

EURO IV - HIMALAYAN VEHICLE SERVICE MANUAL



HIMALAYAN

PREFACE

"FIRST TIME RIGHT" is a very important element for enhancing Customer Satisfaction.

Royal Enfield is committed to upgrade the skills and knowledge of technicians so that they follow scientific repair techniques to ensure "FIRST TIME RIGHT" practices and carry out repairs accurately so that customers will enjoy trouble free performance at all times.

This manual will help in complete understanding of systematic procedures for dismantling, inspection, diagnosis and reassembly for the new Royal Enfield **Himalayan** motorcycle, in a simple and scientific manner.

While this manual is updated with latest Information and Specifications at the time of going to print, due to continuous improvements being done to improve performance, some of the data, illustrations etc., in this manual may be different from some of the parts fitted in the motorcycle.

Please do feel free to write to us at support@royalenfield.com , if you have any queries, clarification, suggestions or feedback.

With warm regards

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HIMALAYAN - VEHICLE VIEWS

VEHICLE VIEW LH



VEHICLE VIEW RH



VEHICLE VIEW TOP



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SECTION 01 - TECHNICAL SPECIFICATION

VEHICLE & VEHICLE SYSTEMS		
A.	ENGINE	
	Engine Type	Single Cylinder, 4 Stroke, SOHC, Air cooled, Fuel Injection
	Bore	78 mm
	Stroke	86 mm
	Displacement	411 cc
	Compression ratio	9.5:1
	Max Power	24.5 bhp (18.02 KW) @ 6500 rpm
	Max Torque	32 Nm @ 4250±250 rpm
	Idle rpm	1250±50 rpm
	Starting System	Electric Start
	Air filter element	Paper element
	Lubrication	Forced Lubrication, Wet sump
	Engine oil capacity	2.3 L (Initial fill only), 2.0 L (Subsequent Refills)
	Engine oil grade	SAE 15W 50 API SL Grade JASO MA 2
	Cooling	Air cooled with Oil cooler
B.	IGNITION SYSTEM	
	Ignition system	Electronic ECU / Variable
	Spark plug	Bosch - UR5CC
	Spark plug gap	0.7 to 0.8 mm
C.	TRANSMISSION	
	Clutch	Wet Multi Plate
	Primary drive	Gear
	Primary ratio	2.312:1
	Gear box	5 Speed, Constant Mesh
	Gear Ratios	
	1st Gear	1 st 2.916:1
	2nd Gear	2 nd 1.833:1
	3rd Gear	3 rd 1.428:1
	4th Gear	4 th 1.173:1
	5th Gear	5 th 1:000:1

VEHICLE & VEHICLE SYSTEMS			
	Secondary Drive		5/8" Chain & Sprocket
	Secondary Ratio		2.533:1
	Drive Chain links		110 links
D.	CHASSIS		
	Frame		Half duplex split cradle
	Suspension	Front	Telescopic, Hydraulic Damping, Front wheel travel: 200 mm
		Rear	Swing arm with Linkage type Hydraulic damping Mono shock, Rear wheel travel: 180 mm
	Brakes	Brake system	Dual channel ABS
		Front Disc	300mm Dia disc.
		Rear Disc	240mm Dia disc.
	Tyre size	Front	90 / 90 - 21
		Rear	120 / 90 - 17
	Tyre Pressures		
	Solo	Front	25 PSI / 1.75 Kg/cm ²
		Rear	32 PSI / 2.25 Kg/cm ²
	With Pillion	Front	27 PSI / 1.89 Kg/cm ²
		Rear	34 PSI / 2.39 Kg/cm ²
	Steering lock		In built
	Fuel tank capacity*		15 ± 0.5 litres approx *
	Low fuel warning		Fuel Gauge (Red zone) 5.5 ±0.5 lts.
	Dead stock (unusable fuel)		0.5 litre approx.
E.	ELECTRICALS		
	Flywheel magneto		221W @ 1500 rpm
	Generation		Alternator, III Phase
	System		12V - DC
	Battery		12V - 8 AH MF
	Head lamp		12V, H4-60/55W - BULB
	Tail lamp / Brake lamp		12V- 4/1W LED
	Licence Plate illuminator		12V- LED

VEHICLE & VEHICLE SYSTEMS			
	Front position lamp	12V - LED	WARNING Using bulbs/ electrical gadgets other than specified rating may lead to overloading/ erratic behaviour / premature failure of electrical system. Modifications or fitments which are not approved by Royal Enfield, will seriously affect the performance of the vehicle and will render the warranty void.
	Speedometer lamp	12V - LED	
	Hi beam indicator	12V - LED	
	Neutral lamp telltale	12V - LED	
	Turn signal telltale	12V - LED	
	Turn signal	12V, 10W * 4 Nos.	
	Horn	12V, 2.5 Amp.	
	Starter Motor	12V, 0.7 KW	
	Instrument Cluster	Digital cluster with main and compass LCD	
	Side Stand indicator	LCD Indication	
F.	DIMENSIONS		
	Length	2190 mm	
	Width	840 mm	
	Height	1360 mm	
	Wheel base	1465 mm	
	Ground clearance.	220 mm	
	Saddle Height	800 mm	
G.	WEIGHTS		■ Values / Dimensions mentioned above are for reference only. ■ In view of continuous improvements being done on our motorcycles, the specifications are subject to change without prior notice.
	Kerb weight (90% fuel&oil)	191 kgs.	
	Max. Pay load	174 Kgs.	

SECTION 02 - PERIODICAL MAINTENANCE

The Periodical maintenance schedule detailed below is based upon average riding conditions and indicates the Intervals at which regular inspections, adjustments, replacements and lubrications must be carried out to help maintain your Himalayan motorcycle meticulously

If in case the motorcycle is used frequently in very dusty environment / severe climatic conditions / Poor Roads / stagnant water etc., the maintenance will need to be done earlier as may be required.

Contact a nearest Royal Enfield Authorised Dealer / Service Center to carry out the periodical maintenance and for any expert advice.

S. No.	DESCRIPTION	FREE SERVICE				PAID SERVICE							
		whichever is earlier				whichever is earlier							
	Kms (x 1000)	0.5	5	10	15	20	25	30	35	40	45	50	
	Months	1.5	6	12	18	24	30	36	42	48	54	60	
1	Engine Oil (Level check / Replace)	R	I	R	I	R	I	R	I	R	I	R	
		Check level at every 1000 Kms or earlier as required											
2	Oil Filter Element	R		R		R		R		R		R	
3	Engine oil strainer on crankcase LH	C		C		C		C		C		C	
4	Inlet / Exhaust Tappet setting	I & A	I & A	I & A	I & A	I & A	I & A	I & A	I & A	I & A	I & A	I & A	
5	Rubber hose, Inlet manifold *	I	I	R	I	R	I	R	I	R	I	R	
6	Oil cooler inlet & outlet pipes *	I	I	I	R	I	I	R	I	I	R	I	
7	Spark plug	C & A	C & A	C & A	R	C & A	C & A	R	C & A	C & A	R	C & A	
8	HT leads for crack	I	I	I	I	I	I	R	I	I	I	I	
9	Fuel Hose	I	I	I	R	I	I	R	I	I	R	I	
10	Fuel Hose & Clip/ Injector 'O' ring/ Seal Ring	I	I	I	R	I	I	R	I	I	R	I	
11	Fuel Pump	Check for screw tightness in all services											
		C	C	R	C	R	C	R	C	R	C	R	
12	Air filter element	Clean/ Replace more frequently if motorcycle always used industry / off Road conditions.											
13	Accelerator Cable	I	I	R	I	R	I	R	I	R	I	R	
14	Rubber Hose, Air filter to Throttle body	I	I	R	I	R	I	R	I	R	I	R	
15	PAV pipes & Hose clip	I	I	I	I	I	R	I	I	I	I	R	
16	Throttle body- Cleaning spray*	Carbo cleaner/ carb click/ or Fuel line cleaner spray every 6000 Km or 6 months whichever is earlier											
17	Clutch Cable	I	I	R	I	R	I	R	I	R	I	R	

A : Adjust

C : Clean

I : Inspect

L : Lubricate

R : Replace

* Refer Service Manual.

Check every time after vehicle is used for off road riding

NOTE:

For maintenance after 50,000 Kms. , please repeat same frequency specified above, in consultation with a Royal Enfield Authorised Dealer / Service Center.

S. No.	DESCRIPTION	FREE SERVICE				PAID SERVICE							
		whichever is earlier				whichever is earlier							
	Kms (x 1000)	0.5	5	10	15	20	25	30	35	40	45	50	
	Months	1.5	6	12	18	24	30	36	42	48	54	60	
18	Clutch free play	Adjust every 1000 Kms or earlier as required											
19	Clutch no slippage	I	I	I	I	I	I	I	I	I	I	I	
20	Clutch Plates				R			R			R		
21	Cam Chain / Chain Pads / Auto chain Tensioner	I	I	I	I	I	I	I	I	I	I	I	I & R
22	Inlet / Exhaust valve seating (compression test) *						I						I
23	Steering head bearings #	I & A	I & A	L & A	I & A	L & A	I & R	I & A	L & A	I & A	L & A	I & R	
24	Front Fork oil	I	I	I	R	I	I	R	I	I	R	I	
25	Fuel Pipe	I	I	R	I	R	I	R	I	R	I	R	
26	Battery terminals (apply petroleum jelly)	C	C	C	C	C	C	C	C	C	C	C	
27	Earth wire eyelet Tightness			I		I		I		I		I	
28	Hydraulic Brake Fluid - Front & Rear #	I	I	R	I	R	I	R	I	R	I	R	
29	Hydraulic brake hose & Washers - Front & Rear #	I	I	I	I	R	I	I	I	R	I	I	
30	Brake Pads - Front & Rear #	I	I	R	I	R	I	R	I	R	I	R	
31	Tyre wear pattern (Front & Rear) # (1)	I	I	I	I	I	R	I	I	I	I	R	
32	Spokes tightness / Wheel rim run out front & rear #	I	I	I	I	I	I	I	I	I	I	I	
33	Front & Rear wheel bearings for play #	I	I	I	I	I	I & R	I	I	I	I	I & R	
34	Swing arm Pivot bearings #	I & L	I & L	I & L	I & L	I & L	I & L	I & L	I & L	I & L	I & L	I & R	
35	Rear Suspension Linkages #	I	I & L	I & L	I & R	I & L	I & L	I & R	I & L	I & L	I & R	I & L	
36	Rear Drive Chain #	Clean, Lubricate & Adjust every 1000 Kms or earlier as required											
37	Drive chain & Sprockets set #	I	I	R	I	R	I	R	I	R	I	R	
38	Rear wheel cush drive rubbers #	I	I	R	I	R	I	R	I	R	I	R	
39	All Mounting Fasteners in vehicle for tightness #	I	I	I	I	I	I	I	I	I	I	I	
40	Hand levers, side stand, Rider & Pillion foot rest Pivots	Lubricate every 1000 Kms or earlier as required											
41	Evaporative Emission Equipment rubber hoses *	I	I	I	R	I	I	R	I	I	R	I	

A : Adjust C : Clean I : Inspect L : Lubricate R : Replace

* Refer Service Manual. # Check every time after vehicle is used for off road riding

NOTE:

For maintenance after 50,000 Kms. , please repeat same frequency specified above, in consultation with a Royal Enfield Authorised Dealer / Service Center.

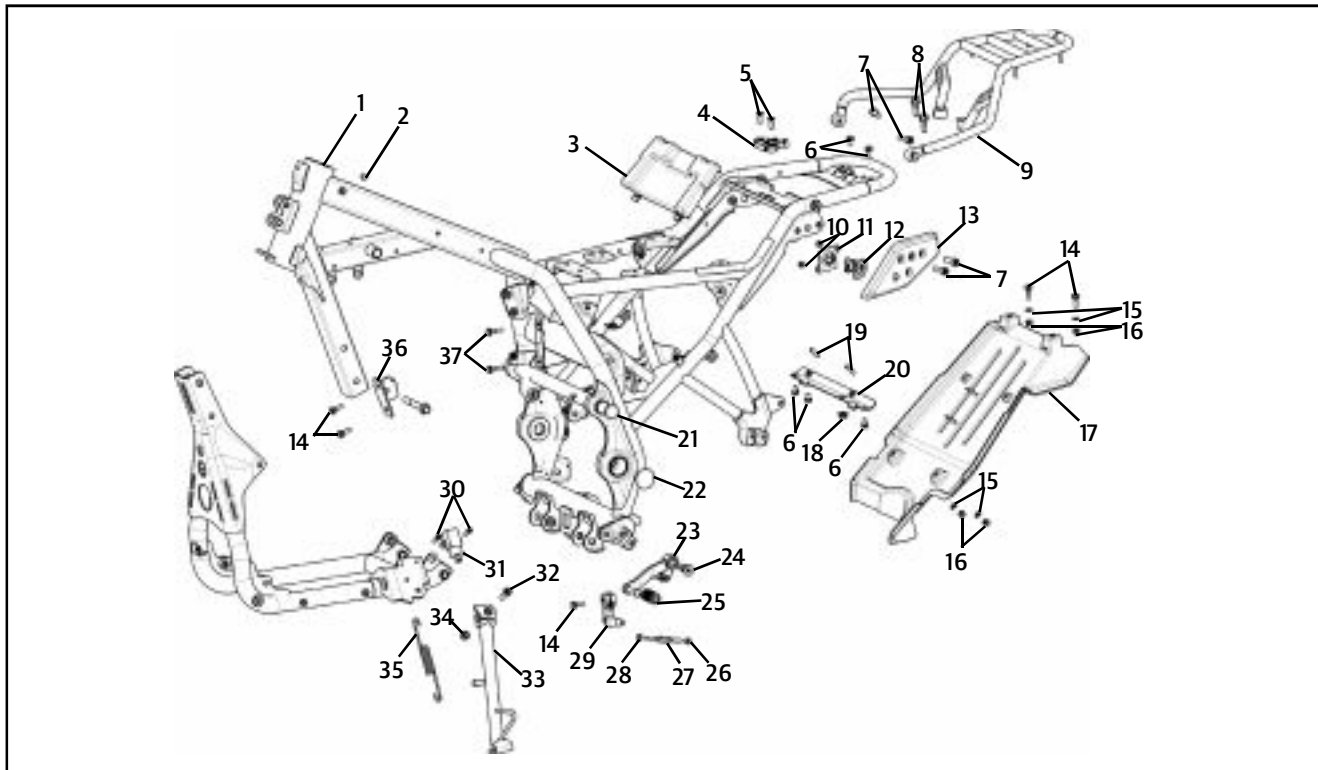
SECTION 03 - SPECIAL TOOLS USAGE LIST

PART NO.	DESCRIPTION	PHOTOS	APPLICATION
ST-26461-2	Front Fork Assembling & Dismantling Tool		To hold pipe seat inside fork main tube for loosening / tightening of Allen bolt on bottom tube.
ST-26485-3	Front Fork Oil Seal Driver		To drive slide bush and fork oil seals into bottom tube
ST-25244-4	Special spanner adjuster		To adjust rear shock absorber spring pre tension

SECTION 04 - ENGINE DISMANTLING FROM FRAME & REASSEMBLY

EXPLODED VIEWS

FRAME LH

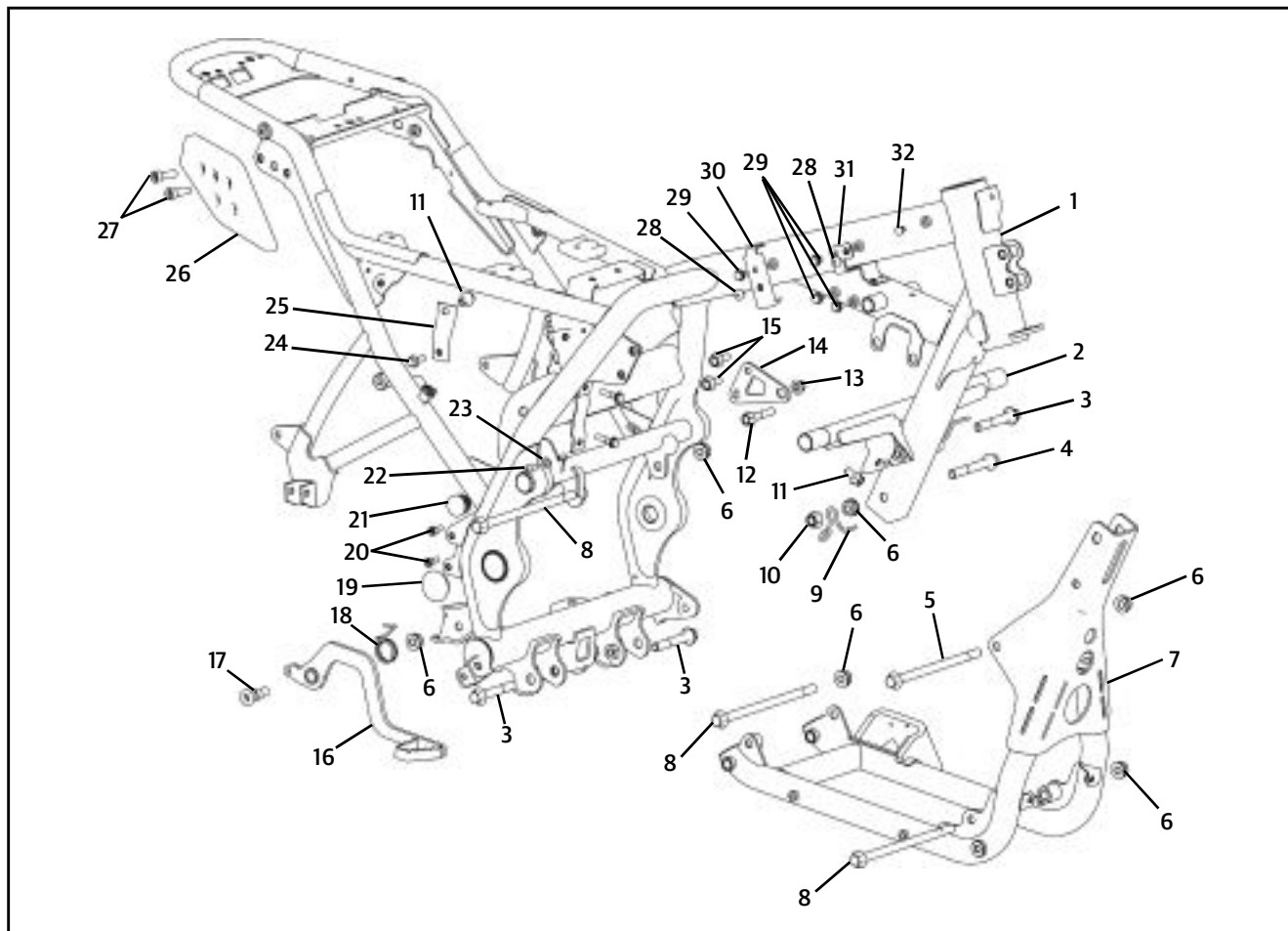


S. NO.	DESCRIPTION	QTY.
A1	Gear Shift Lever Kit	1
1	Main Frame- Black	1
2	Dummy cap- Frame	1
3	Utility Box	1
4	Seat Latch	1
5	Counter Sunk Screw M6 X 1 X 20	2
6	Flanged Hex Bolt M6 X 1 X 10	5
7	Hex Socket Head Screw M8 X 1.25 X 25	4
8	Domed Cap Bolt	2
9	Grab Rail Black	1
10	Philips pan head screw M6X6	2
11	Plate Seat Lock	1
12	Seat Lock	1
13	Saddle Bag Mtg - LH	1
14	Flanged Hex Bolt M6 X 1 X 20	5
15	Plain Washer	4
16	Hex nut with nylon insert	4
17	Piece Mudguard	1
18	Grommet	1

S. NO.	DESCRIPTION	QTY.
19	STUD	2
20	Crossbar Assy	1
21	Dust Cap-Frame Top	1
22	Cap - Swing pivot	1
23	Toe Lever Comp	1
24	Pivot Pin - Gear Shifter	1
25	Sleeve, Gear Lever	1
26	Hex Nut	1
27	Link Rod	1
28	Hex Nut (LH Thread)	1
29	Gear Shift Lever Comp-Short	1
30	Hex Soc Head Cap Screw - M5 X 20	2
31	Switch-Side Stand	1
32	Hex Socket Head Screw M8 X 1.25 X 35	1
33	Side Stand Assy	1
34	Hex Nylock Nut M8 X 9.5	1
35	Spring	1
36	Bracket Assy-Oil Cooler	1
37	Flanged Hex Bolt M6 X 1 X 27	2

EXPLODED VIEWS

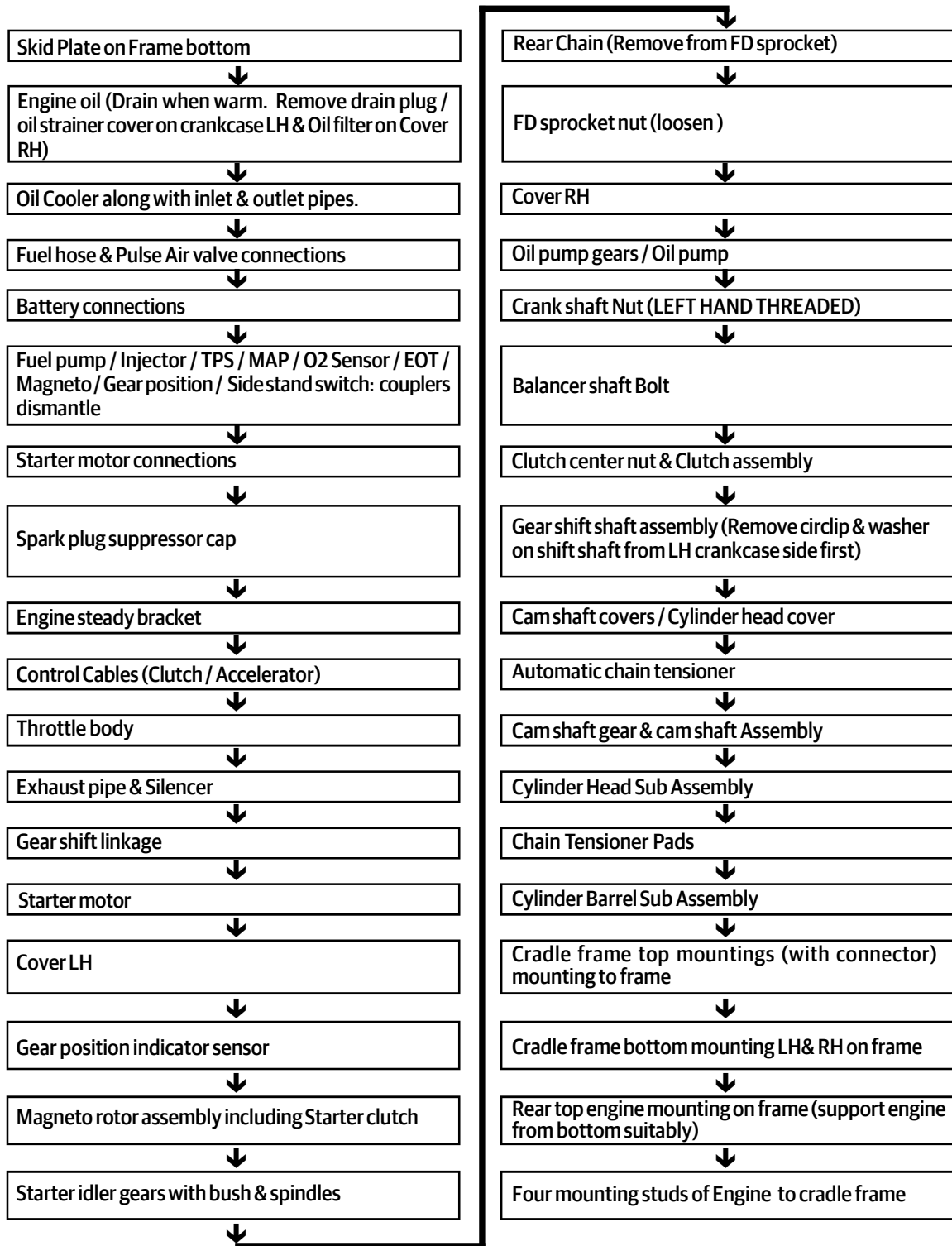
FRAME RH



S. NO.	DESCRIPTION	QTY.
1	Main Frame - Black	1
2	Connector Complete Black	1
3	Flanged Hex. Bolt M10 X 1.25 X 66	3
4	Flanged Hex Bolt, M10 X 1.25 X 75	1
5	Flange Hex Bolt M10 X 1.25 X 165	1
6	Flange U Nut M10 X 1.25	6
7	Cradle Frame	1
8	Flange Hex Bolt M10 X 1.25 X 183	3
9	Clutch Clamp	1
10	Flanged Hex nut M10X1.25	1
11	Flanged Hex Bolt M8 X 1.25 X 16	1
12	Flanged Hex. Bolt M8 X 1.25 X 45	1
13	Flanged Hex. Nut M8 X 1.25	1
14	Steady Bracket Black	1
15	Flanged Hex. Nut M8 X 1.25	2
16	Brake Pedal Comp - RH	1

S. NO.	DESCRIPTION	QTY.
17	Pivot Pin-Brake Pedal	1
18	Spring-Pedal Return	1
19	Cap-Swing pivot	1
20	Hex Soc Head Cap Screw - M6 X 16	2
21	Dust Cap-Frame Top	1
22	Hex.Socket Button Head Screw M6 X 1 X 16	1
23	Plain Washer	1
24	Flanged Hex Bolt M6 X 1 X 20	1
25	Bracket Assy-Airfilter	1
26	Saddle Bag Mtg- RH	1
27	Hex Socket Head Screw M8 X 1.25 X 25	2
28	Philips pan head screw M6X6	2
29	Flanged Hex Bolt M6 X 1 X 10	4
30	Bracket Assy- Solenoid Valve	1
31	Bracket Assy- Roll Over Sensor	1
32	Dummy cap- Frame	1

COMPONENTS DISMANTLING SEQUENCE TO REMOVE ENGINE FROM FRAME



ENGINE DISMANTLING FROM FRAME

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.1	Skid plate - Loosen & remove 6 Flanged Hex screws (2 in front & 4 in bottom. - Remove the spacers and washers between the skid plate and frame.	Flanged Hex Screw: M6 Socket Spanner: 10mm  NOTE: Ensure the engine oil is drained from the engine. 
4.2	Oil Cooler - Remove Inlet & Outlet Banjo union bolts from LH & RH Crankcase respectively & allow oil to drain. - Ensure the 4 washers are removed from the oil pipes / banjo Union - Remove 2 Hex flange bolts securing oil cooler to the frame - Remove oil cooler along with inlet & outlet pipes. (Ensure the Oil pipe No 2 on RH side between engine & frame is taken out carefully, while dismantling the oil cooler.)	Banjo Union Bolts: M14 Socket spanner: 19mm  Flanged Hex bolts: M6 Socket spanner: 8mm. 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.3	Wind Shield Assembly ■ Remove 4 Hex socket head cap screws holding the Wind shield assembly to the top frame. ■ Remove the 4 plastic washers along with the screws and remove wind shield.	Hex Soc Hd. Cap Screw: M5 Allen Key: 4mm NOTE: Hold the rubber mounted nuts from behind while loosening screws. 
4.4	Trafficator front LH, RH & cover cockpit LH, RH. ■ Disconnect Trafficator wiring couplers below headlamp. ■ Remove hex socket head screw mounting the trafficators to the top frames on LH & RH sides. ■ Gently pull out Cover cockpit LH & RH from the rubber grommets in the top frame LH & RH.	NOTE: Couplers are color coded as: LH side: Green RH side: Red Hex socket hd. Screw: M5 Allen key: M4   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.5	Headlamp Assembly ■ Disconnect head lamp wiring coupler below head lamp. ■ Remove the dust caps from the mounting holes in top frame LH & RH. ■ Remove 2 hex socket head screws holding headlamp assembly to top frame LH & RH & remove head lamp assy.	  Hex Socket Hd. screw: M5 Allen Key: 6mm
4.6	Top frame LH & RH ■ Remove 2 Flanged Hex bolts holding the top frame LH & RH to Instrument cluster bracket. ■ Remove the 2 dust caps from the connector in the frame. ■ Loosen 2 hex socket head screw clamping top frames LH & RH, to connector tube. ■ Gently rotate & pull out top frames LH & RH from connector tube.	Flanged hex bolts: M8 Socket Spanner: 12mm Hex Socket Hd. screws: M6 Socket Spanner: 10mm CAUTION Take care not to damage fuel tank while rotating & removing the side support brackets.  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.7	Pillion & Rider Seat ■ Unlock pillion seat by turning key clockwise & lift pillion seat from front end to release rear tab & remove. ■ Lift rider seat from rear end to release front tab & remove.	
4.8	Fuel Tank ■ Remove 2 Hex screws from the rear end of fuel tank. ■ Gently lift fuel tank at the rear and low fuel sensor. ■ Disconnect fuel pump wiring coupler on right sight of fuel tank. ■ Disconenct fuel hose from fuel pump by disconnecting the quick fix adpoter at fuel pump end. ■ Disconnect rubber hose from fuel tank to cannister. ■ Slide fuel tank towards rear to release front clamp from frame ■ Remove tank along with the overflow tube carefully.	Flanged hex bolts: M6 Socket Spanner: 10mm   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.9	Steady Engine Bracket ■ Hold U nut at the cylinder head mounting area with a double end spanner and loosen Hex bolt at the front of the steady engine bracket. ■ Remove the bolt and nut. ■ Support steady engine bracket, Loosen & remove the 2 Flanged hex bolts at the rear end of the bracket and remove the bolts and steady engine bracket.	Flanged hex bolt: M10 Socket Spanner: 12mm Flanged hex nut: M10 Socket Spanner: 12mm  
4.10	Throttle cable ■ Push rubber grommets down and loosen hex nuts completely. ■ Gently pull throttle cable from bracket to release the threaded position from the bracket. ■ Remove inner cable from the throttle body rotor eyelet.	Double End Spanner: 13mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.11	Clutch Cable - Loosen & remove outer locknut from the rear of the cable adjuster. - Loosen inner locknut fully & push adjuster fully into bracket. - Release inner cable from the clevis in the clutch shaft - Remove rubber grommet & outer lock nut & remove clutch cable from the bracket.	Hex Nut: M8 D E Spanner: 12mm NOTE: Gently push the rubber grommet away from the adjuster while removing nut. 
4.12	Bi-starter Cable - Remove the Bi starter cable from the clutch lever at handle bar end. At throttle body end - Remove the tank assy. (as detailed in section 10) - Loosen the hex faced plastic nut on holder cable valve at the throttle body end slowly pull out the valve bi starter from throttle body. - Compress spring & disconnect cable from the valve bi starter. - Remove spring & valve bi starter & slide out cable from the guide. At handle bar end - Loosen switch LH holding screws at the bottom & separate the switch. - Disconnect cable from lever & remove.	 CAUTION Spring loaded cable hence remove slowly. Double end spanner : 12 x 13 mm

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.13	Side Panel LH ■ Remove 3 Hex socket Button head screws (except left bottom one). ■ Gently pull out to release locator from frame rubber Grommet.	Hex. Socket Button Hd Screw M6X12 Allen Key: M5 
4.14	Side Panel RH ■ Remove 3 Hex socket Button head screws (except right bottom one). ■ Gently pull out to release locator from frame rubber Grommet.	Hex. Socket Button Hd Screw M6X12 Allen Key: M5 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.14	Electrical connections A. Battery ■ Remove negative terminal screw and disconnect negative battery cable. ■ Remove positive terminal screw and disconnect positive battery cable. B. Starter Motor ■ Remove the Hex nut securing the wire eyelet to starter motor terminal and remove the wire. ■ Remove flanged hex bolt securing the earth wire eyelet to crankcase. C. Throttle Position Sensor (TPS) ■ Disconnect black coupler from the throttlebody on LH side. D. MAP ■ Disconnect black coupler from throttle body top as RH side. E. Fuel Injector sensor ■ Disconnect black coupler from fuel injector at LH side. F. EOT ■ Disconnect EOT Sensor coupler (white) on RH side. G. Oxygen Sensor ■ Disconnect black coupler from Oxygen sensor as exhaust pipe top.	Philips Hd screw driver  Socket Spanner: 10mm CAUTION Ensure Ignition switch & engine stop switch are in OFF position before disconnection battery & wiring couplers.  Hex flange bolt: M6 X 30 Socket spanner: 8mm  TPS  MAP

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.14	Electrical connections H. Magneto coupler ■ Disconnect white coupler from LH side. ■ Disconnect small Black coupler (Pulsar wire connections from LH Side. I. Gear position switch coupler ■ Disconnect BIG & SMALL Black coupler from LH side. J. Side stand switch coupler ■ Disconnect Red coupler from LH side.	   

