible Errors :** Flatness not check during the assembly. **Effects of Error :** Clutch juddering.	Ensure no dent mark on wheel clutch legs.	
14.	Shaft clutch release assembly slot face machining.	Visual inspection. 	Shaft clutch release machined slot edge uneven.	Machining error.	**Possible Errors :** Flatness not check during the assembly. **Effects of Error :** Clutch juddering.	Ensure uniform surface of machined slot of shaft clutch release assembly.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
15.	Plunger surface flatness.	Check plunger surface for flatness. 	Plunger surface wear / step on milling face.	Manufacturing defect. Uneven wear.	**Possible Errors :** Plunger checking ignored. **Effects of Error :** Clutch juddering.		

Timing Chain Noise

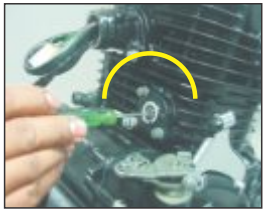
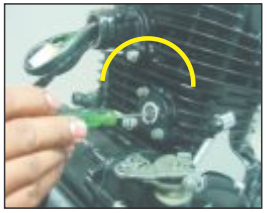
Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	Timing chain elongation measurement	Ser/ Gen/ 09

Timing Chain Noise

What to Check	How to Check	Symptoms observations	What is the most likely cause
Start the engine & check noise from timing chain.	Noise to be checked at engine hot condition (Run the vehicle for 3~4 kms.)		1. Defective chain tensioner. 2. Sticky movement of chain tensioner push rod. 3. Chain tensioner push rod release height less than specification. 4. Timing chain elongation out of specifications. 5. Metallic chain guide bent. 6. Sticky movement of slack side chain guide. 7. Cam sprocket allen bolt loose fitment. 8. Cam sprocket spacer fitted in wrong direction. 9. Abnormal wear / breakage of chain guide . 10. Slack side chain guide bent. 11. Slack side chain guide step bolt, step length less than specifications. 12. Crankshaft & cam sprocket teeth / key way damaged. 13. Cam sprocket collar height out of specifications. 14. Cam sprocket & Crankshaft sprocket teeth profile wear / dent marks.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Chain tensioner.	By applying normal hand force on push rod. 	Push rod goes inside body with normal force	Defective chain tensioner	**Possible Errors :** Push rod movement not check during repair / diagnosis. **Effects of Error :** Timing chain noise.	Always check chain tensioner push rod movement by applying normal force by hand.	
2.	Movement of chain tensioner push rod.	• Rotate chain tensioner screw clockwise.  • Release the push rod by rotating in anticlockwise direction. 	Sticky movement of chain tensioner push road.	Dust entry due to missing cap / bolt.	**Possible Errors :** Chain tensioner push rod movement not checked. **Effects of Error :** Timing chain noise.	- Always check movement of chain tensioner push rod during diagnosis of timing chain noise.	

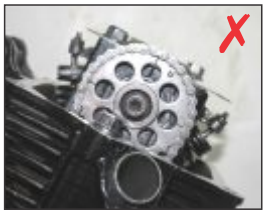
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
3.	Chain tensioner push rod rocking movement.	Visual inspection. 	Rocking movement (to and fro) in push rod.	Excessive play in push rod.	-	-	-
4.	Timing chain elongation	20 link length by vernier caliper. Refer SOP. 	Timing chain elongation out of service limit.	• Wrong grade of engine oil is used.	**Possible Errors :** Timing chain elongation checking ignored. **Effects of Error :** Timing chain noise.	Always confirm timing chain elongation.	

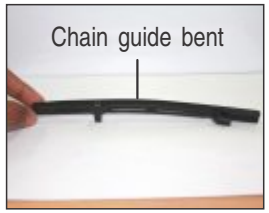
Calculation for measuring 20 link length in stretched condition
Example - -The reading of 20 links is - - 124.06 mm.
Add roller diameter - - 3.3 mm
Then total length of 20 links is - 124.06+3.3=127.36mm

Timing Chain 20 Link Length (in mm)

SN	Parameters		CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Timing Chain	Standard Limit	254.0 - 254.6	254.0 - 254.6	127 - 127.20	127 - 127.20	127 - 127.20	127 - 127.20	127 - 127.20	127 - 127.48	127 - 127.48	127 - 127.48	127 - 127.20	127 - 127.20
	20 Link Length	Service Limit	260.00	260.00	128.00	128.00	128.00	128.00	128.00	128.90	128.90	128.90	128.00	128.00
SN	**Parameters**		**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Timing Chain	Standard Limit	127 - 127.48	127 - 127.48	127 - 127.48	127.00 - 127.05	127.00 - 127.20	127.00 - 127.20	127.00 - 127.20	127~127.2	127 - 127.48			
	20 Link Length	Service Limit	128.90	128.90	128.90	127.254	128.00	128.00	128.00	128.00	128.90			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Metallic chain guide.	Visual inspection.  Metallic Chain Guide	Metallic chain guide bent.	Improper parts handling	**Possible Errors :** Metallic chain guide bent ingored. **Effects of Error :** Timing chain noise.	Always check metallic chain guide for excessive bend.	
6.	Movement of slack side chain guide. Movement of chain guide in Cylinder block slot.	Check for free movement by hand. 	Sticky movement of slack side chain guide.	Wrong / missing dowel pin of slack side chain guide or step bolt collar height less.	**Possible Errors :** Slack side chain guide free movement not checked after fitment. **Effects of Error :** Timing chain noise.	Always ensure the fitment of slack side chain guide dowel pin.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Cam sprocket allen bolt.	Check tightening torque using torque wrench. 	Cam sprocket allen bolt loose fitment.	Torque not applied to cam sprocket allen bolt	**Possible Errors :** Cam sprocket allen fitment not checked. **Effects of Error :** Timing chain noise.	• Always apply specified torque to cam sprocket allen bolt.  • Always use thread locker. 	
8.	Cam sprocket spacer fitment.	Visual inspection. 	Cam sprocket spacer fitted in wrong direction.	Manual error - lack of knowledge. 	**Possible Errors :** Cam sprocket spacer fitted in wrong direction. **Effects of Error :** Timing chain noise.	Always fit cam sprocket spacer in right direction. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	Wear / breakage of chain guide.	Visual inspection. 	Abnormal wear / breakage of rubberized chain guide.	Inadequate lubrication 	**Possible Errors :** Abnormal wear / breakage of rubberized chain guide ignored. **Effects of Error :** Timing chain noise.	Always replace chain guide if found worn.	
10.	Slack side chain guide.	Visual inspection. 	Slack side chain guide bent.	Improper parts handling	**Possible Errors :** Profile of slack side chain guide not checked. **Effects of Error :** Timing chain noise due to less pressure on chain.	Always replace chain guide slack side if found bent. 	
11.	Slack side chain guide step bolt,	By vernier caliper.	Slack side chain guide step bolt, step length less than specifications.	Wrong part (dimensional variation).	**Possible Errors :** - **Effects of Error :** -		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
12.	Crankshaft & cam sprocket teeth / key way.	Visual inspection. 	Teeth / key way damaged.	Cam sprocket bolt loose.	**Possible Errors :** Both sprocket not checked for key way / teeth damaged. **Effects of Error :** Timing chain noise.	Always check key way / teeth of both sprocket & replace if found damage.	
13.	Cam sprocket collar height.	By vernier caliper. 	Cam sprocket collar height out of specification.	Wrong part (dimensional variation)	**Possible Errors :** Cam sprocket collar height not checked. **Effects of Error :** Timing chain noise.	Always check cam sprocket collar height in case of timing chain noise issue.	
14.	Cam sprocket & Crankshaft sprocket.	Visual inspection.  	Cam sprocket & Crankshaft sprocket teeth worn out / dent marks.	Misalignment of both sprockets, possibility of oil starvation.			

Radiator Fan Motor not Working

• Reference for SOP.

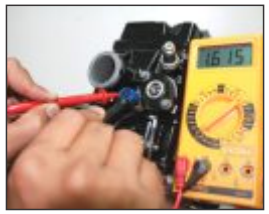
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	Coolant temperature sensor checking - Pulsar 200NS	99
3.	Service Circular	---	---

Radiator Fan Motor not Working

What to Check	How to Check	Symptoms observations	What is the most likely cause
Radiator fan motor working.	Start the vehicle & warm up. check visually for functioning of fan motor.	Radiator fan motor does not work even after engine temperature reaches 98^{0}c.	1. Fuse blown. 2. Coolant temperature sensor resistance value out of specification. 3. Radiator relay defective. 4. Wiring cut 5. Radiator fan motor jammed / burnt. 6. Defective CDI / ECU. 7. Entrapment of foreign material in fan (Breather hose / piece of cloth kept for vehicle cleaning)

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>1.</td><td>Fuse</td><td>Continuity checking by multimeter.
  </td><td>No continuity.</td><td>Fuse blown off.</td><td>Possible Errors :
Fuse not checked during repairs.

Effects of Error :
Radiator fan not working.</td><td></td><td></td></tr>
<tr><td>2.</td><td>Coolant temperature sensor resistance value.</td><td>Check resistance of coolant temperature sensor by multimeter.

Refer SOP.
  </td><td>Resistance values out of specifications.</td><td>Coolant temperature sensor internally short.</td><td>Possible Errors :
Coolant temperature sensor not checked during repair.

Effects of Error :
Engine overheating may lead to severe damage of engine parts.</td><td>• Replace coolant temperature sensor if found defective.

• Ensure firm fitment of coupler.

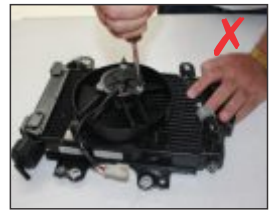
• Always use special tool to remove coolant temperature sensor.
 
  </td><td></td></tr>
</table>

Meter Range	Wire Connections		Standard Value	
	Meter +ve	Meter -ve	Temperature	Resistance K Ohms
20 K Ohms	Coupler Pin 1	Coupler Pin 2	0	5.30 ~ 6.11
			10	3.44 ~ 3.92
			20	2.28 ~ 2.58
			25	1.88 ~ 2.12
			30	1.55 ~ 1.75
			40	1.06 ~ 1.21
			50	0.75 ~ 0.86

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Radiator relay.	a. Check coil resistance of fan motor relay with the help of multimeter. b. Continuity checking. • Connect 12V DC external supply to coil terminals. • Connect multimeter across contacts in continuity mode. • Continuity indicates OK relay. 	Resistance values out of specifications. Relay contacts not showing continuity.	• Radiator fan motor relay coil open. • Relay contacts worn out. • Relay contacts oxidized / black layer formed on contacts.	**Possible Errors :** Radiator relay not checked **during repairs as per SOP.** **Effects of Error :** Engine overheating may lead to severe damage of engine parts.		

Radiator Relay Coil Resistance (in ohm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Coil Resistance	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Coil Resistance	99 - 121	99 - 121	99 - 121	Not Applicable	Not Applicable	Not Applicable	Not Applicable	99 - 121	Not Applicable			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Wiring condition	• Check continuity of wires from relay contact to fan motor. • Relay coil to CDI.  • Coolant temperature Sensor to CDI • Check I/P 12V DC supply to relay coil. 	Wiring circuit open.	Wiring pinched / cut.	**Possible Errors :** Wiring wrong routing / pinching not checked during periodic service. **Effects of Error :** Engine overheating may lead to severe damage of engine parts.		
5.	Radiator fan motor.	Connect external 12V DC supply to fan motor & check its working. 	Fan motor not working after supplying the 12 V DC supply.	Fan motor jammed / burnt.	**Possible Errors :** Fan motor working not checked in servicing **Effects of Error :** Engine overheating may lead to severe damage of engine parts.	Always replace fan motor if found burnt / jammed.	Do not open fan motor for repair. 

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	CDI / ECU	• By replacing with new one. • By diagnostic tool. For SOP refer service station manual of Pulsar RS200	Fan starting after replacement of CDI	CDI short internally.	**Possible Errors :** Defect not confirmed by replacing CDI unit. **Effects of Error :** Engine overheating may lead to severe damage of engine parts.		Don't pull coupler by holding wires. 
7.	Entrapment of foreign material in fan (Breather hose)	Routing of breather hose as per recommendation.	Breather hose routing incorrect. (Towards radiator fan) 	Lack of awareness of breather hose routing.	**Possible Errors :** Breather hose not routed as per recommendation. **Effects of Error :** Breather hose may get entrapped in radiator fan.	Always ensure breather hose is routed correctly. (Towards fuel tank cover) 	

Radiator Fan Working Continuously

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Coolant level checking • Radiator fins checking	77 87
2.	Training Notes	Coolant temperature sensor checking - Pulsar 200NS	99
3.	Service Circular	---	---

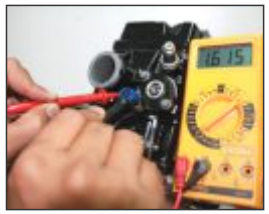
Radiator Fan Working Continuously

What to Check	How to Check	Symptoms observations	What is the most likely cause
Radiator fan motor working.	Start the vehicle	• Fan starting immediately upon starting of engine. • Fan once started runs continuously.	1. Coolant level low. 2. Radiator clogged. 3. Water pump rotor. 4. Thermostat not opening as per specified temperature range. 5. Coolant temperature sensor resistance value out of specifications. 6. Radiator relay defective. 7. Relay wiring short circuited. 8. CDI defective / ECU. 9. Blocked coolant circulation passage.

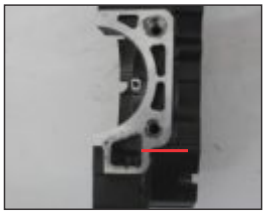
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Coolant level.	Check visually through inspection window of expansion tank. 	Coolant level below MIN mark.	Coolant level low due to leakage through hose pipe, joints & radiator tubes.  	**Possible Errors :** Leakage not checked as daily check point by customer. Coolant level not checked & topped up during servicing as per P.M schedule. **Effects of Error :** Due to low coolant level engine will get overheated & radiator fan motor will run continuously. This will further lead to severe damage of engine parts.	Refer SOP.	
2.	Radiator condition	Check visually for external damage of radiator tubes & clogged radiator fins due to dust & mud. 	Radiator fins clogged due to dust & mud accumulation.	Radiator assembly not cleaned throughly during washing as per SOP. 	**Possible Errors :** Radiator not cleaned as per SOP. Refer SOP. **Effects of Error :** Damaged , clogged radiator fins will result in overheating which may lead to severe damage of engine parts.	If more than 25% of the radiator fins surface is damaged, then replace radiator assembly.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Water pump rotor.	By opening cover of water pump. 	Water pump rotor blades broken.	Rotor dislocated from balancer assembly . 	**Possible Errors :** Water pump rotor not checked during repair. **Effects of Error :** Rise in coolant temperature resulting in radiator fan motor continuously running.	Before fitment of water pump assembly ensure water pump rotor should rotate along with balancer assembly & check water pump blades condition.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Thermostat operation	Insert thermostat in hot water / oil & check by digital thermometer for - a. Opening start at 88^0 C $\pm$ 2^0 C. b. Fully open at 96^0 C $\pm$ 2^0 C.   	Thermostat not opening as per specified temperature range.	Thermostat stuck up in "closed" position. 	**Possible Errors :** Thermostat not checked as per SOP. **Effects of Error :** Thermostat stuck up resulting in coolant circulation through bypass circuit which increases coolant temperature & further resulting in radiator fan motor continuously running.	Adhere to thermostat checking SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Coolant temperature sensor resistance value	Check resistance of coolant temperature sensor by digital multimeter as per SOP. Refer SOP. 	Coolant temperature sensor resistance value out of specification.	Coolant temperature sensor internally short / open.	**Possible Errors :** Coolant temperature sensor not checked during repair. **Effects of Error :** Radiator Fan motor continuously running.	• Replace coolant temperature sensor if found defective. • Ensure firm fitment of coupler. • Always use special tool to remove coolant temperature sensor.  	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Radiator fan motor relay	Continuity checking. • Connect 12V DC external supply to coil terminals. • Connect multimeter across contacts in continuity mode. • Continuity indicates OK relay. 	Relay contacts not showing continuity.	Radiator fan motor relay contacts stuck up.	**Possible Errors :** Relay not checked as per SOP. **Effects of Error :** Fan starting immediately upon starting of engine.		
7.	Radiator Relay wiring condition.	Check wiring visually or continuity with the help of multimeter for short circuit from relay to fan motor 	Relay contact wires pinched & shorted to each other.	Wiring pinched/cut	**Possible Errors :** Wiring wrong routing / pinching not checked during periodic service. **Effects of Error :** Radiator fan motor continuously running.	Rectify wiring problem or replace the wiring harness.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	CDI / ECU.	By replacing with new one.	Problem of radiator fan continuously ON resolved after replacement of CDI.	CDI short internally.	**Possible Errors :** Defect not confirmed by replacing CDI unit. **Effects of Error :** Radiator Fan motor run continuously.		Don't pull coupler by holding wires. 
9.	Coolant circulation passage.	• Check crankcase casting passage opening in cylinder block.  • Check bypass 'T' pipe for blockage by removing it. 	Crankcase passage opening in cylinder block is blocked. By pass T Pipe blocked (Applicable for early kilometers)	Manufacturing defect.	**Possible Errors :** Coolant circulation passage not checked during repairs. **Effects of Error :** Rise in coolant temperature resulting in radiator fan motor continuously running.		

Coolant Mixing in Engine Oil

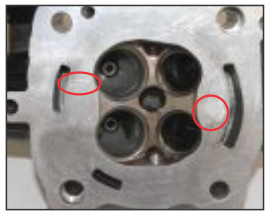
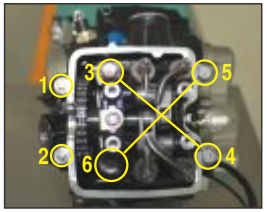
Content **Page No.**

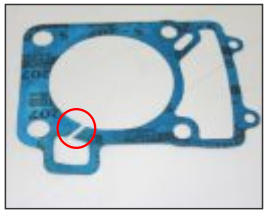
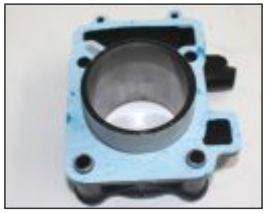
- Reference for SOP.

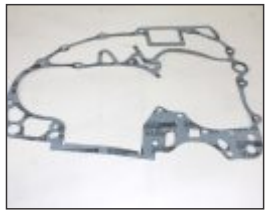
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	---	---

Coolant Mixing in Engine Oil

What to Check	How to Check	Symptoms observations	What is the most likely cause
Coolant mixed with engine oil.	Check engine oil level and colour of engine oil through engine oil inspection window.	• Engine oil level is above max. mark. • Coolant level in expansion tank is very low or not seen. • Colour of engine oil is greenish.	1. Cylinder head gasket distorted / cut. 2. Check cylinder block gasket for tear. 3. Crankcase joining gasket torn. 4. Crankcase mating surface. 5. Water pump seal on water pump shaft cut / deformed / worn out 6. Coolant contamination. 7. Use of non recommended coolant.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Cylinder head.	Remove cylinder head and check the condition of head gasket. 	Cylinder head gasket distorted resulting in coolant mixing in engine oil.	• Uneven tightening of cylinder head bolts.  • Dent mark on cylinder head / cylinder block mating face. 	**Possible Errors :** • While tightening cylinder head bolts criss-cross method is not followed. • Dent mark on cylinder head / cylinder block mating face ignored. **Effects of Error :** Coolant mixed with engine oil.	• Always follow criss-cross tightening sequence and tighten the cylinder head bolts with specified torque.  • Use torque wrench for tightening cylinder head bolts. • Always check cylinder head & cylinder block mating face for dent marks. Remove high points observed on mating face by grinding stone. Always replace cylinder head gasket whenever cylinder head is dismantled.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Cylinder block gasket.	Remove cylinder block and check the condition of cylinder block gasket. 	Cylinder block gasket folded/torn resulting in coolant mixing in engine oil.	Cylinder block gasket got folded / cut while fitting cylinder block assembly. 	**Possible Errors :** • Gasket folded during fitment. • Block surface not cleaned before fitting new gasket. **Effects of Error :** Cylinder block gasket folded/torn resulting in coolant mixing in engine oil.	• Always replace cylinder block gasket whenever cylinder block is dismantled. • Align the gasket properly with dowels before fitment of cylinder block.  • Follow cris-cross pattern while tightening the cylinder head bolts.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Crankcase joining gasket.	Split the crankcase and check the condition of crankcase joining gasket. 	Crankcase joining gasket folded / torn resulting in coolant mixing in engine oil.	• The crankcase gasket not aligned properly while joining of crankcase LH & RH. • Dent on crankcase mating faces. 	**Possible Errors :** • Gasket got folded while fitment. • Crankcase surface not cleaned before fitting new gasket. • Dent on crankcase mating faces ignored. **Effects of Error :** Crankcase joining gasket folded / torn resulting in coolant mixing in engine oil.	• Always replace crankcase gasket if crankcase is split. • Align the gasket properly with dowels before fitment of LH & RH crankcase.  • Check crankcase mating faces for dent. Remove high points observed on mating face by grinding stone. • Ensure crankcase bolts tightening in criss-cross pattern & torque value by torque wrench .  • Once engine is opened, replace balancer shaft oil seal. • Visually inspect balancer shaft for dent & damages. If observed, replace part.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Crankcase mating surface.	• Crankcase machining surface for dents, damages & cut marks.	• Dent marks / damages to crankcase machining surface.	• Handling damage at workshop.	**Possible Errors :** • Handling damage of crankcase during engine overhaul. **Effects of Errors :** Coolant mixing in engine oil.	• Always use engine part handling trays for keeping parts of dismantled engine. 	
		• Application of liquid sealant on crankcase mating surface of Dominar 400	• In adequate application of liquid sealant on crankcase mating surface. • Non recommended liquid sealant used.	• Non adherence to SOP.	-	• Always use recommended liquid sealant (Loctite L5910)	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Water pump seal on water pump shaft.	Remove both water pump seals using special tool & check visually condition of water pump seals.  for SOP refer service station manual.	• Water pump seal lip cut / distorted. • Water pump seal damaged. • Water pump seal lip worn out.	• Contamination of coolant. • Poor surface finish of balancer shaft DLC sleeve. • No / Inadequate quantity of grease between 2 nos. of water pump seals. **Note :-** 1) While removal & re-fitment of water seals use recommended tools on vehicles produced from Nov.16 After replacement of seals do engine oil flushing in engine assembled condition (refer Dominar Service Station Manual for SOP) 2) Prior to Nov. 16 production engine to be dismantled for seal replacement	**Possible Errors :** • Earlier fitment of water pump seals done without use of special tool. • Dent on balancer gear shaft overlooked. **Effects of Error :** Coolant mixed with engine oil.	• Use recommended grade of pre mixed coolant & avoid contamination in storage & filling in radiator.  Part No. : 37104349 Water pump seals removing tool.  Part No. : 37104350 Water pump seals fitting tool. • Use recommended grease (Kluber petomo GHY441) in between 2 nos. water pump seals.	Do not reuse water pump seals.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Coolant contamination.	Visual inspection of coolant.	Coolant colour change / foreign particles in coolant.	Dirt, dust, oil mixed with coolant while top up / replacement.	**Possible Errors :** • Cleanliness not maintained at workshop. • Coolant bottle cap not fitted / left open. **Effects of Errors :** Coolant contamination		
7.	Use of non recommended coolant.	Check coolant bottle used in workshop for coolant top up / replace.	Coolant bottle available in market is used.	Recommendation by BAL is not followed.	-	• Always use HP make ready to use coolant 'Koolex' 	

Engine Stopping Intermittently

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Fuel cock sediment bowl cleaning • Fuel cock paper filter replacement	60 63
2.	Training Notes	---	---
3.	Service Circular	CDI checking	TE 32

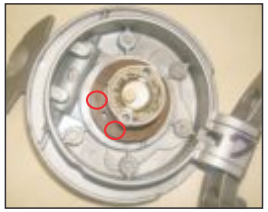
Engine Stopping Intermittently

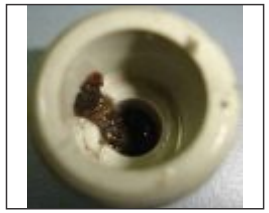
What to Check	How to Check	Symptoms observations	What is the most likely cause
Confirmation of issue of engine stopping intermittently.	Drive vehicle for 5~10 kms.	Engine stopping intermittently.	1. Petrol filled up to petrol tank neck level / petrol qty very less. 2. Intermittent petrol supply from tank to carburetor. 3. Fuel cock filter & Inline fuel filter choked up. 4. Fuel cock sediment bowl clogged. 5. Water / foreign particles in petrol tank / carburettor. 6. Spark plug gap more & electrode wear. 7. Spark plug cap loose fitment / short. 8. Earthing connections loose / oxidized / rusty. 9. H.T coil mounting bolts loose / H.T coil partially short. 10. Magneto / CDI coupler loose / terminal back out. 11. Defective pick up coil. 12. Exciter coil partially short. 13. Defective CDI. 14. Engine idling RPM too low. 15. Fuel pump pressure & delivery less. 16. MIL blinking. 17. Air filter element clogged. 18. Free movement of clutch collar bush in clutch housing. 19. Throttle body passage clogged. 20. Fuel injector clogged. 21. Side stand switch defective. 22. Roll over sensor defective. 23. Main relay chattering.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Petrol filled up to petrol tank neck level / petrol quantity.	Visual inspection	Petrol filled up to petrol tank neck level.	Customer filled petrol more than MAX limit of petrol tank. 	**Possible Error :** Precautionary measures be taken not explained to customer at the time of new vehicle delivery by dealer. **Effect of Error :** Due to excess filling of petrol no space for air in tank for maintaining atmospheric pressure resulting in petrol not flowing by gravity leading to engine stopping intermittently.	Explain customer about fuel tank capacity & adverse effect of excess filling of petrol at the time of new vehicle delivery.	
			Petrol qty very less (petrol not coming out at fuel cock reserve condition).	Fuel qty in petrol tank very less.	**Possible Error :** Customer not paying attention when fuel level dropped to reserve. **Effect of Error :** Engine stopping intermittently.		

Petrol Tank Capacity & Reserve Volume (In Liters)

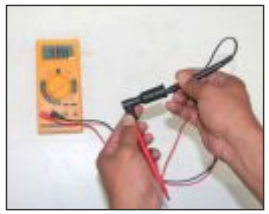
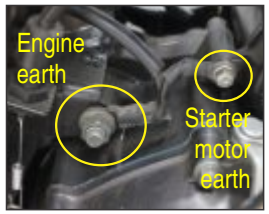
SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	PT Capacity	10.5	11.5	8	8	8	8	8	10	13	8	15	15
2	Reserve (Usable + Dead stock)	2.9	2.0	3.8	3.8	3.8	3.8	3.8	3.5	2.8	4.1	5.2	5.2
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	PT Capacity	12	13	12	12	15	13	13	13	13			
2	Reserve (Usable + Dead stock)	2.6	No Reserve	2.6	2.6	5.2	3.8	3.8	No Reserve	2.8			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Petrol supply from tank to carburetor.	• Remove fuel pipe from fuel cock side & confirm free flow of petrol at fuel cock 'ON' & 'OFF' condition. • If petrol free flow not observed, open petrol tank cap & check again. If petrol free flow observed, check petrol tank cap for air vent clogging.	Engine stopping intermittently.	Petrol tank cap air vent passage clogged.  **Note :-** Petrol tank cap in BS IV models is not to be opened for repairs	**Possible Error :** Petrol tank cap air vent passage not checked. **Effect of Error :** Engine stopping intermittently due to intermittent petrol supply.	Always clean petrol tank cap air vent passage if found clogged.	Do not cut / remove paper gasket/rubber O ring from petrol tank cap.
		If above 2 points are Ok, then remove fuel cock from petrol tank & check fuel cock by passing air at 2 bar from outlet at knob 'ON/'OFF'/ 'RESERVE' condition 	Air not passing from fuel cock inlet tube at knob 'ON'/'OFF'/ 'RESERVE' condition.	Fuel tank body internally clogged.	**Possible Error :** • Entrapment of loctite used for inlet tubes. • Machining error. **Effect of Error :** Engine stopping intermittently due to intermittent petrol supply.	Replace fuel cock if passage not getting clear by blowing low compressed air.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Fuel cock filter Inline fuel filter.	Visual inspection   	Fuel cock filter choked up Inline Fuel filter choked up.	Dust / foreign particles in fuel. Bad quality fuel used	**Possible Error :** Fuel filter not replaced as per P.M schedule. **Effect of Error :** Engine stopping intermittently.	Replace fuel filter as per P.M schedule. Refer SOP.	
4.	Fuel cock sediment bowl.	Visual inspection after opening sediment bowl. 	Heavy accumulated dust/gummy substance & water droplets.	Bad fuel quality.	**Possible Error :** Fuel cock sediment bowl cleaning not done during P.M Schedule. **Effect of Error :** Engine stopping intermittently due to no / intermittent petrol supply.	Always clean fuel cock sediment bowl, strainer & replace paper filter as per SOP. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Water / foreign particles in petrol tank / carburettor.	Loosen carburetor drain screw & drain in clean container. 	Dust & water drop lets observed.	• Condensed water got filled with petrol from fuel pump. • Petrol tank cleaning by keeping nozzle in jet mode	**Possible Error :** **Effect of Error :** Engine stopping intermittently due to no / intermittent petrol supply.	Petrol tank washing in nozzle spray mode only.	

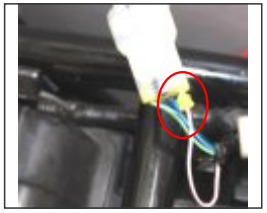
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Spark plug gap & electrode condition.	• Spark plug gap by wire gauge.  • Spark plug electrode condition visual inspection. 	• Spark plug gap not as per specifications. • Spark plug center electrode excessive wear. • Spark plug short.	Spark plug gap adjusted by judgement.  Spark plug centre electrode worn out.  Spark plug short.  Insulator crack. 	**Possible Error :** • Spark plug cleaning & gap adjustment not done during repairs/periodic service. • Spark plug not replaced as per PM schedule. • Excess torque applied to spark plug. **Effect of Error :** Engine stopping intermittently.	• Carry out spark plug cleaning & adjust as per PM Schedule. • Clean spark plug on spark plug cleaning machine.   • Check & adjust spark plug gap with wire gauge only. • Always tighten the spark plug to specified torque only.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Spark plug cap.	Spark plug cap intactness with little force by hand.  	• Spark plug cap loose. • Holding clip given away. • Holding clip rusty.	Spark plug cap not firmly fitted. 	**Possible Error :** • Spark plug cap checking ignored • Spark plug cap grommet condition not checked • Pressurized water applied on spark plug cap **Effect of Error :** Engine stopping intermittently.	• Always ensure tightness of spark plug cap during repair / periodic service. • Check spark plug cap grommet condition.	Do not apply pressurized water on spark plug cap.
8.	Earthing connections.	By hand feel.  	• Earthing connection loose. • Oxidation / paint / rust at earthing surface. • Bolt rusting.	Manual error - earthing connection not tightened.	**Possible Errors :** Loose earthing connection ignored during periodic service. **Effects of Error :** Due to loose earthing interruption in circuit completion leading to engine stopping intermittently.		

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>9.</td><td>H.T coil mounting bolts.</td><td>• Visually check for mounting bolts fitment.
 
• Primary & secondary coil resistance by multimeter.
 
 
• Output by using CDI / H.T coil tester.
 
• Primary & secondary coil wire cable connection</td><td>• H.T coil mounting bolts loose.
• Resistance of primary & secondary coil is not as per specification.
• No / intermittent output.
• Primary & secondary coil wire cable connection loose.</td><td>• H.T coil mounting bolts tightening not ensured during periodic service.
• H.T Coil internally short.
• Primary & secondary connection not checked during periodic service / repairs</td><td>Possible Error :
• H.T coil mounting bolt fitment not ensured during periodic service.
• In case of starting trouble, H.T coil not checked as per SOP
Effect of Error :
Engine not starting / misfiring.</td><td>• Check H.T Coil as per SOP.
• Ensure primary & secondary wire connection for tightness.
• Always ensure H.T coil mounting bolts tightness.
• Replace H.T. coil if body found cracked / damaged.
  </td><td>Never replace H.T coil without checking.</td></tr>
</table>

Coil	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
HT Coil Primary	200 ohm	Primary Terminal	Earth	0.6 - 0.9 ohm
HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.5 - 5.5 k ohm
Twin Output HT Coil Primary	200 ohm	Coupler Pin 1	Coupler Pin 2	0.63 - 0.77 ohm
Twin Output HT Coil Secondary	20 k ohm	Secondary Cable 1	Secondary Cable 2	10.8 - 16.2 k ohm
Central HT Coil Primary	200 ohm	Primary Terminal	Earth	0.51 - 0.63 ohm
Central HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.23 - 5.17 k ohm

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>10.</td><td>Magneto / CDI coupler loose / terminal back out.</td><td>By hand feel.
  </td><td>Coupler connections loose / terminal back out.</td><td>Coupler connections not done.

Terminal back out not checked.
  </td><td>Possible Error :
Coupler connections loose / terminal back out from coupler not checked during diagnosis.

Effect of Error :
Engine stopping intermittently.</td><td></td><td></td></tr>
<tr><td>11.</td><td>Pick up coil.</td><td>Check resistance value by digital multimeter.
  </td><td>Pick up coil resistance value not as per specification.</td><td>• Defective pick up coil.