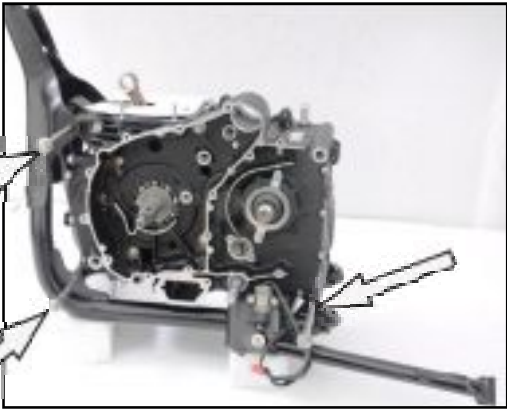
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.14	Electrical connections K. Horn Terminals ■ Disconnect horn terminals. L. Spark plug suppressor cap ■ Disconnect suppressor cap from sparkplug.	 
4.15	Exhaust pipe & Silencer ■ Remove 2 flanged Hex nuts along with washers at the cylinder head end. ■ Release the clamp from the studs. ■ Remove 2 Hex bolts & nuts at the silencer mounting bracket end. ■ Support the silencer and remove the bolt. ■ Gently pull out the exhaust pipe from the cylinder head and remove exhaust pipe with silencer from the vehicle.	Hex Nuts: M8X1.25 Tubular spanner - 12mm NOTE Remove copper washer in cylinder head, exhaust pipe seating area after removing exhaust pipe. NOTE Take care not to damage Oxygen sensor while removing exhaust pipe. Hex bolts: M8 X 1.25X45 Hex Nuts: M8 X1.25 Socket spanner -12mm Double End Spanner: 12mm  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.16	EXAI / REED Connections A. Braided hose to Cylinder head - Loosen screw on the worm clip at end. - Loosen & remove 2 hex socket head cap screws, holding the braided hose to cylinder head. - Gently pull out the braided hose from the bottom tube and remove along with gasket from cylinder head.	  Hd. Cap screws: M6X20 Allen Key: M5
4.17	Fuel Injector & Throttle body A. Fuel Injector - Ensure wiring coupler is disconnected. - Loosen Hex nut and remove completely. - Gently pull out fuel injector along with fuel hose and spacer tube. B. Throttle body - Ensure TPS & MAP Sensor coupler are disconnecting. - Remove Bi starter from throttle body after loosening plastic nut.	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.17	Fuel Injector & Throttle body - Loosen worm clip on the front & rear of throttle body sufficients. - Disconnect here from throttle body to pulse valve. - Hodl the hex nuts on inlet manifold & loosen the 2 hex socket screws. - Slide out throttle body from Air filter housing.	
4.18	Gear shifter/ linkage - Loosen Hex bolt on small gear lever mounted on gear shaft on LH side of engine. - Slide out small lever from shaft.	Hex flange bolt: M6 Socket spanner: 10mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.19	Rear Chain Link Lock - Loosen rear wheel axle nut sufficiently. - Loosen the chain adjuster nuts on LH & RH sides of the swing arm and push the rear wheel inside, to create sufficient slack in the rear chain - Remove chain link lock and remove chain from the engine sprocket.	  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.20	Cradle frame with Engine, separation from Main frame ■ Support cradle frame / engine suitably at the bottom such that it will not drop off when mounting bolts are removed. ■ Loosen Flanged Hex., holding cradle frame top, to main frame. ■ Remove bolt & connector complete. (Ensure the top frame LH&RH and horn connections are removed from the connector tube.) ■ Loosen Flanged Hex bolt from the rear top location of the engine. DO NOT REMOVE THE BOLT FROM THE FRAME. ■ Loosen & remove 2 flanged Hex bolts from the cradle frame rear bottom on both LH & RH sides. ■ Remove the Flanged Hex bolt (loosened earlier) from the rear top location of the engine. ■ Loosen & remove Flanged Hex bolt along with oil cooler bracket, holding oil cooler bracket & cradle frame to main frame. ■ Gently remove the support from the bottom of the cradle frame / engine and simultaneously remove cradle frame with crankcase from main frame.	 Hex flange bolt: M10X66 Socket Spanner: 14mm  Hex flange bolt: M10X183 Socket Spanner: 14mm  Hex flange bolts: M10X65 Socket Spanner: 14mm  Hex flange bolts: M10X75 Socket Spanner: 14mm

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.21	Engine separation from cradle frame ■ Hold flanged Hex bolt on Cradle frame top RH side, and remove Flanged U nut on the cradle frame top LH side. ■ Hold flanged Hex bolt on Cradle frame bottom RH side, and remove Flanged U nut on the cradle frame bottom LH side, ■ Hold flanged Hex bolt on Cradle frame rear RH side, and remove Flanged U nut on the cradle frame rear LH side. ■ Remove the 3 studs from the cradle frame & gently lift up the engine away from the frame.	Hex flange bolt: M10X165 Hex U Nut: M10X1.25 Socket Spanner: 14mm Ring Spanner: 14mm  Hex flange bolts: M10X183 Hex U Nuts: M10X1.25 Socket Spanner: 14mm Ring Spanner: 14mm 

INSPECTION & PRECAUTIONS

- Inspect all the studs & bolts for bends, distortion, thread wear , threads stripped off etc
- Inspect all nuts for thread wear , threads stripped off etc
- **DO NOT REUSE** Nylock Nuts and Hex U nuts, and Pre coated fasteners once they have been tightened and removed. Replace them every time they have been removed.
- **DO NOT REUSE** Washers, O Rings, Oil seals, Dust seals, rubber and plastic material rubber parts, plastic parts, gaskets etc once they have been used and removed
- Inspect all control cables for internal cables fraying / damage
- Carefully inspect studs and nuts that are welded in the frame for any thread damage. If found damaged, use suitable thread cleaning dies to repair the damages. If the threads are beyond repair, remove the damaged studs/ nuts and reweld new studs / nuts correctly.
- Clean the threads in the frame carefully using suitable cleaning and solving agents to clean off dirt and scales
- Apply suitable thread locking liquid as appropriate on non precoated fasteners before assembling and tightening to torque.
- Always tighten fasteners diagonally and evenly to the correct specified torque values
- Clean, and repaint rusted areas in frame and other parts before assembly

TORQUE VALUES

S. No.	Aggregate	Fastener	Torque		Min. Torque		Max. Torque	
			NM	Kg.M	(Nm)	(Kg.M)	(Nm)	(Kg.M)
1	Engine Mtg to Cradle Frame - front top	Flanged Hex Bolt M10X1.25X165	50	5.0	42.5	4.3	57.5	5.8
2	Engine Mtg to Cradle Frame - front Bottom	Flanged Hex Bolt M10X1.25X183	50	5.0	42.5	4.3	57.5	5.8
3	Engine Mtg to Cradle Frame - Rear Bottom	Flanged Hex Bolt M10X1.25X183	50	5.0	42.5	4.3	57.5	5.8
4	Cradle frame Mtg to Frame top	Flanged Hex Bolt M10X1.25X60	50	5.0	42.5	4.3	57.5	5.8
5	Cradle frame Mtg to Frame rear bottom	Hex Flange Bolt M10X1.25X65	50	5.0	42.5	4.3	57.5	5.8
6	Oil Cooler Mtg to frame	Hex Flange M6X1X20	10	1.0	8.5	0.9	11.5	1.2
7	Steady Bracket Mtg to Cylinder head	Hex Flange Bolt M10X1.25X47	50	5.0	42.5	4.3	57.5	5.8
8	Steady Bracket Mtg to Frame	Hex Flange Bolt M8X1.25X20	25	2.5	21.3	2.1	28.8	2.9
9	Skid Plate Mtg to Cradle frame	Hex Flanged Bolt M6X1X10	10	1.0	8.5	0.9	11.5	1.2
10	Side Panels mounting to frame	Hex Button Head M6X1X12	5	0.5	4.3	0.4	5.8	0.6
11	Gear Shift Linkage Mtg to Frame	M10X1.25	30	3.0	25.5	2.6	34.5	3.5
12	Gear Shift Linkage to Shift shaft	M6X1	10	1.0	8.5	0.9	11.5	1.2
13	Fuel tank Mtg to frame	Hex Flange M6X1X27	5	0.5	4.3	0.4	5.8	0.6
14	Exhaust Pipe Mtg to Cyl Head	Flanged Hex Nut M8X1.25	10	1.0	8.5	0.9	11.5	1.2
15	Silencer Mtg to Frame	Hex Socket M8X1.25X25	25	2.5	21.3	2.1	28.8	2.9
17	Rear Wheel Spindle Nut	Hex U Nut M16X1.5	70	7.0	59.5	6.0	80.5	8.1
18	Chain Adjuster Lock nut	Hex Nut M8X1.25	25	2.5	21.3	2.1	28.8	2.9
19	Head Lamp Mtg to Support Brackets	Hex Soc. Hd. screw M8X1.25X25	10	1.0	8.5	0.9	11.5	1.2
20	Trafficators Mtg to Support Brackets	Button Head M6X1X20	5	0.5	4.3	0.4	5.8	0.6
21	Windshield Mtg to Support Brackets	Hex Socket Head Screws M5X16	5	0.5	4.3	0.4	5.8	0.6

ENGINE ASSEMBLY TO FRAME

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.22	Engine on Cradle Frame ■ Locate Engine on cradle frame & ensure the 3 mounting holes of the cradle frame and the engine are aligned. ■ Insert Hex bolt M10X165 from RH side and assemble U nut M10X1.25. DO NOT TIGHTEN FULLY. ■ Insert 2 flanged Hex bolts M10X183 from the front & rear bottom RH side and assemble U nut M10X1.25. DO NOT TIGHTEN FULLY. ■ Tighten all the mountings diagonally to torque.	 Hex flange bolts: M10X165 & M10X183 Hex U Nuts: M10X1.25 Ring Spanner: 14mm. Socket Spanner: 14mm. Torque: 50 Nm (5.0 Kg.M)
4.23	Cradle frame with engine, on Main Frame ■ Locate cradle frame / engine from underneath main frame and lift up with suitable support under engine such that the stud mounting holes align as follows: - Crankcase rear top hole with frame mounting. - 2 mounting holes of cradle frame with 2 holes in frame down tube. - 2 mounting holes at the rear bottom of cradle frame with 2 holes in main frame. ■ Insert flanged Hex Bolt M10X 183 at rear top of engine and assemble U nut. DO NOT TIGHTEN FULLY.	 Hex flange bolts: M10X183 & M10X165 Hex U Nuts: M10X1.25 Ring Spanner: 14mm. Socket Spanner: 14mm. Torque: 50 Nm (5.0 Kg.M)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.23	Cradle frame with engine, on Main Frame ■ Locate 2 flanged Hex bolts M10X65, at rear bottom, LH & RH sides and assemble U nuts DO NOT TIGHTEN FULLY. ■ Position Oil cooler mounting bracket in frame with its small tab resting on the frame inside. ■ Align the mounting hole with the lower mounting hole in frame. ■ Locate Flanged Hex bolt M10X75, over oil cooler bracket and assemble U nut. DO NOT TIGHTEN FULLY. Tighten all the mountings diagonally to torque.	 Hex flange bolt: M10X75 Hex U Nut: M10X1.25 Ring Spanner: 14mm. Socket Spanner: 14mm. Torque: 50 Nm (5.0 Kg.M)
4.24	Rear chain assembly and chain adjustment ■ Place vehicle on center stand with the rear wheel off the ground. ■ Ensure rear axle nut, lock nuts & adjuster nuts on the LH & RH chain adjusters are loosened fully. ■ Push wheel fully inside. ■ Route rear chain through final drive sprocket and locate it on rear wheel sprocket ■ Ensure 'O' rings are located on the chain link and Insert link from the inside of the chain.	 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.24	Rear chain assembly and chain adjustment ■ Assemble 'O' Rings on the chain link and assemble the link plate. ■ Assemble chain link lock on the chain link, ensuring the closed end of the lock is towards the normal direction of rotation of the chain. ■ Tighten adjuster nuts on LH & RH side evenly till the chain has a slack of 20 to 25 mm on its top run. ■ Ensure the reference lines on the LH & RH chain adjusters are matching at the same reference lines in the swing arm on LH & RH sides. ■ Tighten rear wheel axle nut to torque. ■ Tighten lock nuts against the adjuster nuts on LH & RH sides.	  Hex U Nut: M17 Socket Spanner: 24mm. Torque: 70-80Nm (7.0-8.0Kg.M)
4.25	Gear Shifter / Linkage ■ Locate small lever on gear shift shaft, ensuring, small lever is vertical to ground and the gear shift pedal is parallel to rider footrest LH. ■ Assemble Hex bolt on gear shift lever short from the front side and tighten to torque.	Hex Flange Bolt : M6X20 Socket Spanner : 10mm. Torque: 10Nm(1.0Kg.M) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.26	Pulse air valve Connections Braided hose (PAV to Cylinder head) ■ Locate gasket on cylinder head with a little grease to hold it in position. ■ Locate PAV pipe flange on the gasket. ENSURE THE OPEN END OF THE PIPE IS FACING UPWARDS. ■ Tighten PAV pipe to cylinder head with 2 hex socket head cap screws. ■ Locate braided hose with worm clip on the PAV outlet pipe and tighten screw.	Hd. Cap screws: M6X20 Allen Key: M5 Torque : 
4.27	Exhaust pipe & Silencer ■ Locate a new exhaust pipe gasket on the exhaust pipe. ■ Locate exhaust pipe into the cylinder head, position the clamp over the studs on the cylinder head & assemble 2 hex nuts M8 DO NOT TIGHTEN FULLY. ■ Position silencer mounting bracket against the frame at the rear and insert flanged hex bolt. Assemble hex nut over bolt. ■ Tighten the 2 hex nuts at the cylinder head, first and then the silencer bracket nut. ■ Connect the Oxygen sensor coupler to the sensor.	NOTE Assemble new exhaust pipe gasket before locating exhaust pipe in cylinder head. Hex Nuts: M8X1.25 Socket spanner -12mm Torque: 10Nm (1.0Kg.M.) Hex bolts: M8 X 1.25X45 Hex Nuts: M8 X1.25 Socket spanner -12mm Double End Spanner: 12mm Torque: 25Nm (2.5Kg.M) NOTE Ensure Oxygen sensor is assembled on the exhaust pipe. Take care not to damage the oxygen sensor while locating exhaust pipe on cylinder head.  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.28	Throttle body & Fuel Injector A. Throttle Body ■ Ensure worm clip is located on air filter bellow. ■ Locate throttle body inside air filter bellow. ■ Ensure clip hose is located on inlet manifold adaptor. ■ Assemble inlet manifold adaptor on throttle body. ■ Locate 'O' ring on Inlet manifold. ■ Position inlet manifold adaptor (with throttle body) against inlet manifold. Ensure the 2 mounting holes are aligned. ■ Assemble new copper washers on the 2 hex soc head cap screws and insert from the inlet manifold adaptor end. ■ Assemble 2 hex nuts on the screws and tighten adaptor to manifold - inlet. ■ Tighten worm clip screw on air filter bellow and inlet manifold adaptor. ■ Insert valve - Bi Starter plunger into throttle body and tighten the plastic hex nut to throttle body sufficiently.	Hex Soc. Hd. Cap Screw : M6 x 25 Hex nylock nut : M6 Allen Key : 5 mm Double end spanner : 10mm Torque : 10Nm (1.0 Kg.M)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.28	Throttle body & Fuel Injector ■ Connect all electrical couplers as described in the Electrical connections chapter. ■ Connect hose from purge valve to throttle body. B. Fuel Injector ■ Ensure new seal ring is located on fuel injector. ■ Locate fuel injector on manifold - inlet. ■ Ensure stud - injector is firmly tightened on manifold - inlet. ■ Assemble spacer on stud - injector. ■ Assemble 'O' ring on injector top. ■ Position Cap, injector assembly with fuel hose on injector and stud - injector correctly. ■ Tighten cap, injector assembly to stud using hex nut M6. ■ Connect fuel injector coupler.	 Hex nylock nut : M6 Socket spanner : 10mm Torque : 10Nm (1.0 Kg.M)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.29	Throttle Cable ■ Ensure hex nut and rubber grommet are located on the inner cable properly. ■ Locate inner cable in the throttle body rotor eyelet and route inner cable on the rotor. ■ Gently pull outer cable upwards till the inner cable can be located into the bracket slot and release slowly till the threaded portion of the outer cable is fully resting on the bracket. ■ Tighten outer cable to bracket using the hex nut M6. ■ Slide the rubber grommets over the threaded sleeve on outer cable. ■ Adjust the throttle cable free play correctly.	 Hex nut : M6 Double end spanner : 10mm

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.30	Steady engine plate - Position steady engine plate such that the single mounting hole aligns with the cylinder head mounting location & the 2 mounting holes align with the welded nuts in the frame. - Locate 2 Flanged Hex Bolts over the steady engine plate. DO NOT TIGHTEN FULLY. - Locate Flanged Hex Bolt at the front end of the steady bracket, through the cylinder head & assemble flange U Nut. Tighten all the bolts to torque.	 Flanged hex bolts: M10X20 Socket Spanner: 12mm Torque: 20Nm. (2.0Kg.M) Flanged hex bolt: M10X47 Socket Spanner: 12mm Flanged hex nut: M10X1.25 Ring Spanner: 12mm Torque: 50Nm(5Kg.M.) 
4.31	Electrical connections A. Starter Motor Connections: - Position earth wire eyelet on outer mounting hole of starter motor & tighten with flanged hex bolt. - Locate Relay starter cable on the starter motor terminal & tighten with Hex nut.	Socket Spanner: 10mm Hex flange bolt: M6 X 30 Socketspanner: 8mm Torque: 8-12Nm (.8-1.2Kg.M) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.31	Electrical connections B. Throttle Position Sensor (TPS) ■ Connect black coupler to throttle body on LH side. C. MAP Sensor ■ Connect black coupler to throttle body RH side. D. Fuel Injector Sensor ■ Connect black coupler to fuel injector. E. Engine Oil Temperature (EOT) Sensor ■ Connect white coupler to EOT sensor wires. F. Oxygen Sensor ■ Connect Black coupler to sensor wires on the exhaust pipe top.	   

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.31	Electrical connections G. Magneto ■ Connect white coupler on LH side to wiring harness ■ Connect small Black coupler (Pulsar wire connections on LH Side to wiring harness. H. Gear position switch ■ Connect BIG & SMALL Black coupler to wiring harness on LH side.	CAUTION Ensure Ignition switch & engine stop switch is in OFF position before connecting any wiring couplers.    NOTE Ensure Protection couplers are correctly slid over the coupler after connecting. Ensure wiring harness is correctly strapped to frame after connecting couplers.

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.31	Electrical connections I. Side stand switch coupler ■ Connect Red coupler to wiring harness on LH side. J. Battery Connections ■ Connect Positive terminal (Red) to the positive terminal of the battery. ■ Connect negative terminal (Black) to negative terminal of the battery.	 
4.32	Fuel Tank ■ Align the two clamps in the fuel tank inside channel, with the rubber supports on the frame and gently push forward to lock in place. Lift rear end of the tank slightly and - Route the drain hose between the frame without any kinks. - Connect blue coupler of Low fuel sensor to wiring harness	CAUTION When connecting the fuel & cannister hoses ensure they are routed correctly without any kinks.

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.32	Fuel Tank ■ Connect fuel pump wiring coupler on RH side bottom of fuel tank. ■ Connect fuel hose to fuel pump with the quick fix adaptor. ■ Connect rubber hose from cannister to fuel tank bottom. ■ Ensure rubber grommets are in place in the rear mounting holes and align mounting holes to the frame, ■ Locate 2 washers on the hex flange bolts, assemble the bolts and tighten to torque.	Hex flange bolts: M6X27 Socket Spanner: 10mm Torque: 5Nm (0.5Kg.M.)
4.33	Side Panel LH & RH ■ Locate the tab of the side panel in the rubber grommet in frame and press in gently. ■ Assemble 3 Hex socket Button head screws over the panel and tighten.	Hex. Soc Button Hd Screw: M6X12 Allen Key: M5 Torque: 5Nm(0.5Kg.M)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.34	Side Panel RH ■ Locate the tab of the side panel in the rubber grommet in frame and press in gently. ■ Assemble 3 Hex socket Button head screws over the panel and tighten.	Hex. Soc Button Hd Screw M6X12 Allen Key: M5 Torque: 5Nm (0.5Kg.M) 
4.35	Rider & Pillion Seat ■ Locate the rider seat tab under the fuel tank and position the locking plate centrally on the frame. ■ Locate rear seat tab in the frame, align lock pin with the seat latch and gently press on seat to lock. ■ Remove key after locking pillion seat.	
4.36	Connector tube & Top frames ■ Position connector tube from inside the frame such that the horn mounting bracket is on the RH side. ■ Align mounting holes with the upper mounting hole in Frame.	Hex flange bolt: M10X75 Socket Spanner: 14mm. Torque: 50 Nm (5.0 Kg.M) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.36	Connector tube & Top frames ■ Locate Flanged Hex bolt from LH side & thread into the welded nut ■ Ensure the 2 Hex socket screws in top frames LH & RH are loose & locate on the connector tube till they are flush with the outer surface of the connector tube. Do not tighten the screws. ■ Align the mounting holes of top frames LH & RH with the holes in the cockpit mounting bracket assembly and tighten using Hex bolts. ■ Tighten the 2 hex socket head cap screws on the top frame LH & RH to clamp them against the connector tube. ■ Ensure the dust caps are fitted on the connector.	Hex Socket Hd. Cap screws: M6 Allen Key: M5 Flanged hex bolts: M8 Socket Spanner: 12mm Torque: 25Nm(2.5 Kg.M) Flanged Hex Bolts: M8 Socket Spanner: 12mm Torque: 25Nm(2.5Kg.M) NOTE Take care not to damage fuel tank or fork legs while assembling the top frames.  
4.37	Horn ■ Locate horn in the bracket and tighten. ■ Connect horn terminals	

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.38	Trafficator front LH ■ Locate the front lug of the cockpit cover into the rubber grommet in top frame LH. ■ Insert trafficator with GREEN wire coupler into cover cockpit on LH side. ■ Tighten trafficator to the top frame with hex socket button head screw & hex nut. ■ Connect the wiring coupler to the wiring harness	Hex Socket Hd. Cap screws: M6X20 Allen Key: M5 Hex Nut: M6 Double end spanner:10mm Torque: 10Nm.(1.0Kg.M.) NOTE: Couplers are color coded as: LH side: Green RH side: Red  
4.39	Trafficator front RH ■ Locate the front lug of the cockpit cover into the rubber grommet in top frame RH. ■ Insert trafficator with RED wire coupler into cover cockpit on RH side. ■ Tighten trafficator to the top frame with hex socket button head screw & hex nut. ■ Connect the wiring coupler to the wiring harness	Hex Socket Hd. Cap screws: M6X20 Allen Key: M5 Hex Nut: M6 Double end spanner:10mm Torque: 10Nm.(1.0Kg.M.) NOTE: Couplers are color coded as: LH side: Green RH side: Red  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.40	Headlamp Assembly ■ Position head lamp assembly between top frames LH & RH and ensure the mounting holes are aligned. ■ Locate 2 Hex socket head screws on either sides of the top frame and tighten. ■ Connect head lamp wiring coupler. ■ Ensure the dust caps are fitted in the slots on LH & RH sides.	Hex Socket Hd. Cap screws: M8X25 Allen Key: M6 Torque: 10Nm.(1.0Kg.M.) NOTE: Ensure the head lamp beam is properly aligned before final torqueing 
4.41	Windshield Assembly ■ Locate 4 rubber nuts in the top frame LH & RH. ■ Locate wind shield on the top frame, ensure the mounting holes are aligned on both sides and tighten using 4 Pan head screws with plastic washers..	Pan Head screws: M8X25 Philips screw driver Torque: 5Nm.(0.5Kg.M.) 

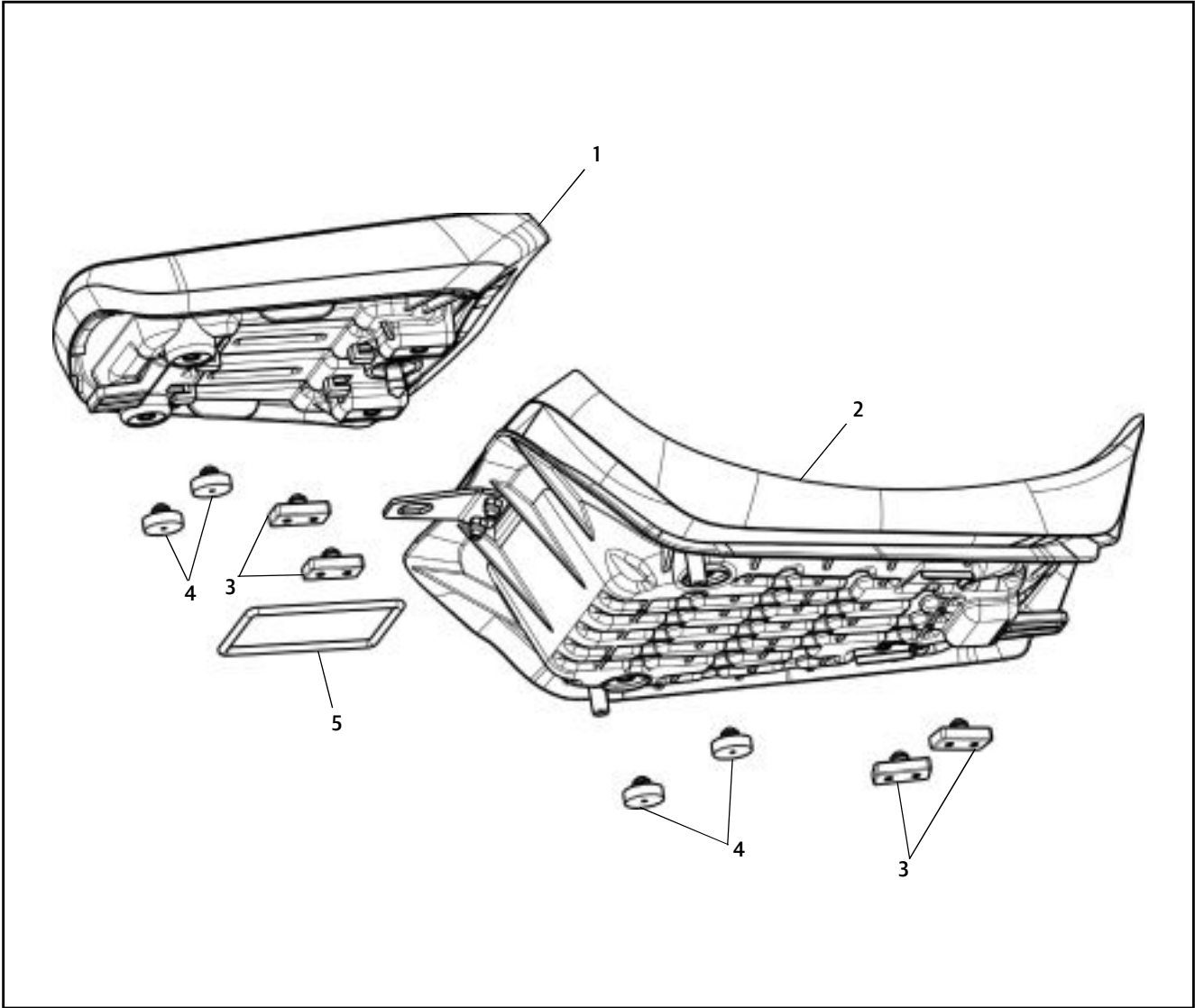
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.42	Bi Starter Cable ■ Locate the Bi starter cable in the lever at handle bar end. ■ Route the cable correctly, on the frame tube under fuel tank. ■ Assemble the cable guide, spring & valve bi starter on the cable. ■ Insert Valve bi starter into throttle body and tighten cable guide to throttle body. ■ Assemble fuel tank on frame as detailed in section ...	
4.43	Clutch Cable Assembly ■ Ensure proper location of inner cable in clutch lever & outer cable in LH bracket at handle bar end. ■ Ensure proper routing of cable along the frame and insert into the bracket in cover RH. ■ Assemble outer lock nut & larger end of rubber grommet on the adjuster. ■ Lock inner cable in the clevis on Cover RH, gently pull cable outwards till resistance is felt & thread out inner lock nut so that it rests against the bracket ■ Ensure 2-3 mm clutch lever free play at handle bar end by suitably turning inner lock nut on cable cable. ■ Tighten outer lock nut against cable bracket.	NOTE: Ensure the rubber grommet is correctly positioned between adjuster & clutch lever on RH cover 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.44	Oil Cooler ■ Insert Oil cooler pipe No 2 from the left side to the Right side, between the engine and the cradle frame. ■ Position Oil cooler mounting holes with the bracket on LH side & tighten with 2 flanged Hex bolts ■ Position 1 each aluminum washer on either sides of the hose banjo union of Hose no.2 and tighten to cover RH with Banjo union bolt. ■ Position 1 each aluminum washer on either sides of the hose banjo union of Hose no.1 and tighten to crankcase LH with Banjo union bolt.	Flanged Hex bolts: M6X20 Socket spanner: 8mm. Torque: 10Nm.(1.0Kg.M.)  Banjo Union Bolts: M14 Socket spanner: 19mm. Torque: 38Nm.(3.8Kg.M.) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.44	Skid Plate ■ Assemble the 4 rubber bushes in the bottom mounting holes of the Skid plate and locate 4 damper bushes on the rubber bushes. ■ Position the Skid plate under the cradle frame and align the mounting holes. Ensure the damper bushes do not fall off. ■ Assemble 4 Flanged Hex Bolts M6 X1 X 35 at the bottom of the Skid plate. ■ Assemble 2 Flanged Hex Bolts, M6 X 1 X 14 at the front of the skid plate. ■ Tighten all the 6 bolts evenly and diagonally.	  Flanged Hex Screw: M6 Socket Spanner: 10mm Torque: 10Nm (0.1 Kg.M)

SECTION 05 - RIDER & PILLION SEAT

EXPLODED VIEWS RIDER & PILLION SEAT



S.NO.	DESCRIPTION	QTY.
1	Pillion Seat Assy	1
2	Rider Seat Assy	1
3	Rubber Support - Front	4

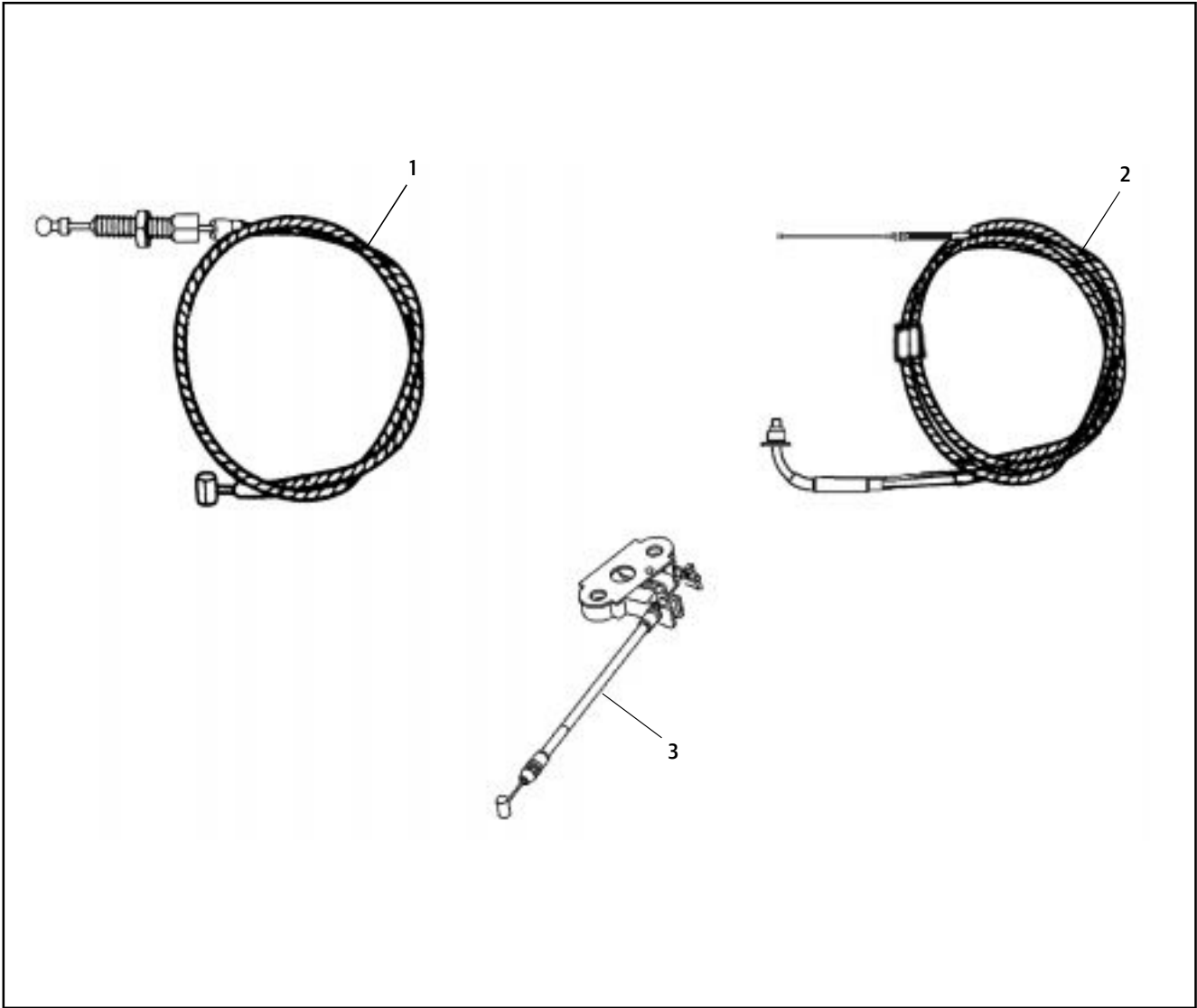
S.NO.	DESCRIPTION	QTY.
4	Rubber Support - Rear	4
5	Tool Kit Strap	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
5.1	Rider & Pillion Seat Dismantling ■ Unlock pillion seat by turning key clockwise & lift pillion seat from front end to release rear tab & remove. ■ Lift rider seat from rear end to release front tab & remove.	  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
5.2	Rider & Pillion Seat Assembly ■ Locate the rider seat tab under the fuel tank and position the locking plate centrally on the frame. ■ Locate rear seat tab in the frame, align lock pin with the seat latch and gently press on seat to lock. ■ Remove key after locking pillion seat.	  

SECTION 06 - CONTROL CABLES

EXPLODED VIEWS CONTROL CABLES



S.NO.	DESCRIPTION	QTY.
1	Clutch Cable Assy.	1
2	Throttle Cable Assembly	1
3	Seat Latch Cable Assy	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
6.1	Clutch Cable - Loosen cable lock nut at the cable bracket end, on engine cover RH & push adjuster in fully - Disconnect inner cable from clutch lever on engine cover RH. - Remove protective rubber cover & nut completely from cable & remove cable from bracket. - Disconnect cable inner from clutch lever on handle bar LH& remove clutch cable.	CAUTION: Inspect Cables for any fraying or damage  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
6.2	Throttle cable At Throttle body end - Loosen cable lock nuts & push adjuster fully into bracket at throttle body end. - Disconnect inner cable from rotor. - Remove bottom nut from cable adjuster & remove cable with adjuster from bracket. At handle bar end - Loosen the 2 screws on the throttle housing on handle bar. - Loosen the screw holding the cable strap plate & slide out the strap plate from the cable - Separate the rotor housing from the handle bar and remove the inner cable from the rotor. - Remove outer cable from rotor housing.	Hex nut : M6 Double End Spanner : 10mm  CAUTION: Inspect Cables for any fraying or damage

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
6.3	Bi-starter Cable ■ Remove the Bi starter cable from the clutch lever at handle bar end. At throttle body end ■ Remove the tank assy. (as detailed in section 10) ■ Loosen the hex faced plastic nut on holder cable valve at the throttle body end slowly pull out the valve bi starter from throttle body. ■ Compress spring & disconnect cable from the vale bi starter. ■ Remove spring & valve bi starter & slide out cable from the guide. At handle bar end ■ Loosen switch LH holding screws at the bottom & seperate the switch. ■ Disconnect cable from lever & remove.	 CAUTION Spring loaded cable hence remove slowly. Double end spanner : 12 x 13 mm

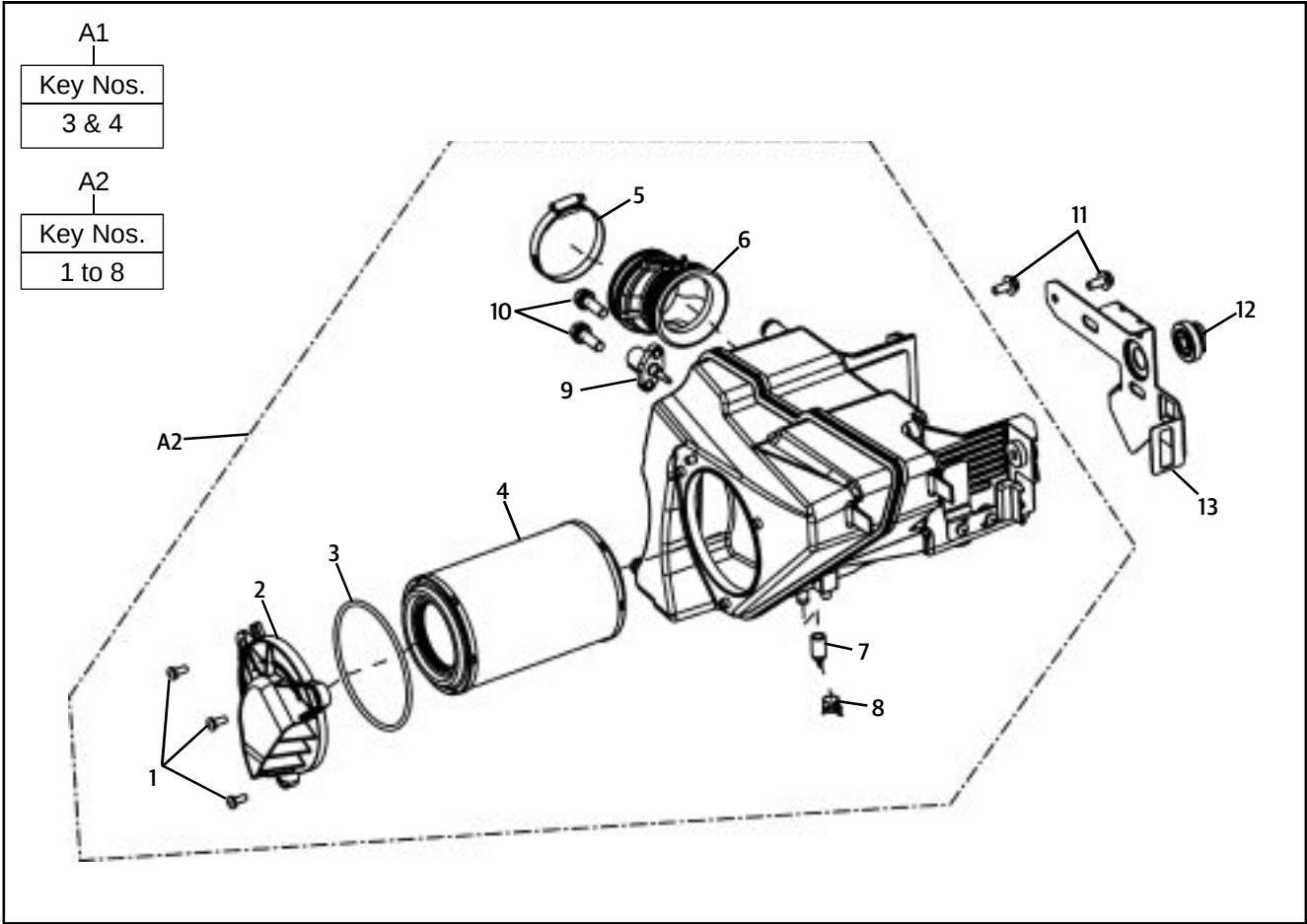
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
6.4	Clutch Cable ■ Ensure proper location of inner cable in clutch lever & outer cable in LH bracket at handle bar end. ■ Ensure proper routing of cable along the frame and insert into the bracket in cover RH. ■ Assemble outer lock nut & larger end of rubber grommet on the adjuster. ■ Lock inner cable in the clevis on Cover RH, gently pull cable outwards till resistance is felt & thread out inner lock nut so that it rests against the bracket ■ Ensure 2-3 mm clutch lever free play at handle bar end by suitably turning inner lock nut on cable cable ■ Tighten outer lock nut against cable bracket	NOTE: Ensure the rubber grommet is correctly positioned between adjuster & clutch lever on RH cover 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
6.5	Throttle cable At Handle bar end ■ Locate outer cable on rotor housing. ■ Locate the rotor housing on the handle bar and locate the inner cable on the rotor. ■ Install the screw holding the cable strap plate & slide out the strap plate from the cable. ■ Install the 2 screws on the throttle housing on handle bar. At Throttle body end ■ Locate the Throttle cable assembly. ■ Slacken the adjusters at the throttle body end for both cables.	Hex nut: Double End Spanner: 10mm CAUTION: Inspect Cables for any fraying or damage 
6.6	Bi Starter Cable ■ Locate the Bi starter cable in the lever at handle bar end. ■ Route the cable correctly, on the frame tube under fuel tank. ■ Assemble the cable guide, spring & valve bi starter on the cable. ■ Insert Valve bi starter into throttle body and tighten cable guide to throttle body. ■ Assemble fuel tank on frame as detailed in section ...	