• Pick up coil cable pinched between crankcase & pick coil bracket.</td><td>Possible Error :
In case of engine stopping intermittently, pick up coil resistance value not checked as per SOP

Effect of Error :
Engine stopping intermittently.</td><td>Always check pick up coil resistance value during repairs / diagnosis.</td><td></td></tr>
</table>

Coils	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
Pick-up coil	2 K Ohm	White- Red wire	Earth	180 ~ 230 Ohm

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>12.</td><td>Exciter coil</td><td>Check resistance value by digital multimeter.
  </td><td>Exciter coil resistance value not as per specification.</td><td>Defective Excitor coil.</td><td>Possible Error :
In case of engine stopping intermittently, Exciter coil resistance value not checked as per SOP

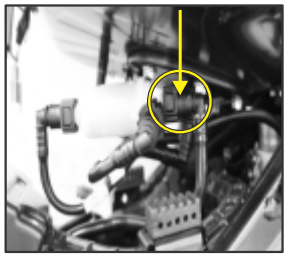
Effect of Error :
Engine stopping intermittently.</td><td>Always check Exciter coil resistance value during repairs / diagnosis.</td><td></td></tr>
<tr><td colspan="5"><table>
<tr><th rowspan="2">Coils</th><th rowspan="2">Meter Range</th><th colspan="2">Multimeter Connection</th><th rowspan="2">Std. value</th></tr>
<tr><th>Meter +ve</th><th>Meter -ve</th></tr>
<tr><td>Exciter Coil - Platina (AC) & CT 100</td><td>2 K Ohm</td><td>Red wire</td><td>Earth</td><td>280 ~ 320 Ohm</td></tr>
<tr><td>Exciter Coil - other than Platina (AC) & CT 100</td><td>200 Ohm</td><td>Red wire</td><td>Earth</td><td>14 ~ 15 Ohm</td></tr>
</table></td></tr>
<tr><td>13.</td><td>CDI</td><td>By using CDI / H.T coil tester.

Refer SOP.
  </td><td>LED indication on CDI / H.T coil tester not glowing.</td><td>CDI Faulty</td><td>Possible Error :
CDI not checked for output / spark intensity during diagnosis.

Effect of Error :
Engine stopping intermittently.</td><td>Always check CDI output / spark intensity during diagnosis using CDI / H.T coil tester.</td><td></td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
14.	Engine idling RPM	Check Engine idling RPM by digital tachometer.  **Note :** Idling RPM checking is not required for fuel injection vehicles.	Engine idling RPM is less than specifications.	Engine idling RPM is not checked during periodic service.	**Possible Error :** • Tachometer not used for engine idling RPM setting. • Engine idling RPM set without ensuring engine oil temperature. • AC ignition system-engine idling RPM set without keeping headlight ON. **Effect of Error :** • Engine stopping intermittently due to low idling RPM	• Always use recommended tachometer for checking engine idling RPM. • Ensure Engine oil temperature 60° C while checking / adjusting engine idling RPM. • AC ignition system - set engine idling RPM by keeping headlight ON.	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>15.</td><td>Fuel pump.
  </td><td>• Checking of Fuel pump working by doing actuator test using BOSCH Diagnostic tool.

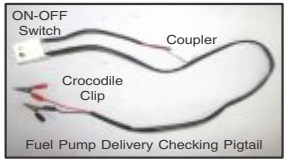
1) Check fuel pump pressure using fuel pump pressure checking tool.
 
  </td><td>• "Fuel pump running" sound not heard & BOSCH tool displays "Fuel pump not OK".

• Fuel pump pressure less than specifications.</td><td>Fuel pump / fuel tank cap / fuel pipe / inline fuel filter defective.

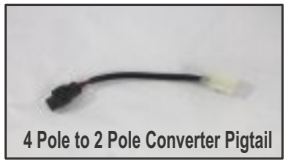
-

<table><tr><th>Sr. No.</th><th>Model</th><th>Fuel pressure</th></tr><tr><td>1</td><td>Pulsar RS 200</td><td>2.4 - 2.8 Kg / Cm^2</td></tr><tr><td>2</td><td>Pulsar RS 200 BS IV, Dominar 400</td><td>3.1 - 3.6 Kg / Cm^2</td></tr></table>
If pressure is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel pressure once again.
<table><tr><th>Status</th><th>Conclusion</th></tr><tr><td rowspan="2">If pressure is not as per specs</td><td>• Check fuel tank cap air vent for blockage.</td></tr><tr><td>• Check & replace fuel pipe, inline fuel filter & fuel pump.</td></tr></table></td><td>-</td><td></td><td></td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
		2) Check free flow of fuel using fuel pump delivery checking pigtail .	Fuel free flow delivery less than specifications.				



Fuel Pump Delivery Checking Pigtail


4 Pole to 2 Pole Converter Pigtail

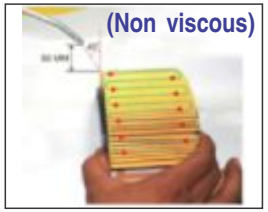
For SOP refer service station manual available on portal.

Sr. No.	Model	Fuel free flow per 10 sec. with new inline fuel filter
1	Pulsar RS 200	180 ± 10 ml minimum
2	Pulsar RS 200 BS IV, Dominar 400	220 ml minimum

If delivery is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel delivery once again.

Status	Conclusion
If delivery is as per specs	• Check fuel tank cap air vent for blockage
If delivery is not as per specs	• Check inline fuel filter for blockage. • Replace fuel pump.

Meter Range	Wire Connections		Continuity Check
	Meter +ve	Meter –ve	
200 Ohms	Orange/Blue	Black/Yellow	2.1 Ohms

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
16.	MIL blinking.	Check using BOSCH make diagnostic tool. 	FI system problem - defective sensor / wiring / actuator will be indicated by BOSCH tool. 	Sensor / wiring / actuator is defective.	**Possible Error :** Sensor / actuator replaced without confirmation by multimeter / diagnostic tool. **Effects of Error :** Engine stopping intermittently	Always check FI system related issue with BOSCH make diagnostic tool. **Please refer Sensors / actuators checking SOP given in MIL blinking issue Page No. 283 - 307**	
17.	Air filter element.	Visual inspection.   	Heavy dust accumulated on filter.	Air filter element not cleaned / replaced as per PM schedule.   	**Possible Errors :** Lack of knowledge. **Effects of Error :** Rich air fuel mixture resulting in high fuel consumption.	Clean / replace air filter as per SOP & PM schedule. Refer SOP. **Note :-** In dusty region air filter cleaning / replacement frequency may vary.	Do not clean viscous filter, (replace filter as per PM schedule)

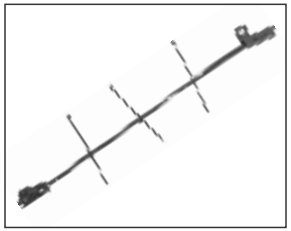
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
18.	Free movement of clutch collar bush in clutch housing.	Collar bush axial movement (To & Fro) inside clutch housing.  	Collar bush To & Fro movement jam in clutch housing.	• Contaminated engine oil. • Dent mark / Scratches on collar bush. • Engine oil quantity less. • Engine oil filter clogged.	**Possible Error :** • Engine oil / oil filter not replaced as per periodic maintenance schedule. • Dent mark / scratches on collar bush ignored. **Effects of Error :** Collar bush to & fro movement jam in clutch housing.	• Always adhere to periodic maintenance schedule. • Dip the collar bush in engine oil before fitment.  • Ensure no dent mark / scratches on collar bush & clutch housing.   • Always keep dismantled engine parts in engine part tray. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
19.	Throttle body passages.	Visual Inspection.  Stepper motor location & Entry hole in throttle body main passage 	Throttle body passage clogged.	• Dust / foreign particles entrapped in throttle body. • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -	Always clean throttle body using carburettor cleaner.  **Part No. : 36001056**	
20.	Fuel injector	Check as per SOP given below.	Fuel injector clogged.	• Dust / foreign particles entrapped in fuel injector • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -		

SOP for checking fuel spray from Fuel Injector

1) Remove air filter cover.
2) Remove fuel injector coupler.
3) Remove fuel injector mounting screw using Tesken screw driver & take out fuel injector along with its pipe from throttle body.
4) Place petrol tank on vehicle & connect fuel pump module coupler & fuel injector coupler.

5) Connect fuel injector pipe to inline fuel filter 'Out' port & keep fuel injector as shown in photograph.
6) Put ON ignition switch & engine kill switch.
7) Press start button.
8) Observe fuel spray pattern from fuel injector output side, collect petrol spray in a container.
9) If no / less / intermittent fuel spray is noticed, replace fuel injector.

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>21.</td><td>Side stand switch.</td><td>Measurement of Input voltage & Output voltage (Side Stand released & operated condition) by Multimeter.
  </td><td>Input / Output voltage not as per specifications.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Magnet Position</th><th colspan="2">Wire connection</th><th rowspan="2">Std. Reading</th></tr><tr><th>Meter +ve</th><th>Meter - ve</th></tr><tr><td>1</td><td>Input voltage (Side stand position - any)</td><td>N.A.</td><td>Red/ Blue</td><td>Yellow/ Black</td><td>5 VDC</td></tr><tr><td rowspan="2">2</td><td>Output voltage (Side stand position - OFF)</td><td>Magnet in front of side stand switch</td><td>Pink</td><td>Yellow/ Black</td><td>2~2.2 VDC</td></tr><tr><td>Side stand position-ON</td><td>Magnet away from side stand switch</td><td>Pink</td><td>Yellow/ Black</td><td>4.8~4.9 VDC</td></tr></table></td><td>• Side stand switch defective.
• Side stand switch wiring disconnection.
• Side stand mounting bracket bend.</td><td></td><td>Always check side stand switch cable as per SOP before replacement.</td><td>-</td></tr>
<tr><td>22.</td><td>Roll over sensor.</td><td>Measurement of Input voltage & Output voltage (Roll over sensor in straight & tilted condition-more than 60 deg.) by Multimeter.
  </td><td>Input / Output voltage not as per specifications.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Vehicle position</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Input voltage</td><td>NA</td><td>Red/ Blue</td><td>Yellow/ Black</td><td>5 VDC</td></tr><tr><td rowspan="2">2</td><td rowspan="2">Output voltage</td><td>Normal position</td><td>Brown/Gre en</td><td>Yellow/ Black</td><td>4.8~4.9 VDC</td></tr><tr><td>Tilled position (> 60°)</td><td>Brown/Gre en</td><td>Yellow/ Black</td><td>2~2.2 VDC</td></tr></table></td><td>• Roll over sensor defective.
• Roll over sensor wiring disconnection.</td><td></td><td>Always check roll over sensor as per SOP before replacement.</td><td></td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>23.</td><td>Main relay.
 
</td><td>Check resistance of coil.
 
Check continuity of contacts.
  </td><td>Main relay chattering.</td><td>• Main relay defective.
• Main relay wiring open / short.</td><td>-</td><td>-</td><td>-</td></tr>
</table>

Meter Range	Connections		Standard Value
	Meter +ve	Meter -ve	
200 Ω	Relay coil terminal 1	Relay coil terminal 2	80 ~ 140 Ω

Starting Trouble

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Fuel cock sediment bowl cleaning • Fuel cock paper filter replacement • Carburettor cleaning • Air filter cleaning • Auto choke checking • Tappet setting • Idling speed / CO% checking • Compression pressure	60 63 66 49 194 21 16 156

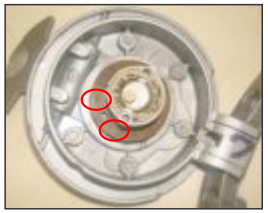
Sr. No	Description	Reference	Page / ser. cir. No.
2.	Training Notes	Thermal sensor checking, Discover DTS-Si	92
3.	Service Circular	• Battery tester • CDI checking	TE 33 TE 32

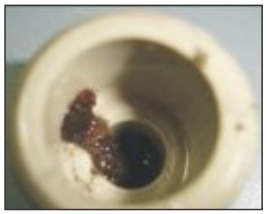
Starting Trouble

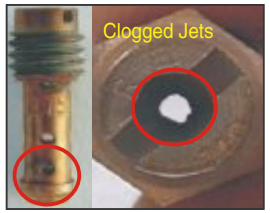
What to Check	How to Check	Symptoms observations	What is the most likely cause
Engine starting by self start / kick start (Engine not starting within 3 kicks / cranking with choke 'ON' condition.	By pressing self start button or by applying kick.	Engine require more cranking for starting.	1. Petrol filled up to petrol tank neck level / petrol qty very less 2. Intermittent petrol supply from tank to carburetor. 3. Water / dust entry in petrol tank & carburetor. 4. Fuel cock sediment bowl clogged. 5. Fuel cock filter & Inline fuel filter choked up. 6. Carburetor jets clogged 7. Foam / paper air filter clogged. 8. Air filter intake duct clogged 9. Intake manifold bolt loose. 10. Carburetor rubber duct cracked. 11. Battery partially discharged. 12. Fuse blown off. 13. Starter relay defective. 14. Wiring harness wire cut / open circuited. 15. Wiring harness coupler connections loose / terminal back out. 16. Clutch switch defective. 17. Kill switch defective. 18. Ignition switch no continuity. 19. Voltage regulator output low. 20. Starter motor jam. 21. Spark plug gap more & electrode wear / short / crack. 22. Spark plug cap loose fitment / short. 23. H.T coil mounting bolts loose / H.T coil partially short. 24. CDI Faulty 25. Pick up coil defective 26. Exciter coil defective

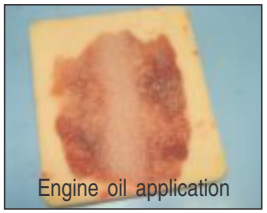
What to Check	How to Check	Symptoms observations	What is the most likely cause
			27. Thermal sensor wire loose / thermal sensor short. 28. Auto choke plunger movement sticky. 29. No / less tappet clearance. 30. CO% less than specification. 31. Engine compression pressure less than specification. 32. Magneto rotor key sheared off. 33. Engine idling RPM too low. 34. Fuel pump pressure & delivery less. 35. MIL blinking. 36. Air filter clogged. 37. Free movement of clutch collar bush in clutch housing. 38. Throttle body passage clogged. 39. Fuel injector clogged.

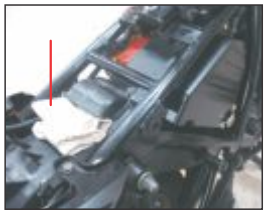
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Petrol filled up to petrol tank neck level / petrol quantity.	Visual inspection	Petrol filled up to petrol tank neck level.	Customer filled petrol more than MAX limit of petrol tank. 	**Possible Error :** Precautionary measures to be taken not explained to customer at the time of new vehicle delivery by dealer. **Effect of Error :** Due to excess filling of petrol no space for air in tank for maintaining atmospheric pressure resulting in petrol not flowing by gravity leading to engine not starting.	Explain customer about fuel tank capacity & adverse effect of excess filling of petrol at the time of new vehicle delivery.	
		Visual inspection	Petrol qty very less (petrol not coming out at fuel cock reserve condition).	Fuel qty in petrol tank very less.	**Possible Error :** Customer not paying attention when fuel level dropped to reserve. **Effect of Error :** Engine not starting		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Intermittent petrol supply from tank to carburetor.	• Remove fuel pipe from fuel cock side & confirm free flow of petrol at fuel cock 'ON' & 'OFF' condition. • If petrol free flow not observed, open petrol tank cap & check again. If petrol free flow observed, check petrol tank cap for air vent clogging	Intermittent petrol supply.	Petrol tank cap air vent passage clogged.  **Note :-** Petrol tank cap in BS IV models is not to be opened for repairs	**Possible Error :** Petrol tank cap air vent passage not checked. **Effect of Error :** Engine not starting due to intermittent petrol supply.	Always clean petrol tank cap air vent passage if found clogged.	Do not cut / remove paper gasket/rubber O ring from petrol tank cap.
		If above 2 points are Ok, then remove fuel cock from petrol tank & check fuel cock by passing air at 2 bar from outlet at knob 'ON/'OFF'/ 'RESERVE' condition. 	Air not passing from fuel cock inlet tube at knob 'ON'/'OFF'/ 'RESERVE' condition.	Fuel tank body internally clogged.	**Possible Error :** • Entrapment of loctite used for inlet tubes. • Machining error. **Effect of Error :** Engine not starting due to intermittent petrol supply.	Replace fuel cock if passage not getting clear by blowing low compressed air.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Water / dust entry in petrol tank & carburetor.	Loosen carburetor drain screw & drain in clean container. 	Dust & water drop lets observed.	• Condensed water got filled with petrol from fuel pump. • Petrol tank cleaning by keeping nozzle in jet mode	**Possible Error :** **Effect of Error :** Engine not starting due to no / intermittent petrol supply.	Petrol tank washing in nozzle spray mode only.	
4.	Fuel cock sediment bowl.	Visual inspection after opening sediment bowl. 	Heavy accumulation of dust / gummy substances & water droplets.	Bad fuel quality.	**Possible Error :** Fuel cock sediment bowl cleaning not done during P.M Schedule. **Effect of Error :** Engine not starting due to no / intermittent petrol supply.	Always clean fuel cock sediment bowl, strainer & replace paper filter as per SOP. Refer SOP.	
5.	Fuel cock filter Inline fuel filter.	Visual inspection   	Fuel cock filter choked up Inline Fuel filter choked up.	Dust / foreign particles in fuel. Bad quality fuel used	**Possible Error :** Fuel filter not replaced as per P.M schedule. **Effect of Error :** Engine stopping intermittently.	Replace fuel filter as per P.M schedule. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Carburetor jets.	Visual Inspection.  	Carburetor jets clogged.	Dust / foreign particles entrapped in carburetor jets.	**Possible Error :** • Carburetor overhaul not done during periodic service. • Bad fuel quality **Effect of Error :** Engine not starting	Always clean carburetor as per SOP & PM Schedule. Refer SOP.  • Use carburettor cleaner for cleaning jets.  **Part No. : 36001056**	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Foam / paper air filter.	Visual Inspection	Foam / paper air filter choked up.	Foam / paper air filter choked up due to excess application of oil on foam filter & heavy dust deposition.  Heavy dust deposition  Heavy dust deposition  Engine oil application • Paper filter element clogged. 	**Possible Error :** • Air Filter cleaning activity skipped during periodic service. • Air filter not cleaned as per SOP. • Excess oil application on foam filter. **Effect of Error :** Too rich air fuel mixture resulting in engine starting problem	Dusty region Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	Air filter intake duct.	Visual inspection.	Air filter intake duct clogged.	Air filter intake duct clogged due to entrapped cloth/first aid kit/tool kit kept under seat. 	**Possible Error :** • Cloth/first aid kit / tool kit kept under seat ignored. • Lack of customer awareness. **Effect of Error :** Starting trouble	Explain customer about adverse effect of putting cloth / first aid kit / tool kit under seat.	
9.	Intake manifold clip / bolt.	Check tightness by ring spanner. 	Intake manifold bolt loose.	Tightness of Intake manifold bolt not checked during periodic service / repairs. 	**Possible Error :** Intake manifold bolts are not checked during periodic service / repairs. **Effect of Error :** Engine not starting	Ensure carburettor / manifold duct mounting clips / bolts for tightness.	

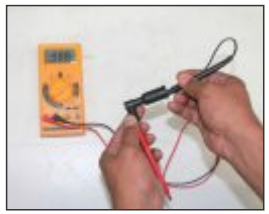
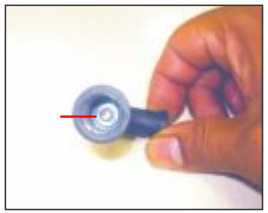
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
10.	Carburetor rubber duct condition.	Visual Inspection. 	Carburetor rubber duct cracked.	Ageing of rubber part.	**Possible Error :** Carburetor rubber duct condition not checked during service / repairs. **Effect of Error :** Excess air passing to carburetor due to cracked carburetor rubber duct resulting in lean mixture causing engine starting problem.	Always check carburetor rubber duct in periodic service & replace as per P.M Schedule.	
11.	Battery Charge condition.	By battery tester as per SOP.  Electrolyte level - visually.	Green & Yellow color : Battery partially discharged Yellow color : Battery discharged Red color : Battery deep discharged. Refer SOP. Electrolyte level above MIN / MAX marks.	Battery partially discharged.	**Possible Error :** Battery charge condition not checked during periodic service. **Effect of Error :** Engine not starting		
12.	Fuse	Continuity checking by multimeter. 	No continuity- fuse blown off.	Main fuse blown off due to electrical spike / short circuit.	**Possible Error :** Fuse not checked during diagnosis. **Effect of Error :** Self start not working.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Starter relay.	• Check resistance value by multimeter as per SOP. • Check continuity of contacts by multimeter. 	• Resistance value out of specification. • No continuity.	• Starter relay defective - open / short circuited. • Carbon deposition on contacts.	**Possible Error :** Incase of starting trouble, starter relay resistance value & continuity not checked as per SOP. **Effect of Error :** Engine not starting.	Replace starter relay if resistance value found out of specifications.	
	SOP for checking starter relay : • Connect external 12V DC supply to starter relay coil terminals. • Click sound will be heard. • Set multimeter on continuity mode. • Connect multimeter at to relay contact terminals. • Continuity (beep sound) indicates starter relay is OK.						
14.	Wiring harness condition.	Visual Inspection. Check points are included in PM check sheets which are being used while attending vehicles for servicing. These check points are included in table as shown	Wiring harness wire cut / open circuited due to rubbing / pinching.	Wiring harness routing / damages not checked during periodic service.	**Possible Error :** Broken clamps, wire open strands & wrong routing of wiring harness not fixed in periodic service. **Effect of Error :** Engine not starting	**ELECTRICAL CHECK POINTS** ☐ Check corrugated pipe for no cut / pinching. ☐ Grommets condition / intactness. (battery terminals brake switches) ☐ Couplers placed in bellows. ☐ Fuse rating & availability of spare fuse in fuse box. ☐ Wire connection at coupler. ☐ Wire routing through clamps & ties. ☐ All lights working ☐ Front brake switch ☐ Rear brake switch ☐ Horn working ☐ H.T. coil connections	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
15.	Wiring harness coupler connections.	By hand feel. 	Coupler connections loose/ terminal back out.	Coupler connections not done. Terminal back out not checked. 	**Possible Error :** Coupler connections loose / terminal back out from coupler not checked during diagnosis. **Effect of Error :** Engine not starting		
16.	Clutch switch.	Check continuity of contacts by multimeter. 	No continuity.	• Contacts worn out. • Dust / dirt / water entry.	**Possible Error :** Clutch switch checking ignored. **Effect of Error :** Self start not starting		
17.	Kill switch.	Check continuity of contacts by multimeter. 	No continuity.	• Contacts worn out. • Dust / dirt / water entry.	**Possible Error :** WD-40 spray not applied for kill switch contact cleaning. **Effect of Error :** Engine not starting		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
18.	Ignition switch.	Continuity checking by multimeter by removing ignition switch coupler. 	No continuity when ignition switch is put in ON condition.	Ignition switch contacts circuit open due to dust & water entry in ignition switch.	**Possible Error :** Engine oil used for making ignition switch operation smooth. **Effect of Error :** Starting trouble	Always apply WD40 spray in ignition switch to make movement free.	
19.	Voltage regulator	By measuring DC output voltage at 4500 rpm by multimeter. 	RR unit voltage output voltage low & not enough to charge battery.	RR voltage output not checked during diagnosis.	**Possible Error :** RR unit defective - low DC output voltage. Discharged Battery ignored. RR Unit checked with discharged battery. **Effect of Error :** Starting trouble	Always check RR unit output voltage during diagnosis. Ensure battery is fully charged.	
20.	Starter motor.	By isolating starter motor from engine & applying starter button. 	Starter motor not running freely due to shaft jam problem.	Water entry in starter motor.	**Possible Error :** Pressurized water jet applied on starter motor during vehicle washing. **Effect of Error :** Starting trouble		Do not apply pressurized water jet on starter motor.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
21.	Spark plug gap & electrode.	• Spark plug gap by wire gauge.  • Spark plug electrode condition visual inspection. 	• Spark plug gap not as per specifications. • Spark plug center electrode excessive wear. • Spark plug short. • Spark plug porcelain cracked.	Spark plug gap adjusted by judgement.  Spark plug centre electrode worn out.  Spark plug short. 	**Possible Error :** • Spark plug cleaning & gap adjustment not done during repairs / periodic service • Spark plug not replaced as per PM schedule **Effect of Error :** Engine not starting	• Carry out spark plug clean & adjust as per PM Schedule. • Clean spark plug on spark plug cleaning machine.   • Check & adjust spark plug gap with wire gauge only.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
22.	Spark plug cap.	Spark plug cap intactness with little force by hand.  	• Spark plug cap loose • Holding clip given away. • Holding clip rusty.	• Spark plug cap not firmly fitted. • Holding clip given away. 	**Possible Error :** • Spark plug cap checking ignored • Spark plug cap grommet condition not checked • Pressurized water applied on spark plug cap **Effect of Error :** Engine not starting.	• Always ensure tightness of spark plug cap during repair / periodic service. • Replace spark plug cap rubber grommets if found cracked.	Do not apply pressurized water on spark plug cap.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
23.	H.T coil mounting bolts.	• Visually check for mounting bolts fitment.  • Primary & secondary coil resistance by multimeter.   • Output by using CDI / H.T coil tester.  • Primary & secondary coil wire cable connection	• H.T coil mounting bolts loose. • Resistance of primary & secondary coil is not as per specification. • No / intermittent output. • Primary & secondary coil wire cable connection loose.	• H.T coil mounting bolts tightening not ensured during periodic service. • H.T Coil internally short. • Primary & secondary connection not checked during periodic service / repairs	**Possible Error :** • H.T coil mounting bolt fitment not ensured during periodic service. • In case of starting trouble, H.T coil not checked as per SOP **Effect of Error :** Engine not starting / misfiring.	• Check H.T Coil as per SOP. • Ensure primary & secondary wire connection for tightness. • Always ensure H.T coil mounting bolts tightness. • Replace H.T. coil if body found cracked / damaged. 	Never replace H.T coil without checking.

Coil	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
HT Coil Primary	200 ohm	Primary Terminal	Earth	0.6 - 0.9 ohm
HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.5 - 5.5 k ohm
Twin Output HT Coil Primary	200 ohm	Coupler Pin 1	Coupler Pin 2	0.63 - 0.77 ohm
Twin Output HT Coil Secondary	20 k ohm	Secondary Cable 1	Secondary Cable 2	10.8 - 16.2 k ohm
Central HT Coil Primary	200 ohm	Primary Terminal	Earth	0.51 - 0.63 ohm
Central HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.23 - 5.17 k ohm

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>24.</td><td>CDI</td><td>By using CDI / H.T coil tester.

Refer SOP.

  </td><td>LED indication on CDI / H.T coil tester not glowing.</td><td>CDI Faulty.</td><td>Possible Error :
CDI not checked for output / spark intensity during diagnosis.

Effect of Error :
Engine not starting</td><td>Always check CDI output / spark intensity during diagnosis using CDI / H.T coil tester.</td><td></td></tr>
<tr><td>25.</td><td>Pick up coil.</td><td>Check resistance value by digital multimeter.
 
<table><tr><th rowspan="2">Coils</th><th rowspan="2">Meter Range</th><th colspan="2">Multimeter Connection</th><th rowspan="2">Std. value</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>Pick-up coil</td><td>2 K Ohm</td><td>White- Red wire</td><td>Earth</td><td>180 ~ 230 Ohm</td></tr></table></td><td>Pick up coil resistance value not as per specification.</td><td>• Defective pick up coil.
• Pick up coil pinched between crankcase & pick up coil bracket.</td><td>Possible Error :
• In case of starting trouble, pick up coil resistance value not checked as per SOP

Effect of Error :
Engine not starting</td><td>Always check pick up coil resistance value during repairs / diagnosis.</td><td></td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>26.</td><td>Exciter coil.</td><td>Check resistance value by digital multimeter.
 
Exciter Coil Checking</td><td>Exciter coil resistance value not as per specification.</td><td>Defective Exciter coil.</td><td>Possible Error :
In case of starting trouble, exciter coil resistance value not checked as per SOP.

Effect of Error :
Engine not starting</td><td>Always check Exciter coil resistance value during repairs / diagnosis.</td><td></td></tr>
</table>

Coils	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
Exciter Coil - Platina (AC) & CT 100	2 K Ohm	Red wire	Earth	280 ~ 320 Ohm
Exciter Coil - other than Platina (AC) & CT 100	200 Ohm	Red wire	Earth	14 ~ 15 Ohm

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>27.</td><td>Thermal sensor.</td><td>Check thermal sensor wire tightness by ring spanner.
 
Thermal sensor resistance value by multimeter.
Refer SOP.
  </td><td>Thermal sensor wire connection loose.

Thermal sensor resistance value out of specification.

Thermal sensor bolt rusty.</td><td>Thermal sensor wire connection tightness not checked during repairs.

Thermal sensor short.

Thermal sensor resistance not OK.

<table><tr><th>Temperature</th><th>Resistance K ohm</th></tr><tr><td>-5°C</td><td>40.70</td></tr><tr><td>0°C</td><td>31.54</td></tr><tr><td>10°C</td><td>20.32</td></tr><tr><td>25°C</td><td>10.50</td></tr><tr><td>30°C</td><td>8.04</td></tr><tr><td>40°C</td><td>5.52</td></tr><tr><td>50°C</td><td>3.68</td></tr><tr><td>60°C</td><td>2.69</td></tr><tr><td>70°C</td><td>1.88</td></tr><tr><td>80°C</td><td>1.37</td></tr><tr><td>90°C</td><td>0.97</td></tr><tr><td>100°C</td><td>0.74</td></tr><tr><td>110°C</td><td>0.55</td></tr><tr><td>120°C</td><td>0.44</td></tr><tr><td>130°C</td><td>0.37</td></tr><tr><td>140°C</td><td>0.29</td></tr><tr><td>150°C</td><td>0.24</td></tr><tr><td>160°C</td><td>0.19</td></tr><tr><td>170°C</td><td>0.16</td></tr><tr><td>180°C</td><td>0.13</td></tr></table></td><td>Possible Error :
Thermal sensor checking ignored during repairs.

Effect of Error :
Auto choke not functioning results in engine not starting in cold weather condition.</td><td>Always ensure thermal sensor wire cable tightness.

Always ensure thermal sensor resistance value during repairs.</td><td></td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>28.</td><td>Auto choke plunger movement.</td><td>Click sound by switching ON & OFF ignition switch.
Resistance value by multimeter.
Refer SOP.
 
<table><tr><th rowspan="2">Meter range</th><th colspan="2">Connection</th><th rowspan="2">Standard value</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>200 Ohms</td><td>Brown</td><td>Orange / Brown</td><td>11 ~ 13 Ohms</td></tr></table></td><td>Resistance value out of specification.
No click sound heard.</td><td>Sticky movement of plunger in carburetor assembly.
  </td><td>Possible Error :
Auto choke checking ignored during repairs.

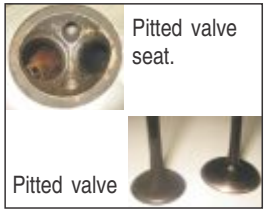
Effect of Error :
Engine not starting in 3 kicks / cranking in cold weather condition.</td><td>Always check functioning of auto choke during periodic service as per SOP.</td><td></td></tr>
<tr><td>29.</td><td>Tappet clearance.</td><td>By feeler gauge at engine cold condition.

Refer SOP.
  </td><td>No / less tappet clearance than specification.</td><td>Tappet clearance not checked during periodic service as per P.M schedule.</td><td>Possible Error :
Tappet clearance not checked & adjusted in periodic service.

Effect of Error :
Engine not starting</td><td>Note :-
Ensure tappet clearance as per the specifications.

Refer details given in high fuel consumption issue page no.</td><td>Do not use worn out feeler gauge for tappet clearance checking & adjusting.</td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
30.	CO %.	By CO gas analyzer at 60°C engine oil temp. Check before catalytic converter. Refer SOP.	CO% less than specification.	Incorrect setting of carburetor.	**Possible Error :** • CO% check & adjust activity not done as per PM schedule & SOP. • e clip position shifted to upper groove. **Effect of Error:-** Engine not starting	Always carry out CO% check & adjust in every service as per SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
31.	Engine compression pressure.	By performing dry & wet compression test. Refer SOP. 	Engine compression pressure less than specification.	Cylinder head gasket worn out / pressed / torn.  Pitting mark on valve seat & valve face.  Valve bend.  Piston ring / block worn out. 	**Possible Error :** Engine compression pressure checking ignored during periodic service / repairs. **Effect of Error :** Engine not starting	• Always check battery charge condition in periodic service. • Educate customer about adverse effects of fitment of additional accessories.	

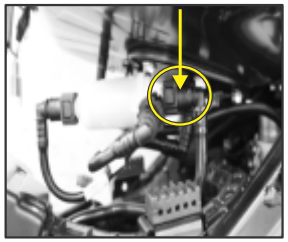
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
				Cylinder block piston seized badly. 			
32.	Magneto rotor key & nut.	Visual Inspection. 	Rotor key sheared off.	• Magneto rotor nut loose.  • Taper cleaning not done before fitment of rotor. • Damage, dent mark on the taper.	**Possible Error :** After doing work related to magneto rotor, nut not tightened to specified torque. **Effect of Error :** Key breakage - ignition timing changed causing starting trouble.	• Ensure no dent / damage marks on taper bush of rotor. • Ensure use of recommended special tools for removing & re-fitment of rotor. • Ensure specified torque while tightening rotor nut / bolt.	

Magneto rotor nut torque value (Kg / m)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Magneto Rotor Nut	4.0 - 4.5	6.5 - 7.0	5.0 - 5.5	6.0 - 6.5	6.0 - 6.5	6.0 - 6.5	6.0 - 6.5	5.0 - 5.5	5.0 - 5.5	6.5 - 7.0	5.0 - 5.5	4.5 - 4.5
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Magneto Rotor Nut	5.9 - 6.1	5.9 - 6.1	5.9 - 6.1	5.0 - 5.5	4.5	6.5 - 7.00	4.5	10.0 - 10.5	6.0 - 6.5			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
33.	Engine idling RPM.	Check Engine idling RPM by digital tachometer.  **Note :** Idling RPM checking is not required for fuel injection vehicles.	Engine idling RPM is less than specifications.	Engine idling RPM is not checked during periodic service.	**Possible Error :** • Tachometer not used for engine idling RPM setting. • Engine idling RPM set without ensuring engine oil temperature. • AC ignition system-engine idling RPM set without keeping headlight ON. **Effect of Error :** • Engine stopping intermittently due to low idling RPM	• Always use recommended tachometer for checking engine idling RPM. • Ensure Engine oil temperature 60° C while checking / adjusting engine idling RPM. • AC ignition system - set engine idling RPM by keeping headlight ON.	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>34.</td><td>Fuel pump.
  </td><td>• Checking of Fuel pump working by doing actuator test using BOSCH Diagnostic tool.

1) Check fuel pump pressure using fuel pump pressure checking tool.
 
  </td><td>• "Fuel pump running" sound not heard & BOSCH tool displays "Fuel pump not OK".

• Fuel pump pressure less than specifications.</td><td>Fuel pump / fuel tank cap / fuel pipe / inline fuel filter defective.

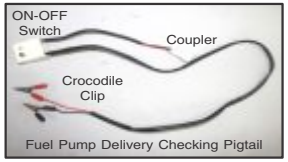
-</td><td>-</td><td></td><td></td></tr>
</table>

Sr. No.	Model	Fuel pressure
1	Pulsar RS 200	2.4 - 2.8 Kg / Cm^2
2	Pulsar RS 200 BS IV, Dominar 400	3.1 - 3.6 Kg / Cm^2

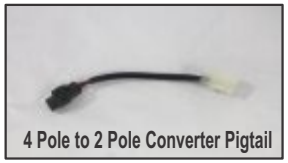
If pressure is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel pressure once again.

Status	Conclusion
If pressure is not as per specs	• Check fuel tank cap air vent for blockage.
	• Check & replace fuel pipe, inline fuel filter & fuel pump.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
		2) Check free flow of fuel using fuel pump delivery checking pigtail .	Fuel free flow delivery less than specifications.				



Fuel Pump Delivery Checking Pigtail


4 Pole to 2 Pole Converter Pigtail

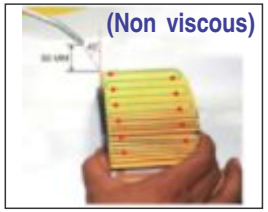
For SOP refer service station manual available on portal.

Sr. No.	Model	Fuel free flow per 10 sec. with new inline fuel filter
1	Pulsar RS 200	180 ± 10 ml minimum
2	Pulsar RS 200 BS IV, Dominar 400	220 ml minimum

If delivery is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel delivery once again.

Status	Conclusion
If delivery is as per specs	• Check fuel tank cap air vent for blockage
If delivery is not as per specs	• Check inline fuel filter for blockage. • Replace fuel pump.

Meter Range	Wire Connections		Continuity Check
	Meter +ve	Meter –ve	
200 Ohms	Orange/Blue	Black/Yellow	2.1 Ohms

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
35.	MIL blinking.	Check using BOSCH make diagnostic tool. 	FI system problem - defective sensor / wiring / actuator will be indicated by BOSCH tool. 	Sensor / wiring / actuator is defective.	**Possible Error :** Sensor / actuator replaced without confirmation by multimeter / diagnostic tool. **Effects of Error :** Engine stopping intermittently	Always check FI system related issue with BOSCH make diagnostic tool. **Please refer Sensors / actuators checking SOP given in MIL blinking issue Page No. 283 - 307**	
36.	Air filter element.	Visual inspection.   	Heavy dust accumulated on filter.	Air filter element not cleaned / replaced as per PM schedule.   	**Possible Errors :** Lack of knowledge. **Effects of Error :** Rich air fuel mixture resulting in high fuel consumption.	Clean / replace air filter as per SOP & PM schedule. Refer SOP. **Note :-** In dusty region air filter cleaning / replacement frequency may vary.	Do not clean viscous filter, (replace filter as per PM schedule)

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
37.	Free movement of clutch collar bush in clutch housing.	Collar bush axial movement (To & Fro) inside clutch housing. 	Collar bush To & Fro movement jam in clutch housing.	• Contaminated engine oil. • Dent mark / Scratches on collar bush. • Engine oil quantity less. • Engine oil filter clogged.	**Possible Error :** • Engine oil / oil filter not replaced as per periodic maintenance schedule. • Dent mark / scratches on collar bush ignored. **Effects of Error :** Collar bush to & fro movement jam in clutch housing.	• Always adhere to periodic maintenance schedule. • Dip the collar bush in engine oil before fitment.  • Ensure no dent mark / scratches on collar bush & clutch housing.   • Always keep dismantled engine parts in engine part tray. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
38.	Throttle body passages.	Visual Inspection.  Stepper motor location & Entry hole in throttle body main passage 	Throttle body passage clogged.	• Dust / foreign particles entrapped in throttle body. • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -	Always clean throttle body using carburettor cleaner.  **Part No. : 36001056**	
39.	Fuel injector	Check as per SOP given below.	Fuel injector clogged.	• Dust / foreign particles entrapped in fuel injector • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -		

SOP for checking fuel spray from Fuel Injector

1) Remove air filter cover.
2) Remove fuel injector coupler.
3) Remove fuel injector mounting screw using Tesken screw driver & take out fuel injector along with its pipe from throttle body.
4) Place petrol tank on vehicle & connect fuel pump module coupler & fuel injector coupler.

5) Connect fuel injector pipe to inline fuel filter 'Out' port & keep fuel injector as shown in photograph.
6) Put ON ignition switch & engine kill switch.
7) Press start button.
8) Observe fuel spray pattern from fuel injector output side, collect petrol in a container.
9) If no / less / intermittent fuel spray is noticed, replace fuel injector.

Engine Misfiring

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Vehicle washing • Silencer tail pipe cleaning • Carburettor cleaning • Tappet setting	10 153 66 21
2.	Training Notes	---	---
3.	Service Circular	CDI checking	TE 32

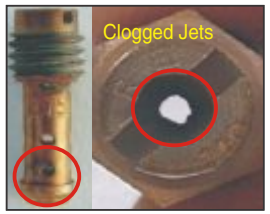
Engine Misfiring

What to Check	How to Check	Symptoms observations	What is the most likely cause
Confirmation of engine misfiring.	Drive vehicle at different speed.	Engine misfiring.	1. Use of adulterated fuel. 2. Spark plug cap loose fitment / short. 3. Spark plug excessive gap & fouling / loose electrodes. 4. Water entry in magneto / CDI / HT coil couplers. 5. Earthing connection loose / oxidized / rusty. 6. Loose electrical connections at magneto / CDI / HT coil couplers / HT coil to spark plug cap. 7. Carburettor jets partially clogged. 8. Pick up coil partially short. 9. Exciter coil partially short. 10. HT coil partially short or mounting bolt loose. 11. RR unit DC voltage output less than specifications. 12. Valve timing incorrect. 13. Silencer partially clogged. 14. Rotor key sheared off. 15. CDI internal component failure. 16. Engine idling RPM too low. 17. Fuel pump pressure & delivery less. 18. MIL blinking. 19. Air filter clogged. 20. Free movement of clutch collar bush in clutch housing. 21. ECU malfunctioning 22. Throttle body passage clogged. 23. Fuel injector clogged.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Fuel.	Visually & by checking odour of fuel.	Clutch cover & engine crankcase color found reddish brown.	Customer has filled fuel from non reputed petrol pump.	**Possible Errors :** BAL Warranty policy not explained to customer by dealer at the time of new vehicle delivery & adverse effect of adulterated fuel. **Effect of Error :** Engine misfiring	Advice customer to fill fuel from reputed fuel pumps only. 	
2.	Spark plug cap.	Spark plug cap intactness with little force by hand.  	• Spark plug cap loose • Holding clip given away. • Holding clip rusty.	• Spark plug cap not firmly fitted. • Holding clip given away. 	**Possible Error :** • Spark plug cap checking ignored • Spark plug cap grommet condition not checked • Pressurized water applied on spark plug cap **Effect of Error :** Engine not starting.	• Always ensure tightness of spark plug cap during repair / periodic service. • Replace spark plug cap rubber grommets if found cracked.	Do not apply pressurized water on spark plug cap.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Spark plug gap & electrode.	• Spark plug gap by wire gauge.  • Spark plug electrode condition visual inspection. 	• Spark plug gap not as per specifications. • Spark plug center electrode excessive wear. • Spark plug short. • Spark plug porcelain cracked.	Spark plug gap adjusted by judgement.  Spark plug centre electrode worn out.  Spark plug short. 	**Possible Error :** • Spark plug cleaning & gap adjustment not done during repairs / periodic service • Spark plug not replaced as per PM schedule **Effect of Error :** Engine not starting	• Carry out spark plug clean & adjust as per PM Schedule. • Clean spark plug on spark plug cleaning machine.   • Check & adjust spark plug gap with wire gauge only.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Magneto / CDI / HT coil couplers.	Visual inspection.	• Water traces seen in couplers. • Coupler contacts oxidized.	Manual error - during washing pressurized water applied on electrical wiring.	**Possible Error :** Vehicle washing not carried out as per SOP. **Effect of Error :** Engine misfiring.	Always adhere to vehicle washing SOP. Refer SOP.	
5.	Earthing connection.	By hand feel.   	• Earthing connection loose. • Rust / oxidation / paint layer on earthing connection surface. • Bolt rusty.	Manual error - earthing connection not tightened.	**Possible Errors :** Loose earthing connection ignored during periodic service. **Effects of Error :** Due to loose earthing interruption in circuit completion leading to engine misfiring.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Electrical connections at magneto / CDI / HT coil couplers / HT coil to spark plug cap.	• By checking male female couplers firm fitment by pulling male female couplers with slight force . • Check for terminal back out from coupler.	• Male female couplers not locked fully. • Terminal back out.	Manual error - coupler / wire connection not checked.	**Possible Errors :** Firm fitment of coupler / connection not checked during periodic service. **Effects of Error :** Engine misfiring.		
7.	Carburetor jets	Visual Inspection. 	Carburetor jets clogged.	Dust / foreign particles entrapped in carburetor jets.	**Possible Error :** • Carburetor overhaul not done during periodic service. • Bad fuel quality **Effect of Error :** Engine not starting	Always clean carburetor as per SOP & PM Schedule. Refer SOP.  • Use carburettor cleaner for cleaning jets.  **Part No. : 36001056**	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>8.</td><td>Pick up coil.</td><td>Check resistance value by digital multimeter.
Refer SOP...
  </td><td>Pick up coil resistance value not as per specification.</td><td>• Defective pick up coil.
• Pick up coil cable pinched between crankcase & pick up coil bracket.</td><td>Possible Error :
In case of starting trouble, pick up coil resistance value not checked as per SOP.

Effect of Error :
Engine misfiring</td><td></td><td></td></tr>
<tr><td></td><td colspan="5"><table>
<tr><th rowspan="2">Coils</th><th rowspan="2">Meter Range</th><th colspan="2">Multimeter Connection</th><th rowspan="2">Std. value</th></tr>
<tr><th>Meter +ve</th><th>Meter -ve</th></tr>
<tr><td>Pick-up coil</td><td>2 K Ohm</td><td>White- Red wire</td><td>Earth</td><td>180 ~ 230 Ohm.</td></tr>
</table></td><td></td><td></td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>9.</td><td>Exciter coil.</td><td>Check resistance value by digital multimeter.

Refer SOP.

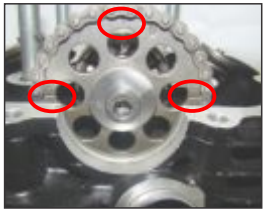
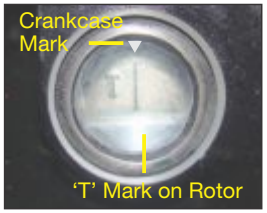
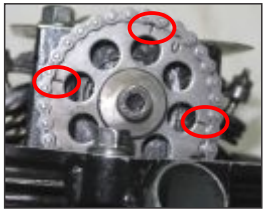
 
Exciter Coil Checking</td><td>Exciter coil resistance value not as per specification.</td><td>Defective Exciter coil.</td><td>Possible Error :
In case of starting trouble, Exciter coil resistance value not checked as per SOP

Effect of Error :
Engine misfiring</td><td></td><td></td></tr>
</table>

Coils	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
Exciter Coil - Platina (AC) & CT 100	2 K Ohm	Red wire	Earth	280 ~ 320 Ohm
Exciter Coil - other than Platina (AC) & CT 100	200 Ohm	Red wire	Earth	14 ~ 15 Ohm

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>10.</td><td>H.T coil mounting bolts.</td><td>• Visually check for mounting bolts fitment.
 
• Primary & secondary coil resistance by multimeter.
 
 
• Output by using CDI / H.T coil tester.
 
• Primary & secondary coil wire cable connection</td><td>• H.T coil mounting bolts loose.
• Resistance of primary & secondary coil is not as per specification.
• No / intermittent output.
• Primary & secondary coil wire cable connection loose.</td><td>• H.T coil mounting bolts tightening not ensured during periodic service.
• H.T Coil internally short.
• Primary & secondary connection not checked during periodic service / repairs</td><td>Possible Error :
• H.T coil mounting bolt fitment not ensured during periodic service.
• In case of starting trouble, H.T coil not checked as per SOP
Effect of Error :
Engine not starting / misfiring.</td><td>• Check H.T Coil as per SOP.
• Ensure primary & secondary wire connection for tightness.
• Always ensure H.T coil mounting bolts tightness.
• Replace H.T. coil if body found cracked / damaged.
  </td><td>Never replace H.T coil without checking.</td></tr>
</table>

Coil	Meter Range	Multimeter Connection		Std. value
		Meter +ve	Meter -ve	
HT Coil Primary	200 ohm	Primary Terminal	Earth	0.6 - 0.9 ohm
HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.5 - 5.5 k ohm
Twin Output HT Coil Primary	200 ohm	Coupler Pin 1	Coupler Pin 2	0.63 - 0.77 ohm
Twin Output HT Coil Secondary	20 k ohm	Secondary Cable 1	Secondary Cable 2	10.8 - 16.2 k ohm
Central HT Coil Primary	200 ohm	Primary Terminal	Earth	0.51 - 0.63 ohm
Central HT Coil Secondary	20 k ohm	Secondary cable	Earth	4.23 - 5.17 k ohm

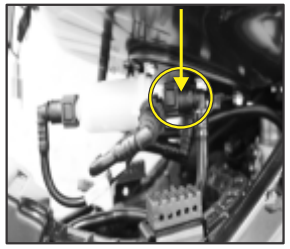
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
11.	RR unit output.	By measuring DC output voltage at 4500 rpm by multimeter. 	RR unit voltage output voltage low & not enough to charge battery.	RR voltage ouput not checked during diagnosis.	**Possible Error :** RR unit defective - low DC output voltage. Discharged battery ignored. RR Unit checked with discharged battery. **Effect of Error :** Engine misfiring	Always check RR unit output voltage during diagnosis. Ensure battery is fully charged.	
12.	Valve timing.	Visual inspection of 'T' mark on cam sprocket & magneto rotor.  TDC marks aligned 	Wrong / incorrect valve timing.	Lack of knowledge. 	**Possible Errors :** Cam sprocket mark & magneto rotor mark not matched . **Effects of Error :** Engine misfiring.	Always adjust valve timing as per SOP. Refer SOP.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Silencer condition.	By hearing engine firing sound.	Silencer partially clogged.	Usage of bad quality fuel. Rust formation due to water entry.	**Possible Errors :** Silencer drain hole not cleaned by BAL recommended drain hole cleaning tool. Silencer tail end pipe for Pulsar 150/180 not cleaned. Silencer tail end cap not used during vehicle washing.  **Effects of Error :** Engine misfiring	Advise customer to fill petrol at reputed petrol pumps only. Adhere to washing & silencer tail pipe cleaning SOP. Refer SOP. 	
14.	Rotor key & nut.	Visual Inspection. 	Rotor key sheared off.	Magneto rotor nut loose. 	**Possible Error :** After doing work related to magneto rotor, nut not tightened to specified torque. **Effect of Error :** Key breakage - ignition timing changed causing engine misfiring.	• Ensure dust / burr free crankshaft magneto taper & rotor ID by cleaning.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
15.	CDI.	By using CDI / H.T coil tester. Refer SOP. 	LED indication on CDI / H.T coil tester not glowing.	CDI Faulty.	**Possible Error :** CDI not checked for output / spark intensity during diagnosis. **Effect of Error :** Engine misfiring	Always check CDI output / spark intensity during diagnosis using CDI / H.T coil tester.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
16.	Engine idling RPM.	Check Engine idling RPM by digital tachometer.  **Note :** Idling RPM checking is not required for fuel injection vehicles.	Engine idling RPM is less than specifications.	Engine idling RPM is not checked during periodic service.	**Possible Error :** • Tachometer not used for engine idling RPM setting. • Engine idling RPM set without ensuring engine oil temperature. • AC ignition system-engine idling RPM set without keeping headlight ON. **Effect of Error :** • Engine stopping intermittently due to low idling RPM	• Always use recommended tachometer for checking engine idling RPM. • Ensure Engine oil temperature 60° C while checking / adjusting engine idling RPM. • AC ignition system - set engine idling RPM by keeping headlight ON.	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>17.</td><td>Fuel pump.
  </td><td>• Checking of Fuel pump working by doing actuator test using BOSCH Diagnostic tool.

1) Check fuel pump pressure using fuel pump pressure checking tool.
 
  </td><td>• "Fuel pump running" sound not heard & BOSCH tool displays "Fuel pump not OK".

• Fuel pump pressure less than specifications.</td><td>Fuel pump / fuel tank cap / fuel pipe / inline fuel filter defective.

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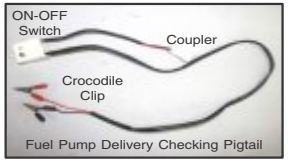
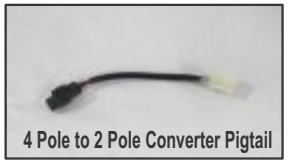
<table><tr><th>Sr. No.</th><th>Model</th><th>Fuel pressure</th></tr><tr><td>1</td><td>Pulsar RS 200</td><td>2.4 - 2.8 Kg / Cm^2</td></tr><tr><td>2</td><td>Pulsar RS 200 BS IV, Dominar 400</td><td>3.1 - 3.6 Kg / Cm^2</td></tr></table>
If pressure is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel pressure once again.
<table><tr><th>Status</th><th>Conclusion</th></tr><tr><td rowspan="2">If pressure is not as per specs</td><td>• Check fuel tank cap air vent for blockage.</td></tr><tr><td>• Check & replace fuel pipe, inline fuel filter & fuel pump.</td></tr></table></td><td>-</td><td></td><td></td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
		2) Check free flow of fuel using fuel pump delivery checking pigtail .	Fuel free flow delivery less than specifications.				



Fuel Pump Delivery Checking Pigtail


4 Pole to 2 Pole Converter Pigtail

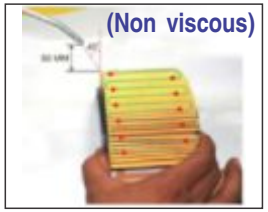
For SOP refer service station manual available on portal.

Sr. No.	Model	Fuel free flow per 10 sec. with new inline fuel filter
1	Pulsar RS 200	180 ± 10 ml minimum
2	Pulsar RS 200 BS IV, Dominar 400	220 ml minimum

If delivery is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel delivery once again.

Status	Conclusion
If delivery is as per specs	• Check fuel tank cap air vent for blockage
If delivery is not as per specs	• Check inline fuel filter for blockage. • Replace fuel pump.

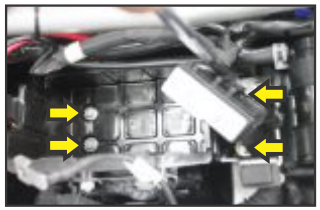
Meter Range	Wire Connections		Continuity Check
	Meter +ve	Meter –ve	
200 Ohms	Orange/Blue	Black/Yellow	2.1 Ohms

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
18.	MIL blinking.	Check using BOSCH make diagnostic tool. 	FI system problem - defective sensor / wiring / actuator will be indicated by BOSCH tool. 	Sensor / wiring / actuator is defective.	**Possible Error :** Sensor / actuator replaced without confirmation by multimeter / diagnostic tool. **Effects of Error :** Engine stopping intermittently	Always check FI system related issue with BOSCH make diagnostic tool. **Please refer Sensors / actuators checking SOP given in MIL blinking issue Page No. 283 - 307**	
19.	Air filter element.	Visual inspection.   	Heavy dust accumulated on filter.	Air filter element not cleaned / replaced as per PM schedule.   	**Possible Errors :** Lack of knowledge. **Effects of Error :** Rich air fuel mixture resulting in high fuel consumption.	Clean / replace air filter as per SOP & PM schedule. Refer SOP. **Note :-** In dusty region air filter cleaning / replacement frequency may vary.	Do not clean viscous filter, (replace filter as per PM schedule)

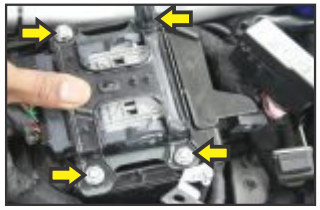
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
20.	Free movement of clutch collar bush in clutch housing.	Collar bush axial movement (To & Fro) inside clutch housing.  	Collar bush To & Fro movement jam in clutch housing.	• Contaminated engine oil. • Dent mark / Scratches on collar bush. • Engine oil quantity less. • Engine oil filter clogged.	**Possible Error :** • Engine oil / oil filter not replaced as per periodic maintenance schedule. • Dent mark / scratches on collar bush ignored. **Effects of Error :** Collar bush to & fro movement jam in clutch housing.	• Always adhere to periodic maintenance schedule. • Dip the collar bush in engine oil before fitment.  • Ensure no dent mark / scratches on collar bush & clutch housing.   • Always keep dismantled engine parts in engine part tray. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
21.	ECU	Check using BOSCH make diagnostic tool. 	ECU defective.	• Internal electronic component failure. • ECU program corrupt.	**Possible Error :** • ECU not removed as per SOP. • EPM 44 ECU fitted in reverse direction. **Effect of Error :** • ECU locating lock may break which will result in wiring harness replacement. • ECU pins will bend resulting in wiring harness replacement.	Always remove & fit EPM 44 ECU as per SOP given on next page.	

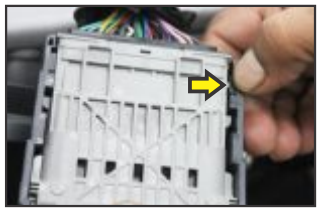
EPM 44 ECU REMOVAL



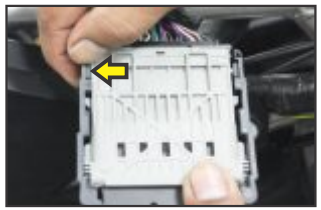
- Remove battery case mounting bolts (4 nos.) with 8 mm spanner.
- Lift battery case along with ECU as shown in photograph.



- Remove ECU mounting bracket nut (4 nos.) with 10 mm spanner & take out ECU mounting bracket.
- Remove battery case.



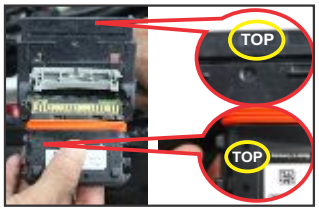
- Pull ECU lock as shown in photograph.



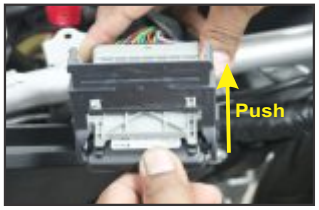
- Pull ECU lock as shown in photograph.
- Till it become perpendicular to gray part.

- Take out ECU.

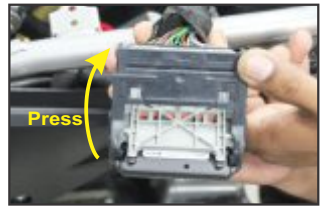
EPM 44 ECU FITMENT



- Ensure that coupler & ECU "Top" written face should be towards upside.



- Fit ECU in coupler completely & apply lock.



Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
38.	Throttle body.	Visual Inspection.  Stepper motor location & Entry hole in throttle body main passage 	Throttle body passage clogged.	• Dust / foreign particles entrapped in throttle body. • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -	Always clean throttle body using carburettor cleaner.  **Part No. : 36001056**	
39.	Fuel injector	Check as per SOP given below.	Fuel injector clogged.	• Dust / foreign particles entrapped in fuel injector • Bad fuel quality.	**Possible Error :** - **Effect of Error :** -		

SOP for checking fuel spray from Fuel Injector

1) Remove air filter cover.
2) Remove fuel injector coupler.
3) Remove fuel injector mounting screw using Tesken screw driver & take out fuel injector along with its pipe from throttle body.
4) Place petrol tank on vehicle & connect fuel pump module coupler & fuel injector coupler.

5) Connect fuel injector pipe to inline fuel filter 'Out' port & keep fuel injector as shown in photograph.
6) Put ON ignition switch & engine kill switch.
7) Press start button.
8) Observe fuel spray pattern from fuel injector output side, collect petrol in a container.
9) If no / less / intermittent fuel spray is noticed, replace fuel injector.

Silencer Noise

Content **Page No.**

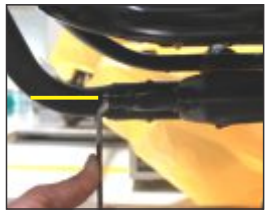
- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	Silencer tail pipe cleaning	153
2.	Training Notes	---	---
3.	Service Circular	---	---

Silencer Noise

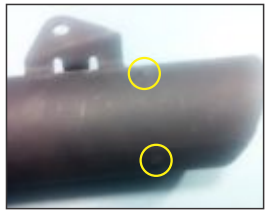
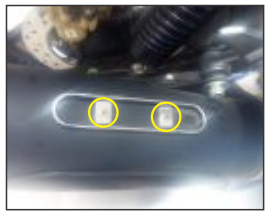
What to Check	How to Check	Symptoms observations	What is the most likely cause
Silencer noise confirmation.	Drive vehicle for 3~4 kms & confirm silencer noise by giving sudden acceleration.	Abnormal / loud noise from silencer.	1. Silencer mounting at cylinder head -nut loose. 2. Silencer hanger bracket bolt loose. 3. Gasket exhaust (Silencer mouth gasket) cracked / deformed. 4. Exhaus TEC nozzle bolt loose. 5. Silencer shield screws loose. 6. Silencer bend pipe fouling with rider foot rest. 7. Silencer rusty. 8. Silencer gas blockage noise. 9. Silencer baffle plates loose. 10. Metallic noise from silencer. 11. Plug weld joint leakage. 12. Rivet loose.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Silencer mounting at cylinder head.	Check torque value by torque wrench. 	Less torque value observed than specification.	After tightening nuts, torque value not confirmed.	**Possible Errors :** Tightening torque not confirmed during periodic service. **Effects of Error :** Abnormal / loud noise from silencer due to leakage of exhaust gases.		Do not tighten one side's nut fully & thereafter the other nut.
2.	Silencer hanger bracket bolt.	Check torque value by torque wrench. 	Silencer noise due to mounting bracket bolt loose.	Bolt is not tightened as per the specified torque.	**Possible Errors :** Tightening torque not confirmed in periodic service. **Effects of Error :** Silencer noise.		
3.	Gasket exhaust (Silencer mouth gasket).	Remove silencer and check visually condition of silencer mouth gasket 	Silencer mouth gasket deformed / pressed.	During fitment silencer mouth gasket not aligned	**Possible Errors :** Reused silencer mouth gasket **Effects of Error :** Abnormal / loud noise from silencer due to leakage of exhaust gases.	Replace silencer mouth gasket whenever silencer is removed from vehicle.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Exhaus TEC nozzle bolt.	Check ExhausTEC nozzle bolt for its tightness by ring spanner. 	Nozzle Bolt loose.	Manual error- After CO gas measurement nozzle bolt is not tightened.	**Possible Errors :** - **Effects of Error :** Exhaust gas leak noise.	After 'CO' checking ensure availability of plain washer & nozzle bolt tightness.	
5.	Silencer shield screws.	• Silencer shield screws tightness using screw driver / allen key.  • Visual Inspection of rubber grommet condition. 	• Shield screws loose. • Rubber grommet torn / deformed.	Shield screws not tightened. Rubber grommet condition not checked.	**Possible Errors :** Shield screws tightening & rubber grommet inspection ignored. **Effects of Error :** Shield rattling noise.	Ensure silencer shield screws are fully tight & rubber grommet are in good condition.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Silencer bend pipe fouling with rider foot rest.	Visual inspection 	During acceleration metallic sound heard	Either silencer or footrest is misaligned.	**Possible Errors :** Vehicle met with an accident & technician ignored to check fouling of footrest / silencer. **Effects of Error :** Noise due to two parts touching to each other - misalignment.	Follow silencer assembly sequence by doing pre-fitment of mounting nut & bolts. Apply specified torque first at silencer mouth nuts & then hanger bracket. Even if after following above steps, fouling observed then rectify / replace defective part.	
7.	Silencer condition.	• Overall inspection of silencer Visually. • Check for rusty liquid oozing out from silencer.	Silencer body rusty & abnormal noise.	Silencer rusty due to continuous use of adulterated fuel or severe atmospheric conditions. 	**Possible Errors :** Customer regularly filling petrol from non reputed petrol pump. **Effects of Error :** Abnormal / loud noise from silencer.	Advise customer to fill petrol from reputed petrol pumps & explain adverse effect of adulterated fuel.	
8.	Silencer gas blockage.	By giving blip to the accelerator in silencer hot condition.	Abnormal noise from silencer.	Silencer baffle inner tube perforated holes blockage.	**Possible Errors :** P150/180 silencer tail pipe not cleaned as per SOP. Refer SOP. **Effects of Error :** Abnormal noise from silencer.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	Silencer baffle plates	By giving blip to the accelerator in silencer hot condition.	Baffle plate looseness noise from silencer.	Baffle plates of silencer dislocated from weld joint 	**Possible Errors :** Manufacturing defect in silencer. **Effects of Error** Silencer abnormal noise	Replace silencer.	
10.	Metallic noise from silencer.	• Remove silencer.  • Remove silencer shields. 	Noise from bend tube, inner tube touching to outer tube.	• Welding dislocation of inner tube in bend pipe. • Entry of pebble from tail pipe.	**Possible Errors :** • Manufacturing defect in silencer. • Mischief in field. **Effects of Error :** Silencer abnormal noise	• Replace silencer. • Hold silencer vertically (tail pipe downward) & shake to remove pebble. If pebble is not coming out then replace silencer.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		• Hold silencer with flange in one hand. • Tap on the bend tube by other hand. 					
11.	Plug weld joint		Exhaust gas leakage through Plug weld joint.	Weld joint leaking - silencer defective.	-	-	-
12.	Rivet		Exhaust gas leakage through rivet	Exhaust gas leakage through rivet - silencer defective.	-	-	-

Scissor Gear Noise

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	---	---

Scissor Gear Noise

What to Check	How to Check	Symptoms observations	What is the most likely cause
Scissor gear.	Drive vehicle and confirm noise while acceleration & de-acceleration.	Whinning noise	1. Less than 2 teeth pre-loading of scissor gear.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Pre - loading of scissor gear.	Remove assembly balancer idler gear complete. Confirm pre-loading of scissor gear in anticlockwise direction with the help of balancer gear holder tool (3710DJ63) as per SOP.  Hold assembly balancer idler gear complete in special tool (3710DJ63) & rotate scissor gear in clockwise direction.  Slippage Test for 3 teeth tension	Pre-loading of scissor gear less than 2 teeth.	• Scissor gear spring stiffness reduced in use. • Manual error-Scissor gear loading not done as per SOP. • 150 cc loading of 1.5 to 1.75 teeth • 180 & 220 cc loading of 2.5 to 2.75 teeth 	**Possible Errors :** Special tool not used while assembling scissor gear. **Effects of Error :** Scissor gear noise.	• Always use special tool balancer gear holder & teeth adjuster. (Part No. : 3710DJ63) for teeth loading. • Replace scissor gear torsion springs in pair. • Replace balancer idler gear (nylon gear) individually if found worn out.	Do not remove the special tool from scissor gear till body balancer alignment and clutch housing fitment done. Never replace balancer gear idler gear complete for abnormal noise.