SECTION 07 - AIR FILTER

EXPLODED VIEWS

AIRFILTER



S.NO.	DESCRIPTION	QTY.
A1	Air Filter Element Kit	1
A2	Air Filter Box Assembly	1
1	Screws M5	3
2	Inlet Cover	1
3	Seal	1
4	Element Air Filter	1
5	Clamp	1
6	Pipe Outlet	1

S.NO.	DESCRIPTION	QTY.
7	Drain Tube	1
8	Clip	1
9	TA SENSOR	1
10	HEX SOCKET HEAD CAP SCREW M5 X 16	2
11	Hex Flange Bolt, M6 X 1 X 14	2
12	Rear Damper - Tank	1
13	Lid - Battery Carrier	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
7.1	Air filter Element from housing ■ Remove 2 hex socket button head screws from the LH side panel. ■ Pull out the side panel gently to release from the grommet in the frame. ■ Loosen & Remove the 3 Pan head screws from the air filter cover. ■ Remove Cover. ■ Remove air filter element from housing.	Pan head Screw M5 Allen Key 4mm  Pan head Screw M5 Allen Key 4mm   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
7.2	Air filter Housing from frame ■ Disconnect battery terminals and remove from air filter housing. (refer electricals section for dismantling battery) ■ Remove 4 flanged hex bolts and remove piece mudguard. ■ Disconnect breather hose from air filter housing ■ Loosen throttle body worm clip sufficiently. ■ Loosen & remove 2 flanged hex bolts, holding air filter housing to frame ■ Gently pull out Fuse box along with its rubber holder from air filter housing ■ Remove RR unit with its rubber holder from air filter housing ■ Loosen and remove 3 flange hex bolts holding the cross bar assembly below air filter housing to frame ■ Remove cross bar assembly ■ Loosen flanged Hex bolt, holding bracket air filter to frame and remove the bolt and bracket air filter. ■ Remove air filter housing from rear side of the frame.	Hex Bolts: M6 Socket spanner: 8mm Screw driver  Hex Bolts: M8 Socket spanner: 12mm NOTE: Ensure the wiring connections are removed  Hex Bolts: M6 Socket spanner: 10mm Hex Bolts: M8 Socket spanner: 12mm 

INSPECTION & CLEANING

- Inspect air filter element carefully for any deformation, damages, heavily clogged with dirt, soggy condition, and / or foreign particles embedded in the element. Replace if any of these conditions are observed.
- Inspect rubber seals, hoses, for cuts, cracks, damages.
- Clean Air filter element every 5,000 Kms OR more frequently if motorcycle is used in dusty / Off road conditions.
- Gently Tap filter element with minimum force to dislodge heavy / embedded dust particles.
- Use compressed air from the outside of the filter element to remove dust particles
- Clean the element on the inside and outside using a soft cloth
- Clean the insides of the air filter housing and cover using a soft cloth
- Replace seals, 'O' Rings and rubber parts whenever the induction system is serviced.
- Replace Air filter element every 15,000 Kms or earlier if motorcycle is used in dusty / off road conditions.

TORQUE VALUES

S. No.	Aggregate	Fastener	Torque		Min. Torque		Max. Torque	
			NM	Kg.M	(Nm)	(Kg.M)	(Nm)	(Kg.M)
1	Bracket Assy-Airfilter top	Flanged Hex Bolt M8 X 1.25 X 16	22.5	2.25	20	2.0	25	2.5
2	Bracket Assy-Airfilter bottom	Flanged Hex Bolt M6 X 1 X 20	10	1.0	8	0.8	12	1.2
3	Crossbar Assy	Flanged Hex Bolt, M6 X 1 X 14	10	1.0	8	0.8	12	1.2
4	Piece mudguard	Flanged Hex Bolt, M6 X 1 X 20	10	1.0	8	0.8	12	1.2
5	Lid battery carrier	Flanged Hex Bolt, M6 X 1 X 14	10	1.0	8	0.8	12	1.2

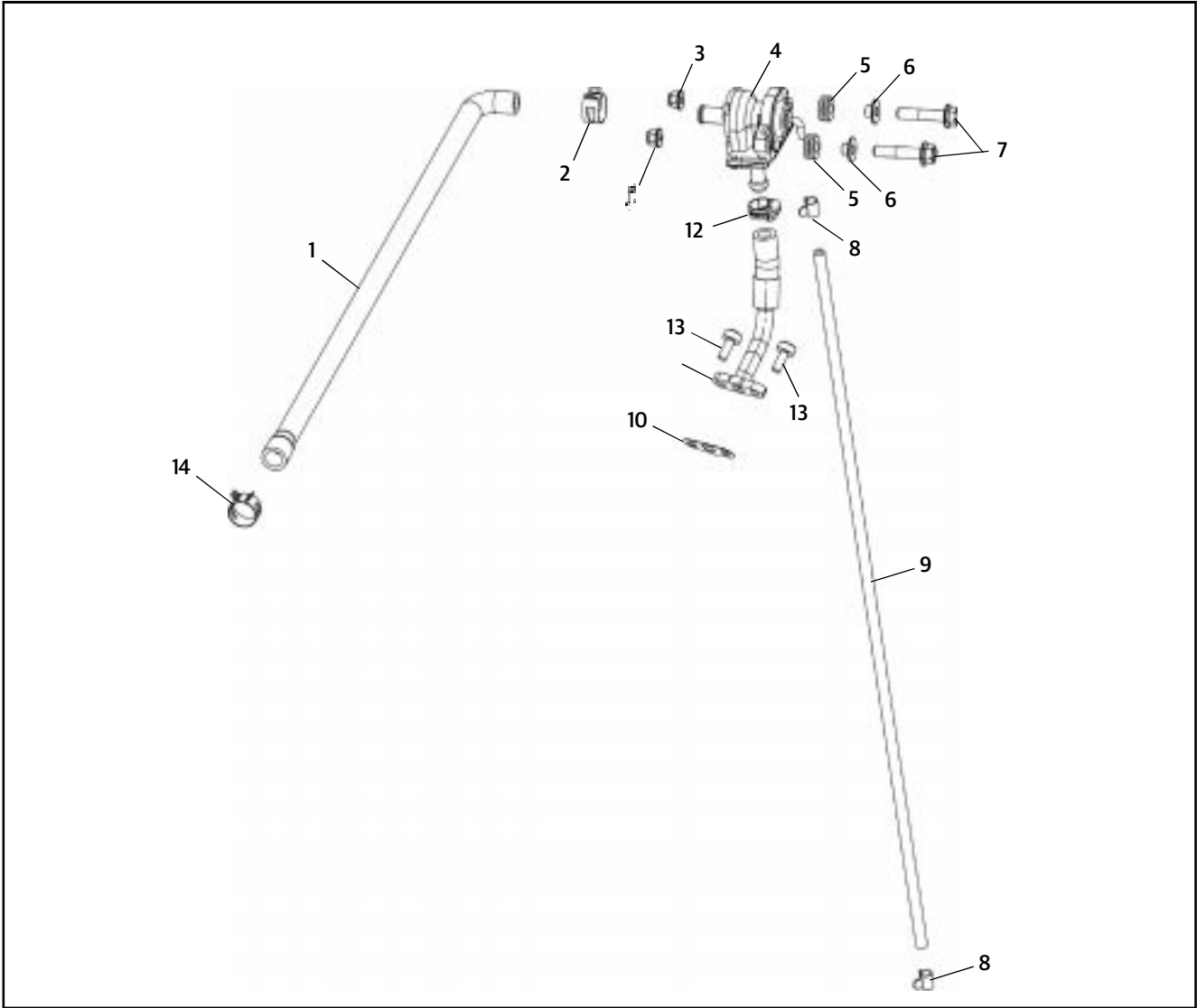
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
7.3	Air filter Housing on frame - Position air filter housing inside frame from rear side with its outlet hole facing Throttle body. - Ensure connecting is correctly & fully seated on both air filter and Throttle body & tighten hose clip to prevent slipping of the connection tube. - Locate cross bar assembly under air filter housing and tighten to frame using 2 flanged hex bolts. - Position bracket assembly, air filter on frame RH side and tighten using flanged hex bolt M8 on top and 2 M6 flanged hex bolts at bottom. - Assemble piece mudguard and tighten to frame with flanged bolts, washers and nylock nuts. - Assemble battery, connect terminals, locate lid battery carrier in housing and tighten with hex bolts. (Refer electricals section for battery assembly)	Screw driver  Flanged Hex Bolts: M6 Socket spanner: 8mm Torque: 8-12Nm (0.8-1.2 KgM.)  Flanged Hex Bolt: M8 Socket spanner: 12mm Torque: 20-25Nm (2.0-2.5 KgM.)  Flanged Hex Bolt: M6 Socket spanner: 8mm Torque: 8-12Nm (0.8-1.2 KgM.)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
7.4	Air filter Element into housing ■ Locate air filter element in housing such that the open end of the element is facing outside. ■ Locate cover on the air filter housing such that the locating pegs and the three mounting holes are aligned. ■ Tighten cover with 3 screws evenly and firmly ■ Locate side panel with its bottom leg located in the rubber grommet ■ Tighten side panel with 2 hex socket button head screws	  Philips head screw driver  Pan head screw M5 Allen Key 4mm 

SECTION 08 - PULSE AIR VALVE

EXPLODED VIEWS

PULSE AIR VALVE



S.NO.	DESCRIPTION	QTY.
1	PAV - Air Filter Hose	1
2	Clip	1
3	Flange Nyloc Type Nut M6 X 1	2
4	Pulse Air Valve	1
5	Damper - Oil Cooler	2
6	Spacer - Oil Cooler	2
7	Hex flange bolt M6 X 30	2

S.NO.	DESCRIPTION	QTY.
8	Clip - PAV Adaptor	2
9	PAV Adaptor Hose	1
10	Gasket Mounting Plate	1
11	Braided Hose assy	1
12	SS Hose Clip	1
13	Hex Socket Head Cap Screw M6 X 20	2
14	Clip - PAV air filter hose	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
8.1	Pulse air valve pipe connections ■ Remove fuel tank from frame. ■ Gently expand the clip and disconnect rubber hose from inlet manifold. ■ Disconnect air inlet hose from pulse air valve. Pulse air valve braided hose: ■ Loosen screw on the SS hose clip. ■ Loosen & remove 2 hex socket head cap screws holding braided hose flange to cylinder head on the exhaust end. ■ Gently pull out braided hose from pulse air valve bottom tube and remove along with gasket. Pulse air valve from frame: ■ Holding the nuts on the inside, loosen and remove the 2 flanged hex bolts from frame ■ Remove pulse air valve from frame, taking care not to drop the spacers and dampers	 Screw driver Hex. Soc head cap screw: M6X20 Allen Key 5mm  Hex bolts & nuts: M6 Double end spanner: 8mm

INSPECTION

- Inspect the hoses for ageing, cuts and / or cracks. Replace as recommended.
- Inspect braided hose for any leaks, cracks and proper sealing at cylinder head

TORQUE VALUES

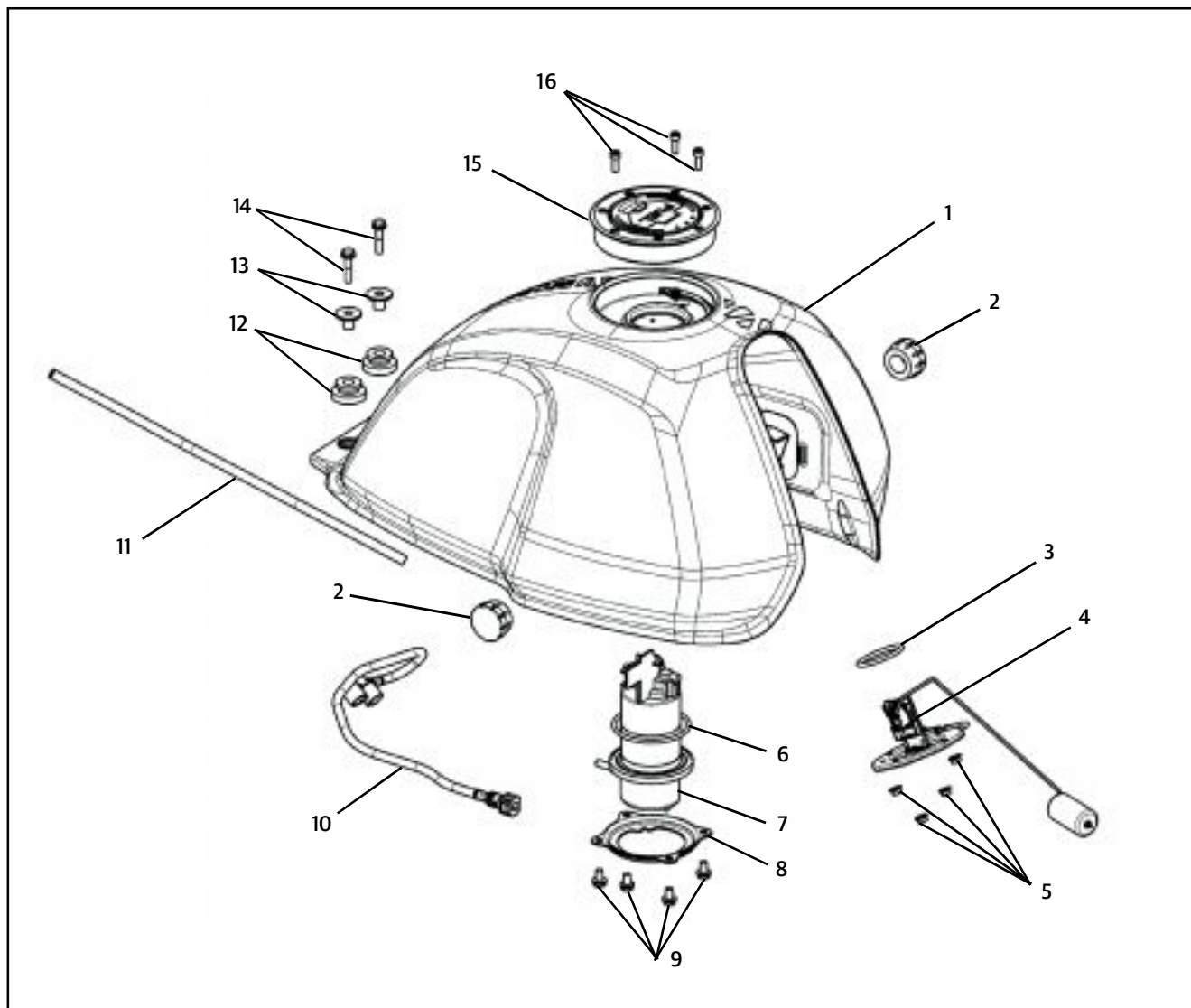
S. No.	Aggregate	Fastener	Torque		Min. Torque		Max. Torque	
			NM	Kg.M	(Nm)	(Kg.M)	(Nm)	(Kg.M)
1	Braided hose mtg to cyl head	Hex Socket Head Cap Screw M6 X 20	10	1.0	8	0.8	12	1.2
2	PAV mtg to frame	Hex flange bolt M6 X 30	10	1.0	8	0.8	12	1.2

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
8.2	Pulse air valve on frame ■ Locate pulse air valve in the frame such that the outlet is facing down, the inlet from Throttle body is on the RH side and the inlet from air filter is on the Left side of the frame ■ Ensure the dampers and spacers are in place in the mounting locations and tighten with 2 hex flange bolts M6X30 ■ Apply grease on the gasket and locate it on the cylinder head ■ Locate worm clip on the braided hose and assemble braided hose on the outlet tube of the pulse air valve ■ Position braided hose flange over the gasket on cylinder head, align the holes and tighten with two hex socket head cap screws ■ Tighten worm clip over the braided hose. ■ Connect the rubber hoses from airfilter and inlet manifold respectively and slide the clips in place.	Flanged Hex Bolts: M6 Socket spanner: 8mm Torque:10-12Nm (1.0-1.2 Kg.M)  Screw driver Hex soc hd cap screws: M6X20 Allen key: M5 Torque:10-12Nm (1.0-1.2 Kg.M) 

SECTION 09 - FUEL TANK

EXPLODED VIEW

FUEL TANK



S.NO.	DESCRIPTION	QTY.
1	Fuel Tank With Sticker - Granite	1
	Fuel Tank With Sticker - Snow	1
2	Front Damper-Tank	2
3	O Ring-Fuel Gauge	1
4	Fuel Level Sensor Unit	1
5	Hex Flange Nut M5 X 0.8	4
6	O Ring- Fuel pump	1
7	Fuel Pump Assy	1
8	Clamp Plate (FPM)	1

S.NO.	DESCRIPTION	QTY.
9	Flanged Hex Bolt M6 X 1 X 10	4
10	P.A. Tube Assy	1
11	Drain Hose	1
12	Rear Damper-Tank	2
13	Bush - Fuel Tank	2
14	Flanged Hex Bolt M6 X 1 X 27	2
15	Cap - Fuel Tank	1
16	Hex socket head cap screw m5x15	3

INSPECTION

- Carefully inspect fuel hose, EVAP hose and vent hose for damage, cuts, cracks, holes, wear or general deterioration. Replace if necessary.

WARNING

- Gasoline is extremely flammable and highly explosive, which could result in serious injury.
- Do not smoke or allow open flame or sparks in the vicinity.
- Store the fuel carefully to avoid spillage.

TORQUE VALUES

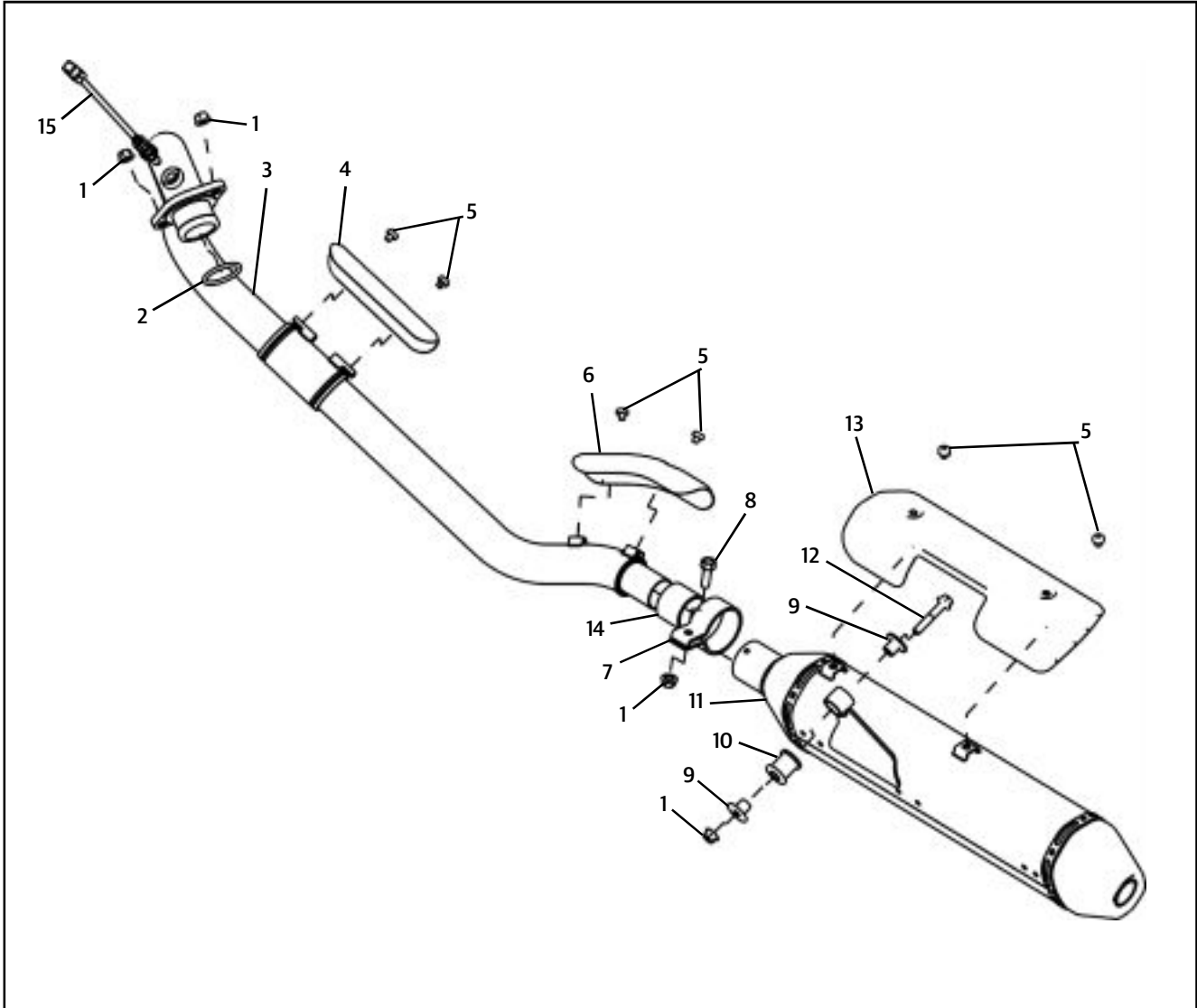
Aggregate	Component	Fastener	Torque Range	
			NM	Kg-M
Fuel Tank	Fuel tank Mounting	Flanged Hex Bolt M6 * 1*27	5	0.5

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
9.2	Fuel tank - Assembly ■ Position fuel tank such that the front mounting clamps are correctly located on the rubber supports on the frame. ■ Gently push fuel tank forward to lock in place. ■ Lift rear end of the tank slightly and : - Connect EVAP hose & remove proper routing in frame without any kinks. - Connect blue coupler of Low fuel sensor to wiring harness ■ Ensure rubber grommets are in place in the rear mounting holes and align mounting holes to the frame, ■ Locate 2 washers on the hex flange bolts, assemble the bolts and tighten to torque. ■ Connect fuel hose to fuel pump using quick fix adaptor.	Hex Flange Bolt M6 Socket Spanner 10 mm Torque 5 NM (0.5 Kg.M)

SECTION 10 - EXHAUST PIPE & SILENCER

EXPLODED VIEWS

EXHAUST PIPE & SILENCER



S.NO.	DESCRIPTION	QTY.
1	Flanged Hex. Nut M8 X 1.25	4
2	Exhaust Gasket	1
3	Exhaust Pipe Assy	1
4	Guard, Cat Pipe	1
5	Flanged Hex Bolt M6 x 1 x 7	6
6	Guard Exhaust Pipe	1
7	Clamp Silencer	1
8	Hex Flange Bolt M8 X 1.25 X 38	1

S.NO.	DESCRIPTION	QTY.
9	Pin Damper	2
10	Damper Bush	1
11	Silencer Assy	1
12	Hex Flange Bolt M8 X 1.25 X 55	1
13	Guard Silencer	1
14	Gasket (Exhaust Pipe & Silencer)	1
15	Oxygen sensor	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
10.1	Exhaust pipe & Silencer ■ The Hego sensor is assembled on the inner side of the exhaust down pipe near the cylinder head. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Disconnect wiring harness coupler from the sensor. ■ Loosen Hego sensor and remove along with copper washer from the exhaust down pipe. ■ Remove 2 flanged Hex nuts along with washers at the cylinder head end. ■ Release the clamp from the studs. ■ Remove 2 Hex bolts & nuts at the silencer mounting bracket end. ■ Support the silencer and remove the bolt. ■ Gently pull out the exhaust pipe from the cylinder head and remove exhaust pipe with silencer from the vehicle.	Deep Groove Socket: 21mm  Hex Nuts: M8X1.25 Socket spanner -12mm  NOTE: Remove copper washer in cylinder head, exhaust pipe seating area after removing exhaust pipe. Hex bolts: M8 X 1.25X45 Hex Nuts: M8 X1.25 Socket spanner - 12mm Double End Spanner: 12mm 

INSPECTION

- Inspect Silencer and Exhaust assemblies for any damages / dents as it might cause damage to the internals.
- Inspect silencer and exhaust pipe joint for any signs of exhaust gas leakage.

CAUTION :

- Do not clean the silencer and exhaust internals with any solvents, gasoline etc as it will damage the catalytic converters.

REPLACE

- Copper gasket between exhaust pipe and cylinder head whenever exhaust pipe is dismantled from cylinder head.

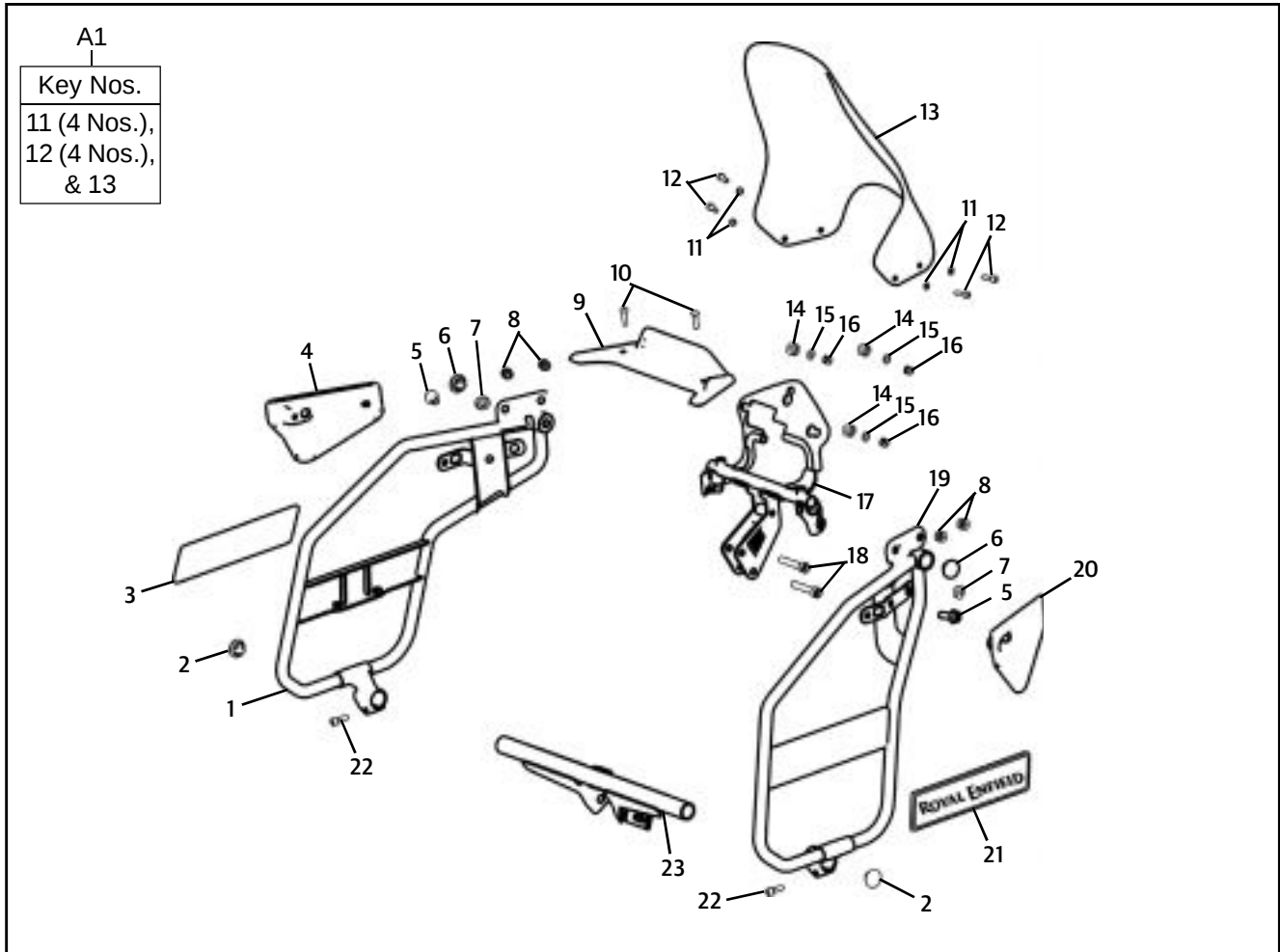
S No.	Aggregate	Fastener	Torque Range	
			NM	Kg-M
1	Exhaust Pipe Mounting to Cyl.head	Flanged Hex Bolt M8 X 1.25 X 16	10	1
2	Silencer Mounting to Frame	Hex Socket M8X1.25X25	25	2.5

No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
10.2	Exhaust pipe & Silencer ■ Locate a new gasket on the exhaust pipe. ■ Locate exhaust pipe into the cylinder head, position the clamp over the studs on the cylinder head & assemble 2 hex nuts M8 DO NOT TIGHTEN FULLY. ■ Position silencer mounting bracket against the frame at the rear and insert flanged hex bolt. Assemble hex nut over bolt. ■ Tighten the 2 hex nuts at the cylinder head, first and then the silencer bracket nut. ■ Locate Hego sensor along with copper washer on the exhaust down pipe near the cylinder head. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Connect wiring harness coupler on the sensor.	Hex Nuts: M8X1.25 Socket spanner -12mm Torque: 10Nm (1.0Kg.M.)  Hex bolts: M8 X 1.25X45 Hex Nuts: M8 X1.25 Socket spanner -12mm Double End Spanner: 12mm Torque: 25Nm (2.5Kg.M)  Deep Groove Socket: 21mm 

SECTION 11 - TOP BRACKET, HANDLE BAR, FRONT MUDGUARD, FRONT WHEEL FRONT SUSPENSION & STEERING STEM

EXPLODED VIEWS

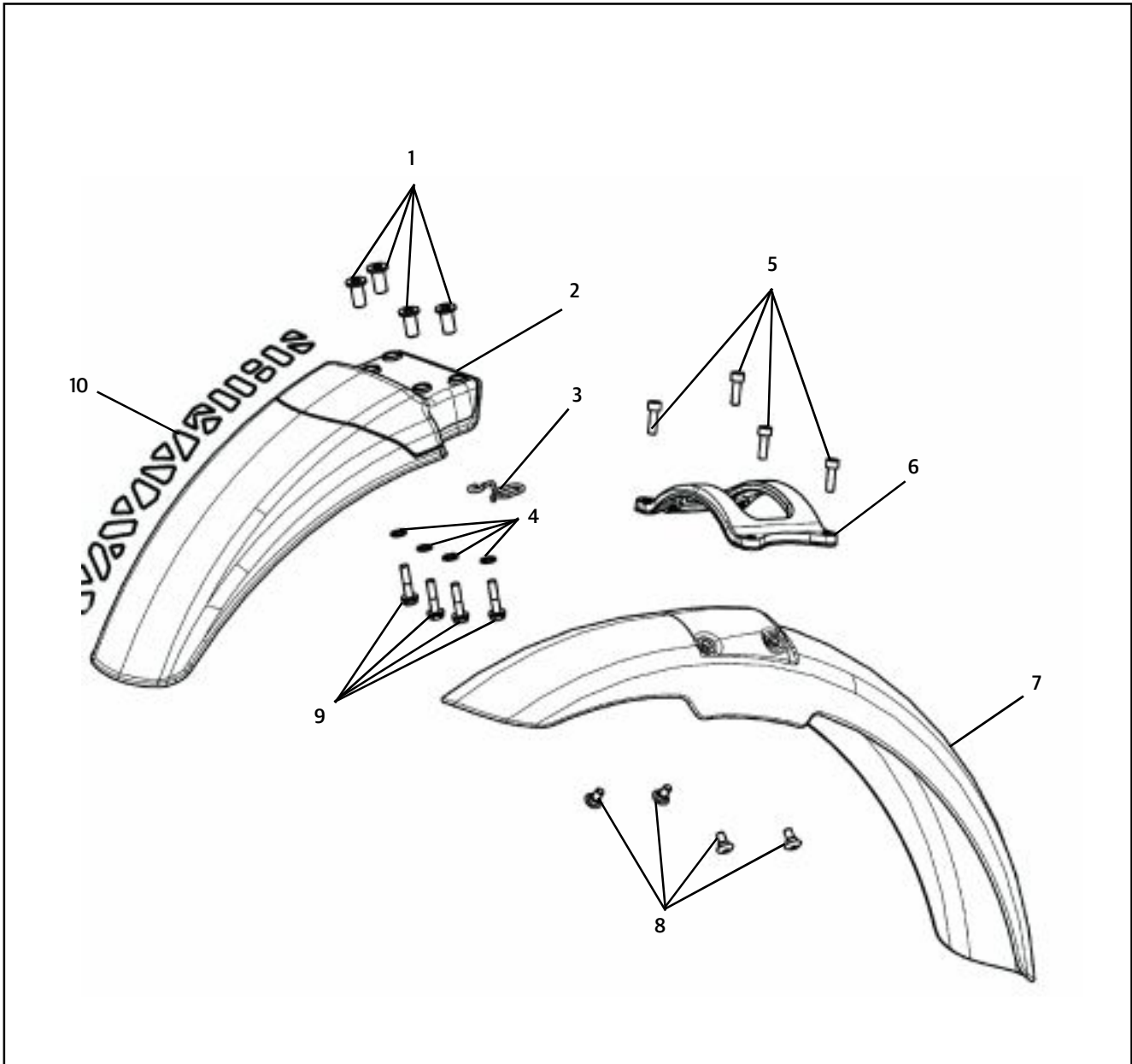
TOP FRAME, WINDSCREEN & COCKPIT BRACKET



S.NO.	DESCRIPTION	QTY.
A1	Wind Shield repair kit	1
1	Top frame LH with Decal	1
2	Dust Cap - Connector Comp	2
3	Decal LH	1
4	Cover Cockpit LH	1
5	Flanged Hex Bolt M8	2
6	Dust Cap-Frame Top	2
7	Grommet	2
8	Rubber Nut-M5	4
9	Cover Cockpit Top	1
10	Hex.Socket Button Head Screw M6X1	2
11	Washer Plastic	4