Chapter II : Frame

Front Suspension Oil Leakage

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	---	---

Front Suspension Oil Leakage

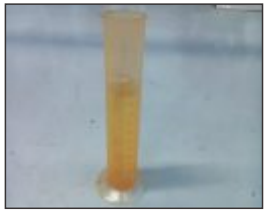
What to Check	How to Check	Symptoms observations	What is the most likely cause
Front Suspension oil leakage from oil seal.	• Visual inspection. activities for reconfirmation of defect. • Lift dust seal up to under arm bracket. • Clean inner pipe & oil seal by clean cotton cloth. • Give manual stroke for 5~10 nos. • Clean oil traces from oil seal by cotton cloth. • Repeat the above step for 2~3 times. • Drive vehicle on the rough road for 2 ~ 3 Kms. • During trial, if oil traces observed on inner pipe then clean inner pipe & oil seal, repeat for 3 times.	Even after cleaning oil on fork inner pipe, oil leakage observed on front fork inner pipe.	1. Fork inner pipe uncleaned. 2. Scratches, rubbing mark, pitting, dent mark on fork inner pipe. 3. Inverted fitment of oil seal. 4. Improper fitment of oil seal in outer pipe 5. Fork misalignment. 6. Excess fork oil. 7. Oil seal lip cut / worn out. 8. Missing antifriction bush.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Fork inner pipe.	Models without rubber bellow - visual checking for dust accumulation on inner pipe Models with rubber bellow - lift rubber bellow upwards and clean dust accumulated if any on inner pipe. For SOP refer service station manual of Avenger 150 & 220 Street 	Dust accumulated on inner pipe.	Rubber bellow cracked, torn or not fitted properly on outer pipe & bellow clip loose / missing	**Possible Errors :** • Models with rubber bellow PM schedule not followed. **Effects of Error :** Oil leakage through front fork.	• Always keep inner pipe clean & free from dust. This will improve life of front fork.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		Use fork seal cleaner for removing minor dust / foreign particles entrapped between. • Dust seal & inner pipe and • Oil seal & inner pipe  SOP for using fork seal cleaner • Insert fork seal cleaner dust seal side between dust seal & inner pipe and rotate twice. • Take out small dust & foreign particles stuck to fork seal cleaner • Repeat the same process for oil seal (Use oil seal side)	Minor dust particles accumulated between • Dust seal & inner pipe and • Oil seal & inner pipe	Dust entry.	**Possible Errors :** Fork seal cleaner not used for removing entrapped dust / burr. **Effects of Error :** Oil seal lip may get cut resulting in front fork dismantling.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Fork inner pipe.	Visual inspection & also by rotating thumb nail around the periphery of inner pipe to understand whether scratches are superficial or deep. 	• Scoring & scratches on inner pipe. • Inner pipe plating peel off and pitting marks. • Dent marks on inner pipe.	• Heavy dust in atmosphere. • Humid/acidic environment & possibility of abnormality in plating process. • Handling damage to fork inner pipe during fork overhaul activity. 	**Possible Errors :** • Vehicle regularly not cleaned by customer. •.Inner pipes damage due to mishandling of vehicle. • Scratches, dent marks on inner pipe ignored during repairs. **Effects of Error :** Oil leakage through oil seal which will reduce front fork efficiency.	• Advise customer to clean vehicle regularly so that dust will not get accumulated on fork inner pipe & dust seal. •Take utmost care while dismantling & re-assembly of front suspension to avoid damage of parts & oil contamination. • Always use clean part handling trays for keeping dismantled parts of front fork.  • In case of scoring marks, plating peel off, dent marks are felt by nail then only replace the fork inner pipe. • Always use fresh oil in recommended qty. • Always replace oil seal with dust seal in pair of same make.	In case of front fork bend do not realign fork inner pipes in local workshops.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Oil seal.	Visual inspection by removing dust seal. 	Oil seal fitted upside down.	Manual error during fork assembly. 	**Possible Errors :** Lack of knowledge. **Effects of Error :** Oil leakage	Oil seal vendor marking should be faced upward. 	
4.	Fitment of oil seal in outer pipe	By lifting dust seal upside. 	Oil seal lock not fitted.	Manual error. 	**Possible Errors :** **Effects of Error :**		
5.	Fork misalignment.	Passing of front axle through both outer tube without fitment of wheel. 	Axle not passing freely.	• Front fender brace deformed. • Vehicle met with an accident.	**Possible Errors :** Vehicle attended for oil leakage problem but root cause not addressed. **Effects of Error :** Repeat complaint of oil leakage.	• Measure centre distance of outer tubes from inside machined face area at hole for front axle. • If brace fender found deformed, replace it.	In case of front fork bend do not realign fork inner pipes in local workshops.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Fork oil.	By measuring jar. 	Oil quantity more than specification.	Excess oil filled than specification. 	**Possible Errors :** Technician unaware about oil quantity to be filled per leg assembly or measuring jar not calibrated. **Effects of Error :** Oil leakage.		

Precautions to be taken :
a) Use lint free cloth for cleaning components.
b) Always keep dismantled parts in clean plastic tray.
c) Always use fresh oil as per specification grade & quantity.
d) Replace oil seal & dust seal in pair as per make.
e) Use special tool for dismantling & assembly of Antifriction bush & oil seal.
f) Advise customer to clean vehicle regularly, specifically fork inner pipe & dust seal area.

Fork oil quantity (in ml / leg)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Fork oil	150 ± 2.5	130 ± 2.5	140 ± 2.5	140 ± 2.5	140 ± 2.5	140 ± 2.5	140 ± 2.5	130 ± 2.5	190 ± 25	140 ± 2.5	160 ± 2.5	320 ± 2.5
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Fork oil	285 ± 5	285 ± 5	285 ± 5	145 ± 2.5	295	195 ± 2.5	195 ± 2.5	420	150			

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Oil seal lip.	Visual inspection by removing oil seal from front fork outer pipe with use of special tool. 	• Oil seal lip damage/cut. • Oil seal loose in outer pipe.	• Oil seal lip damaged due to environmental dust or contamination of front fork oil.  • Outer pipe oil seal seat diameter over size.	**Possible Errors :** • Vehicle regularly not cleaned by customer. • Improper handling / cleanliness of parts. • Oil seal fitment tool not used while fitting oil seal. • Oil seal tight fitment in outer pipe not checked. **Effects of Error :** Oil leakage through oil seal.	Always use special tool while removing & fitting oil seal. Refer SOP.  	Never use screw driver for removing oil seal. 
8.	Antifriction bush.	Visual inspection by dismantling front fork leg assembly. 	Antifriction bush not fitted.	Manual error.	**Possible Errors :** **Effects of Error :**	Antifriction bush to be press fitted by special tool. 	

Drive Chain Noise

Content **Page No.**

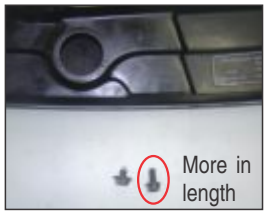
- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Drive chain lubrication. • Drive chain slackness adjustment.	169 176
2.	Training Notes	-	-
3.	Service Circular	-	-

Drive Chain Noise

What to Check	How to Check	Symptoms observations	What is the most likely cause
Drive Chain Noise confirmation.	Drive vehicle on Plain Road, bumpy road and on turning.	Drive chain noise.	1. Improper fitment of chain covers 2. Drive chain noise (Metallic noise) due to mounting bolts touching to drive chain. 3. Lack of drive chain lubrication. 4. Drive chain slackness more than specifications. 5. Drive chain too loose / too tight at different points 6. Coupling rubber damper worn out. 7. Drive chain elongation & sprocket wear.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Fitment of chain covers.	Visual inspection & also by rolling chain  PVC strip intact	Chain cover rattling noise or chain rubbing noise with chain cover.	Improper fitment of chain covers due to manual errors like - • Bolt missing.  • PVC strip / rubber beading missing.  • Lower & upper chain cover not locked with each other. 	**Possible Errors :** - **Effects of Error :** -		

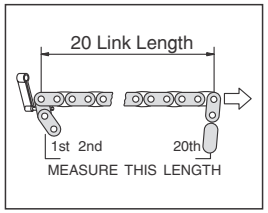
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Drive chain noise.	Put vehicle on center stand, rotate rear wheel to confirm noise in clockwise as well as anticlockwise direction. 	Metallic noise	Chain case mounting bolt touching to drive chain due to use of non recommended bolt. 	**Possible Errors :** Plain washer for chain case mounting bolt not fitted. Bolt having long thread length (non specified) used for chain case mounting. **Effects of Error :** Drive chain noise		
3.	Drive chain lubrication.	Visual inspection. Refer SOP.	Inadequate lubrication to drive chain.	Periodic maintenance of drive chain is not done as per P.M schedule. 	**Possible Errors :** Drive chain lubrication done by non recommended oil or used engine oil. **Effects of Error :** Early wear of drive chain & sprocket.	• Ensure adherence of drive chain cleaning & lubrication as per PM schedule & SOP. • Explain customer about the importance of drive chain cleanliness & lubrication for the chain having no chain case. • Customer to do this activity at every 500 kms at his own with OKS chain lubricating spray.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
4.	Drive chain slackness.	Non O ring chain - by finger taking judgement of chain case marking. O ring chain - by scale. Refer SOP. 	Drive chain slackness not within specification.	Adjustment of drive chain slackness is done by judgement.	**Possible Errors :** SOP not followed **Effects of Error :** Chain noise.		

Drive Chain Slackness (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Drive chain Slack.	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	25 - 30	25 - 35	25 - 35	25 - 35
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Drive chain Slack.	15 - 25	15 - 25	15 - 25	20 - 30	25 - 35	25 - 35	25 - 35	20 - 30	25 - 30			

5.	Drive chain.	By rolling chain & checking slackness at different points by finger with reference to chain case slackness measurement marking. 	Chain too tight at one point & too loose at other point.	Sprocket teeth wear 	**Possible Errors :** Vehicle driven with less / no chain slackness. **Effects of Error :** Drive chain noise.	Always ensure chain slackness as specified & do lubrication periodically.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations ✓ Do's	Recommendations ✗ Don't's
6.	Coupling rubber damper.	Lock rear wheel sprocket firmly by putting screw driver through its window & try to rotate rear wheel clockwise & anticlockwise to confirm play between rear wheel coupling locking lug & rubber damper	• Jerk while releasing clutch. • Play between rear wheel coupling locking lug & rubber damper.	Rubber damper worn out / became hard.	**Possible Errors :** **Effects of Error :**	Play between rear wheel coupling locking lug & rubber damper to be checked while adjusting drive chain free play.	
7.	Drive chain & sprocket	Measure 20 link length by vernier caliper as per SOP given below.	Chain elongation more than service limit.	• Driving vehicle with less chain slackness & inadequate lubrication. • Normal wear & tear.	**Possible Errors :** Chain maintenance not done as per P.M schedule. **Effects of Error :** Drive chain noise due to chain elongation.		

SOP :
- Clean drive chain by removing from vehicle.
- Measure 20 link length in between 1~20 links by vernier caliper. Take 2~3 readings at different points.
- Record maximum reading on vernier caliper (ensure that chain links 20 nos. are in stretched condition by 15 kg load)
- Add roller diameter in the 20 link reading.

Calculation for measuring 20 link length
Example - - The reading of 20 links is X mm.
Add roller diameter 8.5 mm
Then total length of 20 links is - X + 8.5 mm

Drive Chain 20 Link Length

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	20 Link length	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6	254.0 - 254.6
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	20 Link length	301.6 - 302.1	301.6 - 302.1	301.6 - 302.1	254.0 - 254.6	301.6 - 302.1	254.0 - 254.6	254.0 - 254.6	317.5	254.0 - 254.6			

Vibrations

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia		
2.	Training Notes	-	-
3.	Service Circular	-	-

Vibrations

What to Check	How to Check	Symptoms observations	What is the most likely cause
Vehicle vibrations.	Test drive the vehicle on road for confirmation.	Vibration felt at - Mirror Handle bar Rider foot rest Pillion foot rest Grab handle Petrol tank Seat	1. Engine foundation nut / bolts loose. 2. Body parts mounting fasteners loose. 3. Head lamp fairing screws / nuts / bolts loose. 4. Petrol tank & petrol tank cover screws / nut / bolts loose. 5. Engine foundation bushes worn out / damaged. 6. Body balancer gear timing misaligned. 7. Crankshaft run out more than service limit. 8. Crankshaft ball bearing jam / worn out / excessive play. 9. Pillion footrest TPU damper worn out / cracked. 10. Fairing / spoiler - rubber / foam / tape / velcro / Welnut - missing / pinched

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Engine foundation nut / bolts.	Confirm torque value by torque wrench.   	Engine foundation nut / bolts loose.	Engine foundation nut / bolts tightness not checked during repairs / periodic service.	**Possible Errors :** Torque not applied during repair / periodic service.  **Effects of Error :** Vibration from engine.	Always follow engine foundation nuts / bolts tightening sequence as per standard.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Body parts mounting fasteners.	Check by torque wrench. few locations given for reference - • Rear suspension  • Swing arm shaft.  • Front & rear axle.  	Fasteners loose / torque less than specification.	Body parts tightness not checked during repairs / periodic service.	**Possible Errors :** Torque wrench not used for confirming torque values as per standard of body parts fasteners. Condition of rubber dampers provided for cushioning not checked. **Effects of Error :** Vibrations from body parts.	Always ensure tightness of body parts mounting nut / bolts / screws by torque application as per specification wherever applicable.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		• Fork top & side bolts.  • Mirror ball joint.  • Footrest bolts.  • Handle bar. 					

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		• Grab handle  • Fairing assembly. 					
3.	Head lamp fairing screws / nuts / bolts	By spanner / screw driver.  	Fasteners required to assemble speedometer & fairing found loose.	Manual error - fasteners not fully tightened earlier.	**Possible Errors :** Head lamp fairing screws / nuts / bolts tightness not checked during repairs. Damaged well nut not replaced in servicing. **Effects of Error :** Vibrations from head lamp fairing.	Always ensure tightness of petrol tank & petrol tank cover screws / nuts / bolts.	

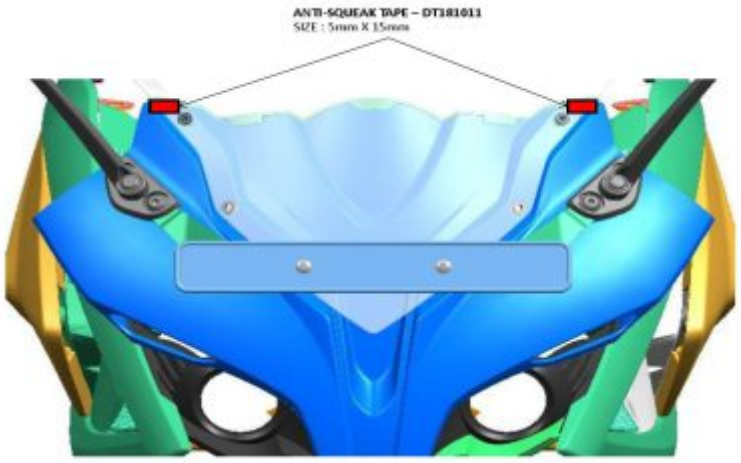
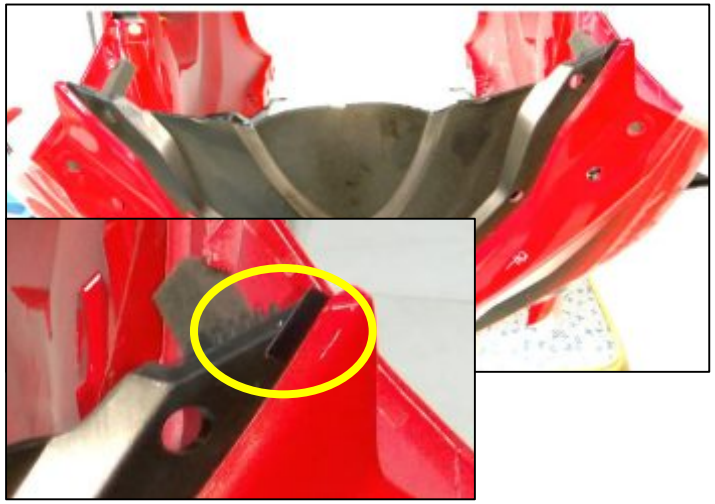
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Petrol tank & petrol tank cover screws / nut / bolts & dampers.	By spanner / screw driver / allen key.    	Vibrations from petrol tank & petrol tank cover.	• Petrol tank & petrol tank cover screws / nuts / bolts tightness not checked during repairs. • Dampers fitted on petrol tank dislocated / missing.	**Possible Errors :** Rubber dampers dislocated / missing not checked. **Effects of Error :** Vibrations from petrol tank & petrol tank cover.	Whenever petrol tank cover is removed for any repair work, ensure all rubber dampers and nut bolts are refitted (Ensure model wise rubber damper / foam & fasteners quantity).	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Engine foundation silent bushes.	Visual inspection after removal. 	Worn out / damaged engine foundation silent bush leads to vibrations from engine.	Engine foundation silent bushes not checked & replaced as per P.M schedule.	**Possible Errors :** - **Effects of Error :** -	Always check engine foundation silent bushes for wear / damage & replace if found worn out / damaged.	
6.	Body balancer gear timing.	Visual inspection after clutch cover removal. 	Misaligned timing of body balancer gear with respect to crankcase RH mark leads to engine vibration.	Manual error - Wrong setting of body balancer gear.	**Possible Errors :** - **Effects of Error :** -		
7.	Crankshaft run out.	Using V block & dial gauge. 	Crankshaft run out more than service limit	In case of engine opening, crankshaft mishandled (Hammering, fallen down)	**Possible Errors :** Inadequate care taken in engine opening & crankshaft handling **Effects of Error :** Crankshaft run out more than service limit leads to engine vibration.	• Always check crankshaft for run out & replace if run out found more than service limit. • Handle crankshaft carefully. • Take utmost care in handling parts & maintaining cleanliness. • Use crankcase heater for stress free fitment of crankshaft.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	Crankshaft ball bearing play.	Clean bearing by diesel & oil (1:1 ratio) Put few drops of oil on steel balls, hold inner race & rotate outer race.  Check free rotation of balls, excess play (Compare with new ball bearing available in spares).	Crankshaft ball bearing jam / excessive play.	Contaminated engine oil Bearing loose / too tight in crankcase bearing seat - Manufacturing error.	**Possible Errors :** Engine oil & filter not replaced as per P.M schedule. Refer SOP. Centrifugal oil filter & oil strainer not cleaned as per PM SOP & schedule. Refer SOP. **Effects of Error :** Engine vibration.	• Use bearing extractor & locator for removal & re-fitment of ball bearing. Take utmost care in handling parts & maintaining cleanliness.	
9.	Pillion footrest TPU damper.	Visual Inspection. 	Pillion footrest TPU damper worn out / cracked.	Wear & tear.	**Possible Errors :** Worn out TPU damper of pilliong footrest ignored. **Effects of Error :** Vibrations from pillion footrest.	• Use dry lube spray 1262 for foot peg cleaning.	

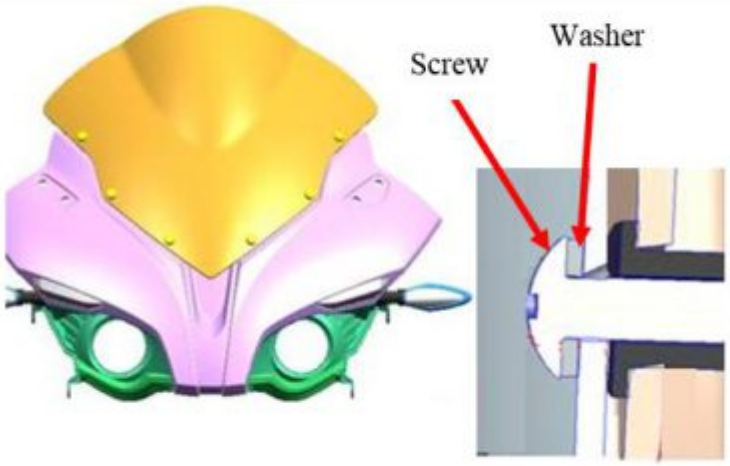
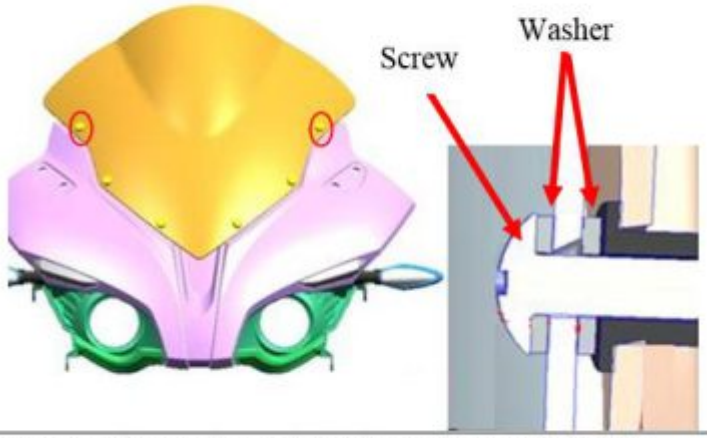
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
10.	Fairing / spoiler - rubber / foam / tape / velcro / Welnut.	By opening related plastic part and checking for missing / damaged parts - rubber, foam tape etc.	Vibrations / noise from fairing / spoiler.	Rubber / foam / tape / velcro / Welnut fitted on fairing / spoiler are damaged / missing.	Note :- As an example on subsequent pages RS 200 model information for dampers & fasteners is given for other models kindly refer model wise SSM.		

1.1- Fairing

Reference photograph	Actual photograph
	
NOTE : Part No.DT181011 (Black Colour Tape)	

Non-metallic washers (2 nos) added between wind shield & fairing LH / RH side top mounting

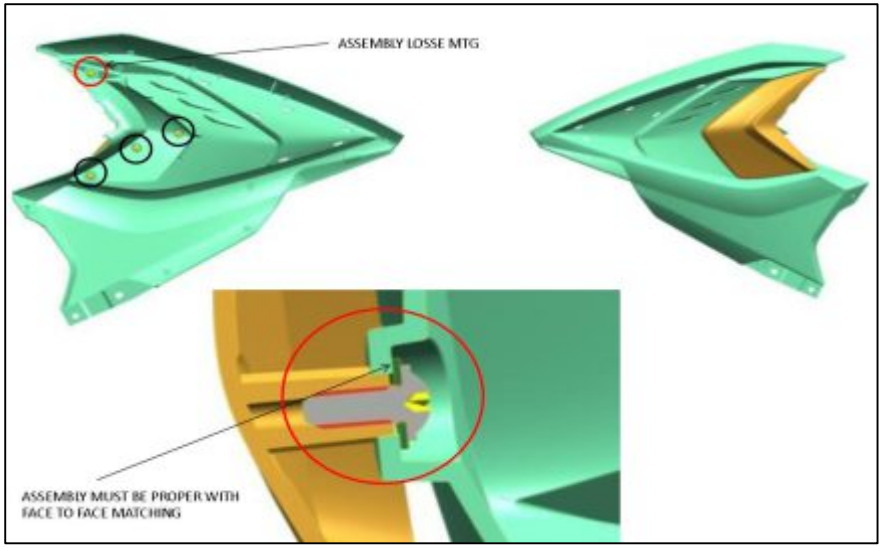
Wind Shield Mounting

Earlier	New
	
Single non metallic washer is used on screw head side.	Non-metallic washer added between wind shield & fairing LH / RH side top mounting.

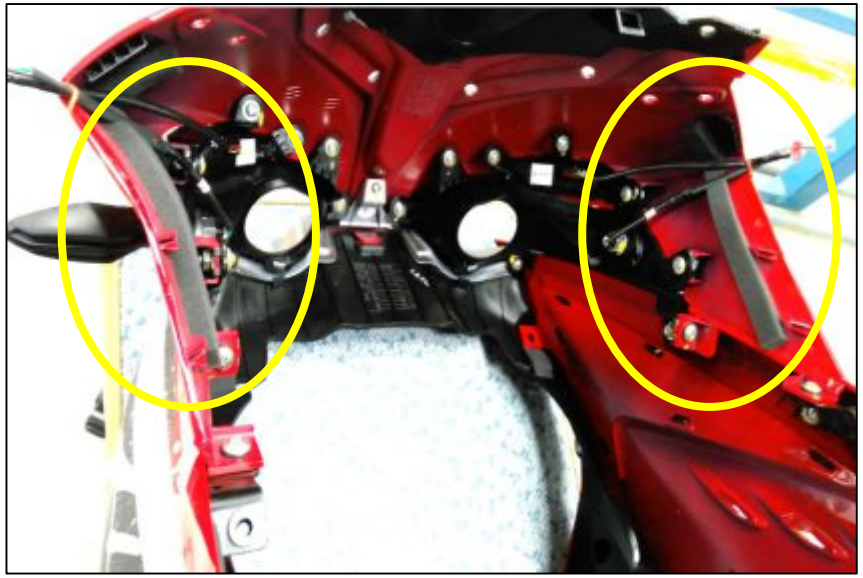
The part number details are as below:

Sr. No.	Existing Part No.	Description	New Part No.	Qty	Interchange ability	MRP of new part (in Rs)
1	39214124	Nonmetallic washer (nylon)	No change	2	NA	0.50

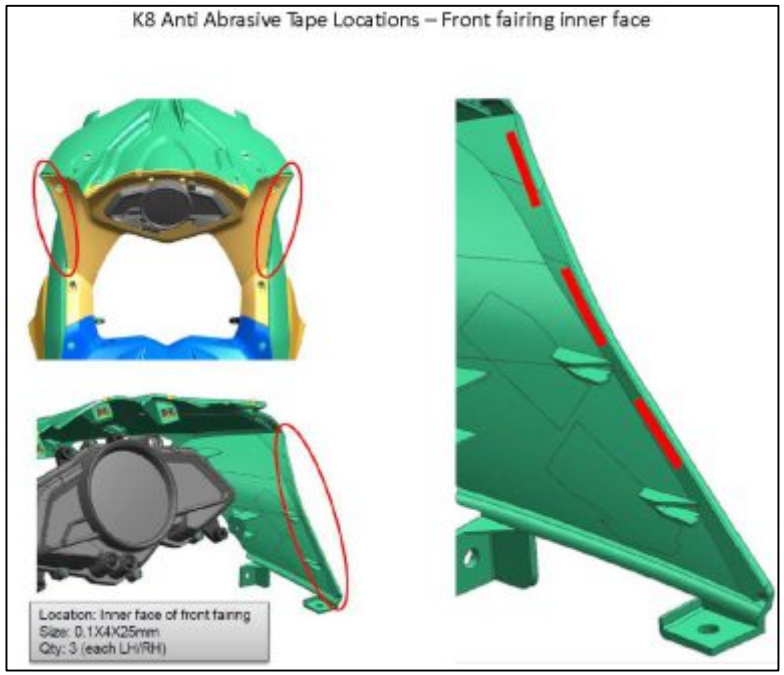
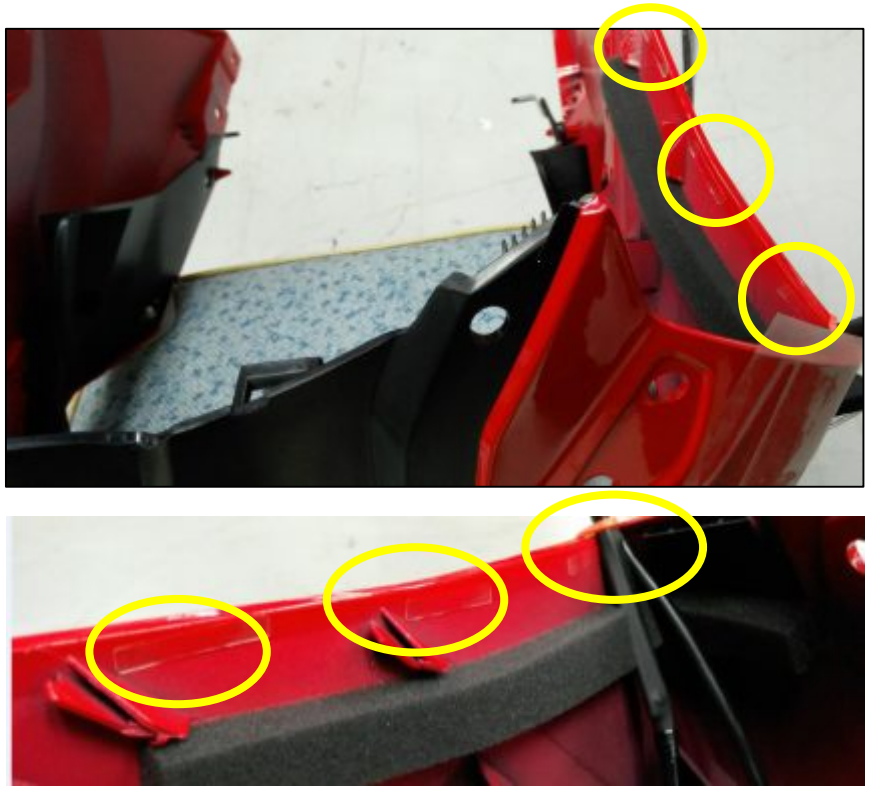
1.2- Side Fairing

Reference photograph	Actual photograph
	
NOTE :There should not be any gap as shown in above pictures	

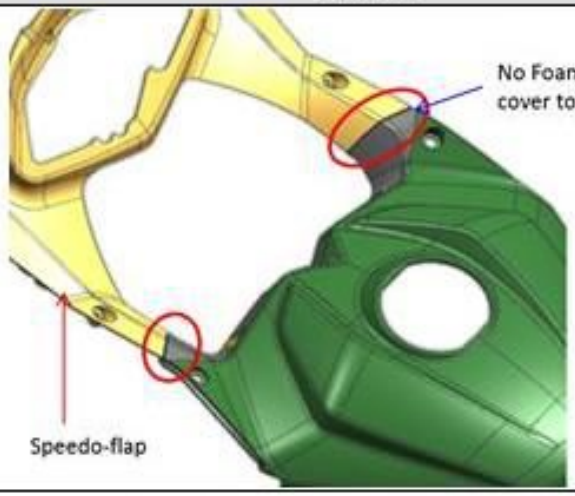
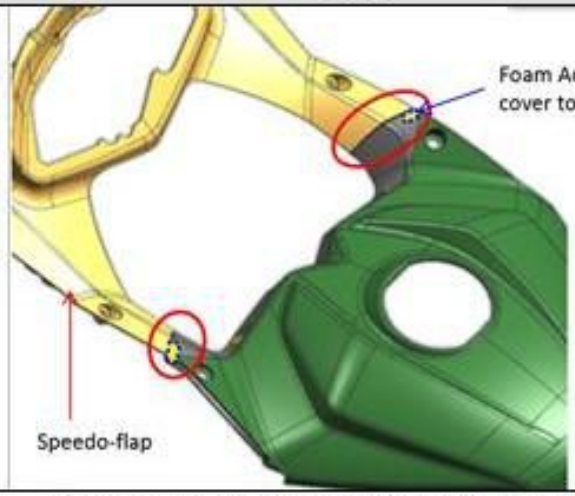
1.3- Side Fairing

Reference photograph	Actual photograph
	
NOTE :Part No.DT181326 (Black Colour Foam)	

1.4- Side Fairing

Reference photograph	Actual photograph
	
Note : Part No. DT181030 (Anti Abrasive Tape)	

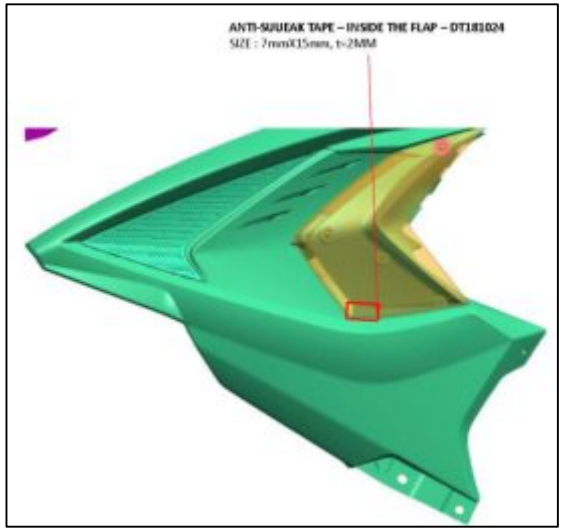
Foam pads (2 nos) affixed on 'Petrol Tank Top Cover' front side LH / RH corners

Petrol Tank Top Cover	
Earlier	**New**
	
Petrol tank top cover without foams	Foam are provided on LH & RH side (2 nos.) (Foam application SOP is given in annexure)

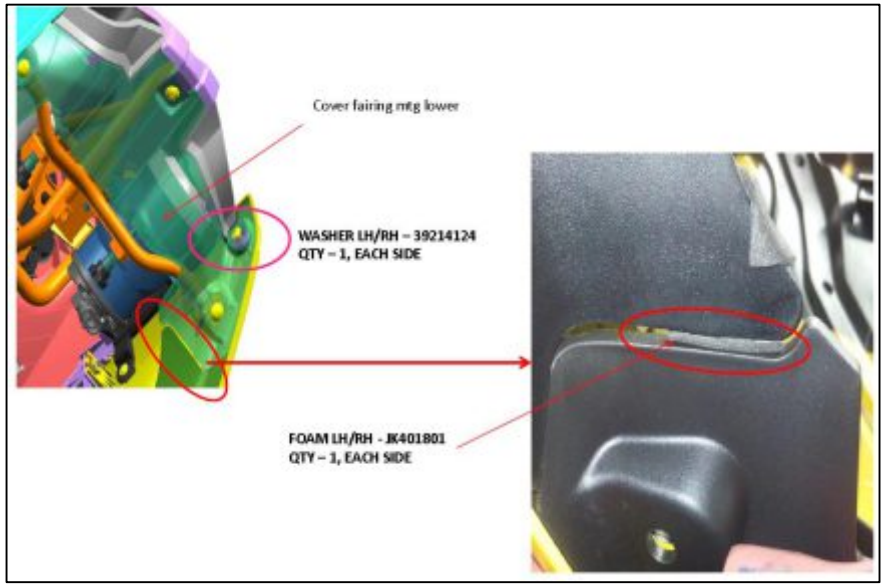
The part number details are as below:

Sr. No.	Existing Part No.	Description	New Part No.	Qty	Interchange ability	MRP of new part (in Rs)
1	--	Foam Tank Cover	DT181034	2	NA	1.50

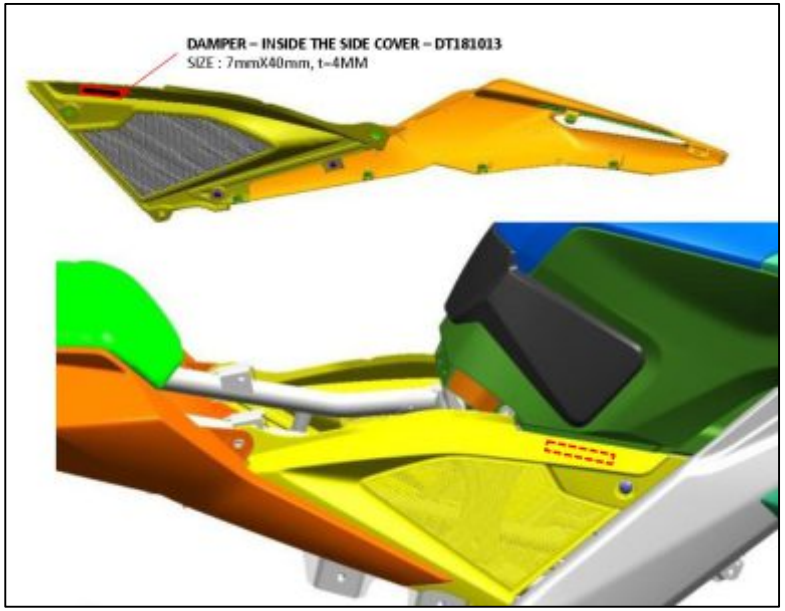
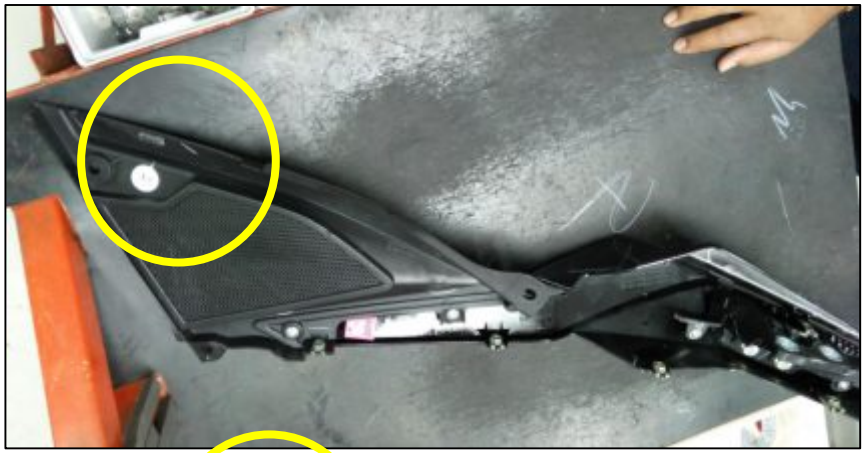
1.5- Side Fairing

Reference photograph	Actual photograph
	
NOTE :Part No.DT181024 (Black Colour Tape)	

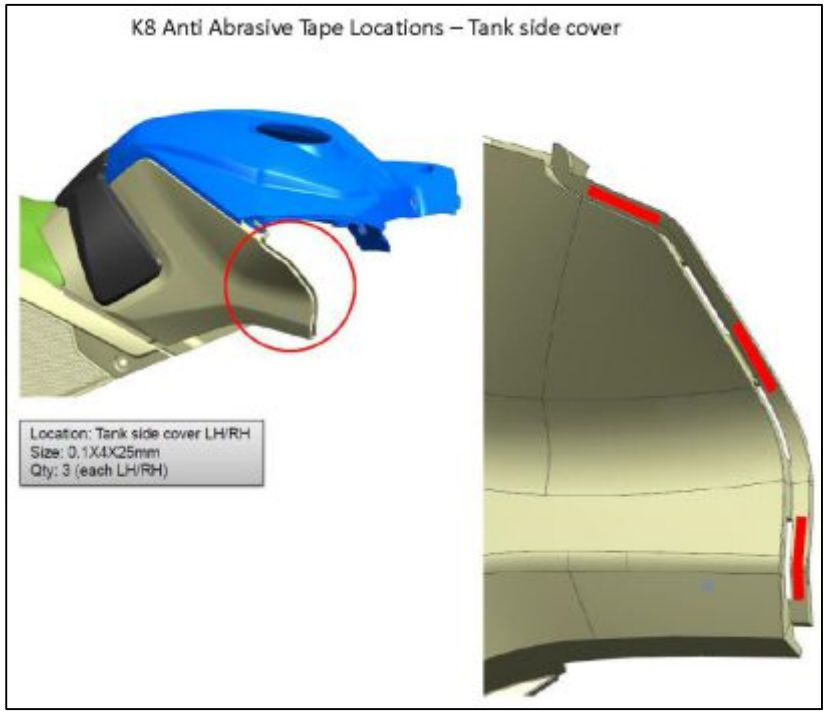
1.6- Side Fairing

Reference photograph	Actual photograph
	
NOTE :Part No.JK401801 (Foam)	

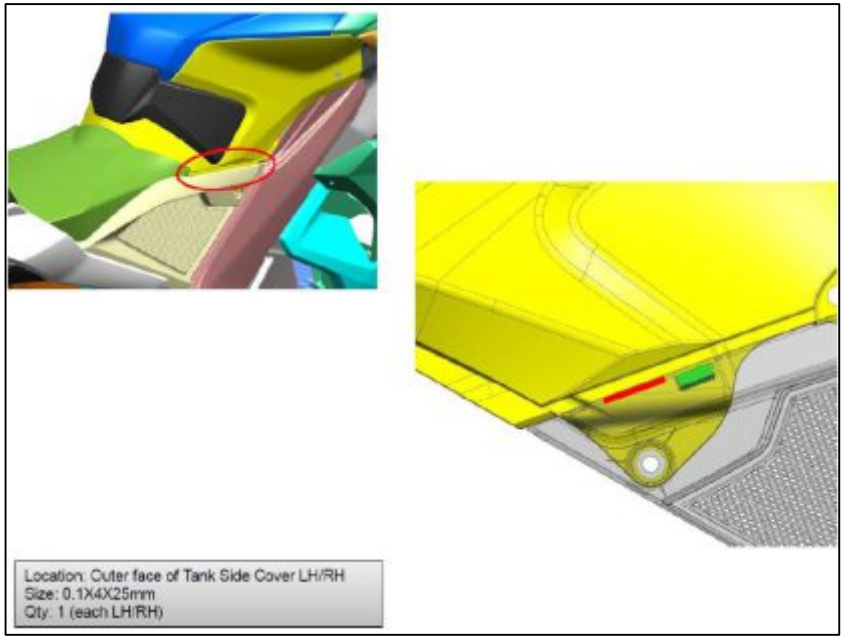
2. Side Cover LH & RH

Reference photograph	Actual photograph
	 
NOTE :Part No.DT181013 (Black Colour Damper)	

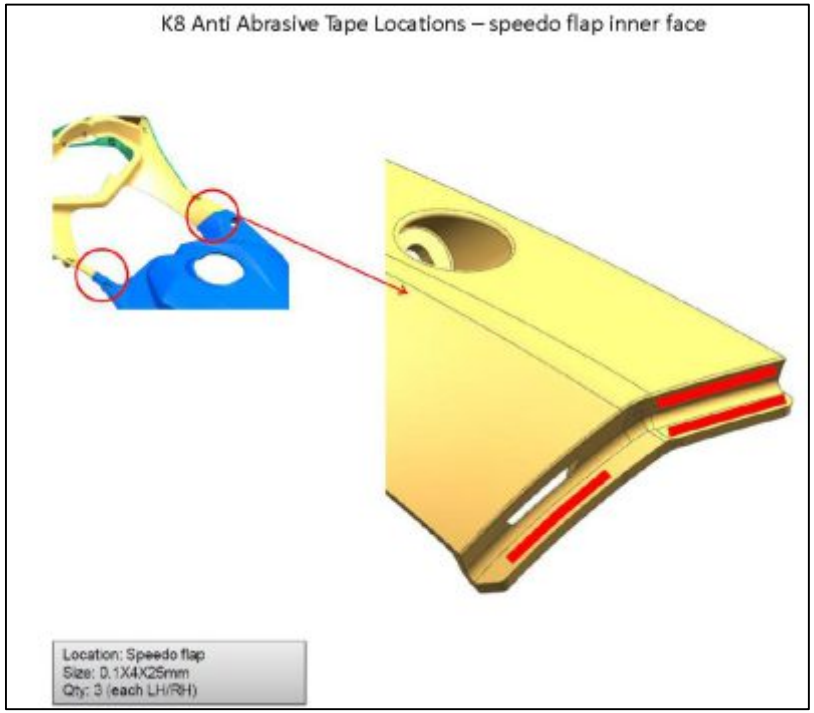
3.1- Tank Side Cover

Reference photograph	Actual photograph
	
Note : Part No. DT181030 (Anti Abrasive Tape)	

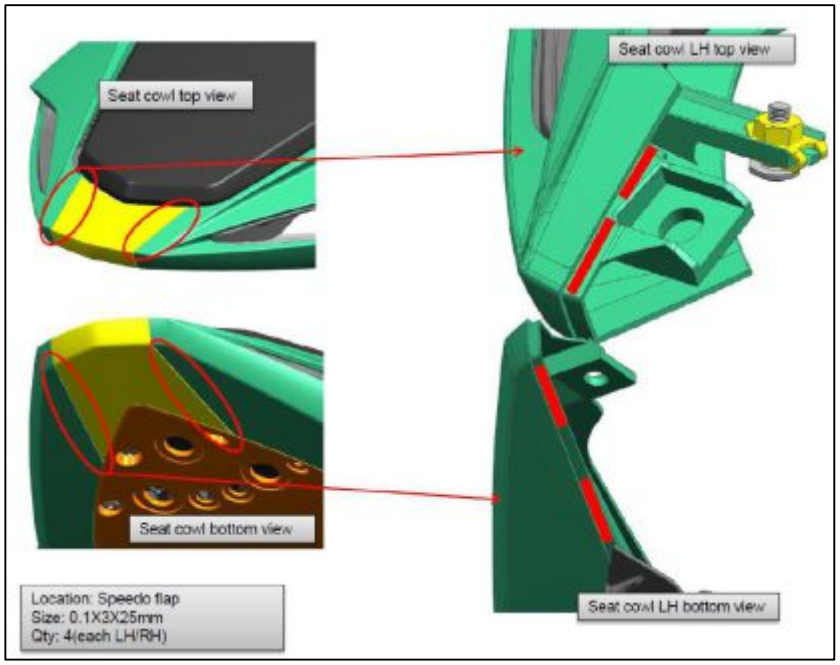
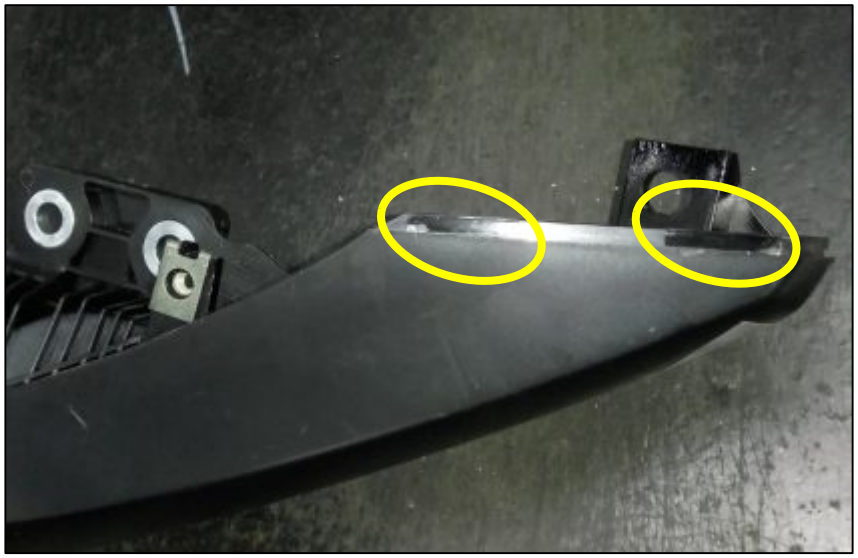
3.2- Tank Side Cover

Reference photograph	Actual photograph
	
Note : Part No. DT181030 (Anti Abrasive Tape)	

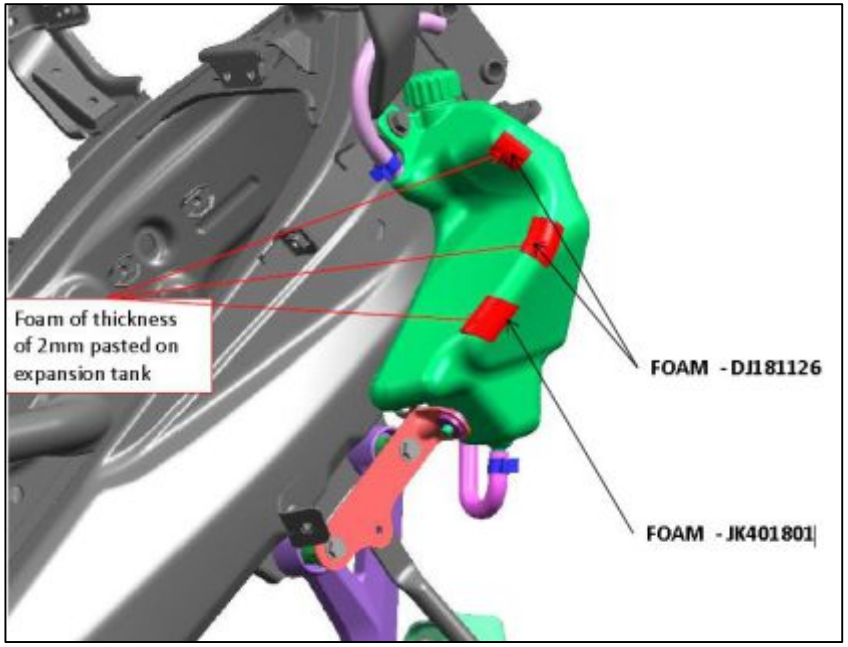
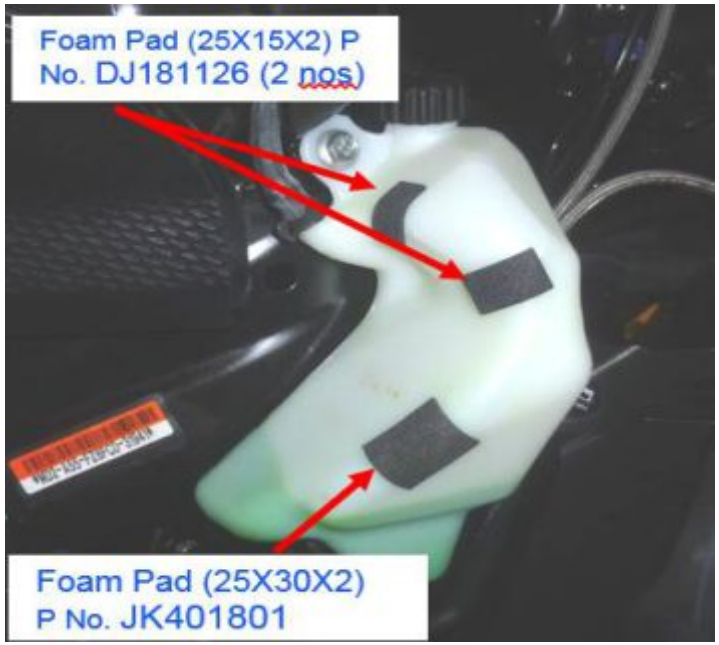
4. Speedo Flap

Reference photograph	Actual photograph
	
Note : Part No. DT181030 (Anti Abrasive Tape)	

5- Seat Cowl

Reference photograph	Actual photograph
	
NOTE :Part No. DT181030 (Anti Abrasive Tape)	

6- Coolant Expansion Tank

Reference photograph	Actual photograph
	
NOTE :Part No. DJ181126 (Foam) Qty. 2 nos. Part No. JK401801 (Foam) Qty. 1 no.	

7- Pillion Seat

Rubber grommet added on pillion seat locking lug in frame gusset

Pillion Seat Assembly	
Earlier	New
	
No grommet on pillion seat locking lug	Grommet added on pillion seat locking lug

The part number details are as below:

Sr. No.	Existing Part No.	Description	New Part No.	Qty	Interchange ability	MRP of new part (in Rs)
1	--	Grommet Rear Seat Rear	DT191022	1	NA	5.00

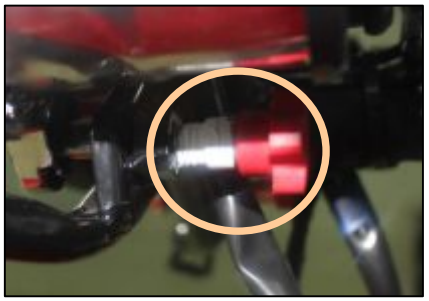
8 - Headlamp Focus adjustment screw

Teflontape application on headlight adjustment screw.

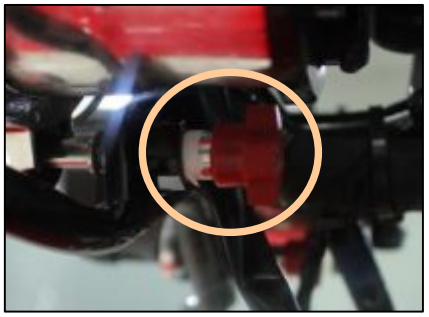
SOP :-

1. Loosen headlight adjustment screw fully.

2. Apply Teflon tape on threaded portion of screw.



3. Re-fit head light adjustment screw.



Front Wheel Jam - Disc Brake System

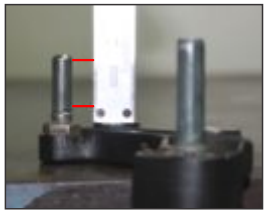
Content **Page No.**

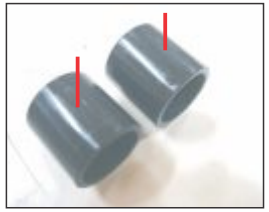
- Reference for SOP.

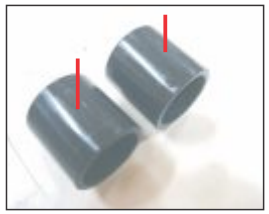
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	---	---

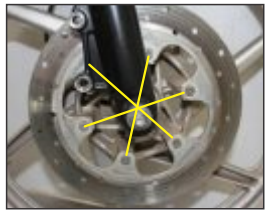
Front Wheel Jam - Disc Brake System

What to Check	How to Check	Symptoms observations	What is the most likely cause
Front wheel freeness.	By rotating front wheel by hand.	Front wheel rotation jammed.	1. Caliper free floating movement jammed. 2. Caliper oil seal lip cut / deformed. 3. Scoring marks on caliper piston. 4. Axle movement through both outer pipes jam. 5. Brake disc bend.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Caliper free floating movement.	By hand feel.	Caliper free floating movement jam.	• Caliper pin dry due to lack of lubrication.  • Caliper pivot pin rubber boot torn / damaged / missing.  • Anchor pin bend. 	**Possible Error :** • Caliper pin not lubricated by silicon grease during repair. • Torn / damaged / missing caliper pivot pin rubber boot ignored. **Effect of Error :** Front wheel jam	• Always carry out caliper pin cleaning / lubrication during repair. • Replace torn / damaged caliper pivot pin rubber boot. • Use only silicon grease for caliper pin lubrication.   Silicon grease pouch supplied through spare parts	Never use AP grease for caliper pin lubrication.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
2.	Caliper oil seal & lip.	Visual after removal from caliper assembly. 	Caliper piston seal & dust seal deformed / lip cut.	• Damaged dust seal causing dust entry.  • Scoring mark on caliper piston.  • Seals not replaced during repair / periodic service.	**Possible Error :** • AP grease / Diesel / Kerosene used during caliper assembly overhaul. • Deformed caliper oil seal & dust seal ignored during repair / periodic service. **Effect of Error :** Front wheel jam	• Always replace caliper seals (minor kit) as per PM schedule. • Always apply silicon grease to caliper oil seal & dust seal before assembling. 	Never use AP grease for caliper pin lubrication.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Scoring mark on caliper piston.	Visual after removal from caliper assembly. 	Dust entry in caliper assembly Caliper piston surface finish improper. Piston movement jam metallic burr stuck in main seal groove.	• Dust entry in caliper assembly through damaged dust seal.  • Deformed / missing caliper piston seal.  • Handling damage / manufacturing defect.	**Possible Error :** • During caliper assembly overhaul, piston checking ignored. • AP grease / Diesel / Kerosene used during caliper assembly overhaul. **Effect of Error :** Front wheel jam	• Always replace caliper major & minor kit as per PM schedule. • Always apply silicon grease to caliper piston seal & dust seal before assembling.	Never use AP grease / Diesel / Kerosene while caliper assembly overhaul.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Axle movement through both outer pipes.	Passing of front axle through both outer tube without fitment of wheel. 	Axle not passing freely.	• Front fender brace deformed. • Vehicle met with an accident.	**Possible Errors :** Vehicle attended for oil leakage problem but root cause not addressed. **Effects of Error :** Repeat complaint of oil leakage.	• Measure centre distance of outer tubes from inside machined face area at hole for front axle. • If brace fender found deformed, replace it.	In case of front fork bend do not realign fork inner pipes in local workshops.
5.	Brake disc.	By dial gauge & magnetic stand. 	Brake disc run out beyond service limit.	Brake disc bend.	**Possible Error :** • Accident damage. • Disc mounting bolts not tightened in criss-cross sequence. • Disc mounting bolts not tightened using torque wrench **Effect of Error :** Front wheel jam	• Always check brake disc for run out. Ensure it is within service limit. • Always tighten disc mounting bolts with a torque wrench in criss-cross manner. 	

Brake Disc Runout (in mm)

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Runout	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0.15	0.15	0.15	0.15	0.15
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Runout	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Not Applicable			

Braking Efficiency Less
(Spongy Brake - Disc Brake System)

Content **Page No.**

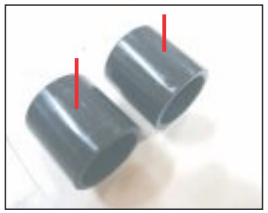
- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Brake fluid level top up • Air bleeding.	120 123
2.	Training Notes	---	---
3.	Service Circular	---	---

Braking Efficiency Less (Spongy Brake - Disc Brake System)

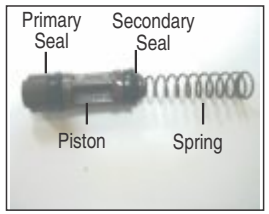
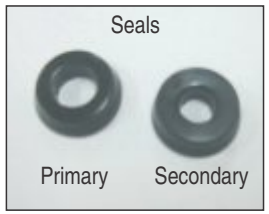
What to Check	How to Check	Symptoms observations	What is the most likely cause
Spongy brake.	Press brake lever & check braking efficiency / effect.	Front brake lever touching to hand grip, still vehicle is not stopping.	1. Low brake fluid level in master cylinder. 2. Air entrapped in brake fluid. 3. Master cylinder vent holes clogged. 4. Brake fluid leakage through caliper assembly. 5. Brake fluid leakage through master cylinder. 6. Master cylinder seals deformed. 7. Disc pad glazed / soaked. 8. Disc pad wear. 9. Brake disc wear. 10. Piston master cylinder movement jammed in master cylinder bore. 11. Burr at aperture hole (Dia-0.7 mm). 12. Actuator pin height variation. 13. Holder plate pin perpendicularity not OK. 14. MIL / ABS icon continuously glowing ON.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Brake fluid level in master cylinder.	Visual inspection. 	Brake fluid level below Min. mark.	• Brake fluid leakage through brake hose / copper washer.  • Brake fluid level not topped up during periodic service. • Brake fluid leakage due to casting porosity.	• Brake hose fouling / rubbing if any is ignored. • During repair, copper washers of brake hose not replaced. • Brake fluid level not topped up during periodic service.	• Always check & top up brake fluid level in periodic service. Refer SOP. • Always replace copper washers whenever brake hose is removed / refitted. 	
2.	Air entrapped in brake fluid.	Carry out air bleeding. Refer SOP. 	Spongy brake.	Low brake fluid level in master cylinder due to brake fluid leakage. 	Air bleeding activity not carried out as per SOP.	Adhere to SOP of air bleeding.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Master cylinder vent holes.	Visual inspection.  Vent holes dust free	Vent holes clogged.	Dust accumulation in master cylinder vent holes.  vent holes clogged	Master cylinder vent holes cleaning not done during repair.	Always ensure master cylinder vent hole are not clogged.	
4.	Brake fluid leakage through caliper assembly.	Visual inspection. 	• Brake fluid leakage. • Brake fluid level low in master cylinder.	• Scoring mark on caliper piston.  • Bleeder nipple loose. 	• Caliper piston not checked during repair / periodic service. • During repair bleeder nipple loose if any is ignored. • During repairs deformed piston seal & dust seal not replaced. • Caliper end banjo bolt loose ignored during repair. • Caliper end copper washer not replaced during repair / periodic service.	• Always ensure bleeder nipple tightness. • Always replace piston seal & dust seal if found deformed. • Always ensure banjo bolt tightness. • Always replace caliper end copper washer if found deformed.	

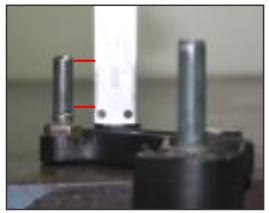
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
				• Caliper piston seal & dust seal deformed.  • Caliper end banjo bolt loose.  • Copper washer at caliper end deformed. 		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Brake fluid leakage through master cylinder.	Visual inspection.	• Brake fluid leakage through master cylinder. • Brake fluid level low in master cylinder.	• Phillips head screws of master cylinder reservoir cover loose.  • Copper washer at master cylinder end deformed.  • Brake fluid leakage through inspection window. 	• During repair looseness of phillips head screws ignored. • Deformed copper washer at master cylinder end not replaced. • Brake fluid level inspection window damaged 'O' ring / locking clip is ignored.	• Always ensure tightness of phillips head screws of master cylinder reservoir cover. • Always replace copper washer at master cylinder end whenever brake hose is removed / refitted. • Always replace brake fluid level inspection window 'O' ring / locking clip if found damaged.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Master cylinder seals.	Visual inspection after opening master cylinder cover. 	Master cylinder seals deformed, lips cut.	Master cylinder seals worn out. 	**Possible Errors :** AP / Diesel / Kerosene applied to seals during overhaul. **Effects of Errors :** Swelling of rubber components resulting in brake jammed / oil leakage.	Apply silicon grease to seals while assembling.	Never use Diesel or Kerosene for overhauling.
7.	Disc pad.	Visual inspection. 	Brake pads glazed.	• Pads water soaked during vehicle washing. • Pads in contact with grease / oil. • Driving with pedal / lever partly pressed causing glazed pads.	**Possible Errors :** Brake pads not checked & cleaned in periodic service. **Effects of Error :** Braking efficiency is less.	• Always adhere to PM schedule of parts replacement. • Check & clean brake pads in every service. • Educate customer about adverse effects of driving with brake pedal pressed. • After water wash remove water / moisture from brake pads by applying brake 4~5 times.	Do not apply pressurized water on brake pads during vehicle washing.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
8.	Disc pad wear	Visual inspection of pad wear indicator groove on disc pad. 	Brake pad worn out. Groove (wear indicator) not visible.	Excessive wear of brake pads.  Wear indicator not visible	**Possible Errors :** Brake pads not checked & cleaned in periodic service. **Effects of Error :** Braking efficiency is less.	Replace pads as per PM schedule.	Don't use brake pads if wear indicator is not visible. This will lead to scoring marks on disc & noisy operation of front brake.
9.	Brake disc.	Vernier caliper. 	Brake disc thickness less than specification.	Brake disc worn out.	**Possible Errors :** Disc not checked for wear. **Effects of Error :** Braking efficiency is less.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
10.	Piston master cylinder movement in master cylinder bore.	By pressing / releasing front brake lever. 	Sticky / jammed movement of piston master cylinder.	Dust / burr entry in master cylinder.	Damaged protection boot on master cylinder actuator ignored.	Always check protection boot on master cylinder actuator pin for intactness & fitment.	
11.	Aperture hole.	Visual inspection in sunlight / torch light. 	Aperture hole blocked.	Aperture hole blocked by burr in brake fluid.	Manufacturing error at vendor end.	Remove burr by passing compressed air.	
12.	Actuator pin height.	Comparing with new pin available in spare stock. 	Actuator pin height less.	Wrong part (dimensional variation) fitted on vehicle.	Manufacturing error at vendor end.	Confirm correct size of actuator pin.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Holder plate pin perpendicularity.	Visual inspection by keeping holder plate on surface plate or by keeping vernier edge on holder plate. 	Holder plate pin perpendicularity not OK.	Wrong part (dimensional variation) fitted on vehicle.	Manufacturing error at vendor end.		
14.	MIL / ABS icon continuously glowing ON.	Please refer Electrical Chapter for MIL / ABS Indication					

Precautions in handling rear disc brake system : Models Pulsar 180, 220, 200 NS, RS 200, AS 200 & Dominar 400.

The rear brake pedal free play of these models is fixed (Factory set) & do not require any adjustment.

As shown in the photograph, after performance testing of master cylinder assembly, push rod position is locked by lock nut & permanent color marking is done.

In field push rod length should not to be disturbed by adjusting lock nut. Push rod length disturbance will lead to rear wheel jam & vehicle breakdown situation.

Front Suspension Noise

Content **Page No.**

- Reference for SOP.

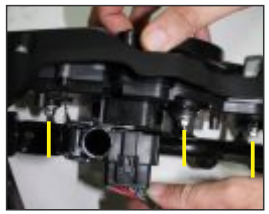
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	• Steering play adjustment. • Front fork oil replacement	239 187
2.	Training Notes	---	---
3.	Service Circular	---	---

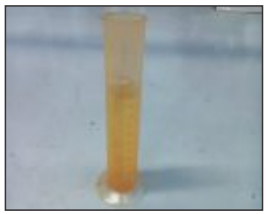
Front Suspension Noise

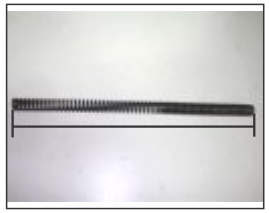
What to Check	How to Check	Symptoms observations	What is the most likely cause
Front suspension noise confirmation	• Drive the vehicle for 3~4 Kms. on plain, bumpy, rough roads to understand the problem. • Confirm noise by removing front fender.	Noise from front side of vehicle.	1. Steering play excess. 2. Front fork top & side bolts loose. 3. Lamp shade mounting bolts loose. 4. Lamp shade cushion rubber cracked / deformed. 5. Front fender mounting bolts loose. 6. Speedometer mounting nuts loose. 7. Fork oil quantity less. 8. Fork spring fitment up side down. 9. Fork spring free length not as per specification. 10. Steering race loose in chassis tube. 11. Antifriction bush fitment.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Steering play	• Put vehicle on centre stand & hold the vehicle firmly from rear side (Ensure rear tyre is on ground & front tyre in air) • Hold front fork outer tube at both sides and make to & fro movement to find steering play. 	Steering play more	Steering slotted ring nut not tightened by special tool. 	**Possible Errors :** Steering slotted ring nut not tightened as per recommended torque & SOP. **Effects of Error :** Steering play excess resulting in front suspension noise	Refer SOP.	Do not tighten steering nut without loosening fork top/ side bolts otherwise fork upper holder bracket would get bent.
2.	Front fork top & side bolts	Check torque value by torque wrench.  	Front fork top & side bolts torque values less than specifications.	Front fork top & side bolts not tightened to specified torque.  	**Possible Errors :** Tightening torque of front fork top & side bolts not confirmed during periodic service. **Effects of Error :** Front suspension noise.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Lamp shade mounting bolts.	Check lamp shade mounting bolts tightness. 	Lamp shade mounting bolts not fully tightened.	Lamp shade mounting bolts loose.	**Possible Errors :** Lamp shade mounting bolts tightness not confirmed in case of front fork noise issue. **Effects of Error :** Front fork noise.		
4.	Lamp shade cushion rubber.	Visually. 	Lamp shade cushion rubber deformed / cracked.	Ageing effect. 	**Possible Errors :** Lamp shade cushion rubber inspection ignored. **Effects of Error :** Front fork noise.	Always replace deformed / cracked cushioning rubber grommet.	
			Fairing mounting bracket rubber grommet ID increased / cracked	Ageing effect.	**Possible Errors :** Fairing mounting cushion rubber inspection ignored. **Effects of Error :** Fairing rattling noise.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Front fender mounting bolts	Check Front fender mounting bolts torque values by torque wrench. 	Front fender mounting bolts loose.	Front fender mounting bolts not tightened to specified torque. 	**Possible Errors :** Front fender bolt torque values not confirmed during periodic service. **Effects of Error :** Front fork noise.	Ensure front fender bolts torque values.	
6.	Speedometer mounting nuts	Speedometer mounting nuts tightness by spanner. 	Speedometer mounting nuts loose.	Speedometer mounting nuts not tightened fully	**Possible Errors :** **Effects of Error :** Rattling noise.	Ensure speedometer mounting nuts tightened as per torque specification.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Fork oil quantity	By draining front fork oil in calibrated measuring jar. 	Front fork oil drain quantity less than specification.	• Oil leakage.  • Earlier oil quantity filled less. 	**Possible Errors :** • Oil leakage ignored. • As per P.M schedule front fork oil not replaced & refill qty less than specifications. **Effects of Error :** Front fork noise due to less oil.	Always use BAL recommended front fork oil as per PM schedule. Refer SOP.	
8.	Fork spring fitment	By dismantling front fork. 	Spring reverse fitment (closed coils upwards)	Assembly error. 	**Possible Errors :** Spring fitment wrong - upside down, not noticed by technician. **Effects of Error :** Front fork noise.	Ensure spring closed coils facing downwards (wheel side) 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
9.	Fork spring free length	Take out fork spring & measure free length by measuring scale. 	Fork spring free length is not within specification.	Fork spring set & different model spring used.	**Possible Errors :** Fork spring free length not measured during repairs. **Effects of Error :** Front fork noise.		