S.NO.	DESCRIPTION	QTY.
12	Hex socket head cap screw M5X16	4
13	Wind Shield	1
14	Grommet-Cluster	3
15	Plain Washer	3
16	Hex Nut M6 with nylon insert	3
17	Cockpit Mtg bracket- Black	1
18	Hex Socket Head Cap Screw M8 X 45	2
19	Top frame RH with Decal	1
20	Cover Cockpit RH	1
21	Decal RH	1
22	Hex Socket Head Cap Screw-M6	2
23	Connector Complete Black	1

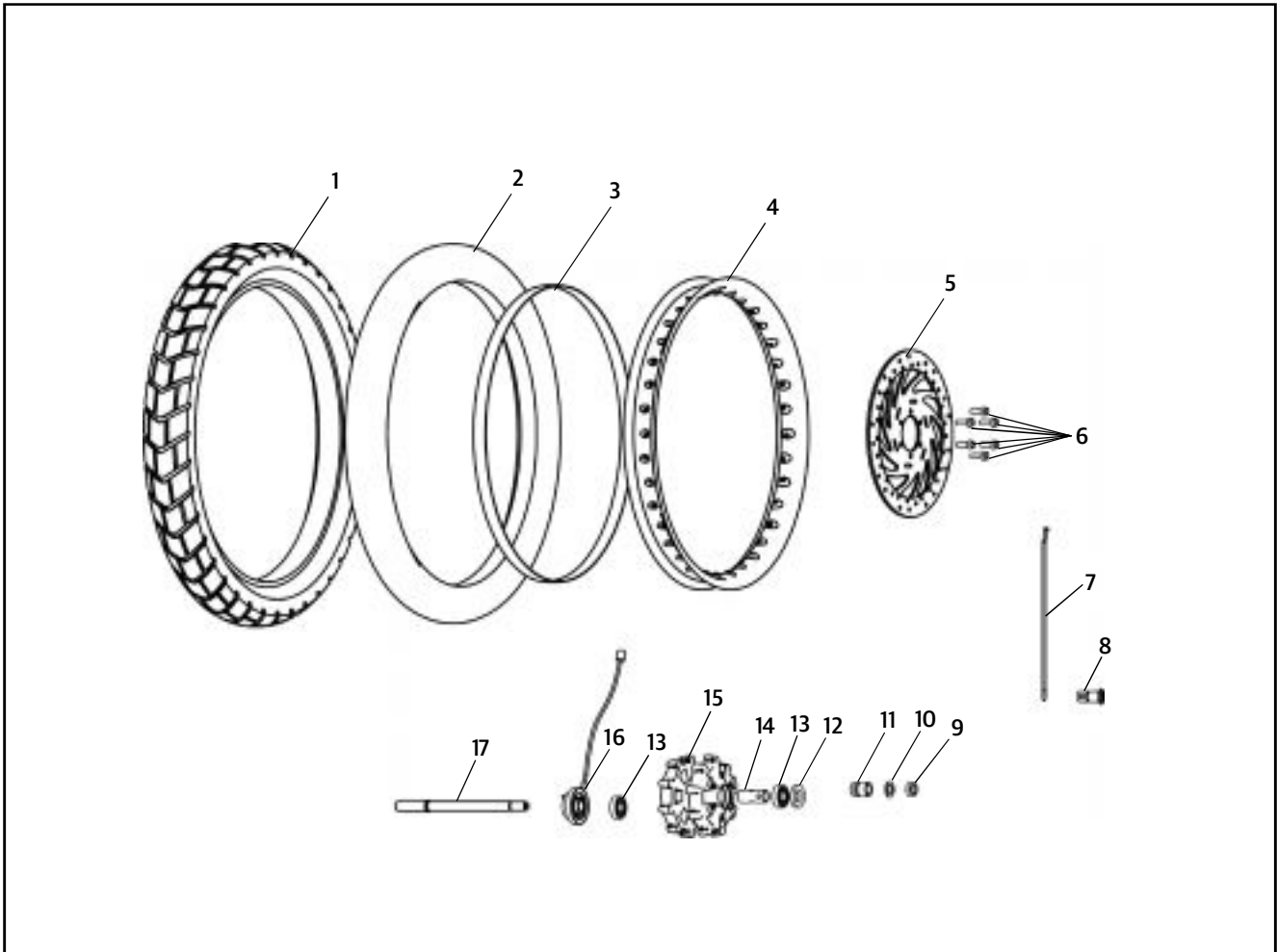
FRONT MUDGUARD



S.NO.	DESCRIPTION	QTY.
1	Insert - Front Fender	4
2	Front Mudguard with sticker assy - Granite	1
3	Clamp-Wheel Speed Sensor	1
4	Lock washer- Internal teeth	4
5	Hex. Socket Head Cap Screw- M6 X 20	4

S.NO.	DESCRIPTION	QTY.
6	Fork Brace	1
7	Front Mudguard - Bottom	1
8	Hex. Socket Button Head Screw M6 X 1	4
9	Flanged Hex Bolt M6 X1X 27	4
10	Sticker - Front mudguard	1

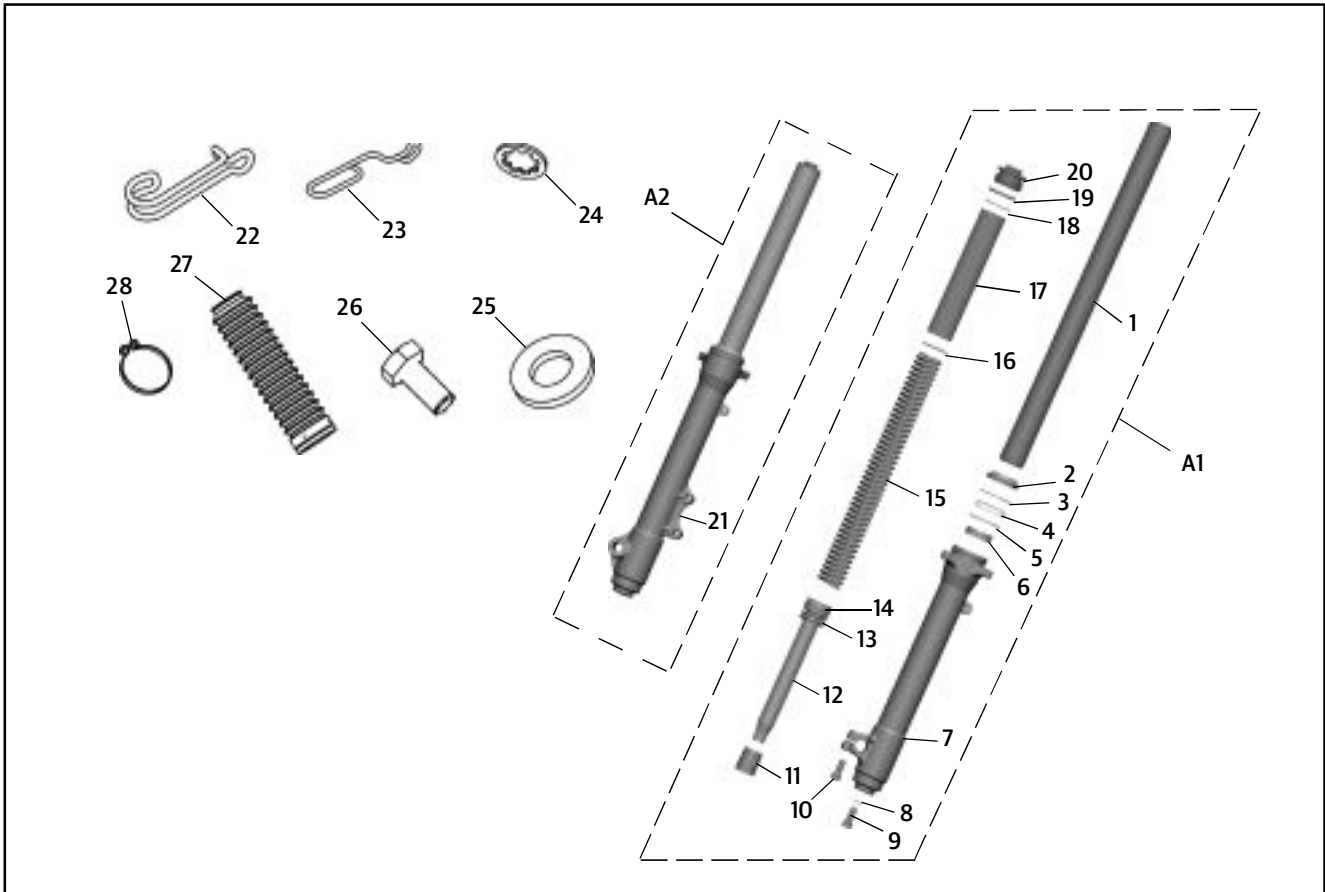
FRONT WHEEL



S.NO.	DESCRIPTION	QTY.
1	Tyre - Front	1
2	Tube - Front	1
3	Rim Tape- Front	1
4	Rim Front	1
5	Disc- Front	1
6	Hex Flanged Bolt M8 X 1.25 X 25	6
7	Spokes Front	36
8	Nipple	36
9	Hex U Nut M16 X1.5	1
10	Washer	1

S.NO.	DESCRIPTION	QTY.
11	Spacer	1
12	Grease Seal, ,25x40x7	1
13	Deep Groove Sealed Ball Bearing 6203 (17 X 40 X 12)	2
14	Spacer - Front Hub	1
15	Front Hub Assy	1
16	Wheel Speed Sensor Assy	1
17	Spindle - Front Wheel	1

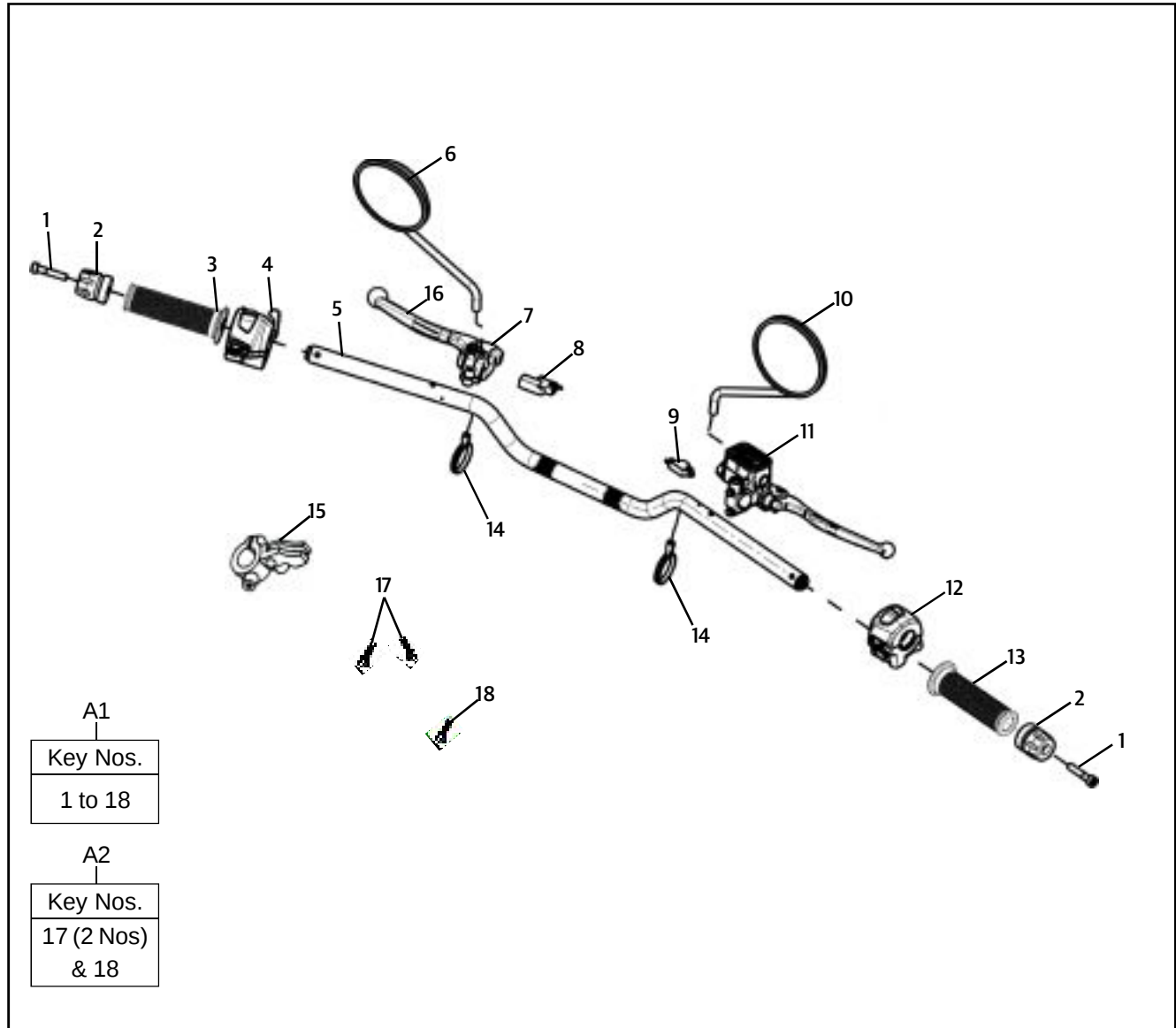
FRONT FORK



S.NO.	DESCRIPTION	QTY.
A1	Front Fork Assy. LH	1
A2	Front Fork Assy. RH	1
1	Inner Tube Assy.	2
2	Dust Seal	2
3	Circlip (Snap - Ring	2
4	Oil Seal	2
5	Bush Washer	2
6	Bush (Outer Tube)	2
7	Outer Tube RH	1
8	Gasket	2
9	Bolt M10X1	2
10	Hex Socket Head Screw M8 X 1.25 X 25	1
11	Spindle Taper	2
12	Piston - Front Fork	2
13	Spring - 2 (Short)	2

S.NO.	DESCRIPTION	QTY.
14	Piston Ring	2
15	Spring - 1 (Long)	2
16	Washer Spring Top	2
17	Spacer	2
18	Washer - 2	2
19	'O' Ring	2
20	Bolt Cap	2
21	Outer Tube LH	1
22	Cable Guide - Brake Hose	1
23	Cable Guide - Speedo Cable	1
24	Lock Washer, M6	2
25	Plain Washer	2
26	Hex. Bolt M6 X 12	2
27	Bellow Fork	2
28	Fork Gaiter Clip	2

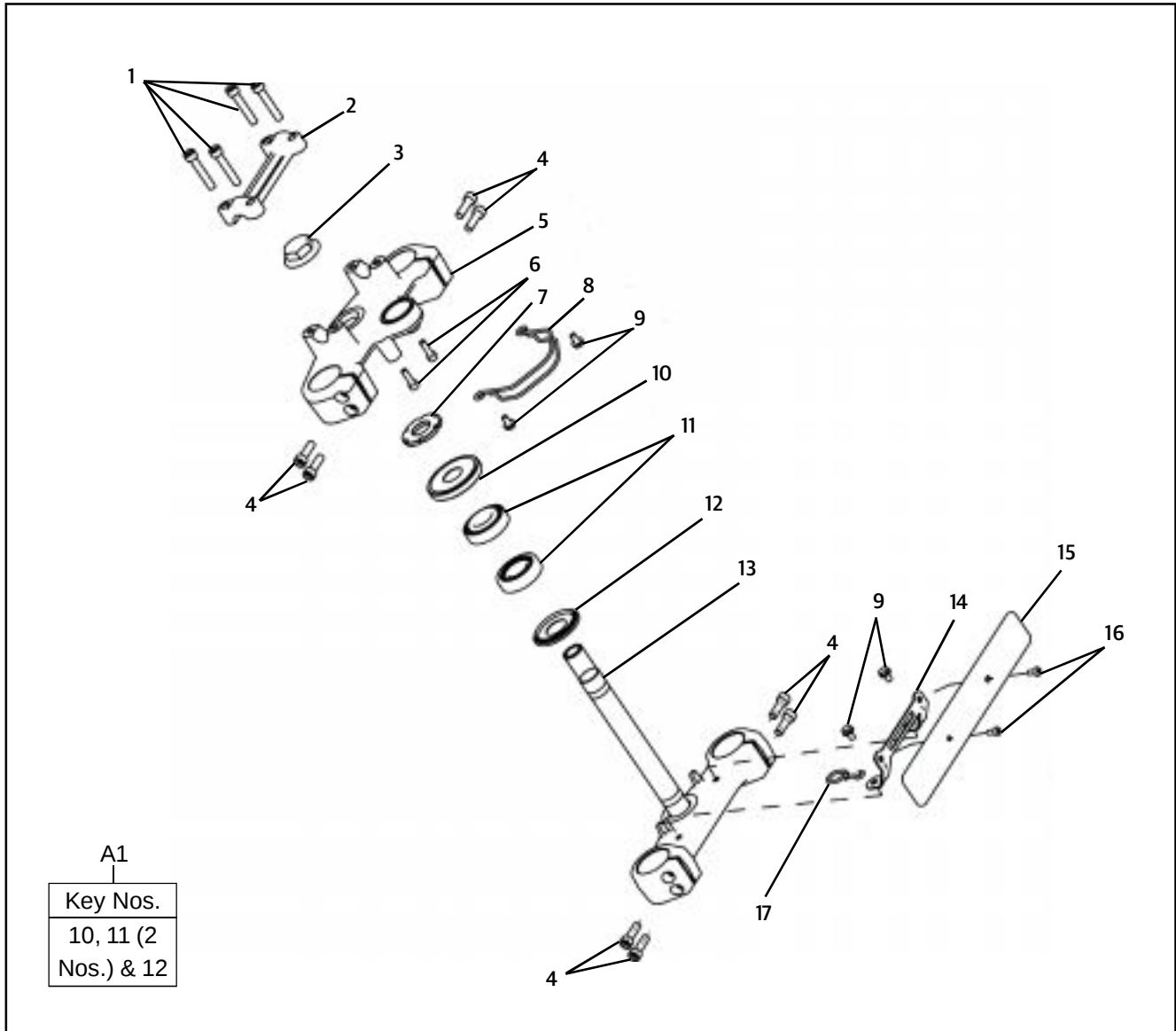
HANDLE BAR



S.NO.	DESCRIPTION	QTY.
A1	Handle Bar Assy Comp with Switch etc	1
A2	Clamp Kit Front M/C	1
1	Hex Socket Head Screw M8 X 48	2
2	Counter Weight Assy	2
3	Hand Grip LH	1
4	Switch Module LH	1
5	Handle Bar Complete	1
6	Rear View Mirror LH	1
7	Lever & Holder Assy- LH	1
8	Clutch Switch	1

S.NO.	DESCRIPTION	QTY.
9	Front Brake Switch	1
10	Rear View Mirror RH	1
11	Master Cylinder - Front	1
12	Switch Module RH	1
13	Grip Comp. Throttle RH	1
14	Mountable Strap- Handle bar	2
15	Bracket - Lever, Clutch LH	1
16	Clutch Lever	1
17	Screw - Clutch Switch	2
18	Screw Brake lever fixing	1

STEERING STEM



S.NO.	DESCRIPTION	QTY.
A1	Steering stem Bearing & dust seal kit	1
1	Hex Socket Head Screw M8 X 40	4
2	Top Raiser - Handle Bar	1
3	Lock Nut	1
4	Hex Socket Head bolt M8 X 1.25 X 25	8
5	Top Yoke	1
6	Hex. Socket Head Cap Screw - M6 X 20	2
7	Ring Nut	1
8	Clip Holder Assy - Wiring Harness	1
9	Flanged Hexogonal Bolt M6 X 1 X 10	4

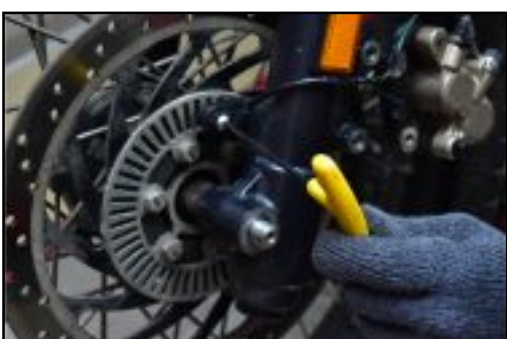
S.NO.	DESCRIPTION	QTY.
10	Dust Seal - Steering Assy top	1
11	Tapered Roller Bearing - 30205 (25 X 52)	2
12	Dust Seal-Steering Assy	1
13	Steering Stem Assy	1
14	Bracket Comp Number Plate	1
15	Number Plate - Front	1
16	Cross Recessed Pan Head Screw M5 X 0.8 X 12	2
17	Clamp-Wheel Speed Sensor	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.1	Top Frame LH & RH Wind Shield Assembly - Remove 4 Hex socket head cap screws holding the Wind shield assembly to the top frame. - Remove the 4 plastic washers along with the screws and remove wind shield.	Hex Soc Hd. Cap Screw: M5 Allen Key: 4mm NOTE: Hold the rubber mounted nuts from behind while loosening screws. 
11.2	Trafficator front LH, RH & cover cockpit LH, RH. - Disconnect Trafficator wiring couplers below headlamp. - Remove hex socket head screw mounting the trafficators to the top frames on LH & RH sides. - Gently pull out Cover cockpit LH & RH from the rubber grommets in the top frame LH & RH.	NOTE: Couplers are color coded as: LH side: Green RH side: Red Hex Soc Hd. Cap crews:M5 Allen Key: 4mm Hex Nut: M6 Double end spanner:10mm   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.3	Headlamp Assembly ■ Disconnect head lamp wiring coupler below head lamp. ■ Remove the dust caps from the mounting holes in top frame LH & RH. ■ Remove 2 hex socket head screws holding headlamp assembly to top frame LH & RH & remove head lamp assy.	Hex soc hd. cap screws: M8 Allen Key: 6mm
11.4	Top frame LH & RH ■ Remove 2 Flanged Hex bolts holding the top frame LH & RH to Instrument cluster bracket. ■ Remove the 2 dust caps from the connector in the frame. ■ Loosen 2 hex socket head screw clamping top frames LH & RH, to connector tube. ■ Gently rotate & pull out top frames LH & RH from connector tube.	Flanged hex bolts: M8 Socket Spanner: 12mm Hex Socket Hd. screws: M6 Socket Spanner: 10mm CAUTION: Take care not to damage fuel tank while rotating & removing the side support brackets.

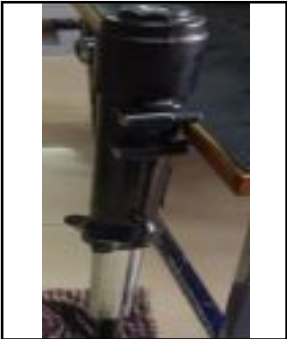
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.5	Instrument cluster Ignition switch & Cockpit mounting bracket ■ Disconnect the instrument cluster wiring coupler ■ Loosen and remove the 3 Hex cap nuts along with the washers. ■ Remove the Instrument cluster from the cockpit bracket ■ Disconnect ignition switch wiring coupler. ■ Loosen and remove 2 hex socket head cap screws beneath switch and remove switch. ■ Remove 2 Allen screws mounting the Instrument cluster bracket to frame head tube.	CAUTION: Instrument cluster must always be stored vertically and away from magnetic objects to prevent damage to the compass and displays. Hex cap nuts: M6 Socket Spanner: 10mm Hex soc. Hd. cap Screw: M5 Allen key: 4mm Hex soc. Hd. cap Screw: M8 Allen key: 6mm    

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.6	Front Mudguard Front Mudguard Top ■ Remove 4 Hex bolts from inside of mudguard. ■ Remove front mudguard top.	Hex bolt: M6 D E Spanner: 10mm NOTE: Ensure the 4 inserts are removed from the top of the mudguard.  
11.7	Front Mudguard Bottom ■ Remove 4 Allen screws securing fork brace to fork legs. ■ Remove 4 Allen screws inside front mudguard bottom to separate mudguard from fork brace.	Hex soc. Hd. cap Screw: M5 Allen key: 4mm Hex soc. Hd. cap Screw: M5 Allen key: 4mm  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.8	Front Wheel ■ Support front end of engine suitably such that the front wheel is off the ground. ■ Loosen pinch bolt on right fork end with 6 mm Allen key. ■ Hold spindle on right side and remove spindle nut and washer from left side. ■ Support wheel and pull out spindle from right side. ■ Remove wheel along with wheel speed sensor and spacer. ■ Remove speedo sensor. ■ Place a suitable spacer of 4 mm thickness, between the brake pads to avoid accidental compression of the brake lever.	CAUTION: Do not press the brake lever when wheel is removed as this will result in the brake pads coming out too far from the brake caliper.    

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.9	Front Fork Assy LH & RH Fork assy from vehicle - Remove 2 Hex bolts holding brake caliper to fork LH. - Loosen 2 each hex socket head cap bolts on the LH & RH side fork crown plate. - Loosen 2 each hex socket head cap bolts on the LH & RH side on steering stem assy. - Rotate main tube & simultaneously pull out from fork crown plate and steering stem assembly. - Repeat same process with other fork assembly.	Hex bolt: M8 T Spanner: 12mm NOTE: Support the wheel caliper suitably to prevent damage to it. Ensure front wheel, wheel speed sensor connecting wire & front mudguards are already removed Hex soc. Hd. cap Screw: M8 Allen key: 6mm   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.10	Front Fork Internals - Hold fork assembly in a bench vice with soft jaws, approximately 6 inches from the top and loosen cap nut. - Remove fork assembly from the bench vise, hold upright and remove cap nut with washer slowly to allow the main spring to expand completely. - Remove washer, spacer and washer spring top and main spring from the inner tube. - Invert the fork assembly to drain out the oil from the fork. - Gently pump main tube into the bottom tube to drain out the oil completely.	Hex cap nut : M16 Ring spanner: 24mm    Fork oil capacity: 455ml/leg 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.11	Front Fork Internals ■ Insert special tool from the main tube end & Locate on the guide tube to prevent it from rotating. ■ Remove Allen screw at the bottom. ■ Remove special tool from inner tube. ■ Remove the dust seal, retainer clip, and fork seal from the outer tube. ■ Separate fork tubes by sharply pulling inner tube out of the outer tube along with the guide bush, seat pipe assembly, rebound spring and cap oil lock.	Hex soc hd. cap screw: M8 Allen key: 6mm  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.12	Handle Bar Assembly ■ Remove rear view mirrors LH & RH from handle bar ■ Disconnect clutch and throttle cables. (refer section 5) ■ Disconnect wiring couplers of LH and RH switch assemblies from the wiring harness ■ Disconnect Front Brake Switch wire connections. ■ Disconnect clutch switch wiring coupler. ■ Remove 2 Hex bolts from master cylinder top mounting bracket on handle bar RH and remove master cylinder complete with brake lever from handle bar. ■ Remove 4 Hex socket screws mounting top raiser to steering stem top bracket & remove handle bar with top raiser.	Hex nut: M10 Double end spanner: 14mm   Hex bolt: M6 Socket spanner: 8mm  Hex soc hd. cap screw: M8 Allen key: 6mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.13	Steering stem assembly ■ Ensure following are removed: - Mirrors LH&RH, Windshield - Headlamp & trafficators. - Instrument cluster. - Ignition switch. - Electrical connections to wheelspeed sensor, clutch switch & front brake switch. - Top frames LH, RH & cockpit bracket - Clutch and throttle cables from handle bar. - Front disc brake system from handle bar & fork end LH - Top raiser and handle bar assembly - Front wheel. - Top & front mudguards - Fork assemblies LH & RH ■ Loosen top nut on steering stem and remove ■ Support steering stem from bottom and remove adjuster nut at the top	Hex nut : M24 Double end Spanner : 30mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.13	Steering stem assembly ■ Remove dust washer from the top ■ Remove steering stem from the frame ■ Remove taper roller bearing from the frame head tube.	  NOTE: The bottom taper roller bearing will be tight in the steering stem and will have to be pulled out of the stem using suitable puller. 

INSPECTION

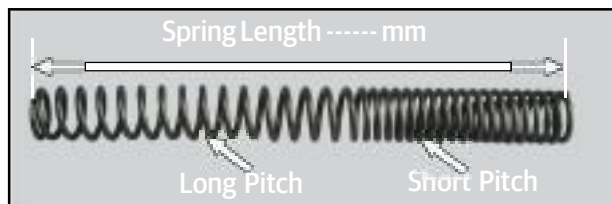
- Inspect steering stem ball races for uneven wear, damage and rusting
- Steering stem for bend
- Inspect front forks for oil leaks
- Spokes for looseness / breakages
- Wheel out of trueness
- Tyre for uneven tread wear, cuts, cracks
- Wheel bearings for sticky rotation, wear out, loose in hub
- Brake pads for uneven / completely worn out

TORQUE VALUES

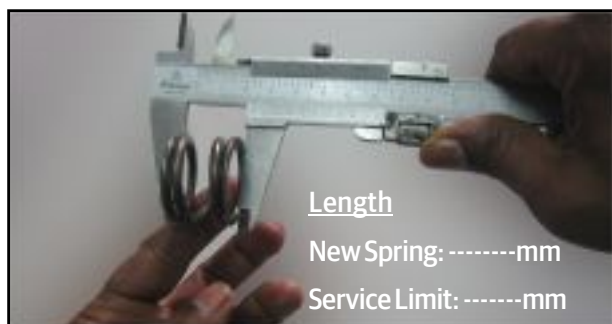
S. No.	Aggregate	Fastener	Torque		Min. Torque		Max. Torque	
			NM	Kg.M	(Nm)	(Kg.M)	(Nm)	(Kg.M)
1	Wind shield Mtg	Hex Socket Head Screws M5X16	5	0.5	4.25	0.43	5.75	0.58
2	Head Lamp Mtg	Hex socket head screw M8X1.25X25	10	1.0	8.50	0.85	11.50	1.15
3	Trafficator Mtg	Button Head M6X1X20	5	0.5	4.25	0.43	5.75	0.58
4	Handle Bar End Mass Mtg	Hex socket cap screw M8x1.25X50	25	2.5	21.25	2.13	28.75	2.88
5	Top Raiser Mtg	Hex socket Head screw M8X1.25X45	25	2.5	21.25	2.13	28.75	2.88
6	Top Yoke Mtg	Hex socket head screw M8X1.25X25	25	2.5	21.25	2.13	28.75	2.88
7	Front Number Plate	Cross Recessed M5X0.8X12	5	0.5	4.25	0.43	5.75	0.58
8	Bottom Yoke Mtg	Hex socket head screw M8X1.25X25	25	2.5	21.25	2.13	28.75	2.88
9	Steering Stem Lock Nut	M24X1-7H	60-70	6.0-7.0	60.00	6.00	70.00	7.00
10	Front Fender Top	M6X1X27	5	0.5	4.25	0.43	5.75	0.58
11	Front Fender Bottom	M6X1X13	5	0.5	4.25	0.43	5.75	0.58
12	Fork Brace Mtg	Hex socket head screw M6X1X20	10	1.0	8.50	0.85	11.50	1.15
13	Front Wheel Spindle Nut	Hex U Nut M16 X1.5	70	7.0	59.50	5.95	80.50	8.05
14	Fork Pinch Bolt	Hex Socket head screw M8X1.25X30	10	1.0	8.50	0.85	11.50	1.15
15	Front Caliper Mtg	Hex Flange Bolt M8X1.25X55	25	0.3	21.25	0.21	28.75	0.29
16	Front Disc Plate Mtg	Hex Flange bolt M8X1.25X25	25	0.3	21.25	0.21	28.75	0.29

WEAR LIMIT

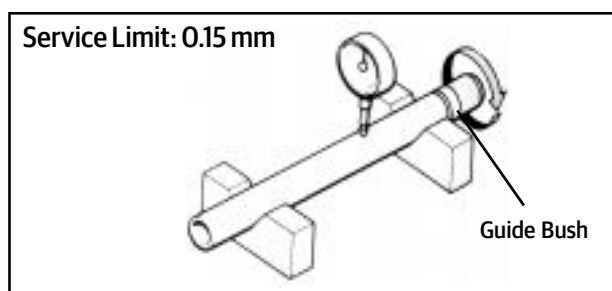
■ Fork spring long



■ Fork spring short



Main tube straightness



S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.14	Steering stem assembly ■ Assemble taper roller bearing on the steering stem such that the taper is facing upwards ■ Insert the steering stem into the frame head tube from the bottom. ■ Support steering stem and assemble taper roller bearing on top of the frame head tube with the taper facing downwards ■ Assemble dust seal washer over the frame head tube. ■ Assemble adjuster nut on steering stem and tighten till there is no sideways play of the steering stem. ■ Rotate steering stem and check for free & smooth rotation on both LH & RH. ■ Locate top yoke over the steering stem ■ Assemble top nut over the top yoke. Do not tighten fully.	NOTE: Ensure taper roller bearings are greased well before assembly.    

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.14	Steering stem assembly ■ The adjustment should be carried out only after assembly of the following. - Cable bracket on top yoke bottom. - Handle bar on Top yoke. - Top mudguard on steering stem. - Front disc brake master cylinder on handle bar RH. (Route the brake hose & wheel caliper towards the left side of vehicle). - Clutch and throttle cables. - Cockpit bracket & Top frames LH & RH. - Electrical connections to clutch switch & front brake switch. - Ignition switch. - Instrument cluster. - Headlamp & trafficators. - Mirrors LH & RH - Windshield - Front fork assembly LH & RH - Wheel Caliper on fork end LH - Front Wheel ■ Hold both forks at wheel axle end and check for any axial play. ■ Turn handle bar to both LH & RH Check for : - Free movement without any stickiness. ■ Loosen / tighten adjuster nut on steering stem to correct axial play and / or sticky movement of steering assembly. ■ Tighten top nut stem to torque on steering.	Steering Stem locknut : M24 Socket Spanner - 30mm Torque - 70 Nm (7.0 Kg.m)

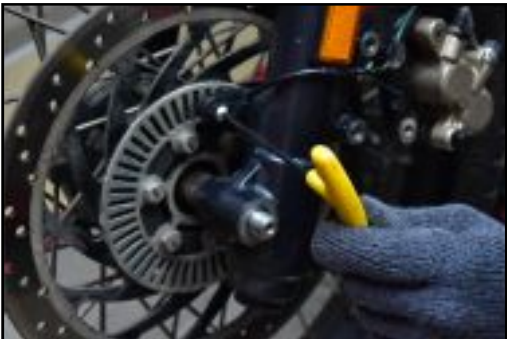
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.15	Handle Bar Assembly ■ Locate handle bar on top yoke. ■ Assemble top raiser over handle bar and tighten with 4 hex socket head screws. ■ Locate Master cylinder on handle bar RH side. ■ Locate top clamp over bracket and tighten with 2 Hex bolts. (Route the brake hose & wheel caliper towards the left side of vehicle) ■ Connect Front Brake Switch wire connections. ■ Connect clutch and throttle cables. (refer section 5) ■ Connect clutch switch wiring coupler. ■ Connect wiring couplers of LH and RH switch assemblies from the wiring harness ■ Assemble rear view mirrors LH & RH from handle bar.	Hex sochd. capscrew: M8 Allen key: 6mm Torque: 25Nm (2.5Kg.M)    

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.16	Front Fork Assy LH & RH Front Fork Internals ■ Locate dust cap, oil seal with its spring facing downwards and spacer from the bottom of inner tube assembly. ■ Assemble spring 2 (short) on piston - front fork and insert tapered end into main tube from the top. ■ Locate spindle taper with a little bit of grease to hold it in position, on the piston - front fork ■ Insert special tool into inner tube assembly, from top to hold piston - front fork.	 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.16	Front Fork Assy LH & RH Front Fork Internals ■ Assembly Outer tube over inner tube assembly bottom such that it is seated fully against the spindle taper. ■ Locate copper washer on hex socket screw and tighten outer tube to piston – front fork. ■ Remove special tool ■ Gently tap plastic spacer and oil seal, into fork end till the oil seal is below the lock ring groove in the fork end ■ Assemble lock ring over oil seal on the main tube ■ Press dust cap into fork end till it is seated flush in fork end. ■ Insert closed coil end of the spring 1 (long) into inner tube. ■ Fill 455ml of fork oil per leg ■ Locate thrust washer and tube spacer inside inner tube. ■ Assemble plain washer over spacer and tighten with the special hex cap nut. ■ Repeat process to assemble other fork.	  Fork oil capacity: 455ml/leg 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.17	Front Fork Assy LH & RH Fork assy on steering stem ■ Insert fork assy LH from LH side of steering stem bottom till it is seated into the top yoke and flush with the top of the top yoke. ■ Insert fork assy RH from RH side of steering stem bottom till it is seated into the top yoke and flush with the top of the top yoke. ■ Tighten 4 Hex socket head screws on the LH and RH sides of the steering stem assembly sufficiently. ■ Tighten 4 Hex socket head screws on LH and RH sides of the top yoke sufficiently. ■ Assemble front mudguard and brace ■ Locate front wheel caliper on fork Lh and tighten with 2 Hex flange bolts.	Hex. Socket screw : M8 Allen head socket : 6mm Torque : 22.5 Nm (2.25 Kg.m) Hex. Socket screw : M8 Allen head socket : 6mm Torque : 22.5 Nm (2.25 Kg.m)   

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.18	Front Mudguard Front Mudguard Bottom ■ Locate fork brace over front mudguard bottom and tighten with 4 hex screws ■ Locate front mudguard bottom with brace between fork legs and tighten with 4 hex socket head screws. Front Mudguard Top ■ Locate insert fender into the mounting holes in front mudguard ■ Locate front mudguard top below the steering stem and ensure mounting holes are aligned. ■ Tighten front mudguard top to steering stem using 4 hex bolts from inside of mudguard.	    Hex Bolt : M6 D.E. Spanner : 10 MM Hex. Socket Head Cap screw : M5 Allen key : 4mm

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.19	Front wheel ■ Locate the spacer placed between the brake pads. ■ Locate wheel speed sensor lugs on the hub slot carefully. ■ Position wheel along with wheel speed sensor and spacer on left side between the front fork legs, ensuring the brake disc is located between the brake pads. ■ Insert wheel spindle from right fork end. ■ Position wheel speed sensor such that it is parallel to ground. ■ Hold spindle on right side, locate washer and nut on spindle on left side and tighten firmly. ■ Tighten pinch bolt on right fork end. ■ Rotate wheel and check for smooth rotation. ■ Press brake lever and check front brake for efficiency.	   

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.20	Top Frame LH & RH Cockpit mounting bracket, instrument cluster & Ignition switch ■ Locate Ignition switch in top yoke and tighten with 2 Hex socket head screws. ■ Connect ignition switch wiring coupler to ignition switch ■ Position cockpit mounting bracket on frame head tube and tighten with 2 Allen screws . ■ Locate instrument cluster on cockpit moutnig bracket ■ Assemble 3 washers on the studs and tighten with 3 cap nuts ■ Connect instrument cluster wiring coupler.	Hex Soc Hd. Cap Screw: M5 Allen Key: 4mm Torque : Hex soc. Hd. cap Screw: M8 Allen key: 6mm Torque : CAUTION: Instrument cluster must always be stored vertically and away from magnetic objects to prevent damage to the compass and displays. Hex cap nuts: M6 Socket Spanner: 10mm Torque :    

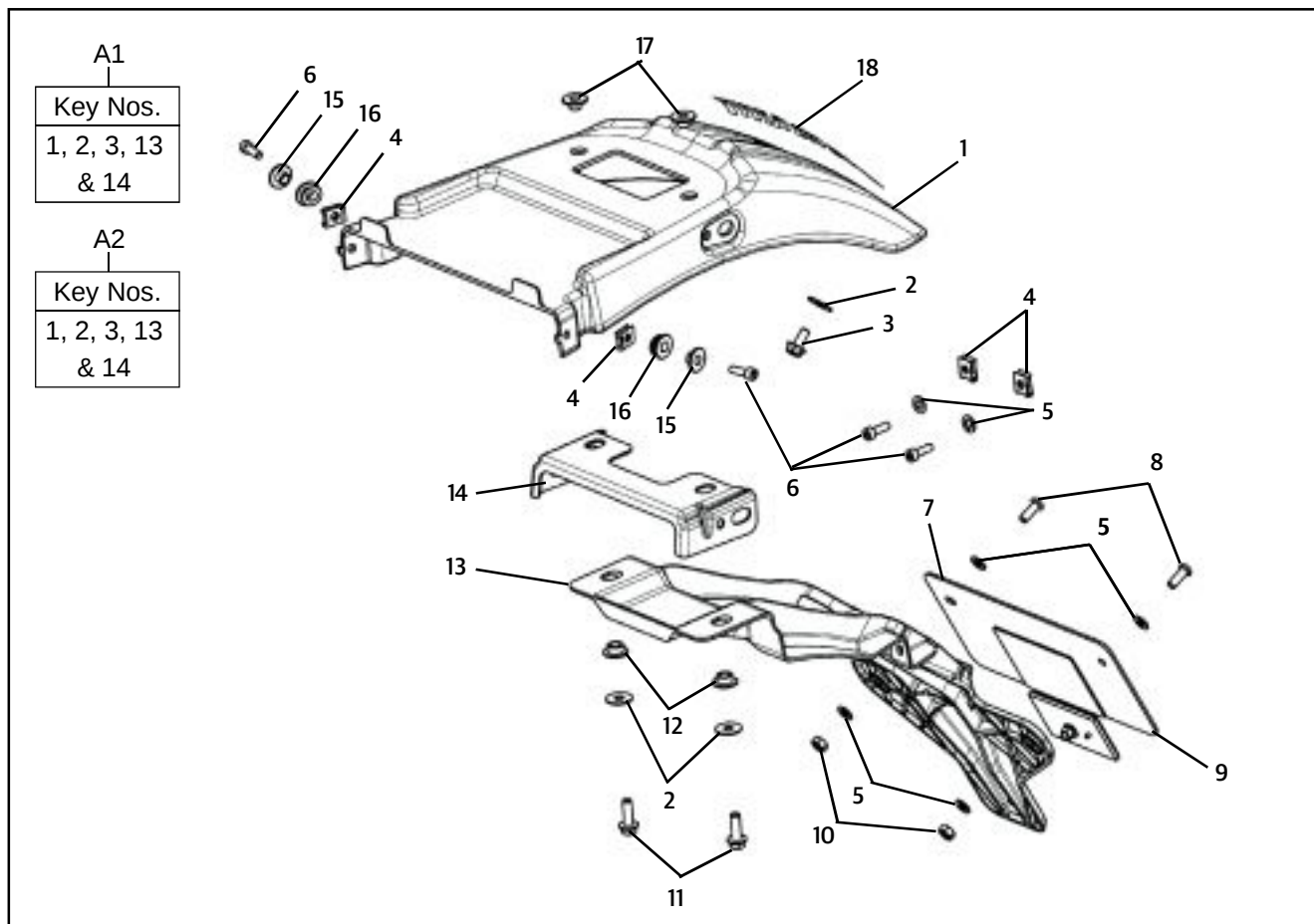
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.21	Top Frame LH & RH ■ Locate top frames LH & RH on connector tube in frame and press in till the mounting holes are flush. ■ Align top mounting hole to cockpit bracket mounting hole ■ Assemble 2 Flanged Hex bolts on top frame LH & RH and tighten to cockpit mounting bracket. ■ Tighten the 2 hex socket head screw clamping top frames LH & RH, to connector tube ■ Assemble 2 dust caps on the connector tube. Headlamp Assembly ■ Position Headlamp housing between top frame LH & RH and tighten with 2 hex socket head screws. ■ Assemble 2 dust caps in the mounting holes in top frame LH & RH. ■ Connect head lamp wiring coupler below head lamp.	Flanged hex bolts: M8 Socket Spanner: 12mm Torque : CAUTION: Take care not to damage fuel tank while assembling top frames. Hex Socket Hd. screws: M6 Socket Spanner: 10mm Torque :    

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
11.22	Trafficator front LH, RH & cover cockpit LH, RH ■ Locate Cover cockpit LH & RH in the rubber grommets in the top frame LH & RH ■ Locate traficator on the cover cockpit and tighten with hex socket head screw. ■ Repeat above process to assemble the other trafficator ■ Connect Trafficator wiring couplers below headlamp. Wind Shield Assembly ■ Locate windshield assembly on top frame. ■ Assemble plastic washers on the 4 Hex socket head cap screws and tighten to top frame LH & RH.	Hex Soc Hd. Cap screws:M5 Allen Key: 4mm Hex Nut: M6 Double end spanner:10mm Torque : NOTE: Couplers are color coded as: LH side: Green RH side: Red NOTE: Hold the rubber mounted nuts from behind while Tightening screws.    

**SECTION 12 - REAR WHEEL, CHAIN &
SPROCKET, SAREE GUARD, CHAIN GUARD,
REAR GUARDS, SHOCK ABSORBER, DRAG &
DROP LINKS, SWING ARM, REAR CHAIN
ADJUSTMENT AND WHEEL ALIGNMENT**

EXPLODED VIEWS

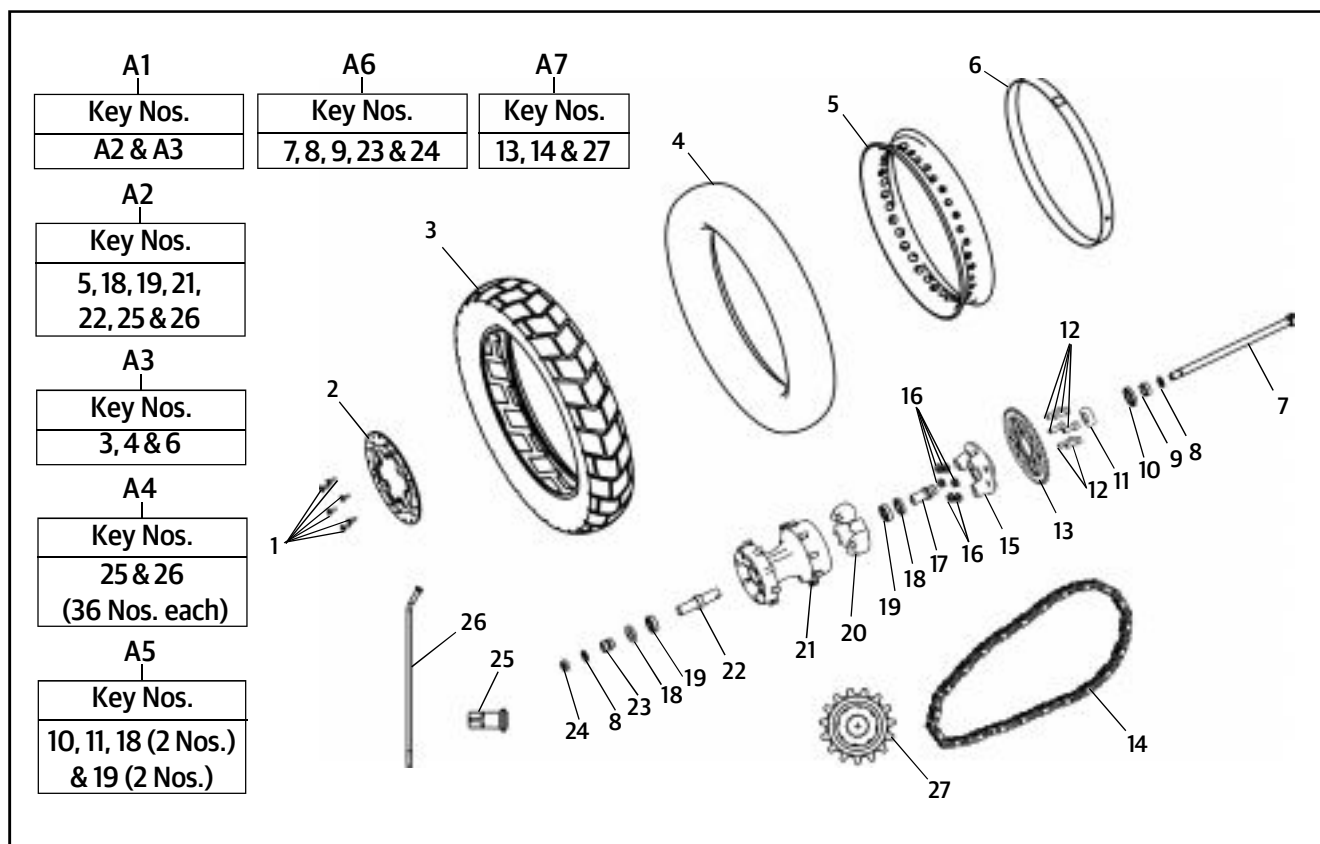
REAR MUDGUARDS



S.NO.	DESCRIPTION	QTY.
A1	Mudguard Assy kit (Granite)	1
A2	Mudguard Assy kit (SNOW)	1
1	Rear Mudguard with sticker assy - Granite	1
2	Plain Washer M6	3
3	Hex flange bolt M6x1x14	1
4	Clip Nut M5	4
5	Plain Washer	6
6	Hex socket head cap screw M5X16	4
7	Rear Number Plate Assy	1
8	Hex.Socket Button Head Screw M6 X 1 X 16	2

S.NO.	DESCRIPTION	QTY.
9	Reflector	1
10	Hex.Nut M6x1 (U Nut)	2
11	Flanged Hex Bolt M6 X 1 X 20	2
12	Grommet - Rear Mudguard	2
13	Mudflap - Rear	1
14	Bracket addon - Rear mudguard	1
15	Spacer - Oil Cooler	2
16	Grommet	2
17	Spacer - Rear mudguard	2
18	Sticker - Rear mudguard	1

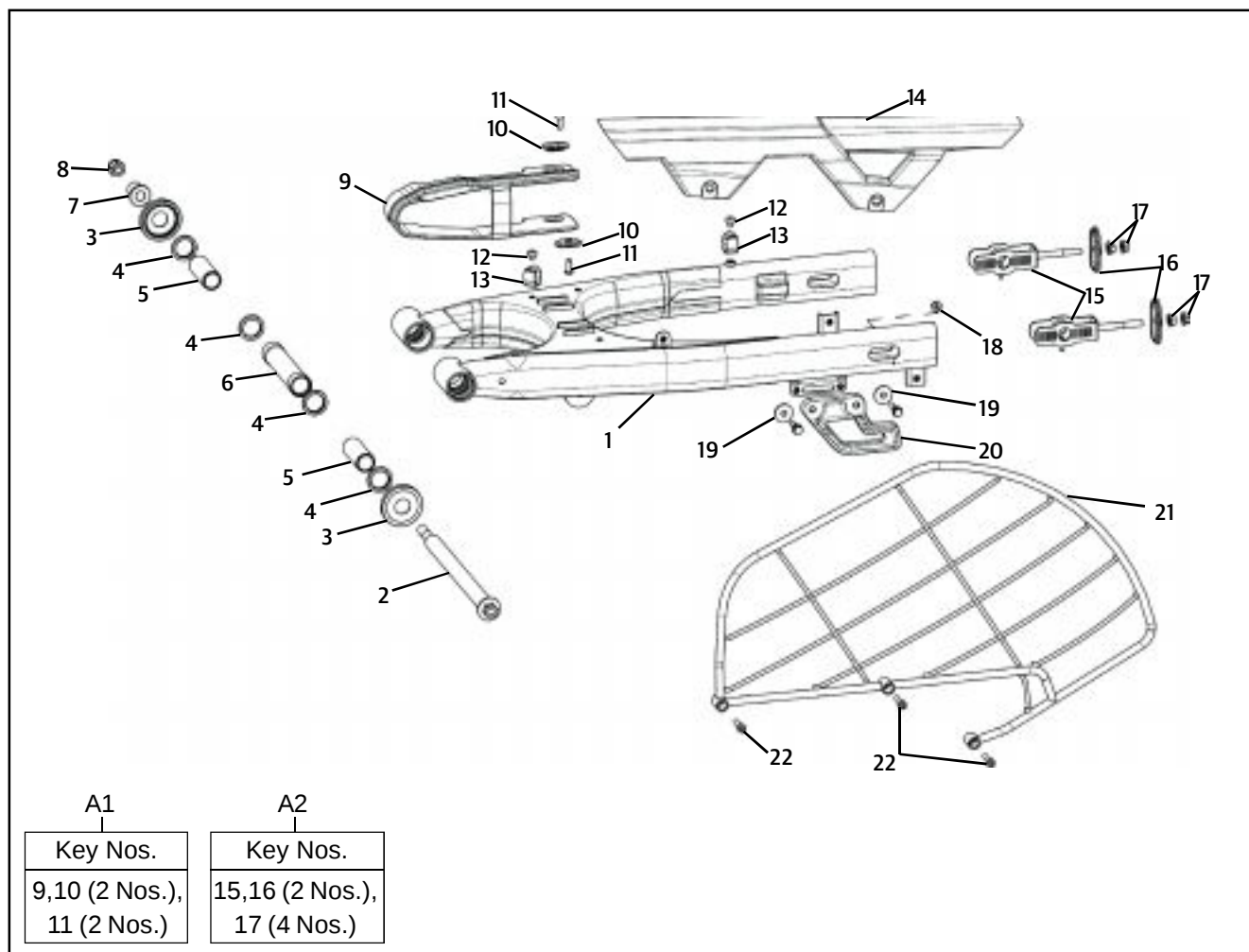
REAR WHEEL



S. NO.	DESCRIPTION	QTY.
A1	Rear Wheel Assy	1
A2	Rear Wheel Kit without tyre, tube and rim tape	1
A3	Tyre & Tube Kit - Rear Wheel	1
A4	Spokes & Nipples Kit	1
A5	Wheel Bearing & Seals Kit	1
A6	Rear Wheel Spindle & Spacer Kit	1
A7	Chain & Sprocket Kit	1
1	Hex Socket Button Head Screw M6X1X14	6
2	Rear Disc Plate	1
3	Tyre-Rear	1
4	Tube-Rear	1
5	Rim Rear	1
6	Rim Tape- Rear	1
7	Spindle - Long	1
8	Washer	2
9	Spacer - Sprocket Side Rear	1
10	Rear Hub Grease Seal	1
11	Ball Bearing 6005 (25 X 47 X12) [Double Side Rubber Sealed]	1

S. NO.	DESCRIPTION	QTY.
12	Socket Head Bolt M10 X 1.25 X 30	6
13	Sprocket - Rear Drive	1
14	Chain- Rear	1
15	Adaptor - RD Sprocket	1
16	Flanged Hex nut M10X1.25	6
17	Spindle Short	1
18	Grease Seal, ,25x40x7	2
19	Deep Groove Ball Bearing 6203 (17 X 40 X12) [Double Side Sealed]	2
20	Cushion Rubber	3
21	Rear Hub Assy	1
22	Spacer Assy-Rear Hub	1
23	Spacer-Disc Side Rear	1
24	Hex U Nut M16X1.5	1
25	Nipple	36
26	Spokes Rear	36
27	FD Sprocket comp	1

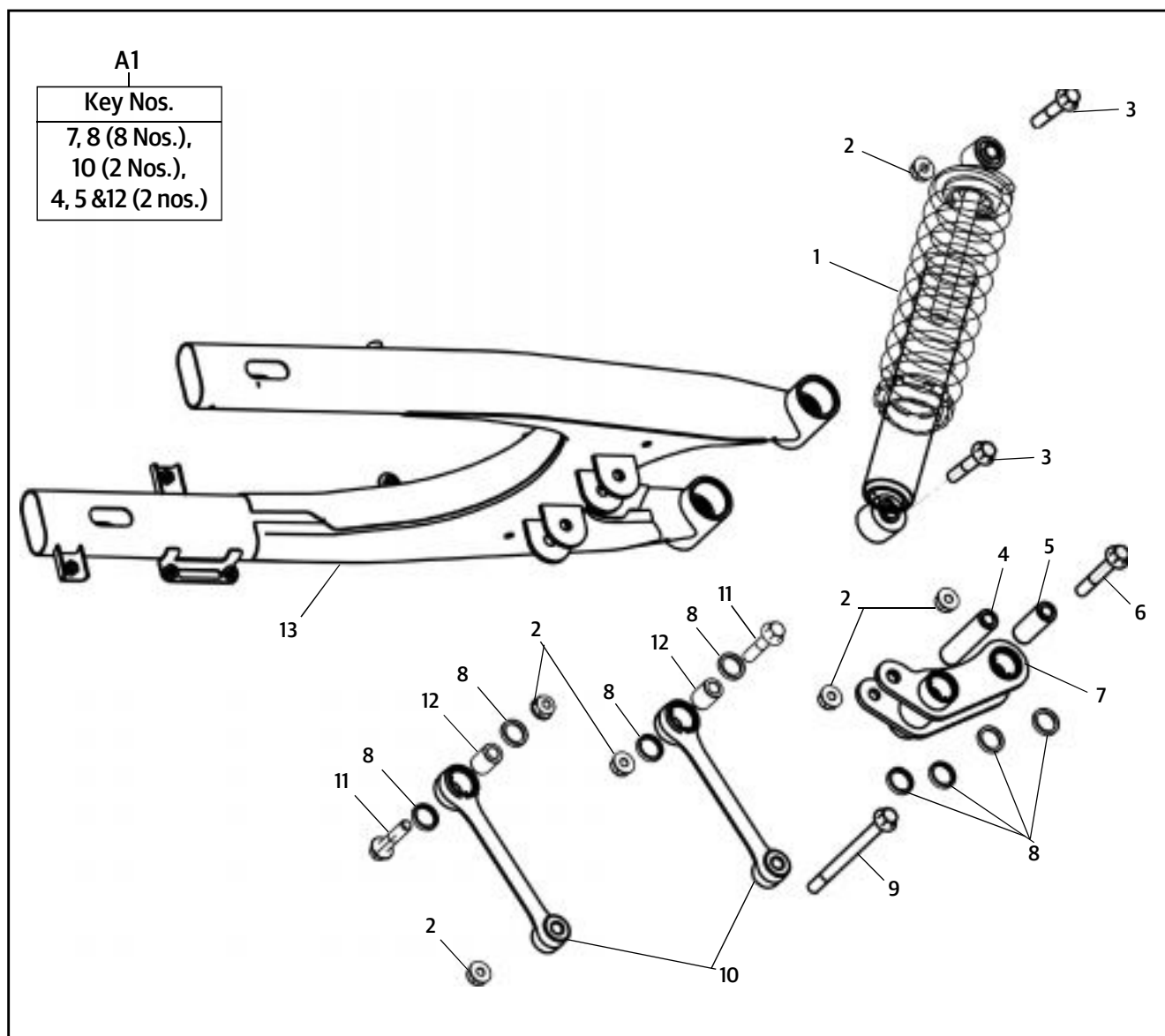
REAR SWING ARM, BEARINGS, CHAIN ADJUSTERS, GUARD, PAD & SAREE GUARD



S.NO.	DESCRIPTION	QTY.
A1	Chain Pad Kit	1
A2	Chain Tensioner Kit	2
1	Swing Arm with bearing-Assy	1
2	Spindle - Swing Arm	1
3	End Cup - Swing Arm	2
4	Oil Seal - Swing Arm	4
5	Inner Race - Needle Bearing	2
6	Inner Spacer - Swing Arm	1
7	Spacer - Swing Arm	1
8	Hex Nut With Nylock M12 X 1.5	1
9	Rear Chain-Pad	1
10	Washer-Chain Pad	2

S.NO.	DESCRIPTION	QTY.
11	Hex.Socket Button Head Screw M6 X 1 X 16	2
12	Philips pan head screw M6X6	2
13	Clip - Rear Disc Hose	2
14	Chain Guard	1
15	Chain Tensioner comp- LH	2
16	Plate - Chain Adjuster	2
17	Flanged Hex. Nut M8 X 1.25	4
18	Hex.Nut M6x1 (U Nut)	2
19	Flanged Hex Bolt M6 X 1 X 27	2
20	Chain - Guide	1
21	Saree Guard	1
22	SS Hex socket head cap screw (M6X25)	3

REAR SUSPENSION



S.NO.	DESCRIPTION	QTY.
A1	Link Assy Kit	1
1	Mono Shock	1
2	Flange U Nut M10 X 1.25	6
3	Flanged Hex. Bolt M10 X 1.25 X 52	2
4	Inner Race- Drag Link Back	1
5	Inner Race- Drag Link Front	1
6	Flanged Hex. Bolt M10 X 1.25 X 66	1

S.NO.	DESCRIPTION	QTY.
7	Drag link Assy with bearing	1
8	Dust Seal Linkage	8
9	Flanged Hex. Bolt M10X1.25 X 132	1
10	Drop link Assy with bearing	2
11	Flanged Hex. Bolt M10X1.25 X 47	2
12	Inner Race- Drop Link	2
13	Swing Arm with bearing-Assy	1

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.1	Rear Wheel Chain & Sprocket ■ Ensure the motorcycle is on a firm, flat surface and the rear wheel is off the ground. ■ Gently remove the brake hose along with its rubber grommets from the locating clips on the swing arm. ■ Loosen rear axle nut on the right side and remove along with washer. ■ Pull out the wheel axle from the left side, taking care not to drop the wheel spacers. ■ Remove the brake caliper assembly from the slot in the swing arm and support it suitably, to avoid damage to the brake hose. ■ Slide out the rear wheel from the swing arm, taking care not to drop the spacers on the wheel hub.	CAUTION: Do not press the brake pedal when wheel is removed as this will result in the brake pads coming out too far from the brake caliper. * Place a suitable spacer of 4 mm thickness, between the brake pads to avoid pads compression in the event the brake pedal is pressed accidentally.   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.2	Saree & Chain guards ■ Remove 2 hex socket head cap screws at the top and 1 hex socket head cap screw at the bottom of saree guard. ■ Remove saree guard and chain guard from swing arm.	Hex soc hd. cap screws: M6 Allen Key: 5mm
12.3	Piece mudguard ■ Remove 4 Hex bolts (2 at the top & 2 at the bottom) ■ Remove piece mudguard	Hex Bolt: M6 Socket spanner: 10mm

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.3	Mud flap rear - Remove 2 hex socket head cap screws with washers, holding mud flap to rear mudguard bottom. - Remove 2 hex bolts holding mud flap to rear mudguard top & remove mud flap. (Ensure 2 rubber grommets & 2 faced spacers are removed). - Disconnect Trafficator couplers LH & RH.	Hex Soc. Hd cap screws:M5 Allen key: 4mm Hex bolt: M6 Socket spanner:10mm NOTE: Support mud flap and disconnect number plate illuminator coupler 
12.4	Rear Mudguard - Remove 2 each hex socket head cap screws from saddle bag mounting plates LH & RH. - Support rear mudguard and remove 2 hex socket head cap screws on LH & RH side and remove rear mudguard.	NOTE: Couplers are color coded : LH side: Green RH side: Red NOTE: Support saddle mounting plate LH to prevent damage to seat latch cable. Hex Soc. Hd cap screws: M5 Allen key:4mm   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.5	Mono shock absorber ■ Ensure Air filter housing and piece mudguard are removed. ■ Hold hex bolt and loosen hex U nut at shock absorber bottom mounting to drag link. ■ Hold hex bolt and loosen hex U nut at shock absorber Top mounting to frame ■ Remove shock absorber.	Hex nut: M10 Hex bolt M10 Double end spanner:17mm Ring spanner: 14mm  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.6	Drag & Drop Links ■ Hold long hex bolt and loosen nut, holding drop links to drag link. ■ Remove long hex bolt. ■ Support swing arm and remove inner race – drag link back, to separate drop links from drag link. ■ Remove the dust seals. ■ Hold hex bolt and loosen nut holding drag link to frame. ■ Support drag link and remove hex bolt to remove drag link from frame along with dust seals. ■ Hold hex bolts and loosen hex U nuts holding the 2 drop links to swing arm bottom. ■ Remove the 2 hex bolts one after the other to release drop links along with dust seals and inner race from swing arm.	Hex nut: M10 Hex bolt M10 Double end spanner:17mm Ring spanner: 14mm NOTE: It will be required to dismantle centre stand from frame for dismantling drag link assembly. NOTE: The needle bearings pressed into the drag and drop links cannot be replaced. In case of bearing worn out or damaged, the entire drop links and/or drag link should be replaced.   

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.7	Swing arm assembly - Remove the 2 dust caps from the swing arm mounting holes in the frame. - Support the swing arm suitably. - Hold swing arm spindle from LH side and remove hex nut from RH side. - Remove swing arm assembly along with the spacers, dust seals and inner race from the frame assembly.	Hex nut: M12 Spindle M12 Socket spanner: 17mm NOTE: The needle bearings pressed into the swing arm cannot be replaced individually. In case of bearing worn out or damaged, the entire swing arm assembly should be replaced.     

INSPECTION

- Spokes for looseness / breakages
- Wheel out of trueness
- Tyre for uneven tread wear , cuts, cracks
- Wheel & sprocket bearings for sticky rotation, wear out , loose in hub
- Brake pads for uneven / completely worn out
- Needle bearings / inner races in drag link, drop links and swing arm assembly for damages rust stiff rotation
- Dust seals in swing arm, drag link and drop links for damages

TORQUE VALUES

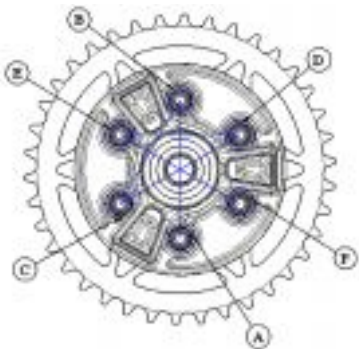
S. No.	Aggregate	Fastener	Suggested Torque		Min. Torque		Max. Torque	
			NM	Kg.M	(Nm)	(Kg.M)	(Nm)	(Kg.M)
1	Drop Link Bottom	Hex Flanged Bolt M10X1.25X65	50.0	5.0	42.50	4.25	57.50	5.75
2	Drop Link Assy	Hex Flanged Bolt M10X1.25X132	50.0	5.0	42.50	4.25	57.50	5.75
3	Shock absorber Top& Bottom Mtg	Hex Flanged Bolt M10X1.25X55	50.0	5.0	42.50	4.25	57.50	5.75
4	Drag link to swing arm Mtg	Hex Flanged Bolt M10X1.25X47	50.0	5.0	42.50	4.25	57.50	5.75
5	Swing Arm Pivot	M12X1.5	70.0	7.0	59.50	5.95	80.50	8.05
6	Chain Guide Mtg	Hex Flange Bolt M6X1X27	10.0	1.0	8.50	0.85	11.50	1.15
7	Rear Wheel Spindle	Hex U Nut M16X1.5	70.0	7.0	59.50	5.95	80.50	8.05
8	Chain Adjuster	Hex Nut M8X1.25	25.0	2.5	21.25	2.13	28.75	2.88
9	Rear Disc Mtg	Button Head Collar Bolt M6X1X14	10+12	1.0 01.2	10.00	1.00	12.00	1.20
10	Rear Wheel Sprocket Mtg	Hex Soc Screw M10X1.25X30 / Flange U Nut M10X1.25	50.0	5.0	42.50	4.25	57.50	5.75
11	Rear Number Plate Mtg	Button Head M6X1X15	5.0	0.5	4.25	0.43	5.75	0.58
12	Tail lamp Illuminator Mtg	Button Head M5	5.0	0.5	4.25	0.43	5.75	0.58
13	Mudguard to Mudflap	Hex Socket Cap Screw M5X0.8X16	5.0	0.5	4.25	0.43	5.75	0.58
14	Rear Trafficator Mtg	Button Head M6X1	5.0	0.5	4.25	0.43	5.75	0.58
15	Tail Lamp Bkt Mtg	Hex Flange M6X1X20	10.0	1.0	8.50	0.85	11.50	1.15
16	Rear Mudguard Mtg	Hex Flange M6X1X20	10.0	1.0	8.50	0.85	11.50	1.15

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.8	Swing arm ■ Ensure rear chain pad is assembled on the swing arm RH side ■ Locate the 2 inner races inside the needle bearing in the swing arm ■ Locate new dust seals in the swing arm on either sides of the inner races on the swing arm. ■ Position the swing arm correctly between the frame and locate new end cups on either side of the swing arm outer and frame inner. ■ Locate inner spacer between the swing arm eyelets in the centre. ■ Ensure all mounting holes of the swing arm spacers, swing arm, inner spacer are aligned and insert spindle fully into frame from the LH side. ■ Assemble spacer washer and hex nylock nut on the spindle RH side and tighten to torque. ■ Ensure free and smooth up and down movement of swing arm.	NOTE: Ensure the needle bearing and inner races are greased well before assembly.      Hex nut: M12 Spindle: M12 Socket spanner: 17mm Torque: 70Nm(7 KgM)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.9	Drag & Drop Links ■ Locate larger end of drop link with inner race and dust seal in place in swing arm and assemble hex bolt. ■ Assemble flange U nut and tighten to torque ■ Repeat above process to assemble second drop link in swing arm. ■ Ensure free movement of both drop links. ■ Ensure the drag link is positioned such that the longer side is facing towards the mounting hole in frame. ■ Position drop links with dust seals on either side of the drag link, ensure the holes are aligned and insert inner race - drag link back, through the drop link till it is flush on either sides of the drop links. ■ Assemble long hex bolt and hex nut. DO NOT TIGHTEN ■ Support swing arm and position drag link with inner race - drag link front and dust seals in the mounting bracket in frame, ensure holes are aligned and insert hex bolt to lock drag link to frame. ■ Assemble hex nut on bolt. ■ Tighten all fasteners of drag and drop links to torque. ■ Ensure free movement of swing arm, drag and drop links.	NOTE: Ensure the needle bearings and inner races are greased well before assembly. Hex nut: M10 Hex bolt M10 socket spanner:17mm Ring spanner: 14mm Torque: 50Nm(5 KgM) Hex nut: M10 Hex bolt M10 socket spanner:17mm Ring spanner: 14mm Torque: 50Nm(5 KgM)   

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.10	Mono shock absorber ■ Locate shock absorber in position between drag link and frame. ■ Align top mounting hole, insert hex bolt, assemble hex nut ■ Align bottom mounting hole, insert hex bolt, assemble hex nut ■ Tighten top and mounting fasteners to torque. ■ Assemble Air filter housing	Hex nut: M10 Hex bolt M10 Double end spanner:17mm Ring spanner: 14mm Torque: 50Nm(5KgM.)  
12.11	Rear Mudguards Rear Mudguard ■ Locate rear mudguard in frame, assemble 2 hex socket head cap screws on LH & RH side frame and tighten to torque ■ Position saddle bag mounting LH & RH on frame and tighten with 2 each hex socket head cap screws to torque.	Hex Bolt: M6 Socket spanner:10mm Hex Soc. Hd cap screws: M6 Allen key: 5mm   