Fork Spring Free Length

SN	Parameters	CT100 / CT100B	Platina 100ES	Discover 100	Discover 125	Discover 100T	Discover 125ST	Discover 125T	Discover 150	V15	Pulsar 135	Pulsar 150	Pulsar 180
1	Free length	Data N/A	Data N/A	448 - 456	448 - 456	448 - 456	448 - 456	448 - 456	388.5 - 396.5	345	398.50	398.50	373.00
SN	**Parameters**	**Pulsar 200NS**	**Pulsar 200RS**	**Pulsar 200AS**	**Pulsar 150AS**	**Pulsar 220**	**Avenger 150**	**Avenger 220**	**Dominar 400**	**V12**			
1	Free length	Data N/A	Data N/A	Data N/A	436.00	373.00	398.5	398.5	751	428 - 432			

10.	Steering race fitment in chassis tube.	Visual inspection & also by doing tapping by mallet.  **Note :-** Models with plastic cap design - special nut is not to be rotated in anticlockwise direction.	Steering race loose fitment in chassis.	Chassis steering tube dia over size or bearing race under size.	**Possible Errors :** Bearing race fitment in chassis not inspected. **Effects of Error :** Front fork noise.	Always use special tool for the fitment of steering cone & confirm firm fitment.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
11.	Antifriction bush fitment.	By dismantling front fork 	Antifriction bush not fitted.	Assembly error.	**Possible Errors :** While assembling front fork, antifriction bush fitment missed out. **Effects of Error :** Front fork noise.		

Rear Suspension Noise

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	-	-
2.	Training Notes	-	-
3.	Service Circular	-	-

Rear Suspension Noise

What to Check	How to Check	Symptoms observations	What is the most likely cause
Rear suspension noise confirmation	Drive the vehicle for 1~2 Kms. on plain, bumpy, rough roads to understand the problem.	Noise from rear side of vehicle	1. Fitment of local make accessories. 2. Fouling of saree guard with RSA lower eyelet nut. 3. Hitting of main stand to chain case / hitting of main stand to road bumps. 4. RSA upper & lower dome nuts loose. 5. Rear shock absorber spring fouling to chain case, spring tension weak & bent spring rubbing against shock absorber body. 6. RSA weak / oil leakage through RSA. 7. Swing arm bush / bearing noise.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Fitment of local make accessories.	Visual inspection. e.g. bracket for milk can, news paper stack etc is fouling with body parts & creating noise.  	Noise from rear side.	Fitment of additional accessories fouling with body parts while rear shock absorber movement.	**Possible Errors :** At time of new vehicle delivery adverse effect of local make accessories & BAL Warranty policy was not explained to customer by dealer. **Effects of Error :** Noise from rear side.	Advise customer to remove additional accessories.	
2.	Fouling of saree guard with RSA lower eyelet nut.	Visually check gap between saree guard & RSA lower eyelet nut. 	Saree guard touching to lower eyelet nut.	Misalignment of saree guard or vehicle met with an accident.	**Possible Errors :** Observation & repair skipped. **Effects of Error :** Noise from rear side.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Hitting of main stand to chain case.	Remove vehicle from center stand, release stand from ground level & check hitting noise or drive vehicle on rough road.  Stand stopper damper rubber.	Hitting noise on rough road.	• Stand stopper damper rubber worn out / missing.  • Main stand bend / misaligned.	**Possible Errors :** Repairs skipped as problem was not diagnosed by service adviser by taking test drive. **Effects of Error :** Noise from rear side.		
4.	RSA upper & lower dome nuts	Check torque values using torque wrench. 	RSA mounting dome nuts torque values less than specification.	Manual error- RSA dome nuts not tightened to specified torque.	**Possible Errors :** Torque value not confirmed in periodic service. **Effects of Error :** Rear suspension noise.		

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Rear shock absorber spring fouling to chain case.	• Visual inspection of RSA spring fouling to chain case. 	• RSA spring fouling to chain case.	• Chain case bent / both half not fitted properly. • Swing arm bracket for chain case mounting bend. • RSA bent.	**Possible Errors :** - **Effects of Error :** -	• Rectify fouling problem if noticed.	
		• Drive vehicle on rough road or through pot holes.	• Direct jerks to rider / pillion rider.	• Spring tension weak.		• Replace RSA.	
		• Water wash the RSA, hold the grab handle and do pumping or drive vehicle on rough road with pillion rider.	• Spring rubbing noise.	• Spring bent.		• Replace RSA.	
6.	Rear shock absorber.	Visually-wipe out oil by clean cotton cloth & test drive vehicle on rough road for confirmation of oil leakage from RSA. 	Oil leakage.	Oil seal damaged.	**Possible Errors :** - **Effects of Error :** -	• If oil leakage is noticed replace rear suspension. • In case shock absorber noise is confirmed then replace RSA one after other to find out defective RSA out of two numbers.	• Never repair RSA for oil leakage. • Do not replace RSA in pair.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Swing arm bush / bearing.	Remove vehicle from center stand / side stand, hold the grab handle and do pumping or drive vehicle on rough road with pillion rider. 	Swishing or creaking noise from swing arm bush / bearing.	Swing arm bush / needle bearing running dry due to lack of lubrication. 	**Possible Errors :** Swing arm lubrication activity not done as per P.M schedule. **Effects of Error :** Swishing or creaking noise from swing arm.		

Chapter III : Electrical

Battery Getting Discharged

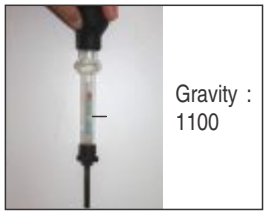
Content **Page No.**

- Reference for SOP.

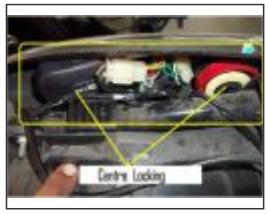
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	---	---
2.	Training Notes	---	---
3.	Service Circular	---	---

Battery Getting Discharged

What to Check	How to Check	Symptoms observations	What is the most likely cause
Battery charge condition.	By 'Battery tester. Refer SOP. By multimeter & hydrometer.	Battery tester LED Indication • Green & Yellow color : Battery partially discharged. • Yellow color : Battery discharged • Red color : Battery deep discharged. Battery open circuit terminal voltage less than 12.0 V & specific gravity less than 1.240 (not applicable to VRLA battery).	1. Electrolyte level below Min level mark. 2. Low specific gravity of electrolyte. 3. Less running / vehicle idle for long time. 4. Higher wattage bulb fitted in head light assembly. 5. Additional DC load on vehicle (additional electrical accessories fitted). 6. Front / rear brake switch sticky / jam / short. 7. Excess current drawn by horn. 8. Excess current drawn by starter motor. 9. Wrong battery charging method. 10. Adding acid in battery. 11. Battery terminal connection loose. 12. Loose coupler connections of battery charging circuit. 13. Electrolyte leakage from battery. 14. Battery charging circuit malfunctioning.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Electrolyte level.	Visually by keeping battery on plain surface. 	Electrolyte level low i.e. below Min mark.	Electrolyte level not topped up during periodic Service.	**Possible Errors :** **Effects of Error :**	• Top up battery level by distilled water only.  • Maintain electrolyte level between Min & Max marks. 	Never use tap water & concentrated acid for top up as it will shorten battery life. 
2.	Specific gravity of electrolyte.	By hydrometer after removal of battery from vehicle. 	Specific gravity less than specification (1.240 in all 6 cells) causing frequent discharging of battery.	Cell weak or partially dead. 	**Possible Errors:** Specific gravity checking in periodic service is skipped. Charging current & voltage not confirmed. **Effects of Errors:** Battery getting discharged.	Top up electrolyte level by distilled water & charge battery for 8 hours and confirm specific gravity in all 6 cells after every 2 hours. 	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Running / vehicle idle for long time.	By discussing with customer.	Vehicle running very less & mainly driven in crowded area with frequent use of horn, brake light & self starter.	Vehicle use occassionally & in crowded area.	**Possible Errors :** Battery self drain. **Effects of Errors :** Battery will not get charged on vehicle. Such battery will further drain by frequent braking & self start.	Explain customer about adverse effects of keeping vehicle idle more than 8 days.	
4.	Higher wattage bulb fitted in head light assembly.	Visually 	Head lamp bulb wattage higher than specification.	Higher wattage bulb fitted by customer for brighter illumination. 	**Possible Errors :** At the time of new vehicle delivery adverse effect of local make electrical accessories & BAL Warranty policy was not explained to customer by dealer. **Effects of Error :** Battery getting discharged frequently.	Ensure BAL specified head lamp is fitted in the vehicle.	Do not fit higher wattage bulb in head lamp as it will result in faster discharging of battery.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Additional DC load on vehicle (additional electrical accessories fitted).	• Bigger horn.  • Higher wattage head lamp bulb.  • Remote operated ignition lock.  • Beeper. 	Battery getting discharged frequently.	Lack of awareness.	**Possible Errors :** At the time of new vehicle delivery adverse effect of local make electrical accessories & BAL Warranty policy was not explained to customer by dealer. **Effects of Error :** Battery getting discharged frequently.	Take consent of customer & remove additional electrical accessories from vehicle.	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>6.</td><td>Front / rear brake switch.</td><td>By operating front brake lever / rear brake pedal.
 
  </td><td>Rear brake bulb glowing without application of front brake lever / rear brake pedal</td><td>Either front brake or rear brake switch jam / sticky.
 
  </td><td>Possible Errors :
• Front & rear brake switch operation not checked during service / repairs.
• Rubber boot of switches not checked for cut / damage during repairs.
Effects of Error :
Brake light continuously 'ON' leading to battery getting discharged frequently.</td><td>Always check & adjust front & rear brake switch operation during periodic service.
Replace elongated / bend rear brake switch spring as applicable.</td><td></td></tr>
</table>

Front brake switch	Brown	Blue	Continuity check by multimeter
Lever Pressed	●	●	Continuity is shown
Lever Released	●	●	No continuity

Rear brake switch	Brown	Blue	Continuity check by multimeter
Brake Pedal Pressed	●	●	Continuity is shown
Brake Pedal Released	●	●	No continuity

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Current drawn by horn.	By encircling clamp meter jaws in positive wire (Brown color) of horn & pressing horn button. 	Horn drawing more current than 2.2A	Horn setting wrong	**Possible Errors :** Horn setting done by disturbing horn mounting bracket nut. **Effects of Error :** More current drawn by horn causing discharging of battery.	Horn setting to be done only by adjusting screw given at back side of horn. 	
8.	Current drawn by starter motor.	By encircling clamp meter jaws in positive wire (Red color) of starter motor & pressing starter button. 	Starter motor drawing more current than specification.	Starter motor shaft jam.	**Possible Errors :** Water entry with dust in starter motor due to high pressure jet wash. **Effects of Error :** Starter motor noise & battery getting discharged.	Replace starter motor if shaft rotation found jam.	Do not apply pressurized water jet on starter motor during vehicle washing.

<table>
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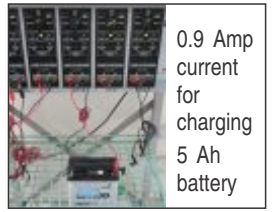
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>9.</td><td>Battery charging method.</td><td>Confirm availability & use of BAL recommended battery charger as per SOP.
 
  </td><td>Battery charging current setting wrong.
i.e battery of 5 Ah capacity charged either by 0.25 or 0.9 A in place of recommended 0.5A. (Applicable for flooded batteries).

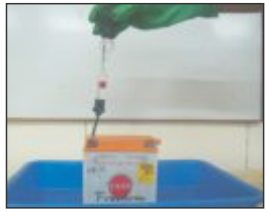
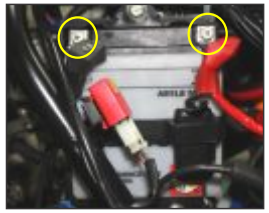
VRLA battery charging current setting wrong.</td><td>Lack of awareness.</td><td>Possible Errors :
Battery charging SOP not followed.

Effects of Error :
Battery getting discharged frequently.</td><td>Always charge battery with recommended charger & specified charging current only.</td><td>Never quick charge battery it will reduce life of battery permanently.
 
0.9 Amp current for charging 5 Ah battery

Never charge battery on constant voltage charger.

Never charge batteries by connecting in series.
  </td></tr>
</table>

Battery type	Battery capacity	Charging current
Flooded	2.5 Ah	0.25 Amp
	5 Ah	0.5 Amp
	7 Ah	0.7 Amp
	9 Ah	0.9 Amp
VRLA	3 & 4 Ah	2.0 Amp
	6 & 8 Ah	4.0 Amp

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
10.	Adding acid in battery.	Check specific gravity by hydrometer. 	Specific gravity more than specification causing frequent discharging of battery.	Sulfuric acid or battery grade electrolyte added in battery for topping up electrolyte level. 	**Possible Errors:** Lack of knowledge **Effects of Errors:** Battery getting discharged.		Never add acid / electrolyte in battery 
11.	Battery terminal connection.	Visual inspection. 	Battery terminal loose.	Battery terminal connection loose - thread slip / terminal crack due to over tightening.	**Possible Errors :** Over tightening battery terminal screw / bolt. Terminal broken due to hammering done for loosening terminal screw / bolt. Petroleum jelly not applied on terminals. **Effects of Error :** Battery getting discharged frequently.		Do not apply grease on battery terminals. 

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
12.	Coupler connections of battery charging circuit.	• Check the firm fitment of coupler joints and cable back out at stator to RR unit & RR unit to battery coupler connections by pulling with slight force.  • Earthing points tightness by ring spanner. Battery -ve terminal  RR mounting. 	Loose coupler joint. Loose earthing connections.	Coupler male female lock broken or male female joint not locked. Earthing connection bolt tightness not checked during servicing. 	**Possible Errors :** Broken coupler lock condition ignored. **Effects of Error :** Battery getting discharged.	Coupler back out wires to be locked properly and tightness to be ensured by pulling wires with little force.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Electrolyte leakage from battery.	Visual inspection.  Leakage through joint of casing & lid.	Battery casing cracked. Electrolyte level above MAX marks & overflow pipe routing not as per standard or not fitted. Leakage through joint of casing & lid.	Handling damage.  Manual error. Manufacturing defect.	**Possible Errors:** Cracked battery casing ignored during repairs, Mishandling of battery while servicing. **Effect of Error:** Electrolyte leakage resulting in battery discharge. Overflow of electrolyte in absence of overflow pipe damages surrounding parts.	Always replace battery if casing is found damaged.  Casing cracked due to handling damage	Do not repair battery locally for leakage.
14.	Battery charging circuit	Check RR unit output voltage as per SOP.  	Battery charging voltage is less than specifications. • Standard value 14.3 to 14.7 V DC @ 4500 RPM	• RR Unit defective. • Battery not fully charged. • Battery charging coil partially short. • Terminal backout in stator plate / RR unit coupler. 	-	Ensure battery is fully charged (battery tester showing green LED) while checking RR unit output voltage.	-

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td></td><td></td><td>Check charged condition of battery.
  </td><td>Battery not fully charged.</td><td>Battery partially discharged due to usage.</td><td rowspan="3">Possible Errors:
• Battery charge condition not checked while checking RR unit output voltage.
• Battery checked by multimeter.

Effect of Error:
• Wrong diagnosis.</td><td rowspan="3">Always check battery charge condition using midtronics battery tester
  </td><td rowspan="3"></td></tr>
<tr><td></td><td></td><td>Check battery charging coil.
  </td><td>Battery charging coil resistance not as per specification.</td><td>Battery charging coil partially short.</td></tr>
<tr><td></td><td></td><td>Check wiring harness coupler connections by hand feel
  </td><td>Coupler connections loose/ terminal back out.</td><td>Coupler connections not done.
Terminal back out not checked.
  </td><td>Possible Error :
Coupler connections loose / terminal back out from coupler not checked during diagnosis.

Effect of Error :
Engine not starting</td></tr>
</table>

Meter Range	Connections		Standard Value
200 Ohms	Meter +ve	Meter -ve	0.4 ~ 0.9
	Blue / White	Blue / White	

Fuse Blowing Frequently

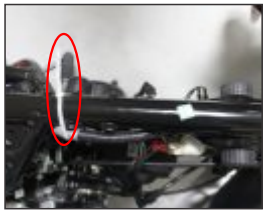
Content **Page No.**

- Reference for SOP.

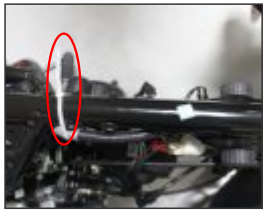
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	-	-
2.	Training Notes	-	-
3.	Service Circular	-	-

Fuse Blowing Frequently

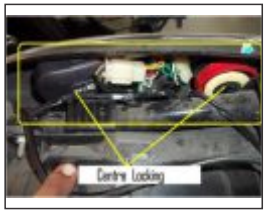
What to Check	How to Check	Symptoms observations	What is the most likely cause
Fuse & wiring harness.	Visual inspection.	Fuse blowing off frequently.	1. Pinching of wiring harness 2. Lower capacity fuse fitted. 3. Wiring insulation cut. 4. Additional electrical accessories fitted. 5. Electrical DC component short circuited internally. 6. Battery acid spillage - Falling of battery acid on wiring harness.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Pinching of wiring harness.	Visual inspection. Pinching locations - • Steering under arm bracket.  • Chassis stopper.  • Below fuel tank.  • Below seat.  	Fuse blowing off frequently due to pinching of wiring harness.	Wiring harness pinching ignored during repairs.	**Possible Errors :** • Wiring harness routing not checked as per PM schedule. • Wiring harness holding clamps / tie band / bellows not checked for its firmness. **Effects of Error :** Fuse blowing off frequently.	• Always ensure wiring harness routing as per standard. • Ensure wiring harness is routed through clamps & not getting pinched.	

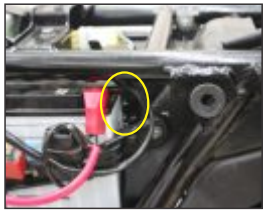
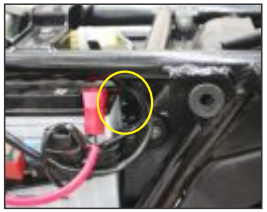
Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		• On handle bar. • Fork top bracket & fairing.  **Note :-** Ensure wiring harness firm fitment by ensuring recommended cable tie band at specified position as per model on chassis & headlight fairing area					
2.	Fuse capacity.	Visual inspection.  	Lower capacity fuse fitted resulting in fuse blowing off frequently.	Main circuit & lighting circuit fuse not checked for specified rating.	**Possible Errors :** Fitment of lower rating fuse ignored. **Effects of Error :** Fuse blowing off frequently.	Use specified rating fuse only.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
3.	Wiring insulation.	Visual inspection. Locations - • On fairing bracket.  • On chassis below fuel tank.  • Below fuel tank. 	Wire insulation cut & strands getting earthed with body parts.	Wiring harness fouling / rubbing ignored during repairs.	**Possible Errors :** • Wiring harness routing not checked as per PM schedule for standard routing. • Wiring harness holding clamps / tie band / bellows not checked for its firmness. **Effects of Error :** Fuse blowing off frequently.	Always check wiring strands for cut / damage. If found apply tape of electrical grade. Replace damage/broken tie bands. Remove welding spatters, sharp edges of fabricated components.	Do not add accessories by cutting wiring harness midway.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
		• On chassis below seat.  • Near rear brake switch  • On handle bar. • Steering tube. 					

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
4.	Additional electrical accessories fitted.	Visual inspection.    • Remote operated ignition lock. 	Due to cutting of wiring harness midway, wire strands exposed & got earthed to body parts resulting in fuse blowing off.	Customer unaware about the adverse effects of the fitment of additional electrical accessories.	**Possible Errors :** At time of new vehicle delivery adverse effect of local make electrical accessories & BAL Warranty policy was not explained to customer by dealer. **Effects of Error :** Fuse blowing off frequently, battery getting discharged	Do tapping of wiring strands if found exposed.	Do not add accessories by cutting wiring harness midway.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Electrical DC component.	• First disconnect all electrical components. • Confirm fuse rating specifications. • Connect battery terminal to battery. • Connect ignition switch & keep it ON. • Connect voltage regulator. • Connect DC operated electrical components one after another & confirm it's function & ensure fuse is not blowing.	Fuse blowing off after connection of a particular part.	Fuse replaced without electrical components checking.	**Possible Errors :** Electrical components not checked for smooth functioning. **Effects of Error :** Fuse blowing off frequently.	Always replace electrical components if found malfunctioning or short internally.	

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
6.	Battery acid spillage-falling of battery acid on wiring harness.	Visual inspection - Electrolyte level.  Overflow tube fitment & routing. 	Excess electrolyte filled up to lid level & battery over flow tube not fitted or wrongly routed leading to spillage of battery acid on wiring harness leading to burning of wiring harness.	Excess electrolyte filled up to lid level in battery.  Overflow tube not fitted / wrongly routed. 	**Possible Errors :** Excess electrolyte filled up to lid level in battery. Overflow tube not fitted or wrongly routed. **Effects of Error :** Wiring harness burnt due to spillage of battery acid on wiring harness & resulting in fuse blowing off due to short circuit.	• Always ensure electrolyte level in battery between Min & Max mark. • Always check battery over flow tube routing.	Do not top up electrolyte level of battery on the vehicle.

Vehicle Speed indication not showing correctly

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- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	-	-
2.	Training Notes	-	-
3.	Service Circular	-	-

Vehicle Speed indication not showing correctly

What to Check	How to Check	Symptoms observations	What is the most likely cause
Speed sensor.	By digital multimeter.	Speed / km reading not displayed correctly in speedometer console.	1. Wire dislocated / terminal back out from speed sensor coupler. 2. Speed sensor cable damaged due to fouling or rubbing. 3. Speed sensor defective. 4. Speedometer assembly defective.

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
1.	Wire dislocated / terminal back out from speed sensor coupler.	Visual inspection. 	Wire dislocated / terminal back out from speed sensor coupler..	Speed sensor cable coupler disconnected by pulling wires.	**Possible Errors :** **Effects of Error :** Speed / odo reading not displayed correctly in speedometer console.		Do not pull wires while disconnecting coupler connection of speed sensor cable. 
2.	Speed sensor cable.	Visual inspection. 	Speed sensor cable damaged due to fouling or rubbing.	Speed sensor cable routed wrongly. 	**Possible Errors :** Speedometer sensor cable routing not checked in periodic service. **Effects of Error :** Speed / odo reading not displayed correctly in speedometer console.	• Always check speed sensor cable for correct routing. • Replace speed sensor cable if found damaged.	

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>3.</td><td>Speed sensor.</td><td>Check speed sensor as per SOP.
  </td><td>Refer SOP as given below for diagnosis</td><td>If voltage readings are not within specification - internal electronic parts are short.</td><td>Possible Errors :
Speed sensor not checked as per SOP.

Effects of Error :</td><td rowspan="2">Always check speed sensor cable as per SOP before replacement.</td><td rowspan="2"></td></tr>
<tr><td colspan="6">SOP for checking wheel sensor :
1. Set multimeter to 20 V DC.
2. Connect multimeter to 4 pole coupler of wheel sensor as follows.
Multimeter +ve - Blue-White wire
Multimeter -ve - Black-Yellow wire
3. Switch ON ignition switch.
4. Rotate front wheel slowly, mark on tyre for identification & 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 very between 4~4.5 VDC & 0 VDC 8 times.
6. Conclusion -
<table><tr><td>Wheel sensor OK</td><td>If 8 times reading on multimeter varies between 4~4.5 VDC & 0 VDC in one rotation of front wheel.</td></tr><tr><td>Wheel sensor faulty</td><td>• If reading on multimeter remains continuously in the range of 4~4.5 VDC.
• If reading on multimeter remains continuously in the range of 0 VDC.</td></tr></table></td></tr>
<tr><td>4.</td><td>Speedometer assembly.</td><td>Visual inspection.</td><td>Speedometer assembly defective - manufacturing defect.</td><td>Internal electronic part short.</td><td>Possible Errors :

Effects of Error :</td><td>Replace speedometer.</td><td></td></tr>
</table>

MIL / ABS Indication ON

Content **Page No.**

- Reference for SOP.

Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	-	-
2.	Training Notes	-	-
3.	Service Circular	-	-

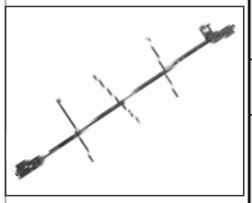
MIL / ABS Indication ON

What to Check	How to Check	Symptoms observations	What is the most likely cause
Error code displayed on diagnostic tool to understand defective component.	By connecting BOSCH diagnostic tool to wiring harness coupler provided for diagnostic tool.	BOSCH diagnostic tool displays defective component.	1. Wire / Terminal back out from pigtail of diagnostic tool. 2. Side stand switch / Wiring open / short. 3. Roll over sensor / Wiring open / short. 4. Oxygen sensor / Wiring open / short. 5. Front / Rear wheel sensor / Wiring open / short. 6. Coolant temperature sensor / Wiring open / short. 7. TMAP sensor / Wiring open / short 8. Crank angle sensor / Wiring open / short. 9. Throttle position sensor / Wiring open / short. 10. Fuel pump open / Fuel pump delivery less / Fuel pump pressure less. 11. Fuel injector / Wiring open / short. 12. Stepper motor / Wiring open / short. 13. ABS indication ON.

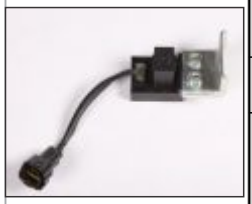
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>1.</td><td>Error code displayed on Diagnostic tool.</td><td>By connecting BOSCH Diagnostic tool to diagnostic tool coupler in wiring harness.</td><td>Error code no. & problem description will be displayed on Diagnostic tool.</td><td>Possibility of failure of Sensor or its wiring.</td><td>Possible error :
Pigtail wire broken while handling of diagnostic tool.

Effect of error :
Link error message will be displayed & diagnostic tool can not be used till further repairs.</td><td>• Diagnostic tool - Wiring harness joining coupler removal & fitment should be done as per SOP by pressing coupler locking pin.

• Handle diagnostic tool & its pigtail with care.</td><td>• Do not pull wires while removing diagnostic tool coupler.

• Avoid contact of oil, grease with diagnostic tool.</td></tr>
<tr><td>2.</td><td>Side stand switch.
  </td><td>Measurement of Input voltage & Output voltage (Side Stand released & operated condition) by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Magnet Position</th><th colspan="2">Wire connection</th><th rowspan="2">Std. Reading</th></tr><tr><th>Meter +ve</th><th>Meter - ve</th></tr><tr><td>1</td><td>Input voltage (Side stand position - any)</td><td>N.A.</td><td>Red/ Blue</td><td>Yellow/ Black</td><td>5 VDC</td></tr><tr><td rowspan="2">2</td><td>Output voltage (Side stand position - OFF)</td><td>Magnet in front of side stand switch</td><td>Pink</td><td>Yellow/ Black</td><td>2~2.2 VDC</td></tr><tr><td>Side stand position-ON</td><td>Magnet away from side stand switch</td><td>Pink</td><td>Yellow/ Black</td><td>4.8~4.9 VDC</td></tr></table></td><td>Input / Output voltage not as per specifications.</td><td>• Side stand switch defective.

• Side stand switch wiring disconnection .</td><td></td><td>Always check side stand switch cable as per SOP before replacement.</td><td>-</td></tr>
</table>

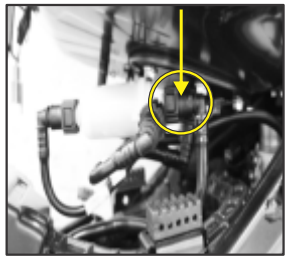
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>3.</td><td>Roll over sensor.
  </td><td>Measurement of Input voltage & Output voltage (Roll over sensor in straight & tilted condition-more than 60 deg.) by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Vehicle position</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Input voltage</td><td>NA</td><td>Red/ Blue</td><td>Yellow/ Black</td><td>5 VDC</td></tr><tr><td rowspan="2">2</td><td rowspan="2">Output voltage</td><td>Normal position</td><td>Brown/Green</td><td>Yellow/ Black</td><td>4.8~4.9 VDC</td></tr><tr><td>Tilled position (> 60°)</td><td>Brown/Green</td><td>Yellow/ Black</td><td>2~2.2 VDC</td></tr></table></td><td>Input / Output voltage not as per specifications.</td><td>• Roll over sensor defective.
• Roll over sensor wiring disconnection.</td><td></td><td>Always check roll over sensor as per SOP before replacement.</td><td></td></tr>
<tr><td>4.</td><td>Oxygen sensor.
  </td><td>• Measurement of resistance between pin no.1 & 2 by Multimeter.
• Continuity checking between pin nos. 3 & 4 by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Pin no. 1</td><td>Pin no. 2</td><td>Heater Resistance: 9 ± 1 Ohm @ 25°C</td></tr><tr><td>2</td><td>Pin no. 3</td><td>Pin no. 4</td><td>Meter displays 1 (Infinity) @ 25°C (open circuit)</td></tr></table></td><td>Displayed readings not as per Specifications.</td><td>• Oxygen sensor defective.
• Oxygen sensor wiring disconnection.</td><td></td><td>-</td><td>-</td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>5.</td><td>Wheel sensor front & Rear.</td><td>Check by using BOSCH diagnostic tool.</td><td>Error code no. & problem description will be displayed on Diagnostic tool.</td><td>• Front / Rear wheel sensor defective.
• Front / Rear wheel sensor wiring disconnection.</td><td>-</td><td>-</td><td>Do not use multimeter to check wheel sensor.</td></tr>
<tr><td>6.</td><td>Coolant temperature sensor.
  </td><td>• Measurement of resistance by Multimeter.
<table><tr><th>Meter Range</th><th colspan="2">Wire Connections</th><th colspan="2">Standard Value</th></tr><tr><th></th><th>Meter +ve</th><th>Meter –ve</th><th>Temperature in Degree Centigrade</th><th>Resistance in K Ohms</th></tr><tr><td rowspan="8">2 / 20 K Ohms</td><td rowspan="8">Coupler Pin 1</td><td rowspan="8">Coupler Pin 2</td><td>0</td><td>5.30~6.11</td></tr><tr><td>10</td><td>3.44~3.92</td></tr><tr><td>20</td><td>2.28~2.58</td></tr><tr><td>25</td><td>1.88~2.12</td></tr><tr><td>30</td><td>1.55~1.75</td></tr><tr><td>40</td><td>1.06~1.21</td></tr><tr><td>50</td><td>0.75~0.86</td></tr></table></td><td>Resistance values not as per specifications.</td><td>• Coolant temperature sensor defective.
• Coolant temp. sensor wiring disconnection.</td><td></td><td>-</td><td>-</td></tr>
</table>

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>7.</td><td>TMAP sensor.
  </td><td>• Measurement of resistance between pin no.1 & 2 by Multimeter.
• Measurement of input voltage & output voltage by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Meter Range</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Resistance</td><td>20 K Ohms</td><td>Pin no. 1</td><td>Pin no. 2</td><td>2 ± 0.5 K Ohms @ 25°C</td></tr><tr><td>2</td><td>Input voltage</td><td>20 VDC</td><td>Red/Blue</td><td>Yellow/Black</td><td>5 VDC</td></tr><tr><td>3</td><td>Output voltage</td><td>20 VDC</td><td>White/Red</td><td>Yellow/Black</td><td>3.8 ± 0.65 VDC</td></tr></table></td><td>Displayed readings not as per Specifications.</td><td>• TMAP sensor defective.
• TMAP sensor wiring disconnection.</td><td></td><td>-</td><td>-</td></tr>
<tr><td>8.</td><td>Crank angle sensor
  </td><td>• Measurement of resistance by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Component</th><th rowspan="2">meter range</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Value</th><th rowspan="2">Results</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Crank angle sensor</td><td>Resistance 2 K Ohms</td><td>White/ Red</td><td>Black/ Yellow</td><td>365 ± 20 Ohms</td><td>OK</td></tr><tr><td rowspan="2">2</td><td rowspan="2">Neutral switch</td><td rowspan="2">Continuity</td><td rowspan="2">Light Green</td><td rowspan="2">Black/ Yellow</td><td>Beep sound</td><td>Ok</td></tr><tr><td>No Beep sound</td><td>Defective</td></tr></table></td><td>Resistance values not as per specifications.</td><td>• Crank angle sensor defective.
• Crank angle sensor wiring disconnection.</td><td></td><td>-</td><td>-</td></tr>
</table>

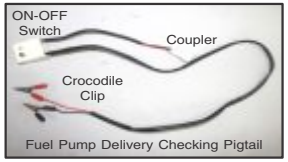
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>9.</td><td>Throttle position sensor.
  </td><td>• Measurement of resistance between pin no. 2 & 3 by Multimeter.
• Measurement of input voltage & output voltage (in POT & WOT position) by Multimeter.
<table><tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th></tr><tr><td>1</td><td>Input voltage</td><td>Red/Black</td><td>Black/Green</td><td>3.3 VDC</td></tr><tr><td>2</td><td>Output voltage idle throttle</td><td>Green/Yellow</td><td>Black/Green</td><td>0.35~0.65 VDC</td></tr><tr><td>3</td><td>Output voltage wide open throttle</td><td>Green/Yellow</td><td>Black/Green</td><td>2.9~3.0 VDC</td></tr><tr><td>4</td><td>Coil Resistance</td><td>Pin 2</td><td>Pin 3</td><td>1.6 ~ 2.4 KOhms</td></tr></table></td><td>Displayed readings not as per Specifications.</td><td>• TPS defective.
• TPS wiring disconnection</td><td></td><td>-</td><td>-</td></tr>
</table>

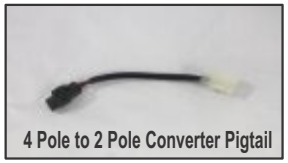
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>10.</td><td>Fuel pump.
  </td><td>• Checking of Fuel pump working by doing actuator test using BOSCH Diagnostic tool.