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.12	Mud flap rear ■ Position mud flap in frame ■ Locate the 2 spacers from the top of the frame, position rear mudguard in frame, ensure the rubber grommets are in place and tighten with 2 hex bolts to rear mudguard top & remove mud flap. ■ Locate 2 hex socket head cap screws with washers, on the rear front end of mud flap and tighten to rear mudguard bottom.	NOTE: Support mud flap and connect number plate illuminator coupler & trafficators LH & RH NOTE: Couplers are color coded : LH side: Green RH side: Red Hex bolt: M6 Socket spanner:10mm Hex Soc. Hd cap screws: M5 Allen key:4mm 
12.13	Piece mudguard ■ Locate piece mudguard and tighten with 4 Hex bolts (2 at the top & 2 at the bottom)	Hex bolt: M6 Socket spanner:10mm  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.14	Saree & Chain guards ■ Position chain guard on swign arm top and saree gurad over the chain guard ■ Assemble 2 hex socket head cap screws at the top and 1 hex socket head cap screw at the bottom of saree guard. ■ Tighten all fasteners diagonally and evenly to torque.	Hex soc hd. cap screws: M6 Allen Key: 5mm Torque: 
12.15	Rear Wheel Chain & Sprocket Assembly ■ Ensure proper seating of bearing and dust seal in adaptor ■ Locate rear wheel sprocket on the adaptor. ■ Ensure the 6 mounting holes are aligned ■ Locate six hex socket head cap screws from the sprocket end. ■ Assemble 6 Nylock nuts on the screws at the adaptor end. ■ Tighten the 6 bolts diagonally and evenly to torque following the sequence shown.	NOTE: Apply Loctite 270 on the Allen screws before assembling nuts.  Tightening Sequence A-B-C-D-E-F  Allen screw: M10 Allen key: M8 Hex nut: M10 Ring spanner: 12mm Torque: 50Nm (5Kg.M)

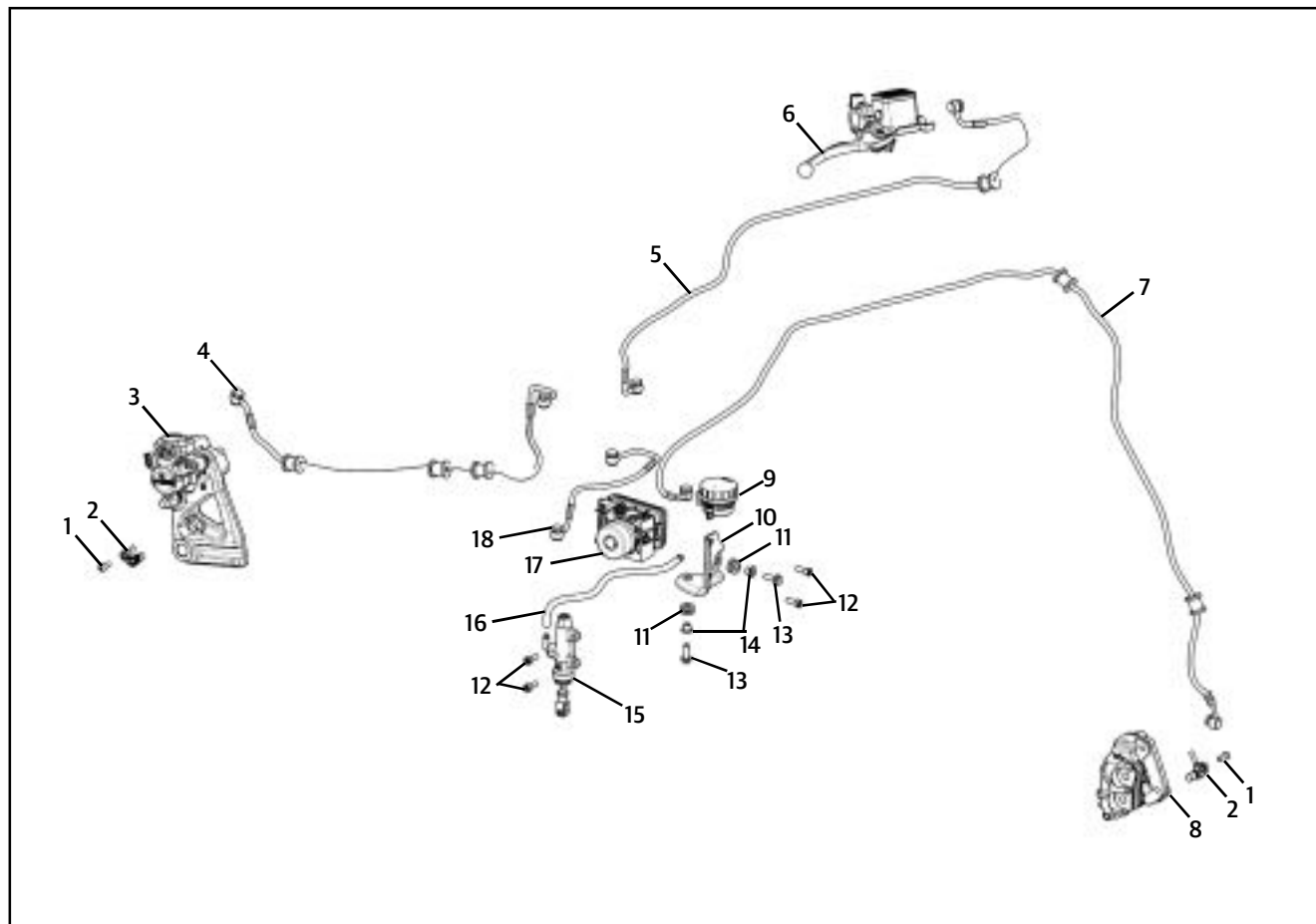
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.16	Rear Wheel Reassembly ■ Ensure the cush rubbers are in place in the wheel hub. ■ Insert the wheel assembly between the swing arms and position the cush rubbers on the rear sprocket lugs correctly. ■ Remove the spacer between the brake pads and locate the caliper such that the brake disc is between the brake pads. ■ Locate the caliper bracket slot on the lug in the swing arm. ■ Position the respective spacers on the left and right side of the wheel hub. ■ Ensure the axle mounting hole in the swing arm, wheel hub and caliper bracket are aligned. ■ Insert the wheel axle from the left side of the swing arm and gently tap it in.	CAUTION: ● Do not force the spindle through as it will cause damage to the threaded end. ● Ensure correct chain tension and rear wheel alignment with front wheel by adjusting the adjusters on both left and right side of swing arm. ● Assemble washer and wheel axle nut on right side and tighten to correct torque. ● Fix the brake hose pipe in swing arm clips properly. CAUTION: ● Please ensure the brake hose is correctly positioned on the clips, without any twist, sharp kinks or damage as it will seriously affect the performance of the rear brake. ● Check rear brake for effectiveness and correct functioning before using the motorcycle. 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
12.17	Chain tension adjustment ■ Ensure vehicle is on its centre stand on level ground ■ Loosen rear axle nut. ■ Loosen the locknut on chain adjuster LH. ■ Loosen / tighten inner nut on chain adjuster LH to increase/ decrease chain slackness.	Hex nut: M16 Socket Spanner: 24mm Tommy Bar Hex nut: M8 Double end Spanner: 12mm NOTE: Ensure chain slackness of 20 to 25 mm on its top run. 
12.18	Wheels alignment ■ Check the matching position of the reference lines on the chain adjuster LH and swing arm LH ■ Loosen lock nut on chain adjuster RH ■ Loosen/ tighten inner nut on chain adjuster RH such that the reference lines on chain adjuster RH and swing arm RH aligns at the same reference as in the LH side. ■ Hold the inner nuts firmly and tighten the lock nuts on chain adjusters LH & RH against the inner nuts while ensuring they are held firmly. ■ Tighten the rear wheel axle nut for torque.	CAUTION: Ensure chain adjuster LH nut is not disturbed while adjusting on the RH side. Hex nut: M8 Double end Spanner: 12mm NOTE: Rotate rear wheel, apply rear brake sharply and hold the pedal depressed. DO NOT RELEASE TILL REAR AXLE NUT IS TIGHTENED Hex nut: M16 Socket Spanner: 24mm Torque: 70Nm (7.0Kg.M.) 

SECTION 13 - ABS (ANTILOCK BRAKING SYSTEM)

EXPLODED VIEWS

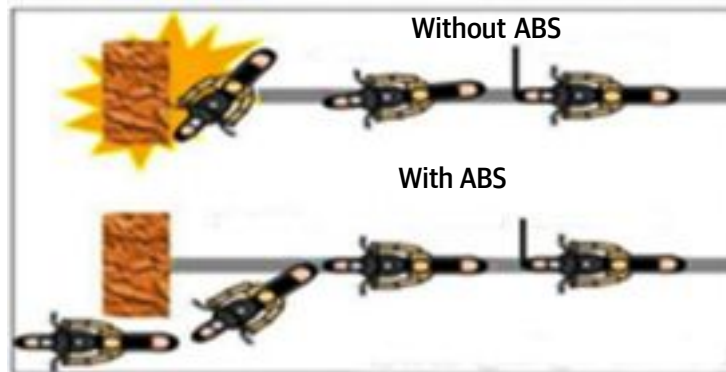
HIMALAYAN - ANTILOCK BRAKE SYSTEM



S.NO.	DESCRIPTION	QTY.
1	Hex.Socket Button Head Screw M6 X 1 X 16	2
2	Wheel speed sensor - ABS	2
3	Caliper Assembly - Rear	1
4	Brake hose - Caliper rear	1
5	Brake hose - Master Cylinder Front	1
6	Master Cylinder - Front	1
7	Brake hose - Caliper Front	1
8	Front Caliper	1
9	Reservoir Kit Rear M/C Threaded	1

S.NO.	DESCRIPTION	QTY.
10	Bracket Assy- ABS Modulator	1
11	Grommet- ABS Modulator	2
12	Hex Soc Head Cap Screw - M6 X 16	4
13	Flanged Hex Bolt M6 X 1 X 20	2
14	Sleeve- ABS Modulator	2
15	Master Cylinder - Rear	1
16	Rubber Hose- Reservoir	1
17	ABS Modulator	1
18	Brake hose- Master Cylinder Rear	1

Anti-Lock Braking System (ABS) fitted in Royal Enfield motorcycles, is a safety system to help the front and rear wheels maintain traction with the road surface in the event of sudden application of brakes by the rider at high speeds. It helps prevent the brakes from “locking” the wheels which can potentially cause the motorcycle to skid and result in loss of control and an accident.



WORKING PRINCIPLE

During hard application of brakes, the sudden increase in the hydraulic force to the front and rear brakes are controlled by a hydraulic pressure moderator which constantly reduces the excessive force on the hydraulic system thereby ensuring the brake pads do not lock the brake discs. The moderator is controlled by an Electronic control unit which not only receives real time inputs on the wheel speeds through sensors fitted near the wheel hubs but also provides inputs to the valves in the moderator to regulate the hydraulic pressure such that the brake pads do not lock the brake disc and cause the motorcycle to skid during emergency brake applications.

CAUTION:

While ABS assists in improved vehicle control during braking, decreased stopping distances on dry and graveled surfaces, it may not be very effective in wet, snow covered, off road, conditions, loose gravel surfaces, hilly roads etc., since the traction of the wheel itself will be very minimal in these conditions.

As far as possible, all braking, including emergency braking should be done with the motorcycle upright and in a straight motion. Avoid hard braking when banking heavily at great speeds.

Caution must be exercised by the rider for safe riding of the motorcycle and judge stopping distances required, depending on the speed at which the motorcycle is travelling.



As soon as the ignition and engine stop switch are switched 'ON', the ABS sign will light up. The lamp will remain 'ON' till the motorcycle attains a speed of 5 Km/h. (3MPH) and then switch 'OFF'. This indicates the ABS is working properly.

In the event the lamp does not switch 'OFF' and remains continuously 'ON' at higher speeds, it is recommended not to ride the motorcycle and get the brake system inspected and corrected through a nearest authorized Royal Enfield Distributor.

8.1 LOCATION OF THE ABS SYSTEM PARTS

1. ABS INDICATOR

- Located inside the Instrument Cluster.

ABS



2. MODULATOR

- Located inside panel RH.



3. ABS ECU

- Located adjacent to Modulator



4. FRONT BRAKE MASTER CYLINDER.

- Located on Handle bar RH side



8.1 LOCATION OF THE ABS SYSTEM PARTS

5. FRONT WHEEL CALIPER.

- Located on the fork end LH side



6. WHEEL SPEED SENSOR - FRONT

- Located on the fork end LH side



7. TONER RING - FRONT WHEEL.

- Located on front Hub centre (below brake disc)



8. REAR BRAKE MASTER CYLINDER

- Located on the frame bottom on RH side.



8.1 LOCATION OF THE ABS SYSTEM PARTS

9. REAR HYDRAULIC FLUID RESERVOIR

- Located on Frame RH Side.



10. REAR WHEEL CALIPER

- Located on swing arm RH side



11. WHEEL SPEED SENSOR - REAR

- Located on the rear caliper assembly mounting bracket



12. TONER RING - REAR WHEEL

- Located on Rear wheel right side.



CAUTION :

DO NOT REMOVE OR DISMANTLE ANY PART OF THE ABS SYSTEM - BRAKE HOSE CONNECTIONS, MODULATOR, ECU ETC AS IS WILL NOT ONLY AFFECT THE BRAKING EFFICIENCY SEVERELY BUT WILL ALSO DEACTIVATE THE MODULATOR AND THE ECU

DO NOT ATTEMPT TO REMOVE THE ECU OR THE ELECTRICAL CONNECTIONS FROM THE MODULATOR AS IT WILL ERASE THE MEMORY AND THE PROGRAMME.

IF FOR ANY REASON THE BRAKE HOSES OR THE MODULATOR HAS TO BE SERVICED, THEN THE ENTIRE HYDRAULIC FLUID SYSTEM BLEEDING HAS TO BE CARRIED OUT AND THE ECU HAS TO BE REPROGRAMMED.

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	ABS Modulator & ECU ■ Ensure Ignition switch and engine stop switch is in OFF position. ■ Drain out hydraulic brake fluid from the front and rear reservoirs and brake calipers by loosening the bleeding screws in the front and rear calipers and gently pumping the brakes. ■ Remove the side panel RH by loosening 2 Socket head cap screws on the sides. ■ Loosen and remove the 4 banjo bolts holding 4 brake hoses to the modulator.	CAUTION: Brake fluid is extremely corrosive and hence please take care not to spill on any part of the motorcycle Head cap Screw : M6 Allen Key : 5 mm  

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	ABS Modulator & ECU ■ Remove wiring coupler to the ABS ECU and gently pull out ECU. ■ Remove 2 hex bolts on the sides and 1 hex bolt at the bottom, holding modulator to the mounting bracket. ■ Remove modulator from the bracket.	Hex Bolt: M6 Double end spanner: 10mm 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3	ABS Modulator & ECU ■ Locate ABS assembly to the bracket. ■ Ensure Ignition switch and engine stop switch is in OFF position. ■ Install 2 hex bolts on the sides and 1 hex bolt at the bottom, holding modulator to the mounting bracket ■ Connect wiring coupler to the ABS ECU and gently locate out ECU. ■ Locate and install the 4 banjo bolts holding 4 brake hoses to the modulator.	Hex Bolt: M6 Double end spanner: 10mm  

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3	ABS Modulator & ECU ■ Locate the side panel RH on the RH side by installing 2 socket head cap screws on the sides.	Head cap Screw : M6 Allen Key : 5 mm 

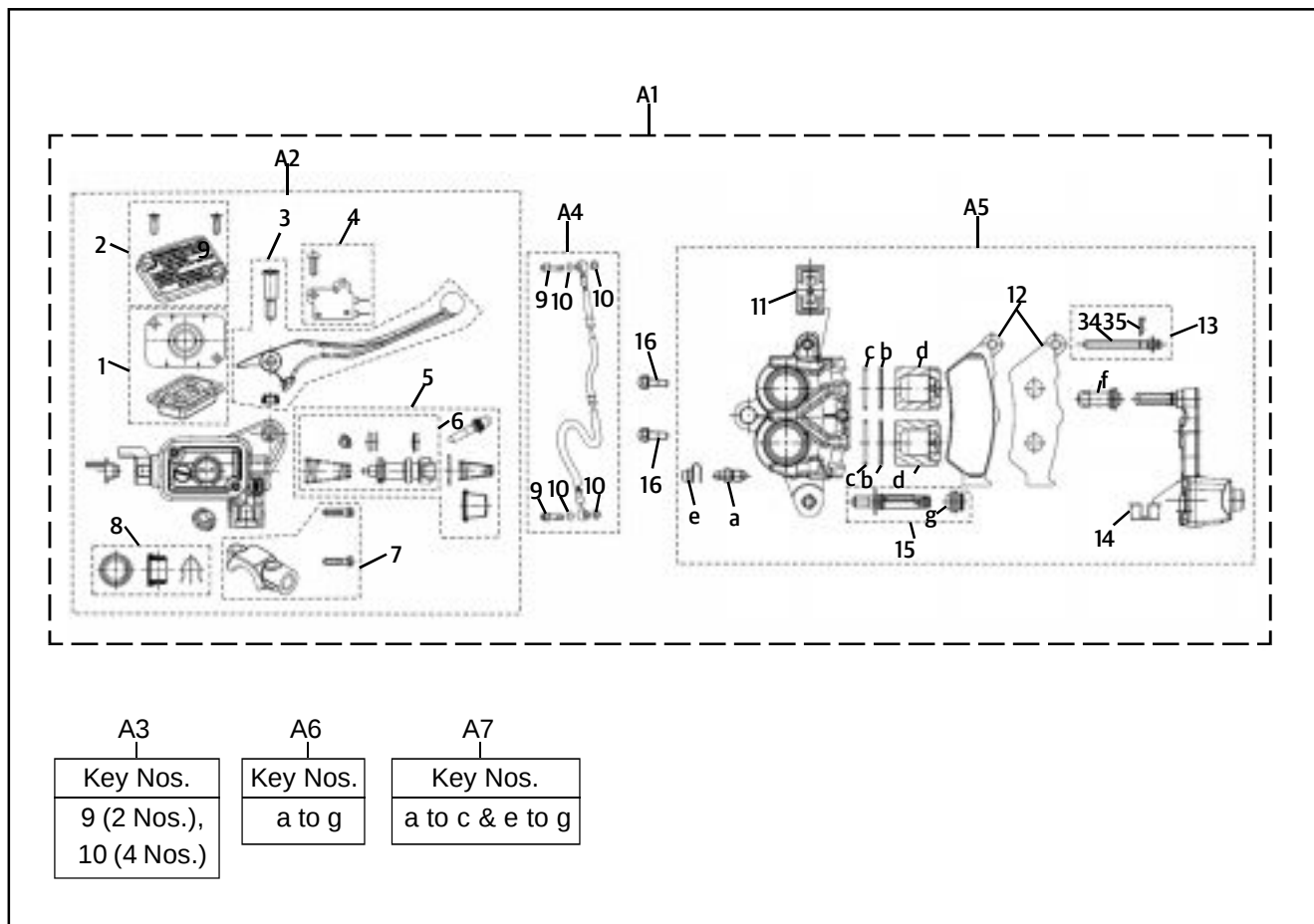
ABS (ANTI-LOCK BRAKING SYSTEM) EFI TROUBLE SHOOTING CODES

S.No.	P Codes for ABS	Components monitored and malfunction type
1	5043 H	Front wheel speed sensor Disconnection/ground Short/Uz Short
2	5042 H	Front wheel speed sensor malfunction - Plausibility
3	5045 H	Rear wheel speed sensor Disconnection/ground Short/Uz Short
4	5044 H	Rear wheel speed sensor malfunction - Plausibility
5	5025 H	Deviation between Wheel speeds (WSS_GENERIC)
6	5017 H	Front Inlet Valve malfunction (EV)
7	5018 H	Front Outlet Valve malfunction (AV)
8	5013 H	Rear Inlet Valve malfunction (EV)
9	5014 H	Rear Outlet Valve malfunction (AV)
10	5035 H	Pump Motor Malfunction
11	5019 H	Valve Relay malfunction (Failsafe relay)
12	5055 H	ECU malfunction
13	5052 H	Power Supply Malfunction (Low Voltage)
14	5053 H	Power Supply Malfunction (High Voltage)
15	5122 H	Varcode EEPROM ReadError
16	5223 H	VarCode EEPROM Out Of Range
17	5331 H	Front Wheel Pressure sensor ohmic fault
18	5332 H	Front wheel pressure sensor offset/Test Pulse/POT fault
19	5333 H	External Supply for Pressure sensor failure

SECTION 14 - HYDRAULIC DISC BRAKES

EXPLODED VIEWS

HYDRAULIC DISC BRAKE SYSTEM - FRONT

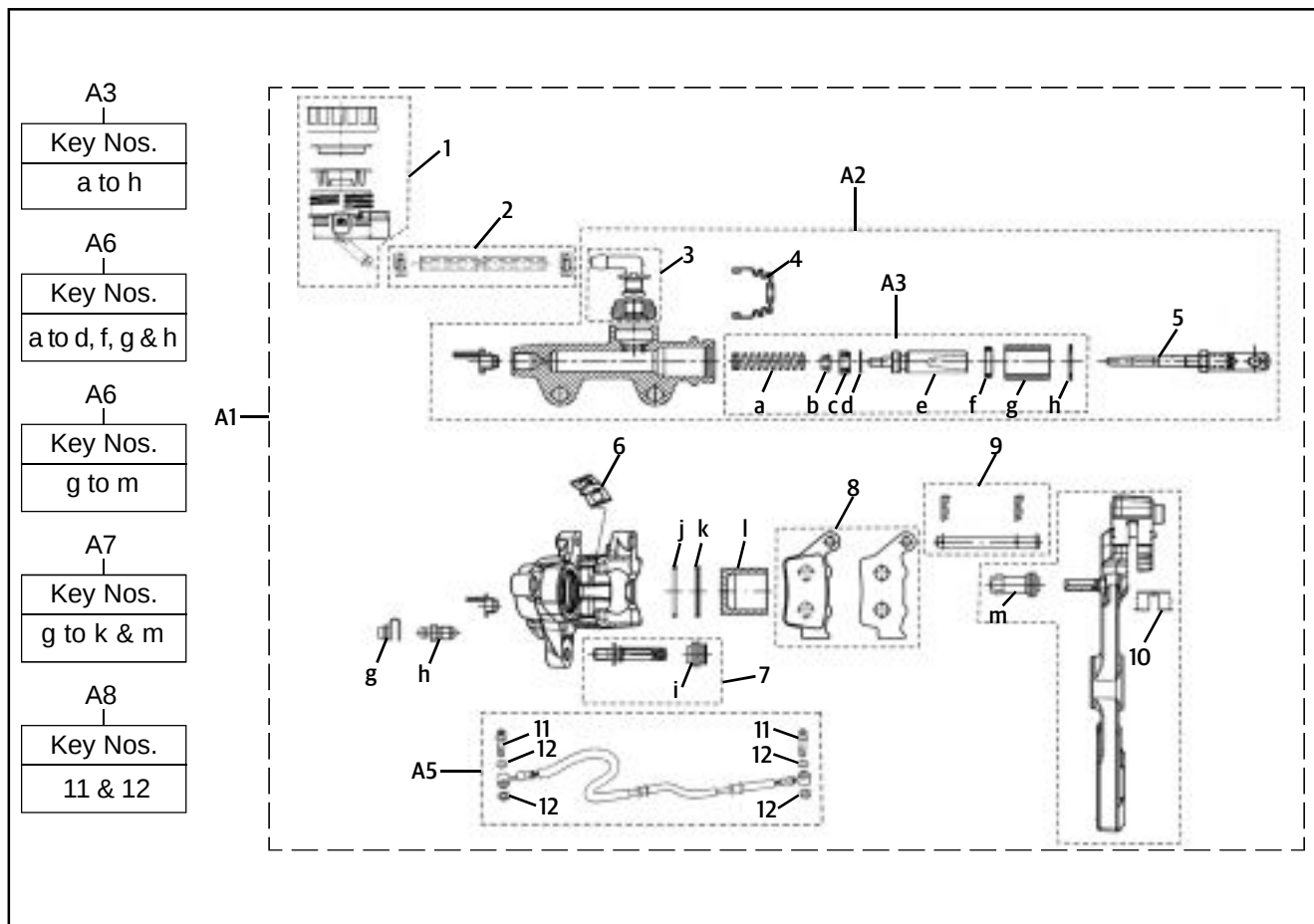


S.NO.	DESCRIPTION	QTY.
A1	Disc Brake System Assembly Kit Front	1
A2	Master Cylinder Assembly with Brake Lever - (BBI)	1
A3	Banjo Bolt Kit	1
A4	Front Brake Hose Assy and Banjo Bolt Kit Front M/C	1
A5	Caliper Assy Front	1
A6	Major Kit Front Caliper	1
A7	Minor Kit Front Caliper	1
1	Diaphragm Kit Front M/C	1
2	Reservoir Cover Kit Front M/C	1
3	Lever Kit Front M/C	1
4	Front Brake Switch	1

S.NO.	DESCRIPTION	QTY.
5	Major Kit Front M/C	1
6	Minor Kit Front M/C	1
7	Clamp Kit Front M/C	1
8	Oil Window Assembly Kit	1
9	Banjo Bolt	2
10	Washer	4
11	Pad Spring	1
12	Disc Pad Kit - Front Caliper - (BBI)	1
13	Pad Pin Kit Front Caliper	1
14	Wear pad	1
15	Primary Pin Kit Front Caliper	1
16	Flanged Hex. Bolt M8 X 1.25 X 55	2

EXPLODED VIEWS

HYDRAULIC DISC BRAKE SYSTEM - REAR



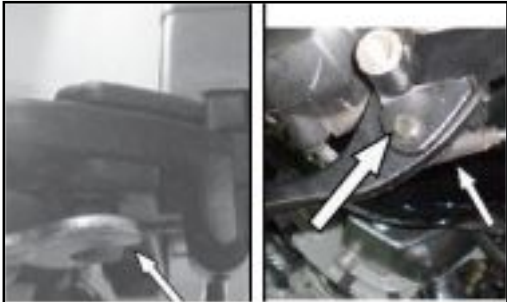
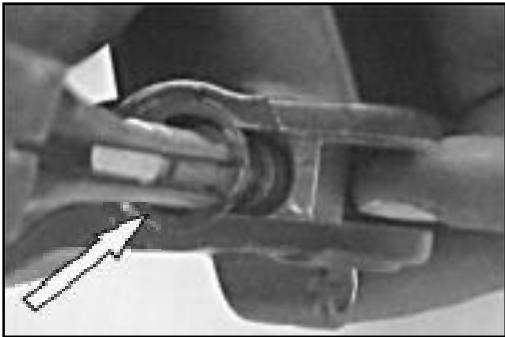
S.NO.	DESCRIPTION	QTY.
A1	Disc Brake Assembly Rear	1
A2	Rear Master Cylinder Assembly	1
A3	Major Kit Rear M/C	1
A4	Minor Kit Rear M/C	1
A5	Rear Brake Hose Assy with Banjo bolt kit	1
A6	Major Kit Rear Caliper	1
A7	Minor Kit Rear Caliper	1
A8	Banjo Bolt Kit	1
1	Reservoir Kit Rear M/C Threaded	1
2	Reservoir Tube Kit Rear M/C	1

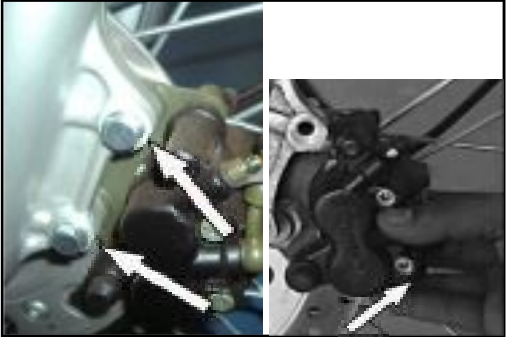
S.NO.	DESCRIPTION	QTY.
3	Connector Kit Rear M/C	1
4	Boot Rear M/C	1
5	Push Rod kit- Rear M/C	1
6	Pad Spring- Rear	1
7	Primary Pin Kit Rear Caliper	1
8	Brake Pad Kit Rear Caliper - BBI	1
9	Pad Pin Kit Rear Caliper	1
10	Wear pad	1
11	Banjo Bolt	2
12	Washer	4

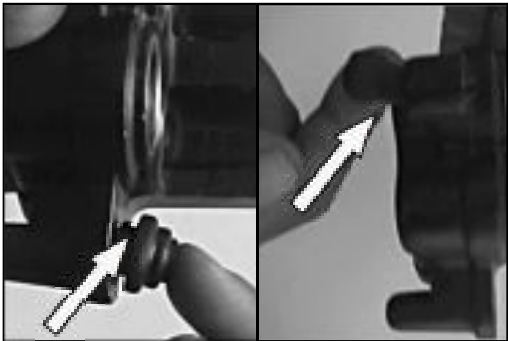
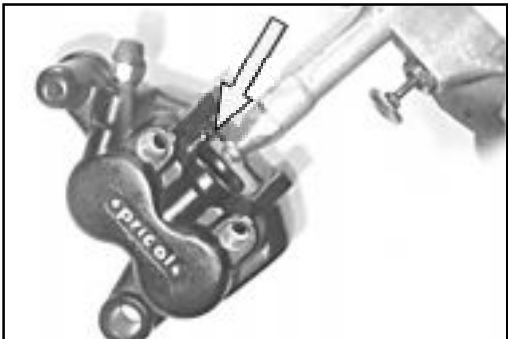
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1	Front Disc Brake	
13.1.1	Master cylinder from handle bar ■ Remove rear view mirror RH. ■ Disconnect front brake Switch coupler. ■ Gently depress the lock tab of front brake switch with a blunt object to release from the bracket and remove switch. ■ Remove protective rubber cap on bleeder nipple on the caliper. ■ Loosen bleeder nipple by about 2 turns.	Double end spanner: 14mm    Ring Spanner: 10mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1	Front Disc Brake	
13.1.1	Master cylinder from handle bar ■ Connect one end of a transparent flexible tube of length about 12" (30cms.) firmly to the bleeder nipple. ■ Insert the other end of the tube into a clean glass or plastic container to collect the brake fluid. ■ Gently depress brake lever slowly and release to drain the brake fluid through the bleeder screw. Repeat this process several times till the fluid is completely drained from the brake system.	CAUTION: Brake fluid is extremely corrosive hence ensure it does not spill on any painted, rubber parts. 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1	Front Disc Brake	
13.1.1	Master cylinder from handle bar - Place a clean tray below brake caliper to collect residual brake fluid from the brake system. - Loosen and remove the banjo bolt along with sealing washers from the brake hose at wheel caliper end. - Loosen and remove the banjo bolt along with sealing washers from the brake hose at master cylinder end. - Remove the brake hose from vehicle. - Remove 2 slotted screws from the top cover. - Remove top cover diaphragm plate and rubber diaphragm from master cylinder.	Ring Spanner: 14mm NOTE: Ensure brake fluid does not spill while removing the brake hose. Double end Spanner: 14mm Philips screw driver    

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1	Front Disc Brake	
13.1.1	Master cylinder from handle bar ■ Remove the brake lever pivot lock nut, brake lever pivot from bracket. ■ Remove brake lever and protective rubber boot from master cylinder. ■ Remove Circlip from the Master cylinder body slowly and carefully. ■ Remove conical spring and piston with seals from master cylinder housing.	Screw driver & Double end spanner: 8mm  CAUTION: Spring loaded. Remove with care.  Hex nut: M6 Ring spanner: 8mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1	Front Disc Brake	
13.1.2	Wheel caliper from fork end LH - Loosen the 2 hex bolts holding brake caliper to fork end. - Remove caliper assembly from fork end.	Hex nut: M10 Ring spanner: 12mm 
13.1.3	Brake pads from caliper - Remove the 2 grub screws on the caliper body. - Loosen and remove 2 socket headed pin screws from the caliper body. - Remove the brake pad from Caliper Assembly.	Screw Driver Allen screws : 4mm Allen key : M5 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.1.3	Brake pads from caliper ■ Remove Mounting Bracket from the Caliper Assembly. ■ Remove the Pad tensioner spring plate from caliper.	 
13.1 13.1.4	Front Disc Brake Pistons & seals from caliper ■ Remove the bellow & boot from the caliper assembly. ■ Hold the caliper body with the pistons facing downwards. ■ Blow low pressure compressed air with a nozzle into the oil passage hole on the caliper, to drive out the pistons from the caliper bores. ■ Gently remove the seals from caliper using a blunt and soft tool.	 

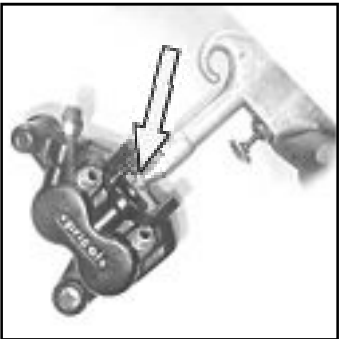
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.1.	Fluid draining ■ Remove protective rubber cap on bleeder nipple on the caliper. ■ Connect one end of a transparent flexible tube of length about 12" (30cms.) firmly to the bleeder nipple. ■ Insert the other end of the tube into a clean glass or plastic container to collect the brake fluid. ■ Loosen bleeder nipple by about 2 turns. ■ Gently depress brake pedal slowly and release to drain the brake fluid through the bleeder screw. Repeat this process several times till the fluid is completely drained from the brake system. ■ Remove the brake hose with rubber grommets from the swing arm.	    Bleeder Nipple Ring spanner: 10mm

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.1	Fluid draining - Loosen and remove the banjo bolt along with sealing washers from the brake hose at wheel caliper end. - Disconnect the rear brake light switch coupler (black) from wiring harness near battery. - Using a double end spanner, loosen the hex nut cum brake light switch and remove - Remove the brake hose from vehicle.	Banjo bolt Ring spanner: 12mm NOTE: Place a clean tray below brake hose to collect residual brake fluid. Brake light switch Double end spanner: 14mm NOTE: Remove the sealing washers from either side of the brake hose banjo.   
13.2.2	Master cylinder reservoir Unscrew lid from master cylinder reservoir and remove lid along with diaphragm.	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.1.	Master cylinder reservoir ■ Release metal clip and disconnect hose from reservoir to master cylinder. ■ Loosen and remove hex socket screw holding reservoir to frame and remove reservoir along with hose. ■ Remove split pin from the pin on brake pedal ■ Remove pin and disconnect brake pedal from the link rod in master cylinder. ■ Loosen 2 socket head screws holding master cylinder to frame.	 Hex soc Hd screw : M4 Allen key : 5mm  Split pin Nose pliers  Hex soc Hd screw : M4 Allen key : 5mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.3	Master cylinder ■ Remove protective rubber boot from master cylinder. ■ Remove Circlip from the Master cylinder body slowly and carefully. ■ Gently pull out piston with bush, seals, spring guide and conical spring from master cylinder housing.	 Circlip Circlip pliers  CAUTION: Do not use any sharp tool to pull out the piston from the master cylinder. Pull out gently with minimum force. 
13.2	Front Disc Brake	
13.2.4	Brake pads from wheel caliper ■ Remove 2 locking clips from the brake pad pivot in wheel caliper	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.4.	Brake pads from wheel caliper ■ Pull out the pivot pin from the inside of the caliper. ■ Remove the brake pads from the caliper.	 
13.2.5.	Wheel caliper from swing arm ■ Loosen and remove rear wheel axle nut. ■ Pull out the pivot pin from the inside of the caliper. ■ Separate the Mounting Bracket from the Caliper Assembly by gently pulling them apart.	 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.2	Rear Disc Brake	
13.2.5.	Wheel caliper from swing arm Remove the Pad tensioner spring plate from caliper and mounting bracket.	
13.2	Rear Disc Brake	
13.2.5.	Piston & seal from caliper - Hold the caliper body with the piston facing downwards. - Blow low pressure compressed air with a nozzle into the oil passage hole on the caliper, to drive out the piston from the caliper bore. - Gently remove the piston with seal from caliper using a blunt and soft tool.	CAUTION: Do not use high pressure air. Support piston while removing from caliper. Ensure the bore in the caliper does not get scored or damaged. Ensure piston outside surfaces does not get scored or damaged. 

GENERAL PRECAUTIONS

- Check the system for any fluid leaks at banjo union joints, damaged brake hose etc. at periodic intervals as detailed in the maintenance schedule.
- Whenever checking brake fluid level, ensure vehicle is on its centre stand and the fluid reservoir is parallel to the ground, whenever checking fluid level.
- Cover motorcycle painted surfaces, plastic and rubber parts while overhauling or bleeding a brake system. Do not allow brake fluid to come in contact with any parts of the motorcycle as brake fluid has highly corrosive properties.

CLEANING

- Clean master cylinder filler cap before removing.
- Use only fresh brake fluid to clean rubber and other parts of the hydraulic brake system. DO NOT use any petroleum based cleaning solvents, water or detergents etc.

INSPECTION:

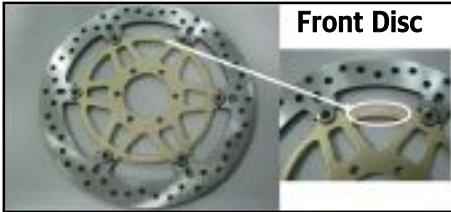
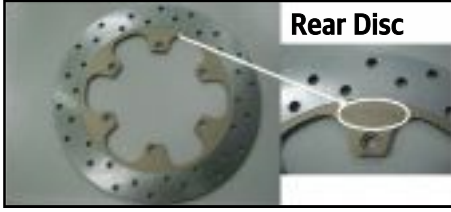
- Inspect brake fluid level is always between the MAX and MIN level markings in the reservoir.
- Prior to riding the motorcycle every time, check brake disc inside and outside surfaces carefully for any contamination with oil, grease, slippery substances, brake fluid etc. as these will render the braking system ineffective. In case of any contamination, wash the brake disk with water and mild detergent to remove the contaminations, clean well with a good degreasing agent, blow compressed air to dry the brake disc thoroughly.
- Inspect brake hose joints; reservoir and wheel caliper ends for any traces of fluid seepage or leaks. Check and correct the leaks immediately, if any noticed.
- Inspect Brake hoses for any damage, cracks or cuts, ageing etc and replace damaged parts immediately.
- Inspect brake pads for embedded foreign objects, abnormal wear, age hardening of friction material etc.
- Inspect and ensure the pads are not worn out beyond the wear indication limit marks on the pads. Replace pads as soon as they have reached the wear limit marks
- Check rubber seals on the plunger for wear, cracked edges or any other damage. Replace seals whenever the plunger is removed
- Check master cylinder housing and piston for any scoring, pitting due to corrosion or any other damages.
- Check the master cylinder bore for any damages, scoring marks etc.
- Check piston outside surfaces for any damages, scoring marks, corrosion etc. Replace pistons if any of the above is observed.

CAUTION:

- **Use only DOT 3 or DOT 4 grade brake fluid from a sealed container.** Do not mix different types of brake fluid as they may not be compatible.
- Whenever the disc brake system is overhauled, ensure that the old fluid is drained out completely and then filled with fresh brake fluid **ONLY** from a sealed container.
- In case of any brake fluid contamination in the brake system, the contaminated brake fluid must be flushed out completely from the entire system, the internal parts cleaned well, filled with fresh brake fluid and the brake system bleeding must be carried out.

- Always replace brake pads as a set only.
- Always replace banjo union washers, 'O' rings, diaphragm washers, dust seals and piston seals whenever the hydraulic disc brake system is overhauled.
- Always replace damaged parts like pistons, fixing pin etc. **DO NOT attempt to repair damaged pistons, pins, master cylinder, caliper etc.** as it may render the disc brake system to become ineffective and seriously affect braking efficiency.
- Ensure the brake disc is clean and dry at all times for the brakes to work at peak efficiency.

WEAR LIMITS

Component	What to Measure	Service Limit	Where to Measure
Brake Disc plate	Thickness of the disc plate	Minimum disc thickness as engraved on the disc	 Front Disc  Rear Disc
	Flatness of the disc plate	0.1 mm	
	Runout of the disc plate	0.3 mm	

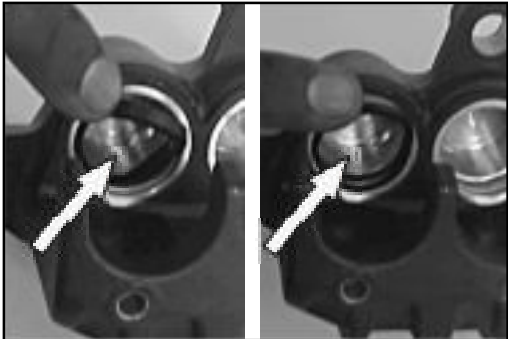
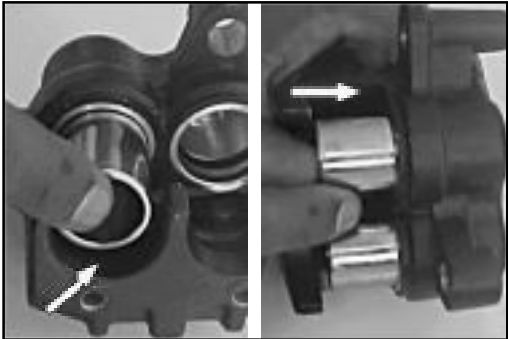
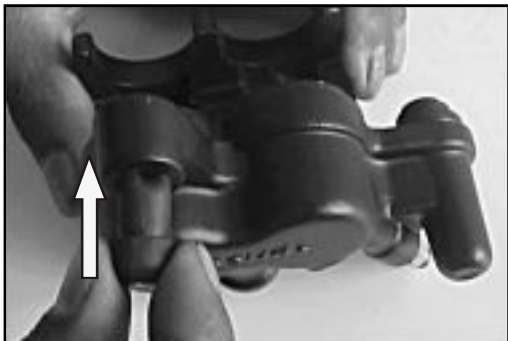
Component	What to Measure	Service Limit	Where to Measure
Brake pads	Wear out of brake pads	As marked in the brake pads	
Master cylinder bore ID	Wear out of the cylinder	12.76 mm	
Master cylinder Piston OD	Wear out of piston	12.64 mm	
Wheel caliper cylinder bore ID	Wear out of the cylinders	25.46 mm	
Wheel caliper Pistons OD	Wear out of pistons	25.31 mm	

TORQUE VALUES

S. No.	Aggregate	Fastener	Suggested Torque	
			NM	Kg.M
1	Master cylinder assembly clamp	Hex Bolt M6	9.0	0.9
2	Brake lever pivot	Pivot bolt.	6.0	0.6
3	Brake lever pivot lock nut.	Pivot bolt lock nut	6.0	0.6
4	Brake hose banjo bolts	Banjo bolts	35.0	3.5
5	Master cylinder cover screws	Slotted screws	1.5	0.15
6	Brake pad pin bolts	Socket pin bolts	20.0	2.0
7	Grub screw, brake pad in bolts	Grub screw	3.0	0.3
8	Bleeder nipple	Hex nipple	10	0.1
9	Wheel caliper mounting on fork end LH	Hex Nut M8X1.25	30.0	3.0

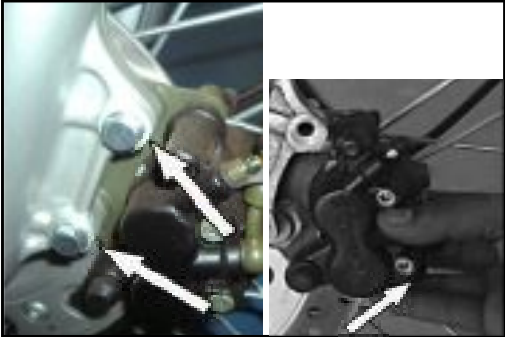
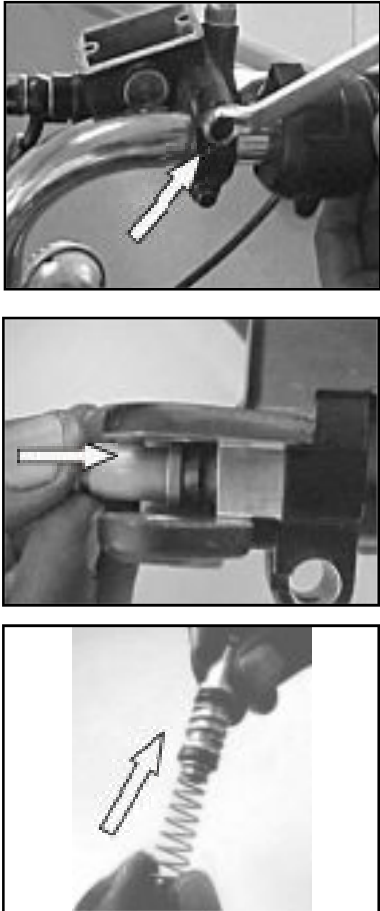
GENERAL INSTRUCTIONS - DISC BRAKE

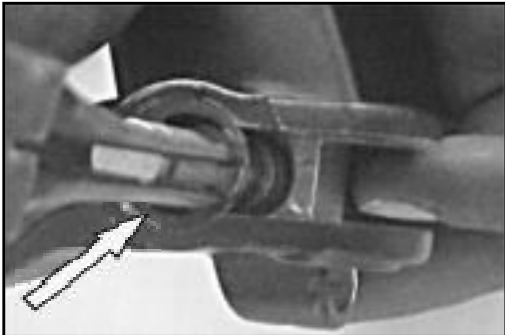
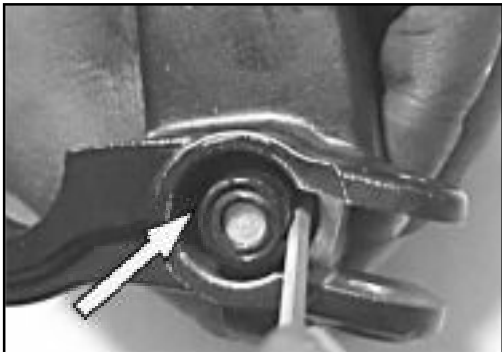
- Check, monthly or every 2000 kms., the Brake fluid level through the Sight-glass whether it is above the 'MINLINE' mark. While checking, turn the handle bar straight, until the reservoir is horizontal.
- Never mix different types of brake fluids. (DOT 4 & ABOVE Together)
- Do not clean the rubber parts with petrol or any other gasoline product or water. Use clean brake fluid only.
- In case of water contamination of Brake fluid, drain the fluid completely, refill the system and bleed.
- Do not top up brake fluid above "Max" level to avoid front wheel binding problem
- Check periodically whether the Disc has been contaminated with oil, brake fluid or grease and clean contaminated Disc with a high quality brake-degreasing agent.
- Always keep the disc clean and dry at all times for the brakes to work at peak efficiency.

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3 13.31	Front Disc Brake Pistons & seals in caliper ■ Coat fresh brake fluid on new dust seals and piston seals. ■ Install piston seals in the inner groove and dust seals in the outer groove in the bore in caliper assembly. ■ Coat the caliper cylinders and pistons with fresh brake fluid. ■ Insert the closed end of the pistons into the caliper bores and gently press it into caliper fully till the open ends of the piston are flush with the caliper bore outer edge. ■ Smear fresh brake fluid on the caliper boot and bellow and assemble them on the caliper body.	NOTE: Do not apply force while assembling the pistons into the caliper. Press only with minimal hand pressure. Assemble pistons one at a time into the caliper.    

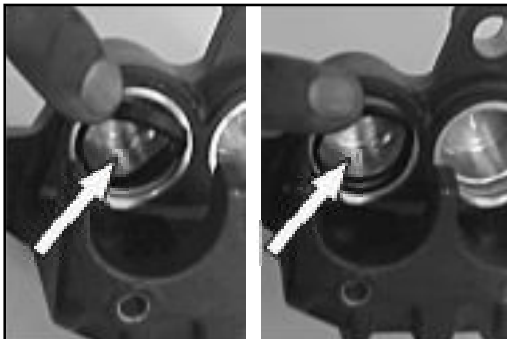
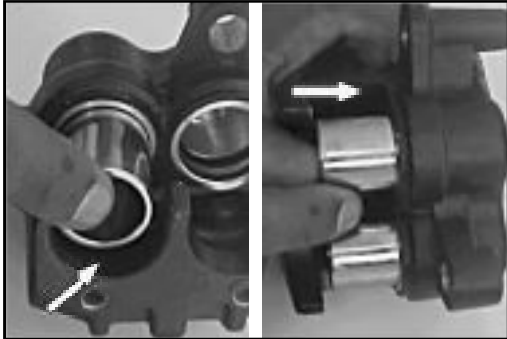
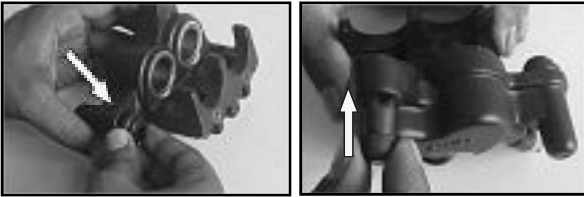
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3 13.3.1	Front Disc Brake Pistons & seals in caliper ■ Install the pad tension spring plate in the Caliper body. ■ Assemble Bleed screw with the dust cap on the caliper body. ■ Assemble the Mounting Bracket on the caliper Body.	 Ring Spanner: 8 mm Torque: 10Nm (0.1Kgm)  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3	Front Disc Brake	
13.3.2	Brake pads in caliper ■ Install brake pad on the piston side first with its friction material facing outside. ■ Install the other brake pad with the friction material facing the opposite brake pad. ■ Apply Silicon grease on the pin OD and assemble the Pin bolt by pressing gently through the brake pads into caliper body. ■ Tighten the pins to the caliper body. ■ Assemble Grub screws on the pins and tighten.	NOTE: Ensure pads are positioned and locked correctly in the mounting bracket lug.   Brake pad pins Allen key: 5mm Torque: 20Nm (2.0Kgm)  Grub screws Screw driver Torque: 3Nm (0.3Kgm) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3 13.3.3	Front Disc Brake Wheel caliper on fork end LH ■ Locate caliper on fork end LH and ensure the brake disc is positioned between the brake pads. ■ Tighten caliper assembly to fork end with 2 hex bolts.	Hex bolt: M10 Socket spanner: 12mm Torque: 30Nm (3.0Kgm) 
13.3 13.3.4	Front Disc Brake Master cylinder on handle bar ■ Locate master cylinder assembly on the handle bar. ■ Locate clamp on handle bar and tighten the master cylinder assy. To handle bar with 2 hex bolts. ■ Smear the piston, seals and cylinder bore with fresh brake fluid and assemble piston sub-assembly into the master cylinder by gently pushing it into the bore.	Hex Bolts : M6 Socket spanner : 8mm Torque : 9Nm (0.9 KgM)  NOTE: Ensure the circlip is seated correctly inside the groove.

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3	Front Disc Brake	
13.3.4	Master cylinder on handle bar ■ Locate the conical spring on the piston, compress and assemble Circlip into the groove of the master cylinder. ■ Assemble the rubber Boot. ■ Apply Silicon grease on the Lever pivot hole and on the Piston surface. ■ Position brake lever inside the bracket, locate pivot screw from the top and tighten to bracket. ■ Assemble lock nut below and tighten. ■ Assemble the Brake Switch on the bracket. ■ Connect the brake light switch.	 CAUTION: Do not use tools with sharp ends.  Hex Screw Hex nut : M5 Screw driver Spanner: 8mm Torque: 6Nm(0.6 KgM)  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3	Front Disc Brake	
13.3.5	Brake hose on master cylinder and wheel caliper ■ Position brake hose against the mounting hole on master cylinder such that it is pointing downwards correctly.. ■ Locate 2 new copper washers on either sides of the brake hose banjo and tighten with banjo bolt. ■ Route the brake hose correctly from the right side towards the wheel caliper in fork end LH. ■ Position brake hose against the mounting hole on wheel caliper correctly. ■ Locate 2 new copper washers on either sides of the brake hose banjo and tighten with banjo bolt. ■ Fill fresh brake fluid in the Master cylinder till "MAX" mark ■ Assemble the diaphragm, plate and cover. ■ Tighten screws gently.	 Banjo bolt : M8 Socket Spanner : 12mm Torque : 38Nm (3.8 KgM)   Slotted screws Screw driver Torque: 15Nm(.15KgM) 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.3 13.3.5	Front Disc Brake Brake hose on master cylinder and wheel caliper ■ Assemble the rear view mirror. ■ Bleed the air out of the hydraulic brake system.	
13.4 13.4.1	Rear Disc Brake Piston & seals in caliper ■ Coat fresh brake fluid on new dust seals and piston seals. ■ Install piston seals in the inner groove and dust seals in the outer groove in the bore in caliper assembly. ■ Coat the caliper cylinder and piston with fresh brake fluid. ■ Insert the closed end of the piston into the caliper bore and gently press it into caliper fully till the open ends of the piston are flush with the caliper bore outer edge.	 NOTE: Do not apply force while assembling the piston into the caliper. Press only with minimal hand pressure.  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4 13.4.1	Rear Disc Brake Piston & seals in caliper ■ Install the pad tension spring plate in the Caliper body. ■ Assemble Bleed screw with the dust cap on the caliper body. ■ Position the guides on the Caliper and mounting bracket correctly on the rubber boot and assemble caliper body in the mounting bracket	 Ring Spanner: 8 mm Torque: 10Nm (0.1Kgm)  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4 13.4.1	Rear Disc Brake Wheel caliper on swing arm ■ Locate caliper with mounting bracket on the swing arm such that the brake disc is correctly positioned inside the caliper. ■ Assemble wheel axle through the caliper bracket on the swing arm. ■ Assemble axle nut and tighten to torque.	
13.4.2	Brake pads on wheel caliper ■ Locate the brake pads inside the caliper on either sides of the disc with the friction material facing the disc. ■ Locate the pivot pin from the inside of the caliper correctly. ■ Assemble the 2 locking clips on the brake pad pivot pin.	  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4 13.4.3	Rear Disc Brake Master cylinder ■ Locate new O ring inside the master cylinder bore. ■ Assemble the spring guide on the small end of the spring. ■ Locate the peg on the piston, on the spring guide ■ Locate large bush over the piston. ■ Insert the large end of the spring along with the piston and guide bush into the master cylinder bore and hold it in compressed position inside the master cylinder. ■ Assemble Circlip in the master cylinder body and ensure it is locked properly in the groove ■ Assemble the protective rubber boot on the master cylinder.	CAUTION: Do not use any sharp tool to assemble the O ring or piston in the master cylinder.  Circlip Circlip pliers  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4	Rear Disc Brake	
13.4.3	Master cylinder ■ Position Master cylinder on frame and ensure the mounting holes are aligned. ■ Assemble 2 socket head screws on the mounting holes and tighten master cylinder to frame.x ■ Insert link rod in master cylinder and align mounting eyelet with brake pedal eyelet correctly. ■ Insert lock pin from outside and assemble split pin on lock pin on the inside.	Hex soc Hd screw:M4 Allen socket:5mm Torque: 10Nm(0.1Kg.M)  Split pin Nose pliers 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4 13.4.4	Rear Disc Brake Master cylinder reservoir - Align reservoir mounting hole to frame and tighten with hex socket head screw. - Connect rubber hose to reservoir and master cylinder and lock metal clip in place firmly at both ends.	Hex soc Hd screw : M4 Allen key : 5mm  
13.4.5	Brake hose - Position brake hose against the mounting hole on master cylinder such that it is pointing inwards correctly. - Locate 2 new copper washers on either sides of the brake hose banjo. - Assemble Banjo bolt with brake switch on the brake hose banjo, and tighten banjo to master cylinder. - Connect brake light switch coupler to main harness.	Brake light switch Double end spanner: 14mm NOTE: Ensure proper routing of brake hose before tightening.  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.4	Rear Disc Brake	
13.4.5	Brake hose ■ Locate rubber grommets on the brake hose in the clips in swing arm ■ Position brake hose against the mounting hole on wheel caliper correctly. ■ Locate 2 new copper washers on either sides of the brake hose banjo and tighten with banjo bolt. ■ Fill fresh brake fluid in the Master cylinder till "MAX" mark ■ Bleed the air out of the hydraulic brake system.	Banjo bolt Ring spanner: 12mm  

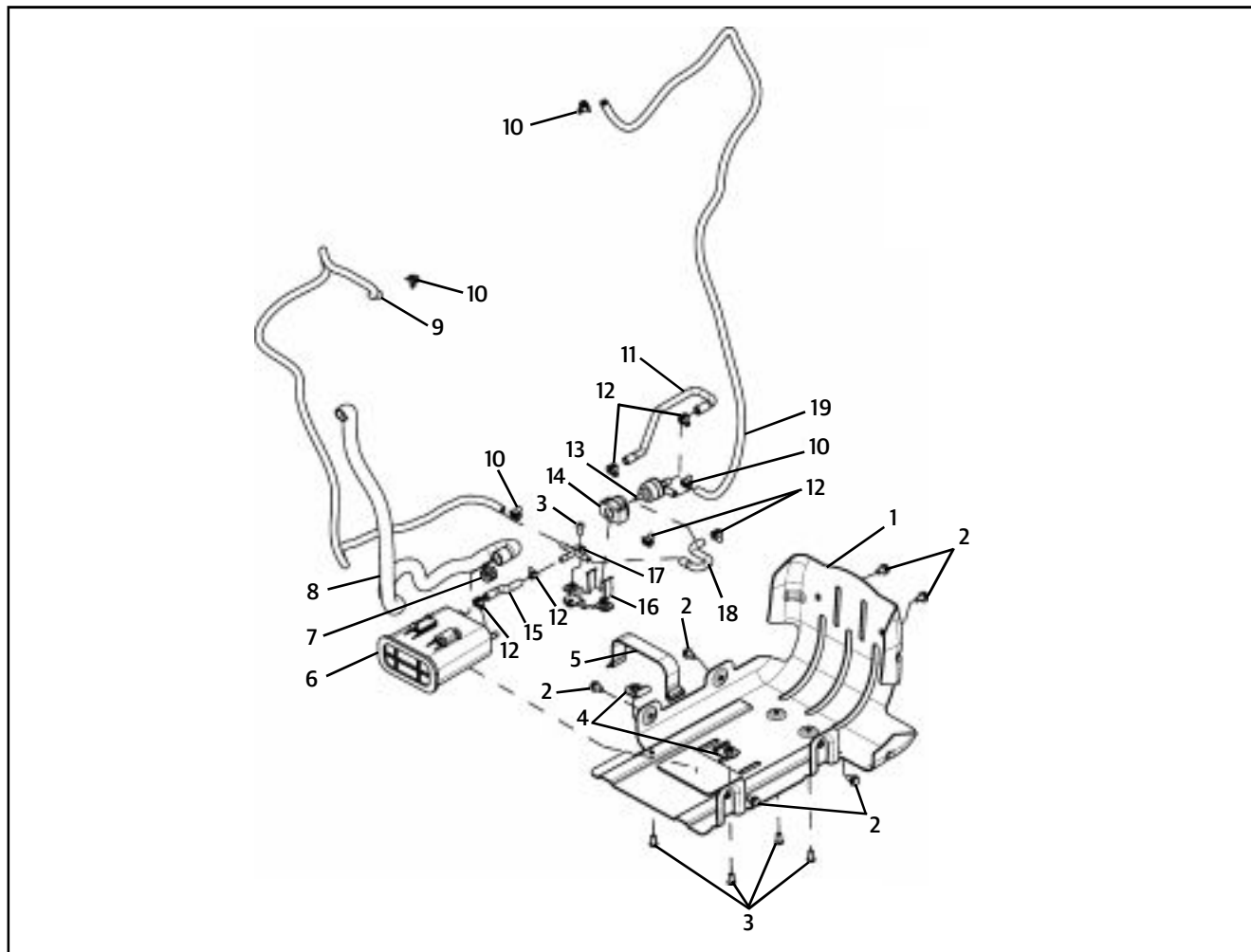
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.5	Disc brake bleeding ■ Ensure the bleeding screw is fully tight. ■ Fix a transparent flexible tube of length 12" (30 cms.) firmly on the bleeder nipple and insert the other end into a glass or plastic container containing about 100ml of fresh brake fluid. ■ Ensure the tube end is fully immersed in the fluid. This will prevent atmospheric air from getting sucked into the caliper unit during the bleeding process. ■ Ensure the master cylinder reservoir is filled with fresh brake fluid from a sealed container up to "MAX" level. ■ Fix the diaphragm, plate and top cover and tighten cover just sufficiently. ■ Depress brake lever / brake pedal completely and release fully to allow the brake fluid to fill up in the brake system and caliper. ■ Repeat above step several times while periodically inspecting the fluid level in the reservoir. Top as required to maintain level at "MAX" ■ When a slight firmness is felt on the lever / pedal and travels only up to halfway, hold the lever/ pedal firmly depressed in that position. DO NOT RELEASE THE LEVER.	Screw driver     CAUTION: Fill only with DOT3 or DOT4 brake fluid. Do not mix DOT 3 & DOT 4 fluids. NOTE: Do not tighten the cover fully since it may be required to top up fluid during bleeding process.

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.5	Disc brake bleeding - Loosen the bleeder screw at caliper end by $\frac{1}{2}$ to 1 turn to allow air bubbles in the brake system to escape into the transparent tube connected to the nipple. - When the bleeder screw is loosened and air escapes from the brake system along with brake fluid through the bleeder nipple, the brake lever / pedal will depress further. DO NOT RELEASE THE LEVER BUT HOLD IT FIRMLY AT THIS POSITION. - After all the air bubbles escape thro the bleeder nipple, tighten bleeder screw firmly and then only release brake lever / pedal. - Check and top up brake fluid in the master reservoir up to "MAX" level. - Repeat the steps above, till the brake lever / pedal movement is minimal and locks firmly without any sponginess in applied position. - Also check and ensure there are no more air bubbles being carried out by the fluid while bleeding the system.	Bleeder Nipple: M6 Ring spanner: 10mm Torque: 10Nm (0.1KgM)

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
13.5	Disc brake bleeding ■ Ensure the bleeder screw is tightened fully and fix the dust cap. ■ Check and top up brake fluid in the master cylinder reservoir up to For front brake master cylinder ■ Assemble diaphragm, plate and top cover and tighten with 2 slotted screws on the front brake master cylinder. For front brake master cylinder ■ Tighten the cover firmly on the reservoir in the rear brake master cylinder.	Slotted screw Philips head Screw driver Torque: 1.5Nm (0.015KgM) NOTE: Check and ensure there is no sponginess of the brake lever / pedal when brakes are applied. Carry out a road test to check the braking efficiency. Check for any leaks at the banjo or the bleeding screw areas and ensure all tightness of all fasteners.

SECTION 14 - EVAPORATIVE EMISSIONS

HIMALAYAN MODEL



S.NO.	DESCRIPTION	QTY.
1	Skid plate with Canister pad	1
2	Flanged Hex Bolt M6 X 1 X 10	6
3	Hex.Socket Button Head Screrw M6 X 1 X 12	5
4	Bracket Assy- Canister mounting	2
5	Rubber Strap- Canister	1
6	Canister Assy	1
7	Clip	1
8	Hose- Air vent	1
9	Hose- Purge Valve to Throttle body	1
10	Hose-Clip	4

S.NO.	DESCRIPTION	QTY.
11	Hose- Canister to Purge valve	1
12	Hose-Clip	6
13	Purge Valve	1
14	Grommet- Purge Valve	1
15	Hose- Canister to T Connector	1
16	Bracket Assy- Purge Valve	1
17	T Connector	1
18	Hose- T Connector to Purge Valve	1
19	Hose- Fuel tank to Purge Valve	1

LOCATION OF EVAP IN MOTORCYCLE

The canister is connected to the fuel tank to trap all the fuel vapours that build up in the fuel tank .

HIMALAYAN

Location : Located on Skid Plate.



PURGE VALVE

The purge valve is a mechanically controlled one way valve. When the engine is off, the purge valve is closed. When the engine is started, the vacuum created in the suction port is used to open this one way valve and allow the vapors to go into the inlet port.

The Evaporative emission control system EVAP fitted in our motorcycles prevents gasoline vapors from escaping into the atmosphere from the fuel tank.

As soon as the motorcycle is parked after riding or parked under the sun, the hot radiation from the engine / sunlight causes the fuel in the tank to warm up and releases fuel vapors.

The EVAP system prevents these fuel vapors recycled to engine to avoid vapor into the atmosphere and stored in a charcoal canister.

As soon as the engine is started, these vapours are purged from the canister, into the combustion chamber.

The system consists of a canister, purge valve, rubber hoses, connectors and a sealed fuel tank cap.

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
1.	Canister ■ Loosen 6 hex. bolts mounted on skid plate on LH, RH & Top Portion of the skid plate. ■ Loosen 5 hex. screws mounted on canister assy. & Purge valve. ■ Gently remove the 2 canister bracket assy along with rubber strap ■ Gently remove the canister from the skid plate assy.with the hoses.	Hex Bolt : M6 Socket Spanner : 8mm Hex Soc. Head Screw : M6 Allen Key : 5 mm  

INSPECTION

Inspect rubber hoses and joints periodically for any cuts cracks or fractures. Replace if damaged.

Inspect Canister periodically for any damage to its body cuts or cracks.

Replace all rubber hoses and connectors every 12,000 Kms.

TORQUE CHART

Aggregate	Component	Fastener	Torque Range	
			NM	Kg-M
Canister	Canister Assembly Bracket	Hex. Flange bolt M6 X 1 X 20	10	1.0

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
1.	Canister ■ Locate canister assy on the skid plate along with the hoses. ■ Locatge the canister bracket assy. on the skid plate along with rubber strap. ■ Install 5 hex screws okn canister assy. & purge valve. ■ Install 6 hex bolts on skid plate LH, RH & Top portion.	 Hex Soc. Head Screw : M6 Allen Key : 5 mm Hex Bolt : M6 Socket Spanner : 8mm Torque : 10 Nm 

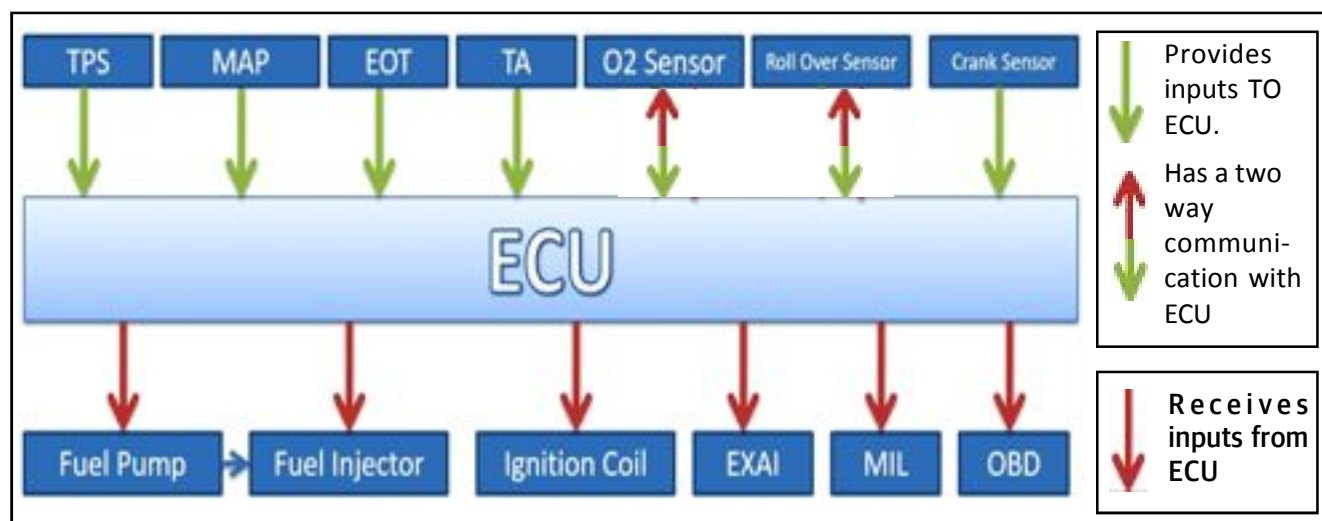
SECTION 15 - ENGINE MANAGEMENT SYSTEM (EMS)

The EMS consists of an Electronic Control Unit (ECU) which constantly receives inputs like engine temperature, ambient temperature, throttle position, manifold air pressure, exhaust emissions through the various sensors provided to optimize the air fuel ratio AND crank position (from the crank position sensor) in relation to the engine RPM to optimize the ignition advance for proper combustion of the air fuel mixture.

This is very essential for:

- Compliance with BS IV regulation related to exhaust emissions
- Optimum fuel efficiency and power output
- Excellent cold start ability and sustained high speed drive ability.

FUNCTIONAL DIAGRAM OF THE EMS



In addition to optimizing engine performance, the ECU also has an inbuilt memory by which any EMS related malfunctions will get stored and help diagnose the fault accurately.

There is also an inbuilt safety system, which, in the event of the motorcycle's banking angle is below 60° OR is involved in an accident causing the motorcycle to fall over on either of its sides with the gears engaged and the engine running, both the fuel supply and ignition will be cut off to stop the engine and prevent any further damage from being caused.

SPECIFICATIONS / FUNCTIONS OF THE VARIOUS EMS PARTS

1. ELECTRONIC CONTROL UNIT (ECU)

LOCATION

The Electronic Control Unit (ECU) is located under the seat.

SPECIFICATION

Operating Voltage: 8 - 16 V

Sensor Supply Voltage: 5 V

Operating temperature: -10°C to + 60°C

Storage Temperature: -20°C to + 80°C



The ECU consists of a microprocessor with two memories Flash Memory and E² PROM.

Flash memory is an exclusive recording unit. It collects different inputs from various sensors and calculates optimized values and provides the outputs to the respective controlling devices.

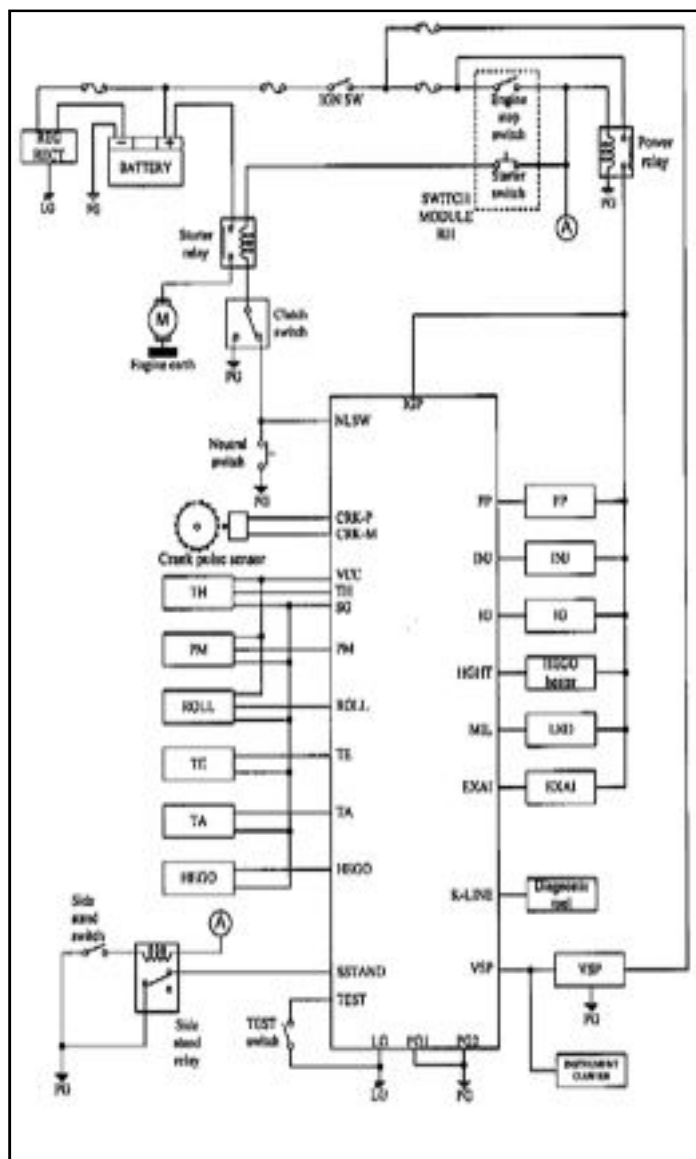
E²PROM is an abbreviation for Electronically Erasable Programmable Read Only Memory. This memory records information related to performance of the various sensors in the EMS on a real time basis AND also records any sensor failures if it occurs during operation of the motorcycle.