1) Check fuel pump pressure using fuel pump pressure checking tool.
 
  </td><td>• "Fuel pump running" sound not heard & BOSCH tool displays "Fuel pump not OK".

• Fuel pump pressure less than specifications.</td><td>Fuel pump / fuel tank cap / fuel pipe / inline fuel filter defective.

-</td><td>-</td><td colspan="2"><table><tr><th>Sr. No.</th><th>Model</th><th>Fuel pressure</th></tr><tr><td>1</td><td>Pulsar RS 200</td><td>2.4 - 2.8 Kg / Cm^2</td></tr><tr><td>2</td><td>Pulsar RS 200 BS IV, Dominar 400</td><td>3.1 - 3.6 Kg / Cm^2</td></tr></table>
If pressure is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel pressure once again.
<table><tr><th>Status</th><th>Conclusion</th></tr><tr><td rowspan="2">If pressure is not as per specs</td><td>• Check fuel tank cap air vent for blockage.</td></tr><tr><td>• Check & replace fuel pipe, inline fuel filter & fuel pump.</td></tr></table></td></tr>
</table>

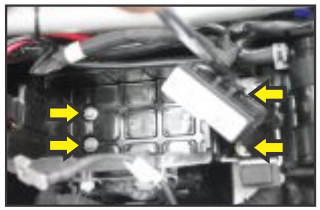
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td></td><td></td><td>2) Check free flow of fuel using fuel pump delivery checking pigtail .
 

Fuel Pump Delivery Checking Pigtail
 
4 Pole to 2 Pole Converter Pigtail
 
For SOP refer service station manual available on portal.
• Checking of Fuel pump working by doing actuator test using BOSCH Diagnostic tool.</td><td>Fuel free flow delivery less than specifications.
• Tick sound not heard & BOSCH tool displays "Fuel pump not OK".</td><td colspan="3"><table><tr><th>Sr. No.</th><th>Model</th><th>Fuel free flow per 10 sec. with new inline fuel filter</th></tr><tr><td>1</td><td>Pulsar RS 200</td><td>180 ± 10 ml minimum</td></tr><tr><td>2</td><td>Pulsar RS 200 BS IV, Dominar 400</td><td>220 ml minimum</td></tr></table>
If delivery is less than specs in fuel tank cap closed condition, open fuel tank cap and check fuel delivery once again.
<table><tr><th>Status</th><th>Conclusion</th></tr><tr><td>If delivery is as per specs</td><td>• Check fuel tank cap air vent for blockage</td></tr><tr><td>If delivery is not as per specs</td><td>• Check inline fuel filter for blockage.
• Replace fuel pump.</td></tr></table>
<table><tr><th>Meter Range</th><th colspan="2">Wire Connections</th><th>Continuity Check</th></tr><tr><td rowspan="2">200 Ohms</td><td>Meter +ve</td><td>Meter –ve</td><td rowspan="2">2.1 Ohms</td></tr><tr><td>Orange/Blue</td><td>Black/Yellow</td></tr></table></td><td></td><td></td></tr>
</table>

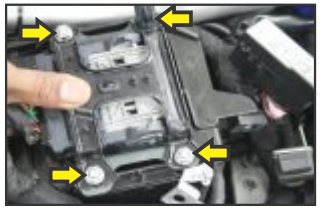
<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>11.</td><td>Fuel Injector
  </td><td>• Measurement of resistance by Multimeter.
• Checking of Fuel injector working by doing actuator test using BOSCH Diagnostic tool.</td><td>• Resistance values not as per specifications.
• Tick sound not heard & BOSCH tool displays "Fuel Injector not OK".</td><td>• Fuel Injector defective.
• Fuel Injector wiring disconnection.</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="8"><table>
<tr><th rowspan="2">Sr.No.</th><th rowspan="2">Parameter</th><th rowspan="2">Meter Range</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Reading</th></tr>
<tr><th>Meter +ve</th><th>Meter -ve</th></tr>
<tr><td>1</td><td>Resistance</td><td>200 Ohms</td><td>Pin no. 1</td><td>Pin no. 2</td><td>12 ± 0.6 Ohms @ 20°C</td></tr>
</table></td></tr>
<tr><td>12</td><td>Stepper motor.
  </td><td>• Measurement of resistance between pin no. 1 & 4 and 2 & 3 by Multimeter.
• Checking of stepper motor working by doing actuator test using BOSCH Diagnostic tool.</td><td>Displayed readings not as per Specifications.
• Tick sound not heard & BOSCH tool displays "stepper motor not OK".</td><td>• Stepper motor defective.
• Stepper motor wiring disconnection.</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="8"><table>
<tr><th rowspan="2">Sr.No.</th><th colspan="2">Wire Connections</th><th rowspan="2">Standard Value in Ohms</th></tr>
<tr><th>Meter +ve</th><th>Meter -ve</th></tr>
<tr><td rowspan="2">1</td><td>Pin no. 1</td><td>Pin no. 4</td><td rowspan="2">51 ±10%</td></tr>
<tr><td>2</td><td>Pin no. 2</td><td>Pin no. 3</td></tr>
</table></td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
13.	Glowing of ABS Indicator in speedo console. **Note :** ABS Indicator (Yellow) ((ABS)) : With Ignition switch ON the ABS indicator glows. When vehicle speed is more than 10 Km/hr the ABS indicator goes off, if this indicator glows while vehicle is running, it means there is problem in ABS unit.	Visual Inspection  Dominar 400 Secondary speedo	ABS Unit not functioning.	• ABS fuse blown off. • F9 fuse blown off from main fuse box. • Front & rear wheel sensor defective. • ABS unit defective. • ABS related wiring open / short. • Earth connection of ABS unit disconnected. 	-	-	-

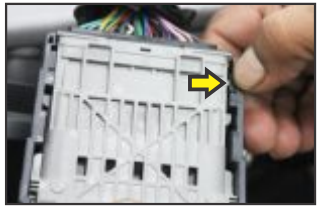
EPM 44 ECU REMOVAL



- Remove battery case mounting bolts (4 nos.) with 8 mm spanner.
- Lift battery case along with ECU as shown in photograph.



- Remove ECU mounting bracket nut (4 nos.) with 10 mm spanner & take out ECU mounting bracket.
- Remove battery case.

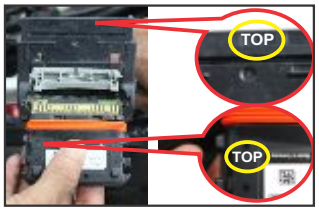


- Pull ECU lock as shown in photograph.

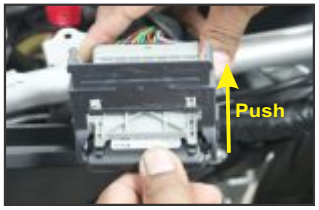
- Pull ECU lock as shown in photograph.
- Till it become perpendicular to gray part.

- Take out ECU.

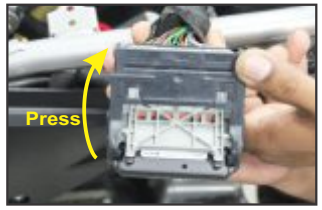
EPM 44 ECU FITMENT



- Ensure that coupler & ECU "Top" written face should be towards upside.

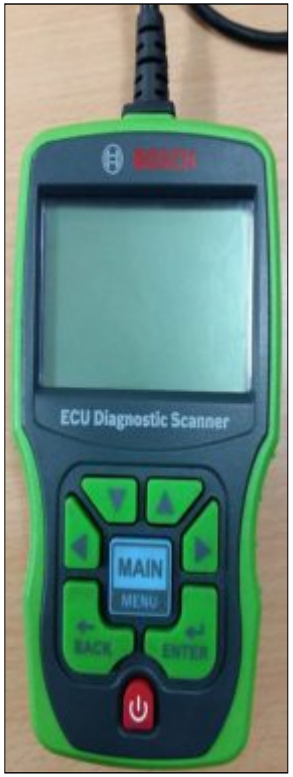


- Fit ECU in coupler completely & apply lock.



EPM 44 ECU FLASHING

Bosch Diagnostic Tool Updation



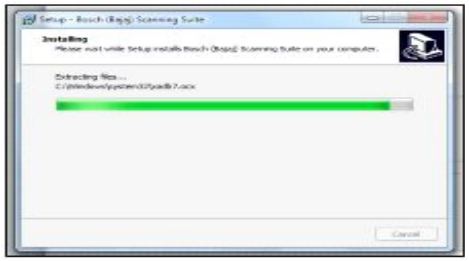
Bosch Diagnostic Tool

Bosch Diagnostic Tool Software Installation CD

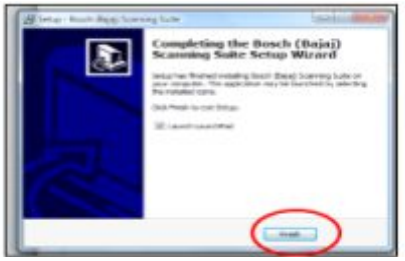
Step 1 :- Install the BOSCH Diagnostics Software CD (Provided along with tool) in PC or Laptop

1. Insert CD & select setup file

2. Click on OK



3



4. Click on Finish

After successful installation you will see two icon on Desktop

Icon 1

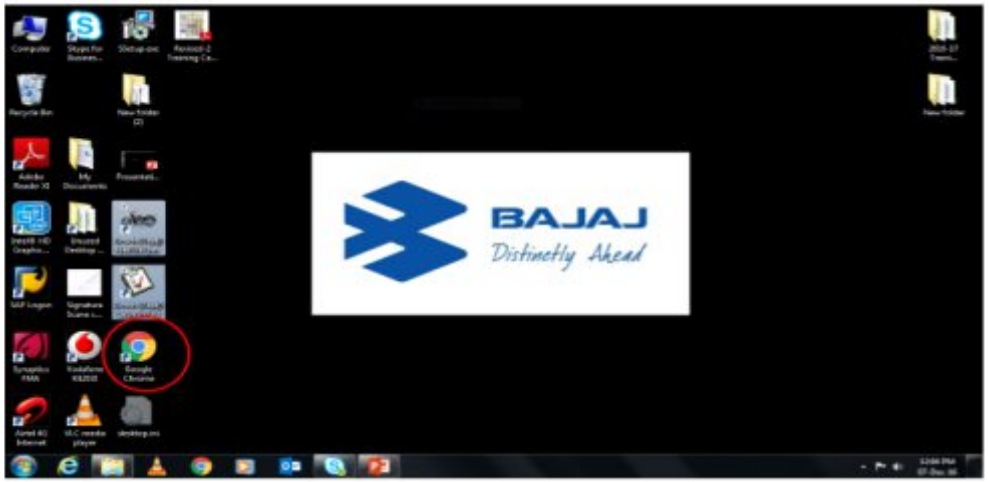
Icon 2

Icon 1 :- Bosch (Bajaj) HexFileSync :- For Unlocking tool after 150 times usage.

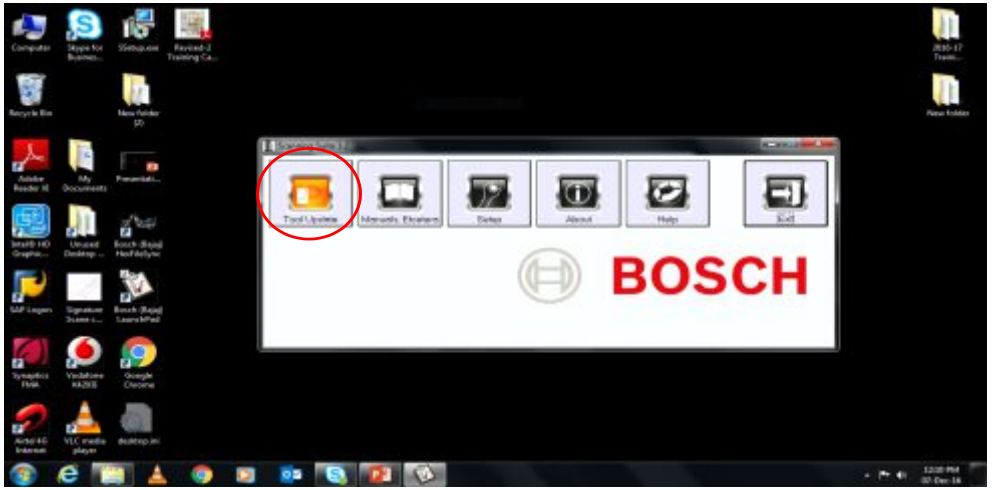
Icon 2 :- Bosch (Bajaj) LaunchPad : For updation of Tool software.

EPM 44 ECU FLASHING

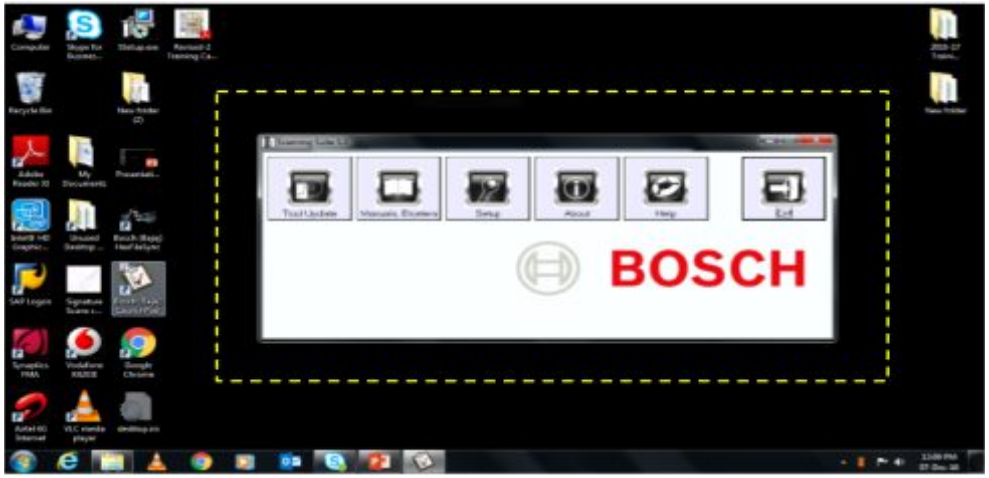
Step 2 :- Double Click on "Bosch (Bajaj) LaunchPad" icon



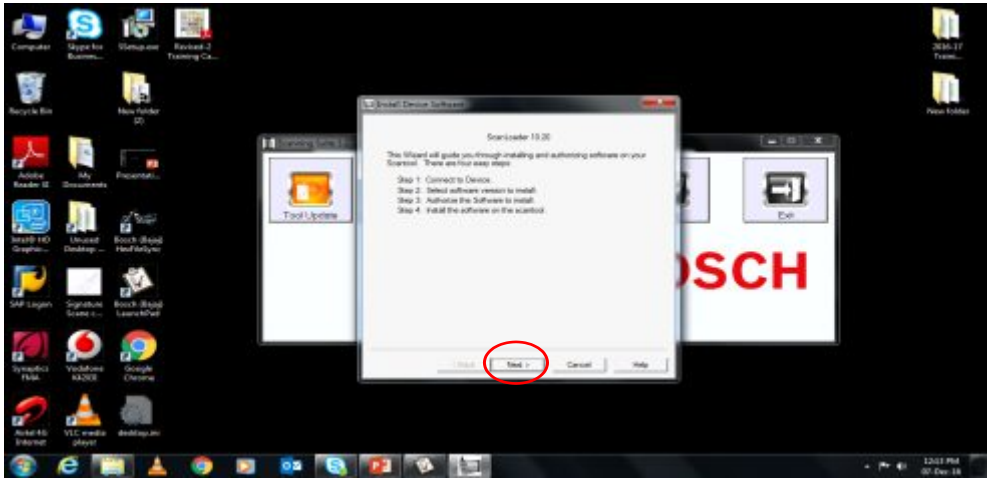
Step 3 : Double click on “Tool Update”



Scanning Suite 3.2 will appear on screen

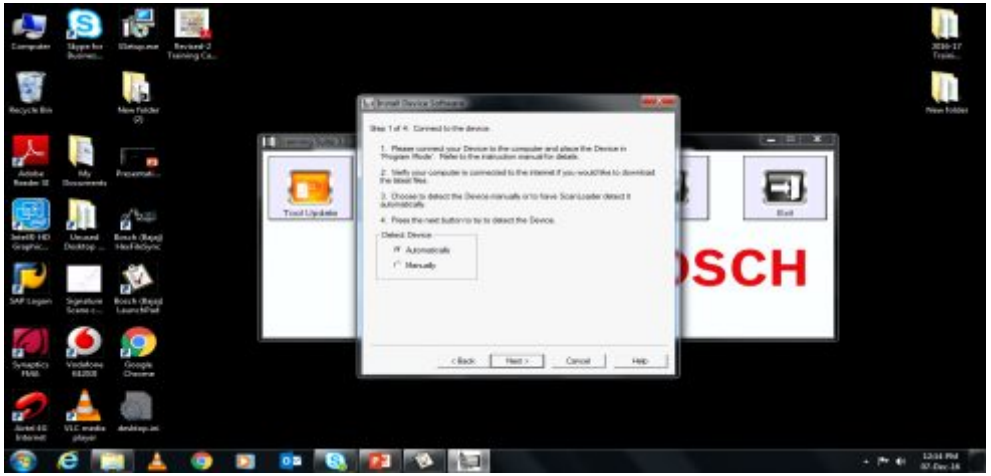


Step 4: Click on “Next”



EPM 44 ECU FLASHING

Step 5: Below screen will appear.

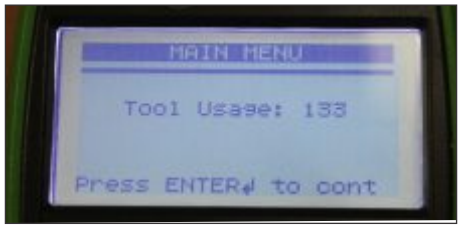


Follow the instructions 1 to 4 given on screen. *(Refer next slides)*

1. Connect the Bosch Diagnostic tool with PC/ Laptop by USB cable provided along with tool.

After connection above Message will appear on BOSCH tool screen.

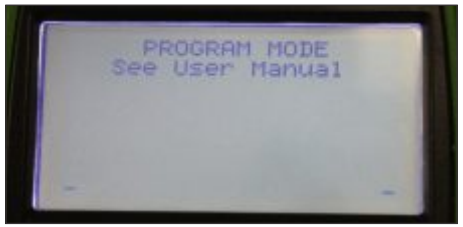
2. Place the device on "Program Mode"



1. Press Enter

2. Select System Setup by down arrow & press Enter.

3. Select Program Mode & press Enter



4. Above Text message will appear on tool screen.

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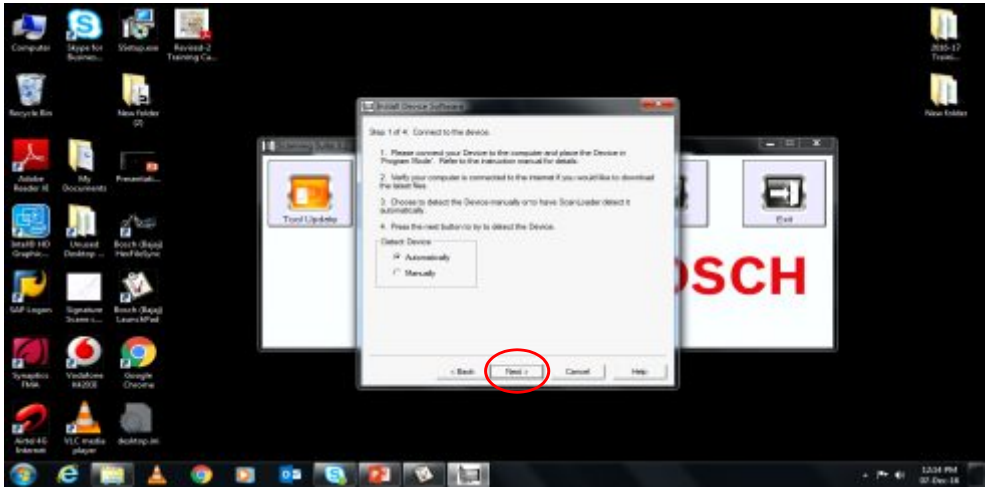
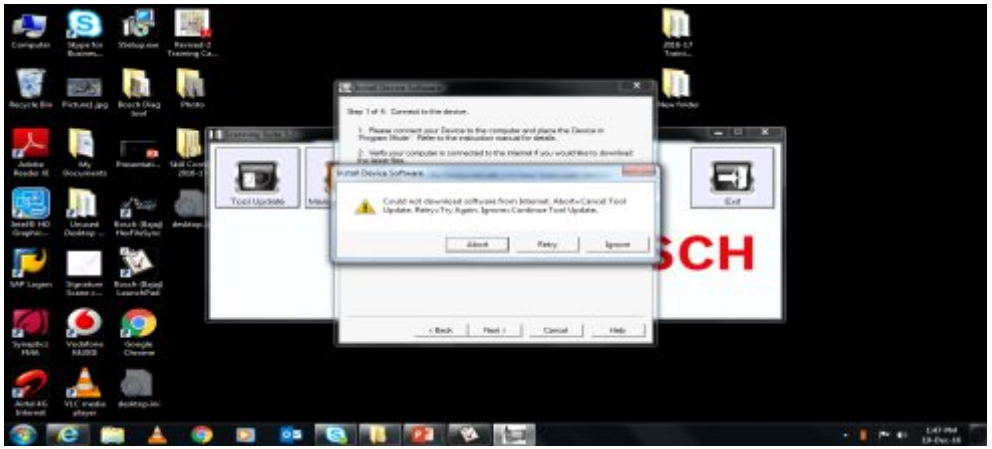
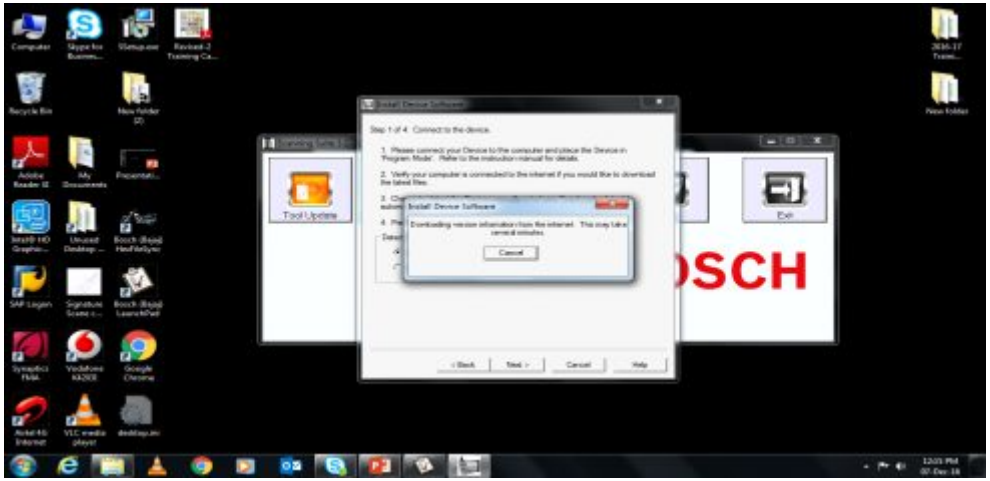
3 & 4. Ensure "Automatically" mode is selected and then Click on Next.



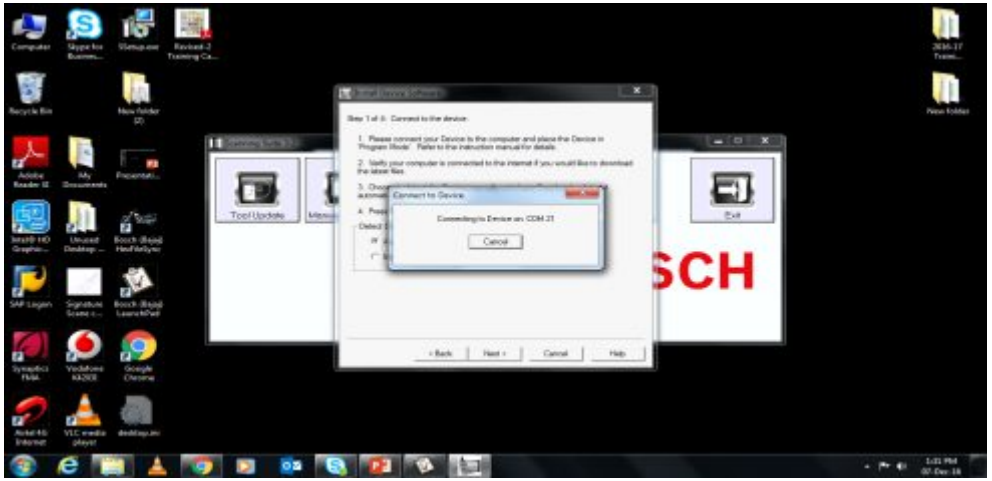
If internet connection is weak then below error message may appear on screen. Retry 2 to 3 times and then click on Ignore.



Downloading version information from internet will start.



Tool will start connecting with internet & below screen will appear while connecting.



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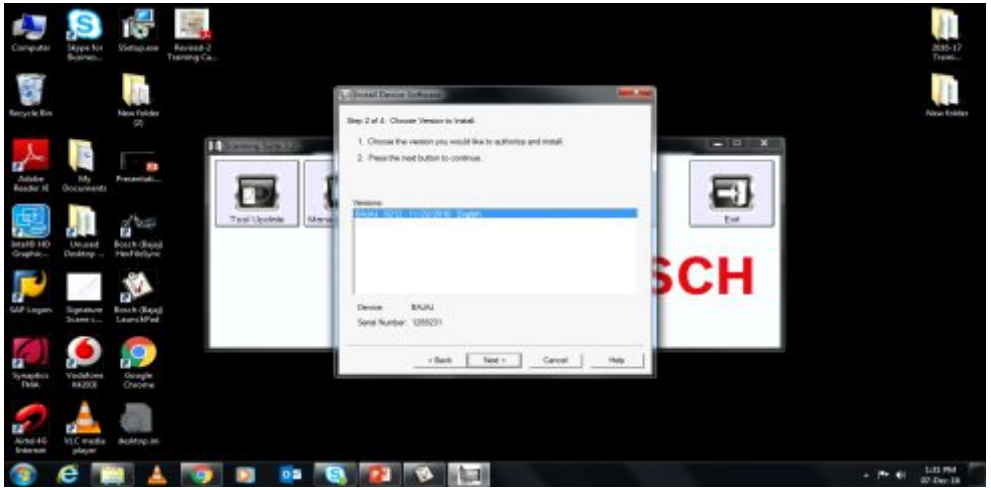
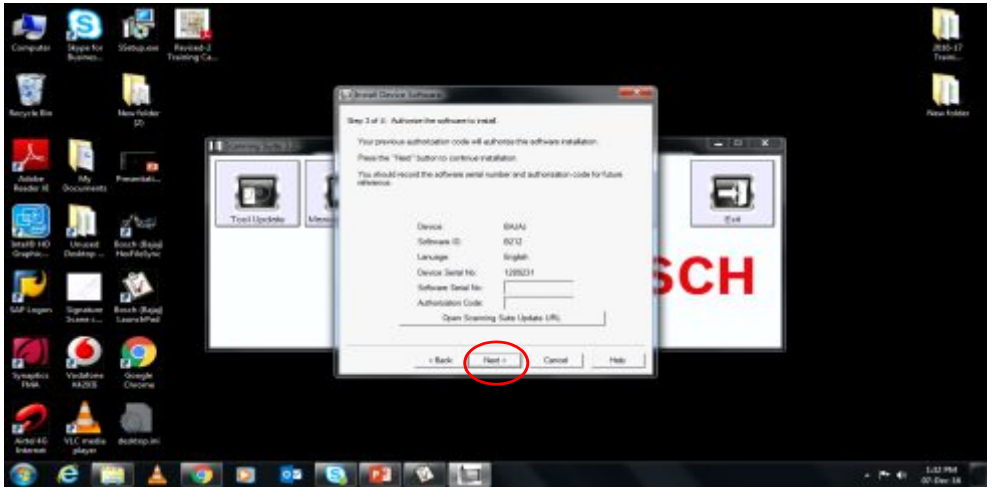
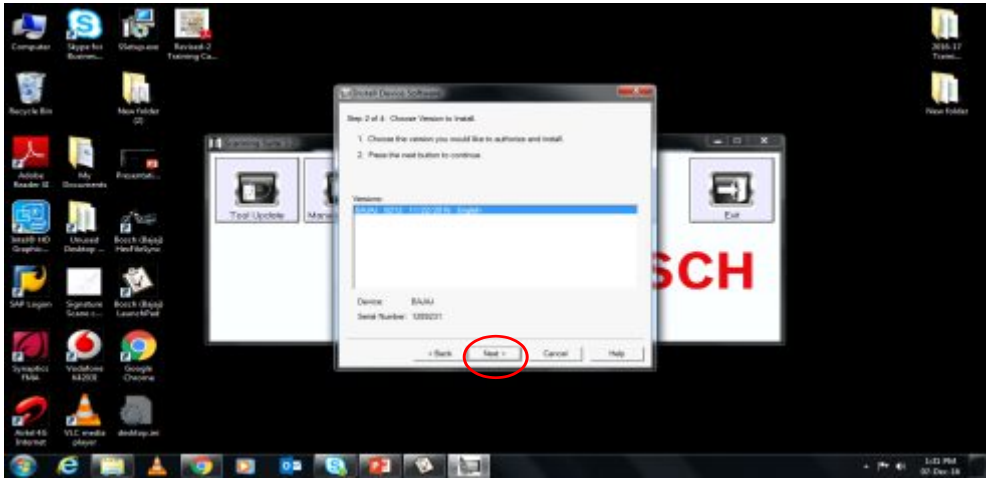
After tool get connected , below screen will appear.



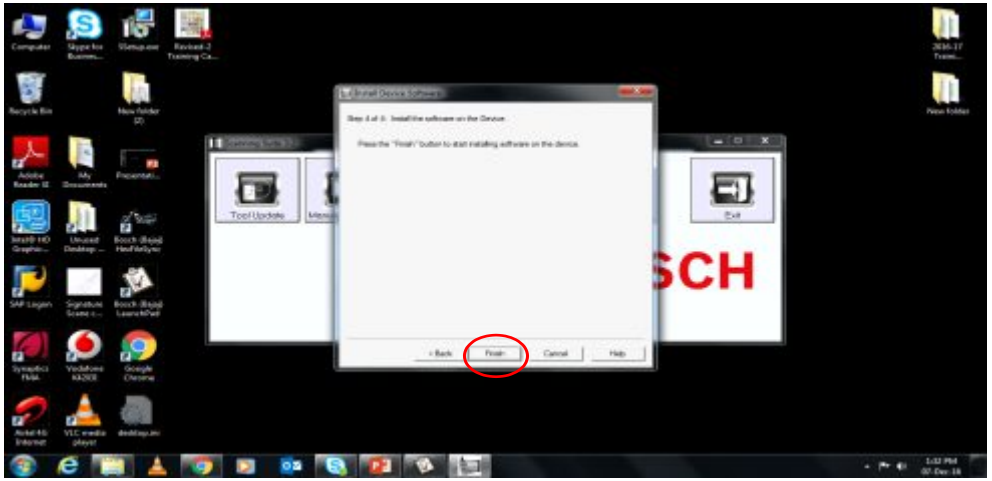
Step 7: Click on Next. (No need to enter the Software serial no. & Authorization code)



Step 6: Select the file displayed and click on Next



Step 8: Click on Finish



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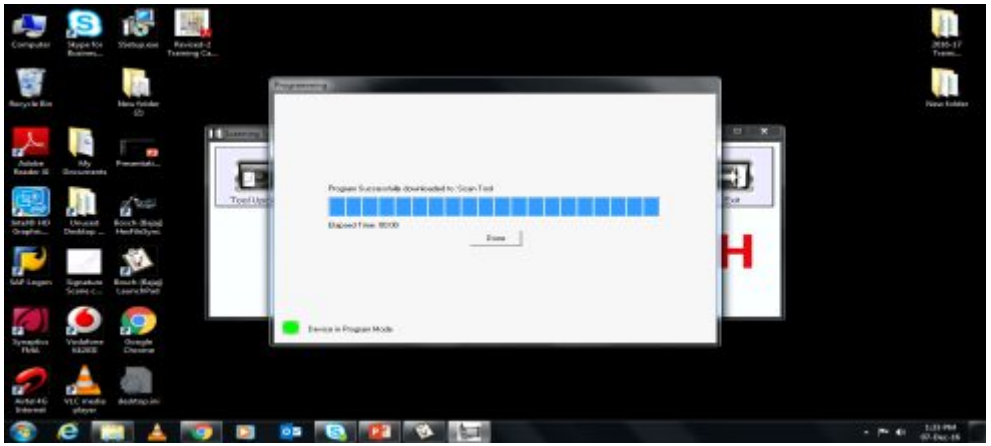
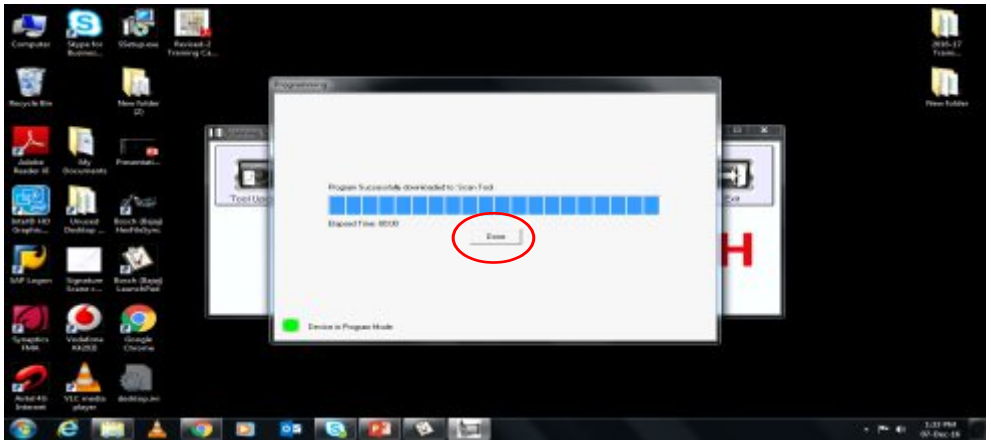
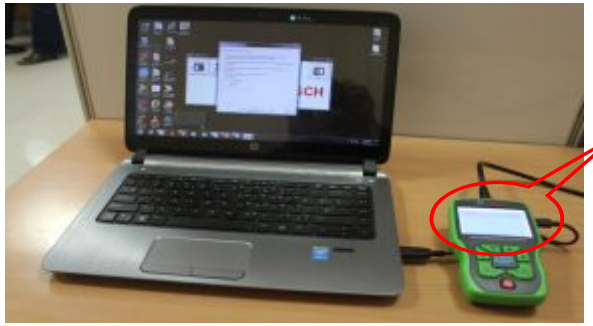
Old program will automatically get removed and New program will downloaded. Below screen will appear while downloading the new program.



Click on Done for completing the Updation process. Now tool is Updated for Dominar 400



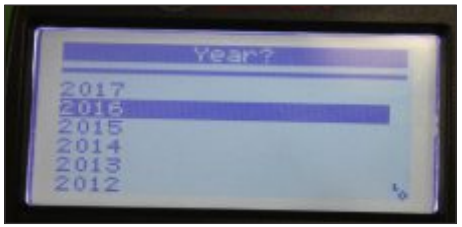
Step 9: For confirmation Disconnect & Reconnect Bosch tool to PC/Laptop.



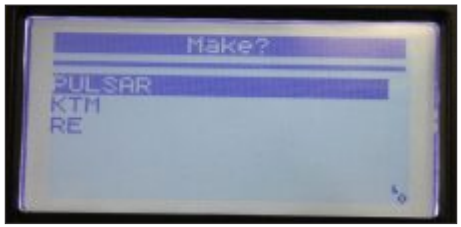
After connection above Message will appear on BOSCH tool screen.
Press Enter

Follow the below steps on BOSCH diagnostic tool to confirm "Dominar 400" model option is available.

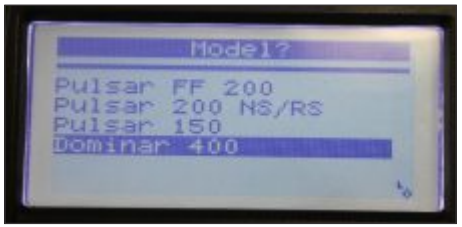
Select Vehicle Diagnostics & press Enter.



Select year 2016 or 2017 & press Enter.



Select Pulsar Make & press Enter.



Dominar 400 model will available on screen.

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BuildOTP Software installation SOP

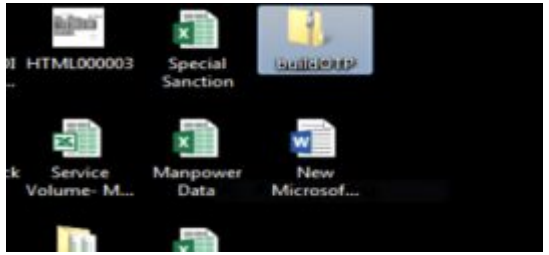
1. Open following link through internet.

   https://file.ac/aaIcT9NxPGQ/

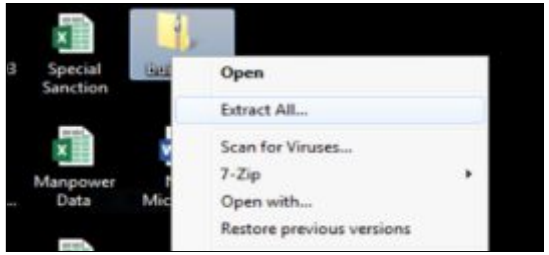
2. Build OTP.zip folder will appear on your Laptop / PC screen

3. Click on Download button for downloading zip file

4. Copy BuildOTP zip file from download folder to Desktop of PC / Laptop



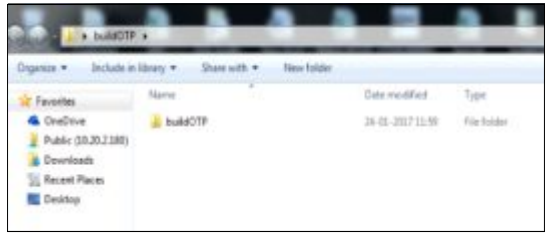
5. Right click on “buildOTP” zip folder & select “Extract all”option for extracting buildOTP folder.



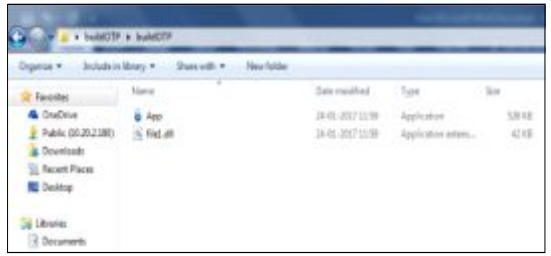
6. Select extract file location as “Desktop” in browse field & click on Extract button.

   BuildOTP folder will appear on PC / Laptop screen. Open the folder

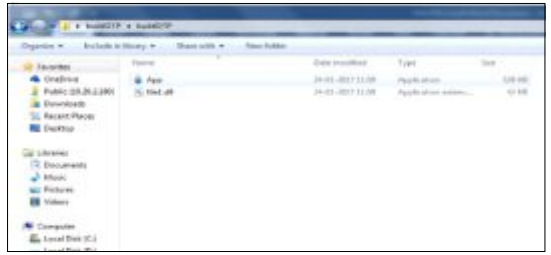
7. Open buildOTP folder.



8. Following 2 application will appear on PC / Laptop screen.



9. Double click on “App” .



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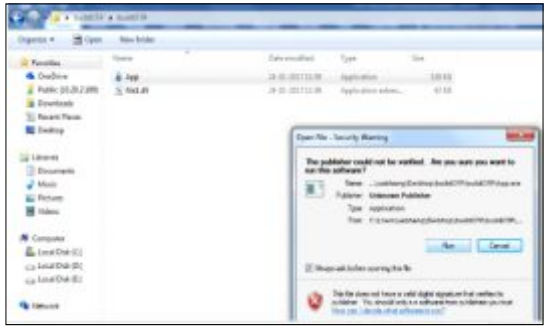
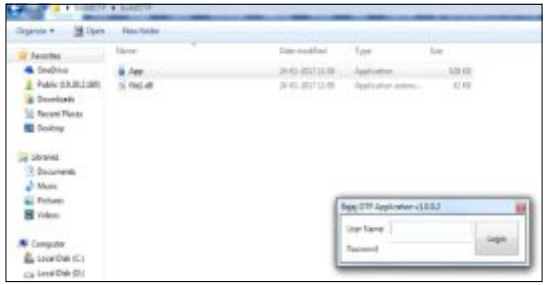
10. Message shown in photograph will appear on PC / Laptop screen

    Click on “Run”.



11. Start using following details for key generation-

    Insert following details :-
    User name : Bajaj
    Password : Bajaj1

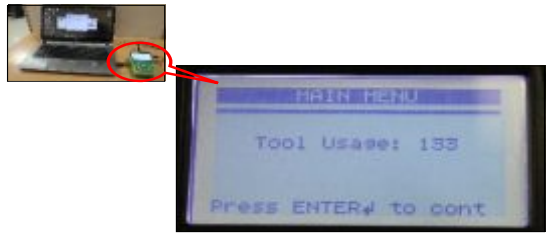


Downloading Hex file from BAL server to Bosch diagnostic tool

1. Connect the Bosch Diagnostic tool with PC / Laptop (in which Bosch tool CD in installed)by USB cable provided along with tool.

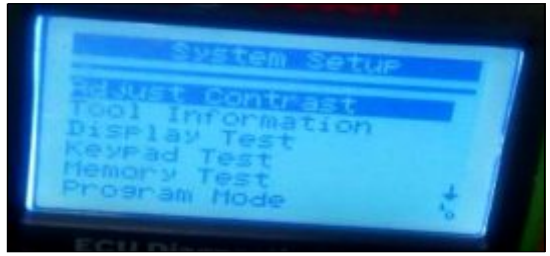
2. After connection, message as shown in photograph will appear on Bosch diagnostic tool screen

    Press enter



3. Select “System Setup” by down arrow & press Enter.

4. Various options will appear on diagnostic tool screen



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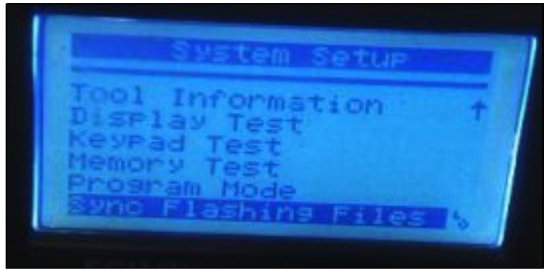
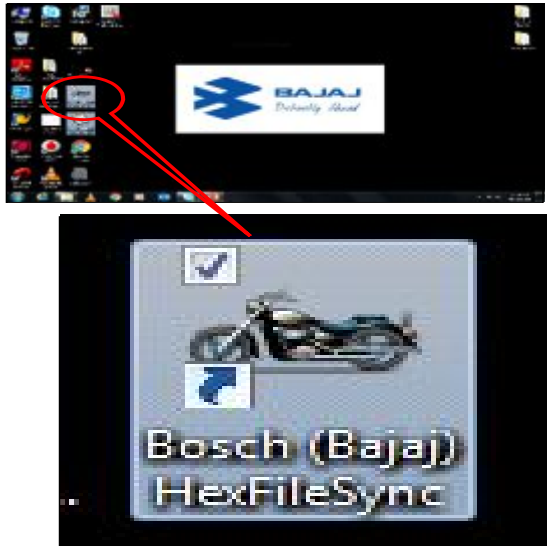
5. Select “Sync Flashing Files” by down arrow & press Enter.



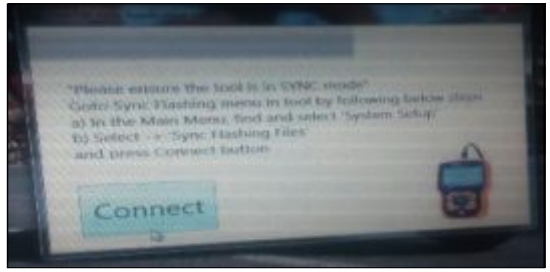
6. Message as shown in photograph will appear on Bosch diagnostic tool screen

7. Double click on “ Bosch (Bajaj) HexFileSync” icon available on PC / Laptop.



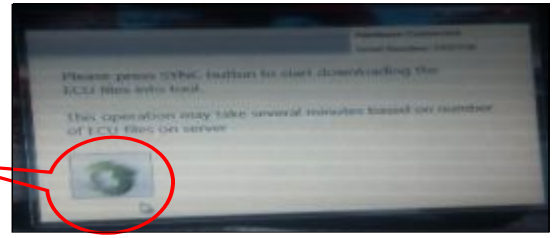
8. Message as shown in photograph will appear on PC / Laptop screen.

   Click on “Connect” option for connecting diagnostic tool to server

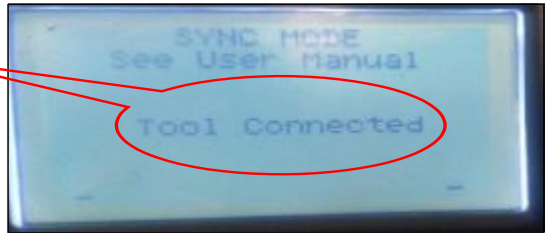


9. After successful connection, message as shown in photograph will appear on PC / Laptop screen.

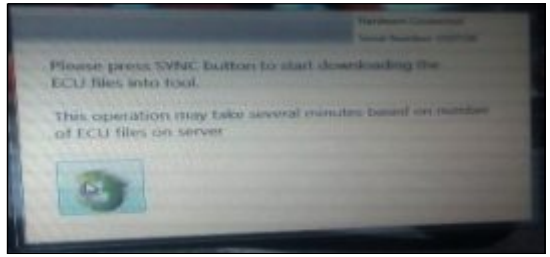
   “Green color circular arrow” on PC / Laptop screen indicates successful connection of diagnostic tool.



“Tool connected” message will appear on diagnostic tool screen also.



10. Click on “Green color circular arrow” appeared on PC / Laptop screen.



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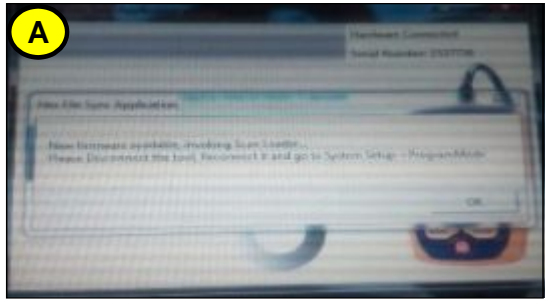
11. All ECU Hex files available on server starts downloading in diagnostic tool & message shown in photograph will appear on PC / Laptop screen.

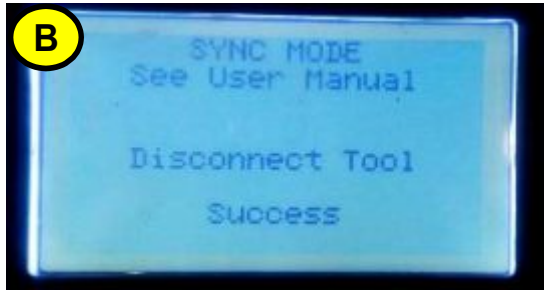
Precaution :-
Do touch the USB cable while hex file downloading is in process. Any loose connection in USB port will result in complete rework of hex file downloading from server.

12. After successful downloading of all ECU hex files, messages –

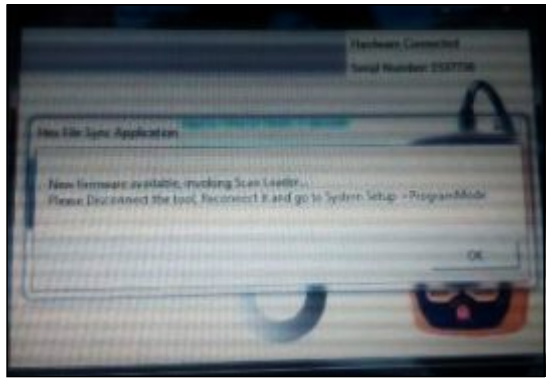
shown in photograph - A will appear on PC / Laptop screen



shown in photograph - B will appear on diagnostic tool screen

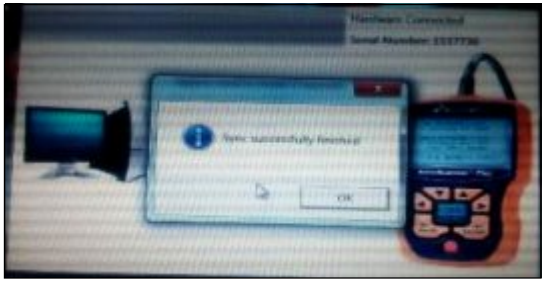


13. Disconnect the diagnostic tool, Reconnect it & go to System set up ---- Program Mode



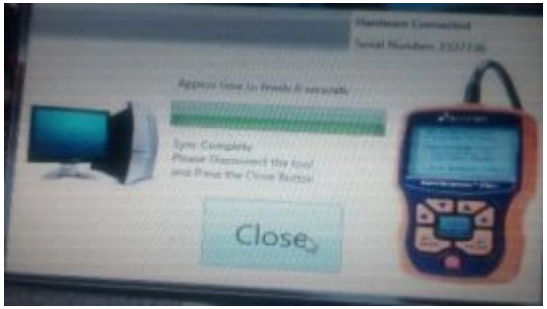
NOTE :- Do not click on **"OK"** button after completion of hex file download

14. Message as shown in photograph will appear on PC / Laptop screen.



Press OK

15. Message as shown in photograph will appear on PC / Laptop screen.



Disconnect the diagnostic tool & Press **Close**

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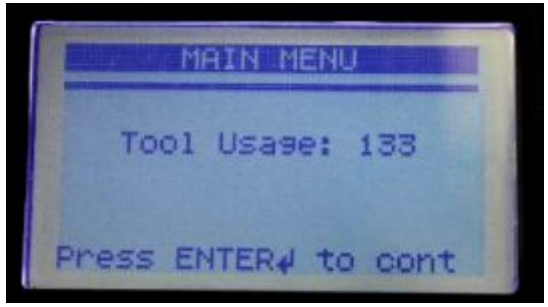
ECU Flashing on vehicle with diagnostic tool

1. Remove pillion rider seat with vehicle ignition key.

2. Connect diagnostic tool coupler to CAN communication port

3. “Tool usage” message will appear on diagnostic tool screen.

Press Enter



4. Select “Vehicle Diagnostics” & Press Enter

5. Please select option as mentioned in pictures below.

A

B

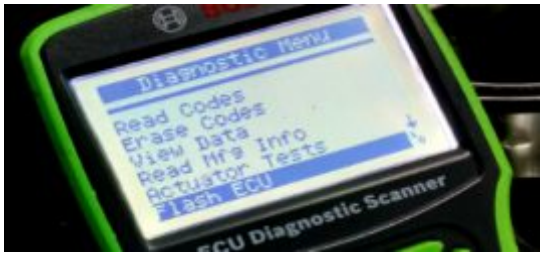
C

D

6. Message as shown in photograph will appear on diagnostic tool screen.

Press Enter

7. Select the “Flash ECU” option from diagnostic menu shown on diagnostic tool screen & Press Enter



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8. All the hex files available will be shown on diagnostic tool screen

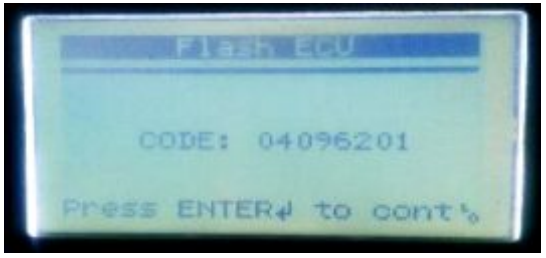
9. Select the following hex files & Press Enter

Model	Hex File
Dominar 400 - ABS	**BAK10IN1605110**
Dominar 400 - Non ABS	**BAK10IN1605111**

10. Eight digit code will appear on diagnostic tool screen.

    Note down this eight digit code against the specific VIN for reporting purpose.

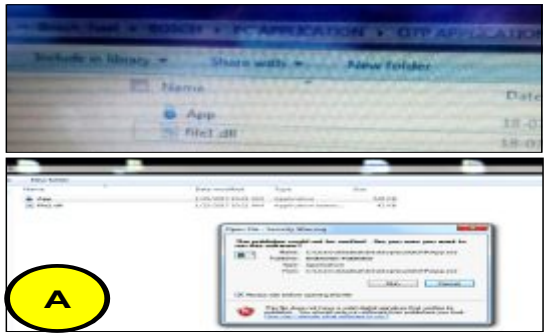
    DO NOT disconnect the diagnostic tool.



11. Double click on “App” icon on Laptop screen in a folder extracted from Zip folder .

    Message shown in photograph - A will appear on Laptop screen.

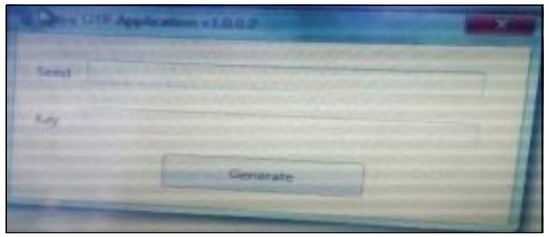
    Click on **“Run”.**



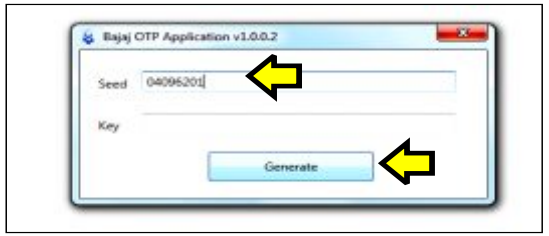
12. “Bajaj OTP Application v 1.0.0.2” will appear on PC / Laptop screen

    Insert following details :-
    User name : Bajaj
    Password : Bajaj1

13. Message as shown in photograph will appear on PC / Laptop screen

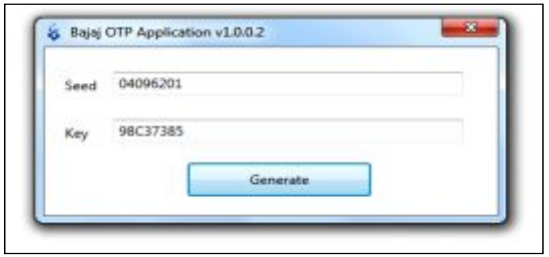


14. Enter eight digit code in “Seed” field. Click on “Generate” for generating key.



15. Key gets generated as shown in photograph.

    Note down this key for reporting purpose.



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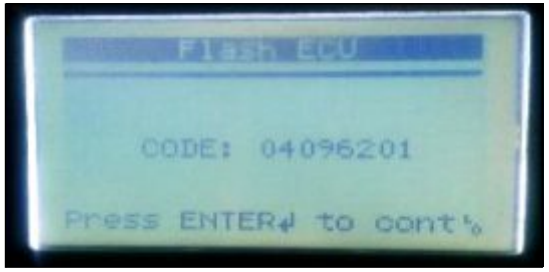
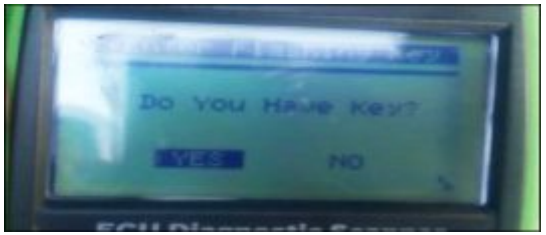
16. Go back to diagnostic tool where the eight digit code was appearing on diagnostic tool screen.

    Press Enter



17. Message as shown in photograph will appear on diagnostic tool screen.

    Select **YES** & **Press Enter**



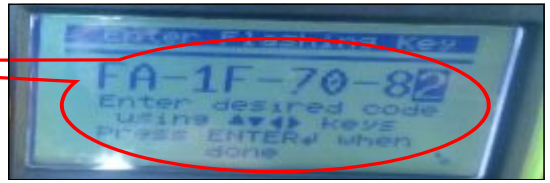
18. Enter the key received from buildOTP App.

    Key can be entered using Left / Right / Up / Down buttons provided on diagnostic tool.

    Use Up / down key for scrolling from 0 to 9 & A to F

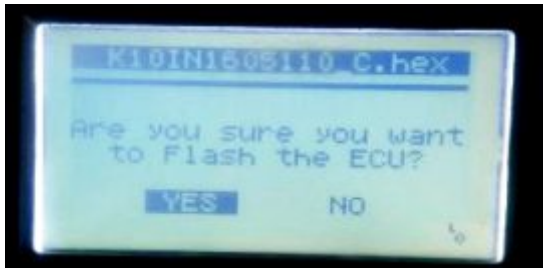
    Note :- Wrong key will not be accepted by diagnostic tool.

    Sample photograph of Key entered in tool.



19. Message as shown in photograph will appear on diagnostic tool screen.

    Select **YES** & **Press Enter**

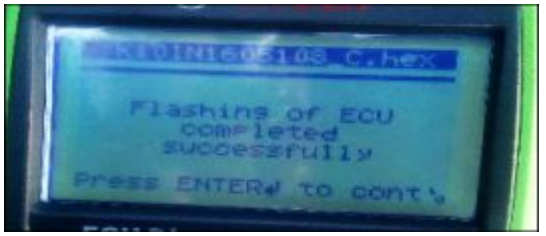


20. Message as shown in photograph will appear on diagnostic tool screen.

    This will take 4 - 5 Minutes, never disconnect / disturb the connection

21. After successful completion of ECU Flashing activity, message as shown in photograph will appear on diagnostic tool screen.

    Press Enter & Disconnect the diagnostic tool.

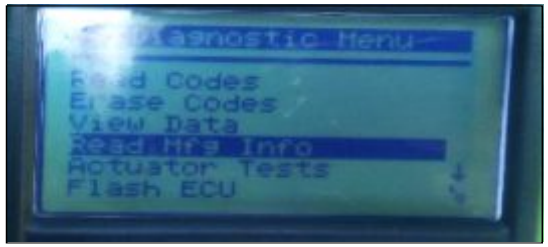


Confirmation

1. Reconnect the tool & select "Vehicle Diagnostics"

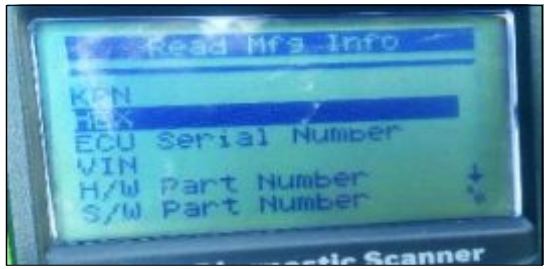
   Select "Read Mfg. Info" from diagnostic menu & **Press Enter**

EPM 44 ECU FLASHING

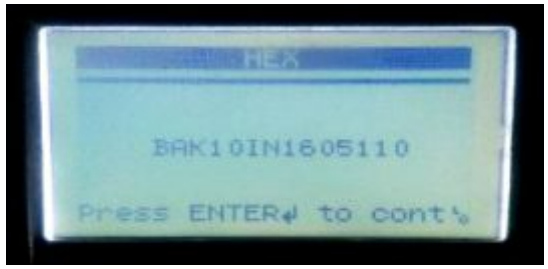


2. Message as shown in photograph will appear on diagnostic tool screen.

   Select Hex & **Press Enter**



3. Hex file flashed will be displayed on diagnostic tool screen.
   Verify the hex file displayed on diagnostic tool screen with following table. **Hex file number on tool screen must match with hex files given in following table.**



Model	Hex File
Dominar 400 - ABS	**BAK10IN1605110**
Dominar 400 - Non ABS	**BAK10IN1605111**

Press Enter & disconnect the diagnostic tool.

Important Points

- After every repairs, ECU history to be cleared using diagnostic tool.
- Diagnostic tool to be unlocked as per SOP after usage for 150 times.
- Hex files to be updated as per HO instructions only.
- New hex file number will be informed to you on case to case basis.

Engine over temperature icon “ON”

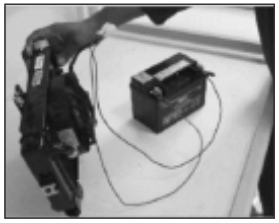
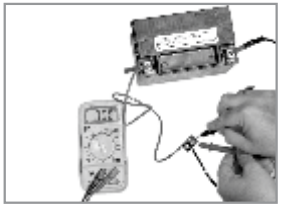
Content **Page No.**

- Reference for SOP.

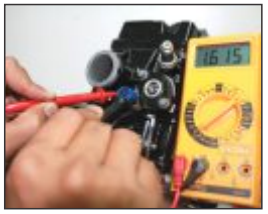
Sr. No	Description	Reference	Page / ser. cir. No.
1.	P.M. Encyclopedia	-	-
2.	Training Notes	-	-
3.	Service Circular	-	-

Engine over temperature icon “ON”

What to Check	How to Check	Symptoms observations	What is the most likely cause
Engine over temperature icon ON in speedo console.	Visually	Engine over temperature icon glowing in speedo console.	1. Radiator fan motor jammed. 2. Radiator fan relay defective. 3. Coolant temperature sensor defective. 4. Thermostat stuck up in "closed" condition. 5. Coolant level low. 6. Coolant pump Blades broken. 7. Radiator fins damaged.

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>1.</td><td>Radiator fan motor.</td><td>Disconnect fan motor coupler & give 12 VDC supply using external source.
  </td><td>Fan motor jammed.</td><td>• An obstacle trapped in fan blades.
• Radiator fan motor defective.</td><td>-</td><td>Ensure external source (battery) used is fully charged.</td><td>-</td></tr>
<tr><td>2.</td><td>Radiator fan relay.</td><td>• Connect 12 VDC supply using external source to relay coil terminals & check continuity of contacts by multimeter.
• Continuity of wire from radiator relay to ECU.
 
  </td><td>• Relay contact continuity not shown on multimeter.
• No continuity from ECU to Radiator relay coil.</td><td>• Radiator relay defective.
• Wiring disconnection.</td><td>-</td><td>-</td><td>Do not connect multimeter to relay coil terminals which are connected to external battery.</td></tr>
</table>

Meter Range	Connections		Standard Value
	Meter +ve	Meter -ve	
200 Ohms	Relay Coil Terminal 1	Relay Coil Terminal 2	80 ~ 140 ohms

<table>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">What to Check</th><th rowspan="2">How to Check</th><th rowspan="2">Symptoms observations</th><th rowspan="2">What is the most likely cause</th><th rowspan="2">Possible Errors / Effects of Error</th><th colspan="2">Recommendations</th></tr>
<tr><th>✓ Do's</th><th>✗ Don't's</th></tr>
<tr><td>3.</td><td>Coolant temperature sensor.</td><td>• Measurement of resistance by Multimeter.
• Continuity of wire from Coolant temp. sensor to ECU.
  </td><td>• Resistance values not as per specifications.
• No continuity from ECU to coolant temp. sensor.
<table><tr><th rowspan="2">Meter Range</th><th colspan="2">Wire Connections</th><th colspan="2">Standard Value</th></tr><tr><th>Meter +ve</th><th>Meter -ve</th><th>Temperature</th><th>Resistance K Ohms</th></tr><tr><td rowspan="8">20 K Ohms</td><td rowspan="8">Coupler Pin 1</td><td rowspan="8">Coupler Pin 2</td><td>0</td><td>5.30 ~ 6.11</td></tr><tr><td>10</td><td>3.44 ~ 3.92</td></tr><tr><td>20</td><td>2.28 ~ 2.58</td></tr><tr><td>25</td><td>1.88 ~ 2.12</td></tr><tr><td>30</td><td>1.55 ~ 1.75</td></tr><tr><td>40</td><td>1.06 ~ 1.21</td></tr><tr><td>50</td><td>0.75 ~ 0.86</td></tr></table></td><td>• Coolant temperature sensor defective.
• Wiring disconnection.</td><td>-</td><td>Continuity check to be done after disconnection of both couplers, sensor and ECU.</td><td>-</td></tr>
<tr><td>4.</td><td>Thermostat operation</td><td>Put thermostat in hot water & visually check opening of thermostat at specified temperature.
 

 
</td><td>Thermostat stuck up & not opening at specified temperature.
<table><tr><th>Model</th><th>Fan Start</th><th>Fan Stop</th></tr><tr><td>Pulsar RS 200</td><td>95° C</td><td>90° C</td></tr><tr><td>Dominar 400</td><td>95.3° C</td><td>90° C</td></tr></table></td><td>Thermostat defective.
  </td><td>Possible errors -
• Thermostat checked without confirming water temperature.
• Thermostat not checked as per SOP.
Effect of error :
• Wrong diagnosis.
• Thermostat stuck up resulting in coolant circulation through bypass circuit which increases coolant temperature & further resulting in radiator fan motor continuously running.</td><td>• Use nitrile rubber hand gloves while dipping thermostat in hot water.</td><td>-</td></tr>
</table>

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
5.	Coolant level	• Check hoses for cracks. • Check cylinder head gasket condition. • Visual Check for leakage through radiator. • Visual Check for leakage through expansion tank. 	• Leakage of coolant through cracked hose. • Leakage of coolant through cylinder head gasket. • Damaged radiator fins. • Leakage of coolant through expansion tank.	• Coolant hose cracked. • Coolant hose clip dislocation & causing hose crack. • Damaged / reused cylinder head gasket. • Damaged radiator fins. • Cracked expansion tank.	**Possible errors-** • Coolant leakage ignored. **Effect of error:** • Engine overheating. • May lead to Engine seizure.	• Always fit hose clip in white marking provided on hose. • Check coolant level during every service. • Always top up coolant level with Bajaj Koolex Coolant. 	• Do not reuse cylinder head gasket.
6.	Coolant pump.	Visual check for blades condition.	Blades broken.	-	**Possible errors-** • Broken blade ignored. **Effect of error :** • Engine overheating. • May lead to Engine seizure.	-	-

Sr. No.	What to Check	How to Check	Symptoms observations	What is the most likely cause	Possible Errors / Effects of Error	Recommendations	
						✓ Do's	✗ Don't's
7.	Radiator fins.	Visual inspection.	Radiator fins damaged.	-	**Possible errors-** • Radiator used as it is. **Effect of error :** • Engine overheating. • May lead to Engine seizure.	Always check radiator fins during periodic service for damage if any.	-