The main advantage of E²PROM is it records data, even when the motorcycle's electrical system is switched OFF.

This will help in diagnosing the motorcycle performance and also to view the history and defect codes, whenever the Royal Enfield NACS II diagnostic tool is connected to the socket in the wiring harness of the motorcycle.

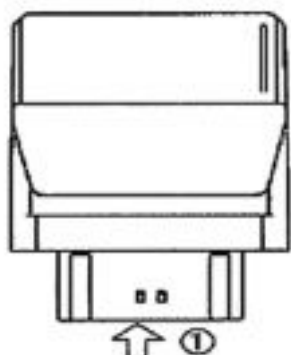
Once the defect is diagnosed and corrected, the history of the defect can be erased using the Royal Enfield NACS II diagnostic tool.

ECU LAYOUT

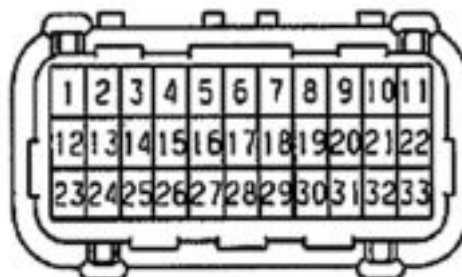


ECU PIN DETAILS

Pin No.	Name	Function
1	IGP	Ignition Power
2	LG	Logic Ground
3	HEGO	HEGO Sensor
4	SG	Sensor Ground
5	TH	Throttle Position Sensor
6	VCC	Sensor Power Output (+5V)
7	-	-
8	FP	Fuel Pump
9	PG1	Power Ground1
10	PG2	Power Ground2
11	IG	Ignition Coil
12	CRK-P	Crank Pulse Sensor
13	-	-
14	TA	Air Temperature
15	TEST	Test Switch
16	INJ	Injector
17	VSP	Vehicle Speed Sensor
18	-	-
19	-	-
20	-	-
21	-	-
22	MIL	Multi Indicator Lamp
23	CRK-M	Crank Pulse Sensor GND
24	TW	Engine Temp. Sensor
25	SSTAND	Side Stand Switch
26	ROLL	Roll Sensor
27	PM	Manifold Pressure Sensor
28	EXAJ	Exhaust Air Injection
29	NLSW	Neutral Switch
30	K-LINE	Diagnostic Tool
31	-	-
32	-	-
33	HEGO HT	HEGO Sensor Heater



① TERMINAL LAYOUT



2. CRANK POSITION SENSOR

LOCATION

The crank position sensor sends an alternating voltage signal to the powertrain control module, which is used to determine engine speed and ignition timing. Thus the speed of the engine is instantly known by the ECU.

SPECIFICATION

Output Voltage: 3 - 5 V AC.

Resistance : $200 \pm 20 \Omega$



It provides an alternating electrical pulse to the ECU, to determine crankshaft speed and TDC position by scanning the 17 pips and 1 long gap between 2 particular pips on the rotor. This input helps the ECU to optimize both fuel injection as well as Ignition advance required to suit the crankshaft rotation speed (RPM).

In the event the throttle is held wide open with gears in neutral, leading to crankshaft speed above 5500 RPM, the high frequency electrical pulses from the crank position sensor will prompt the ECU to restrict fuel supply so that the crank speed reduces below 5000 RPM. This is a safety aspect to prevent damage to moving engine parts.

3. ENGINE TEMPERATURE SENSOR

LOCATION

The engine temperature sensor (EOT) is located on the cylinder head, below the inlet manifold on the oil passage.

SPECIFICATION

Operating Temperature: -55°C to $+250^{\circ}\text{C}$

Resistance at 80°C : $1.63\text{K} \Omega \pm 5\%$

Sensor Supply Voltage: 5V



It senses the oil temperature and provides the input to the ECU on a real time basis. The ECU can then determine the fuel injector operating time to provide the required amount of vaporized fuel into the combustion chamber for optimum performance of the motorcycle and also to meet the emission norms.

4. O2 SENSOR

LOCATION

The HEGO sensor is located on the exhaust down pipe, just after the cylinder head.

SPECIFICATION

Operating Voltage : 16V (Max)

Operating temperature: 600°C - 950°C



It detects residual oxygen in the exhaust gases versus the amount of oxygen in the atmosphere and provides the data on a real time basis to the ECU based on which the fuel injection is metered continuously to control exhaust emissions and for optimum performance of the motorcycle.

5. EXHAUST AIR INJECTION UNIT (SOLENOID)

LOCATION

The exhaust air injection unit (EXAI) is located underneath the fuel tank.

SPECIFICATION

Operating voltage : 10 V to 14.5 V

Operating Temperature: - 20°C to +120°C



In addition to the Hego sensor, the EXAI gets inputs from the ECU to supply filtered air into the exhaust end of the cylinder head, primarily during idling RPM so as to meet exhaust emission specifications.

6. THROTTLE BODY

LOCATION

The throttle body is located below the fuel tank, between the intake side of the cylinder head & the air filter assembly.

SPECIFICATION

Operating Voltage: 5 V.

Out Put Voltage: 0 – 5V.

Throttle Angle : 0 – 80°

Resistance Maximum: 5 K Ω

Out Put at Idling: 0.6 $\pm$ 0.2V.

Operating Temperature: -20°C to +80°C



It consists of a throttle plate (butterfly valve) to regulate the airflow into the cylinder head depending on the throttle opening and a manual Bi Starter which helps control idling RPM in extreme cold conditions.

The throttle body also has a throttle position sensor (TPS) and manifold absolute pressure sensor (MAP).

7. THROTTLE POSITION SENSOR (TPS)

LOCATION

Throttle Position Sensor (TPS) is located on the throttle body at the end of the butterfly valve spindle to monitor the position of the butterfly valve.

SPECIFICATION

Max Resistance : 5 K Ω

Operating Temp : - 20°C to +80°C

Supply Voltage : 5 V



The sensor consists of a potentiometer and provides a variable resistance depending upon the position of the butterfly valve to the ECU. This helps the ECU to regulate the fuel injector opening duration to provide the required amount of vaporized fuel into the combustion chamber for optimum performance of the motorcycle.

8. MANIFOLD ABSOLUTE PRESSURE SENSOR (MAP)

LOCATION

The Manifold Absolute Pressure Sensor (MAP) is located on top of the throttle Body.

SPECIFICATION

Operating Temperature: -20°C to +80°C

Supply Voltage: 5 V



The MAP sensor monitors the manifold pressure at the intake end and provides data to the ECU on a real time basis. This helps the ECU to calculate the air density and the air inflow rate and determines the fuel injector opening duration to provide the required amount of vaporized fuel into the combustion chamber for optimum performance of the motorcycle.

9. AMBIENT AIR (TA) SENSOR

LOCATION

The TA sensor is located on the rear side of the filter box assembly in Bullet EFI, Classic EFI, Thunderbird EFI models and on the outlet pipe of the air filter housing in Continental GT models.

SPECIFICATION

Operating Temperature: -30°C to +120°C

Supply Voltage: 5 V $\pm$ 0.5 V



The ambient temperature input is provided to the ECU on a real time basis, based on which the ECU determines the fuel injector operating time to provide the required amount of vaporized fuel into the combustion chamber for optimum performance of the motorcycle.

10. FUEL PUMP ASSEMBLY

LOCATION

The fuel pump is located on the left side bottom of the fuel tank and submerged in the fuel so that it cannot ignite itself due to any electrical short circuits. The fuel pump has an inbuilt micro filter which helps to filter even the minute dust particles that may come in the fuel.

SPECIFICATION

Operating Voltage: 6 V to 15 V

Operating Temperature: -15°C to +60°C

Fuel Pressure: 294 Kpa



As soon as the Ignition switch and the engine kill switch are in ON position, the fuel pump creates a positive pressure of 294KPa in the fuel line and up to the injector. The fuel pump operation is determined by the ECU so that there is no excessive pressure in the fuel system to prevent damage to the fuel injector, fuel hose. Any excess pressure is bypassed back into the fuel tank.

11. FUEL INJECTOR

LOCATION

The fuel injector is located at an angle on the intake side of the cylinder head so as to maximize fuel spray and minimize wall wetting, for optimum performance of the motorcycle.

SPECIFICATION

Operating Voltage : 10 V to 16 V

Operating Temperature : -30°C to +120°C

Fuel Pressure : 343 Kpa

Resistance : 10.3 $\pm$ 0.5 Ohms



The Fuel Injector is a solenoid operated electromagnetic valve, which enables the pressurized fuel delivered by the fuel pump, to be atomized and sprayed into the cylinder head combustion chamber.

The fuel injector operation and duration to deliver vaporized fuel is controlled by the ECU based on the critical operating inputs received from the crank position sensor, EOT sensor, ambient air temperature sensor, throttle position sensor, manifold pressure sensor and HEGO sensor.

12. EFI ECU POWER & SIDE STAND RELAYS

LOCATION

There are two identical relays located under the seat.

SPECIFICATION

Operating Voltage : 10 V to 16 V

Operating Temp : - 30 ° C to + 120 ° C

Fuel Pressure : 343 Kpa

Resistance : 10.3±0.5 Ohms



The EFI ECU Power relay supports functioning of the ECU and fuel pump. The Side stand relay provides the inputs regarding the position of the side stand to the ECU. In the event the side stand is NOT retracted and the motorcycle is attempted to be started, it signals the ECU which cuts off the fuel supply thus preventing the engine from starting.

13. ROLLOVER SENSOR

LOCATION

The rollover sensor is located on the frame under the seat.

SPECIFICATION

Operating voltage : 10 V to 14.5 V

Operating Temp : - 20 ° C to + 120 ° C



The rollover sensor, also known as a "banking" sensor, is a safety feature. If the banking angle of the motorcycle goes below 60° OR in the event of an accident causing the motorcycle to fall over on either of its sides with the engine running, the rollover sensor will "command" the ECU to cut off both the fuel supply and ignition, thus stalling the engine to prevent any further damage from being caused by the engine that may be running with a stuck open throttle and the gears engaged.

To re activate the system, the motorcycle should be made upright in its centre stand position, the ignition switch and stop switch must be switched OFF and switched back ON after a few seconds. This will help to RESET the rollover sensor.

14. MALFUNCTION INDICATOR LAMP (MIL)

LOCATION

Malfunction Indicator Lamp (MIL) is located in the small meter on the Headlamp casing

When both the Ignition & Engine kill switch is "ON" and after vehicle is started, MIL will glow for few seconds and switch OFF, this indicates that all the functions of EMS are functioning correctly.

In the event of any malfunction the MIL will glow continuously. The EMS should be checked using either the test pin method OR the Royal Enfield NACS II diagnostic tool connected to the socket in the wiring harness of the motorcycle.



S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.1	Electronic Control Unit (ECU) Himalayan ■ The ECU is located under the fuel tank. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Unlock side panel LH and remove the panel LH. ■ Gently pull seat latch cable to release seat and remove seat. ■ Gently pull out the ECU from the rubber housing located in the frame. ■ Gently release lock and disconnect the wiring coupler from the ECU. ■ Remove ECU.	 

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.2	Crank position sensor ■ The Crank position sensor is located inside the cover RH of the engine assembly. ■ Drain engine oil from the engine. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Disconnect Magneto wiring coupler from the electrical harness. ■ Loosen and remove 2 Hex Flange Bolt M6 X1 X 85 from cover RH front. ■ Loosen and remove 7 Hex Flange Bolt M6 X1 X 70 from cover RH, top, centre and bottom. ■ Loosen and remove 1 Hex Flange Bolt M6 X1 X 45 from cover RH rear. ■ It may be necessary to gently tap and remove cover RH as the magnetic forces in the rotor can be acting on the stator and making it difficult to remove. ■ Remove gasket. ■ Remove 2 Hex Flange Bolt M5 X 0.8 X 16, holding Pulsar coil to cover RH inside. ■ Remove 3 Hex Socket Head Cap Screw M5 X 30, holding stator coil to cover RH inside.	CAUTION: ■ Ensure stator coupler is disconnected before removing cover RH. ■ Gently tap on the tabs provided in the front and rear of Cover RH to release the cover from the crankcase. 

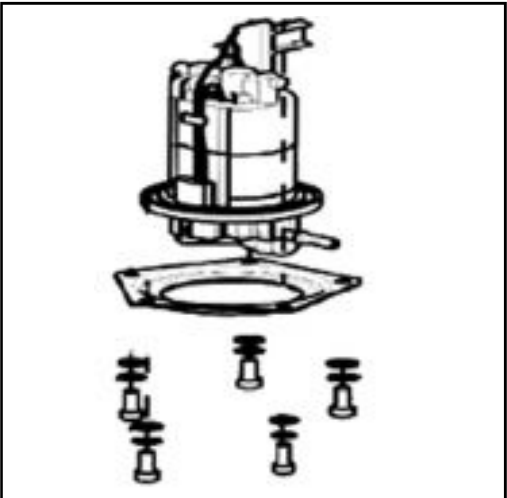
S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.3	Engine Temperature Sensor ■ The Engine temperature sensor is located on the cylinder head right side, below the inlet manifold. ■ Ensure Ignition switch and stop switch are in OFF position Disconnect wiring harness coupler from the sensor. ■ Gently Loosen engine temperature sensor and remove along with 'O' ring.	Deep Groove Socket bit: 17mm   

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.4	O2 Sensor ■ The Hego sensor is assembled on the inner side of the exhaust down pipe near the cylinder head. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Disconnect wiring harness coupler from the sensor. ■ Loosen Hego sensor and remove along with copper washer from the exhaust down pipe.	Deep Groove Socket: 21mm 

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.5	Exhaust Air Injection Unit (EXAI Solenoid) ■ The EXAI Solenoid is located on the frame under the fuel tank along with the reed valve. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Disconnect wiring harness coupler from the EXAI solenoid. ■ Release the 2 clips on the Inlet and outlet pipes connected to the EXAI solenoid, and disconnect the pipes. ■ Loosen Gland nut at cylinder head end and disconnect braided hose connecting reed valve to cylinder head. ■ Remove the 2 Hex Screws holding the reed valve mounting bracket to frame and remove along with EXAI solenoid. ■ Remove socket head cap screw holding the EXAI solenoid to the reed valve bracket.	Gland Nut Double end spanner: 16mm Soc Hd Cap Screw: M5X20 Allen Key 4mm Hex Screw M6 X 16 Socket spanner: 8mm  NOTE: Ensure spacer between the EXAI solenoid & bracket is removed.

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.6	Throttle Body ■ The throttle body is located between the cylinder head inlet and the air filter outlet hose. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Disconnect TPS and MAP wiring couplers. ■ Slacken the locknuts on the adjusters and remove throttle cables from the throttle body. ■ Disconnect rubber hose connecting throttle body to the EVAP canister. ■ Disconnect manual Bi Starter cable from throttle body by loosening and removing the plastic nut on LH side. ■ Loosen hose clip on air inlet rubber hose. ■ Loosen hose clip on Adaptor between throttle body and cylinder head. ■ Remove throttle body by gently sliding it out of the inlet bellow and adaptor.	 - Adjuster Nuts Double end spanner: 12mm - Hose clip screws: Flat screw driver NOTE: The throttle position sensor (TPS) and Manifold Absolute Pressure Sensor (MAP) are not serviceable and hence should not be removed from the throttle body.

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.7	Ambient Air (TA) Sensor Himalayan ■ The TA sensor is assembled on the pipe outlet between air filter housing and Throttle body. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Remove seat assembly ■ Disconnect the wiring coupler from the TA sensor. ■ Using a long reach Philips head screw driver, loosen and remove the 2 screws, holding TA sensor to pipe outlet. ■ Remove TA sensor along with gasket, from pipe outlet.	Hex Soc Hd Cap Screws: M5 X 20 Allen Key: 4mm Philips head screws Philips Screw driver 

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.8	Fuel Pump Assembly ■ The fuel pump assembly is located inside the fuel tank at the left side, rear bottom. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Remove Seat assembly and fuel tank. ■ Loosen & remove 5 Hex Socket Button Head Cap Screws along with the copper & fibre washers. ■ Remove clamp plate. ■ Pull out fuel pump from the fuel tank. ■ Take care to remove the O ring from the fuel tank.	CAUTION: ■ Store fuel in a tight sealed container in a well ventilated, cool and dry place. ■ Do not smoke or allow open flame or sparks in the vicinity. NOTE: Ensure Ignition switch and engine kill switch are in OFF position Drain fuel completely from fuel tank before removing fuel pump. Hex Soc Button Hd Cap Screws: M6 X 12 Socket spanner: 8mm  

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.9	Fuel Injector ■ The fuel injector is assembled on the inlet side of cylinder head below the fuel tank. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Remove Seat assembly and fuel tank. ■ Disconnect the wiring coupler from the fuel injector. ■ Loosen worm clip on the inlet fuel hose and remove fuel hose from cap injector assembly. ■ Remove hex nut from top of injector cap assembly and remove injector cap along with "O" ring. ■ Remove the spacer from the stud. ■ Gently pull out the Injector from the cylinder head.	Hex U nut: M6 X 1 Ring spanner: 8mm 

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.10	EFI ECU Power & Side Stand Relays Himalayan ■ Two identical relays are located near the battery. ■ Located in a rubber holder on the side of the battery carrier. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Remove side panel LH. ■ Gently pull out relay from the rubber holder and electrical socket.	

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.11	Roll Over Sensor ■ Located below the seat on the frame. ■ Ensure Ignition switch and engine stop switch are in OFF position. ■ Disconnect the wiring coupler from the sensor. ■ Loosen and remove the hex socket screw holding the sensor to the frame and remove the sensor.	Hex Soc Hd Screw: M6 Allen Key: 5mm 

S. No.	Aggregate to Dismantle / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.12	Malfunction Indicator Lamp Himalayan ■ Located in the RPM meter in the instrument cluster. ■ Ensure Ignition switch and engine stop switch are in OFF position. ■ The instrument cluster does not have any individual serviceable parts.	

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.13	Electronic Control Unit (ECU) Himalayan ■ Locate ECU under the Fuel tank. ■ Connect the wiring coupler on the ECU and gently lock. ■ Gently push the ECU on its rubber housing located in the frame. ■ The ECU is located under the seat. ■ Locate seat on the frame and push it for proper seating. ■ Locate the side panel LH and lock side panel LH.	 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.14	Crank position sensor ■ Locate Crank position sensor inside the cover RH of the engine assembly. ■ Install 3 Hex Socket Head Cap Screw M5 X 30, on stator coil to cover RH inside. ■ Install 2 Hex Flange Bolt M5 X 0.8 X 16, on Pulsar coil to cover RH inside ■ Locate gasket. ■ Install and tighten 1 Hex Flange Bolt M6 X 1 X 45 on cover RH rear ■ Install and tighten 7 Hex Flange Bolt M6 X 1 X 70 on cover RH, top, centre and bottom. ■ Install and tighten 2 Hex Flange Bolt M6 X 1 X 85 on cover RH front. ■ Connect Magneto wiring coupler in the electrical harness. ■ Fill engine oil.	CAUTION: ■ Ensure stator coupler is disconnected before removing cover RH. ■ Gently tap on the tabs provided in the front and rear of Cover RH to release the cover from the crankcase. 

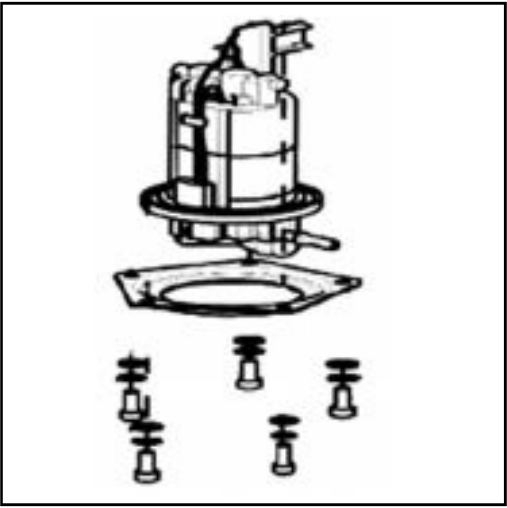
S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.15	Engine Temperature Sensor ■ Locate engine temperature sensor along with 'O' ring on the cylinder head right side below the inlet manifold. ■ Ensure Ignition switch and stop switch are in OFF position, Connect wiring harness coupler on the sensor.	Deep Groove Socket bit: 17mm   

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.16	O2 Sensor ■ Locate Hego sensor along with copper washer on the exhaust down pipe near the cylinder head. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Connect wiring harness coupler on the sensor.	Deep Groove Socket: 21mm 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.17	Exhaust Air Injection Unit (EXAI Solenoid) ■ Locate socket head cap screw on the EXAI solenoid to the reed valve bracket. ■ Install the 2 Hex Screws on the reed valve mounting bracket to frame. ■ Locate EXAI Solenoid on the frame under the fuel tank along with the reed valve. ■ Install Gland nut at cylinder head end and connect braided hose connecting reed valve to cylinder head. ■ Connect 2 clips on the Inlet and outlet pipes connected to the EXAI solenoid. ■ Ensure Ignition switch and stop switch are in OFF position, Connect wiring harness coupler in the EXAI solenoid.	Gland Nut Double end spanner: 16mm Soc Hd Cap Screw: M5X20 Allen Key 4mm Hex Screw M6 X 16 Socket spanner: 8mm  NOTE: Ensure spacer between the EXAI solenoid. & bracket is removed.

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.18	Throttle Body ■ Locate throttle body between the cylinder head inlet and air filter outlet house. ■ Gently slide throttle body on the inlet bellow and adaptor. ■ Locate hose clip on Adaptor between throttle body and cylinder head. ■ Locate hose clip on air inlet rubber hose. ■ Connect manual Bi Starter cable on throttle body by tightening and locating the plastic nut on LH side. ■ Connect rubber hose from throttle body to the EVAP canister. ■ Locate the locknuts on the adjusters and locate throttle cables on the throttle body. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Connect TPS and MAP wiring couplers.	 - Adjuster Nuts Double end spanner: 12mm - Hose clip screws: Flat screw driver NOTE: The throttle position sensor (TPS) and Manifold Absolute Pressure Sensor (MAP) are not serviceable and hence should not be removed from the throttle body.

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.19	Ambient Air (TA) Sensor Himalayan ■ Locate TA sensor along with gasket on pipe outlet between air filter housing and throttle body. ■ Using a long reach Philips head screw driver, Install 2 screws, holding TA sensor to pipe outlet. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Connect the wiring coupler in the TA sensor. ■ Assemble seat assembly	Hex Soc Hd Cap Screws: M5X20 Allen Key: 4mm Philips head screws Philips Screw driver 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.20	Fuel Pump Assembly ■ Locate the O ring in the fuel tank. ■ Locate fuel pump assembly inside the fuel tank at left side. ■ Install clamp plate. ■ Install 5 Hex Socket Button Head Cap Screws along with the copper & fibre washers. ■ Assemble Seat assembly and fuel tank	NOTE: Ensure Ignition switch and engine kill switch are in OFF position. Hex Soc Button Hd Cap Screws: M6 X 12 Socket spanner: 8mm NOTE : In three times operation of kill switch in ignition on condition, 210 ml to 240ml of fuel should get collected.  

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.21	Fuel Injector ■ Locate fuel Injector on the inlet side of the cylinder head below the fuel tank. ■ Locate the spacer in the stud. ■ Locate hex nut from top of injector cap assembly and place injector cap along with "O" ring. ■ Locate worm clip on the inlet fuel hose and locate fuel hose on cap injector assembly. ■ Ensure Ignition switch and stop switch are in OFF position. ■ Connect the wiring coupler from the fuel injector. ■ Assemble Seat assembly and fuel tank.	Hex U nut: M6 X 1 Ring spanner: 8mm 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.22	EFI ECU Power & Side Stand Relays Himalayan ■ Ensure Ignition switch and stop switch are in OFF position. ■ Gently push the two identical relays in the rubber holder and electrical socket. ■ Locate in a rubber holder on the side of the battery carrier. ■ Locate side panel LH.	

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.23	Roll Over Sensor ■ Locate the hex socket screw on the sensor to the frame and install the sensor which is located below the seat on the frame. ■ Connect the wiring coupler from the sensor. ■ Ensure Ignition switch and engine stop switch are in OFF position.	Hex Soc Hd Screw: M6 Allen Key: 5mm 

S. No.	Aggregate to Assemble / Instructions	Fastener, Size, Tool Usage, Precautions, Photos
4.24	Malfunction Indicator Lamp Himalayan ■ Ensure Ignition switch and engine stop switch are in OFF position. ■ Locate the RPM meter in the instrument cluster. ■ The instrument cluster does not have any individual serviceable parts.	

EMS FAULT DIAGNOSIS & TROUBLE SHOOTING

NOTE:

- During diagnosis the motorcycle should be parked in its center stand, the side stand in fully retracted position and with the gears in neutral .
- The battery should be in fully charged and proper working condition.
- There should be no external electrical sources or interferences near the motorcycle.

TYPES OF DIAGNOSIS

There are three levels of identifying a malfunction in the ECU or the sensors.

LEVEL 1 VISUAL

As soon as the ignition switch, engine stop switch are in ON position and the side stand is in fully retracted position, the MIL will glow and will switch OFF after a few seconds after the engine is started. This indicates the EMS system is in its auto diagnostic mode and the EMS is working perfectly.

In the event the MIL glows continuously and does not switch off, it indicates a malfunction in the EMS.

LEVEL 2 TEST PIN

In the event the MIL is continuously ON and does not switch OFF, the test pin method will help narrow down to the sensor / electrical connection that caused the malfunction.

LEVEL 3 GENERIC SCAN TOOL (NACS II DIAGNOSTIC TOOL)

A generic scan tool supplied by Royal Enfield will help identify the exact cause of the malfunction in the EMS, when connected between the motorcycle and a computer.

The tool will take inputs from the ECU and provide to the computer to display the defect code that will help identify the specific sensor/connections.

In addition the generic scan tool can also help download the history of the vital parameters of the EMS, engine performance and earlier defects for detailed analysis and records.

The generic scan tool will also be able to erase previous defects after the same has been rectified.

METHOD OF CHECKING

LEVEL 1 VISUAL

- Switch OFF the ignition and engine stop switch.
- Check for any loose coupler connections at the sensor end. Correct loose connections if any.
- Switch ON ignition and engine stop switch. Ensure side stand is fully retracted.
- Check for MIL Indication in the cluster/Console.
 - Start the engine.
 - Allow engine to run in idling RPM for about 30 seconds and switch off engine.

- Repeat the above process for 2 more times.
 - Ensure MIL Indications goes off after above method.
 - This will help to recalibrate the MIL and store the error code in the ECU.
- If in case the defect is not eliminated and the MIL glows continuously, proceed to **level 2 test pin method** to resolve the defect.

LEVEL 2 TEST PIN METHOD

An open single pole connector is provided close to the UCE.

- Connect a piece of wire to this connector and suitably ground it to the motorcycle body.
- Switch ON ignition and engine stop switch and observe the MIL keenly for a series of short and long blinks at different intervals, to identify the defective sensor / wiring connection as detailed in the table below,

MIL BLINK CODES DESCRIPTION

MIL BLINK	MALFUNCTION INDICATION
MIL will glow continuous. Engine will start but not perform to its potential	
Long 0 Short 6	Throttle position sensor Malfunction
Long 0 Short 9	Manifold Air Pressure sensor Malfunction
Long 1 Short 2	Engine oil temperature sensor Malfunction
Long 1 Short 3	Intake Air temperature sensor Malfunction
Long 1 Short 7	O2/HEGO Sensor Malfunction
Long 4 Short 5	O2 Sensor heater circuit Malfunction
Long 5 Short 4	EXAI Circuit Malfunction
MIL will glow continuous. Engine will NOT start but will crank	
Long 6 Short 6	Crankshaft position sensor Malfunction
Long 1 Short 5	Roll over sensor Malfunction
Long 3 Short 3	Fuel Injector Circuit Malfunction
Long 3 Short 7	Ignition Coil Circuit Malfunction
Long 4 Short 1	Fuel pump relay circuit Malfunction
Long 7 short 0	Vehicle/Wheel speed sensor Malfunction(only for Continental GT Model)

LEVEL 3 GENERIC SCAN TOOL METHOD

When the fault is detected, the GST raises a flag to conform readiness Permanent/Confirmed/Pending DTC. If some DTCs are defined for a sensor or device, a readiness for the sensor or device is judged as formed when one of readiness for the DTCs is formed.

- NACS II Diagnostic Tool can read the error codes (P - codes in the adjacent table) to easily diagnose the system causing the malfunction.
- It can also be used to capture engine data for future reference for saving data regarding issues of engine malfunction before in the process of resolving engine malfunction.

DIAGNOSTIC TROUBLE CODES DESCRIPTION

Items	Parameters	Description	DTC
Throttle position sensor	TH	Too low input voltage	P0120
		Too High input voltage	P0123
Manifold Air Pressure sensor	PM	Too low input voltage	P0107
		Too High input voltage	P0105
Engine Oil Temperature Sensor	TW	Too low input voltage	P0117
		Too High input voltage	P0115
Intake Air Temperature Sensor	TA	Too low input voltage	P0112
		Too High input voltage	P0110
Rollover Sensor	RO	Too low input voltage	P1630
		Too High input voltage	
O2 Sensor	HG	Short circuit to ground or open circuit (low or open)	P0130
Fuel Injector	IJ1	Short circuit to ground or open circuit	P0201
		Short circuit to Battery	
Ignition Coil	IG1	Short circuit to ground or open circuit	P0351
		Short circuit to Battery	
Fuel Pump Relay	FLR	Short circuit to ground or open circuit	P0230
		Short circuit to Battery	
O2 sensor Heater	HR	Short circuit to ground or open circuit (low or open)	P0030
Vehicle / Wheel speed sensor	VSP	The Sensor circuit malfunction	P0500
AIR System Switching Valve "A" Circuit	EXAI	Short circuit to ground or open circuit (low or open)	P0412
Crankshaft position sensor	CRK	The Sensor circuit malfunction	P0335

INSTRUCTIONS (DO'S & DON'T'S)

- 1) DO NOT remove any of the sensor connections / couplers / Battery connections when the Ignition switch is ON OR the engine is running.
- 2) DO ensure the battery is in good condition & Fully Charged Battery.
- 3) DO start the engine only when it is in centre stand or when rider sitting on the vehicle with both the stands retracted. **(Engine will NOT Start OR switch OFF if side stand is extended).**
- 4) DO NOT rev the engine fully - immediately after starting OR just before shutting off the engine.
- 5) DO NOT remove the fuel hose (high pressure) from the fuel pump to fuel injector, when engine is running OR with the ignition switch ON. Fuel flows at a very high pressure during these times.
- 6) DO NOT use a booster or high voltage-charging unit instead of a battery. Use only a good, correctly charged battery to start OR check the motorcycle.
- 7) DO NOT use high pressure water jet to clean the ECU / Throttle Body / any of the sensors. Keep them well protected while washing the vehicle.

NOTE:

Since this BS IV vehicle has AHO function, while using NACS II tool the head lamp fuse can be removed to avoid the battery drain.

SECTION 16 - ELECTRICAL COMPONENTS

TECHNICAL SPECIFICATIONS

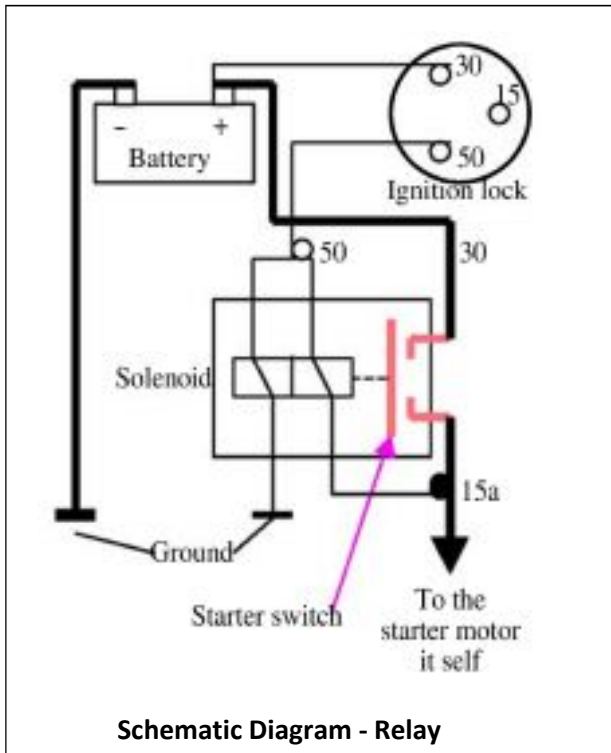
System / Battery	12V DC / 12V 14 Ah
Starter Motor	0.9KW
Solenoid Switch	Magnetic Relay type

INSPECTION

Ensure earth terminal is located on the outside hex flange bolt of the starter motor before tightening both bolts.

RELAY STARTER

WIRING LAYOUT



INSPECTION

1. COIL RESISTANCE CHECK

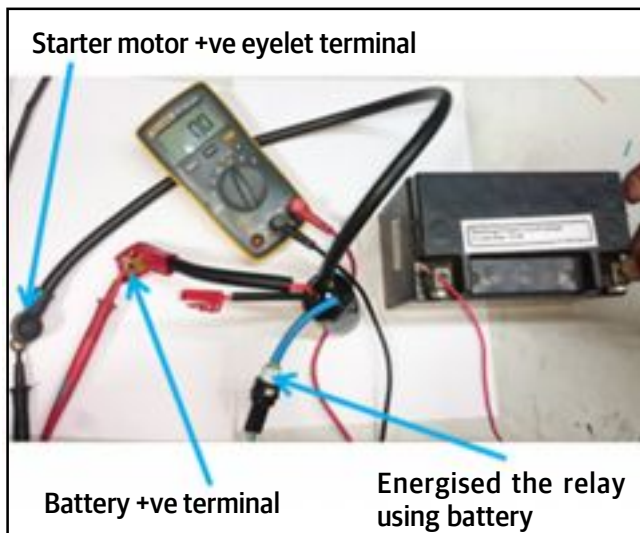
- Set the Multimeter in Resistance check mode.
- Keep the positive (Red) probe of the Multimeter on coil positive and Negative probe (Black) of the Multimeter on coil negative.(Refer the below table for polarity identification).
- Resistance Spec unit - 3.96 Ω
- If resistance deviates from the specification or if coil is open/short, Relay starter to be replaced.

Sl.No.	BS IV	Coil Polarity & Wire Color
1.	Classic 500 Model	Coil +ve = Blue Coil -ve = White
2.	GT Model	Coil +ve = Brown / Green Coil -ve = Brown / Blue



1. TO CHECK - CONTACT CLOSURE AFTER ENERGISING:

- Give a supply voltage of 12V across the relay coil (2 pole female terminal). Battery positive on coil positive and Battery negative on coil negative.
- After energizing the coil, check the continuity between Battery +ve terminal and Starter +ve terminal (Ring terminal) using Multimeter. If the Multimeter indicates OÜ with a beep sound, the contacts have got closed. If the Multimeter indicates as open (OL) ,contacts have not closed and hence the Relay starter has to be replaced.



RR UNIT

INSPECTION

STEP 1 :

Check the condition of the six diodes used in the RR Unit.

Take the Multimeter and change the mode to diode check mode. Diode mode would be available in continuity mode.



NOTE :

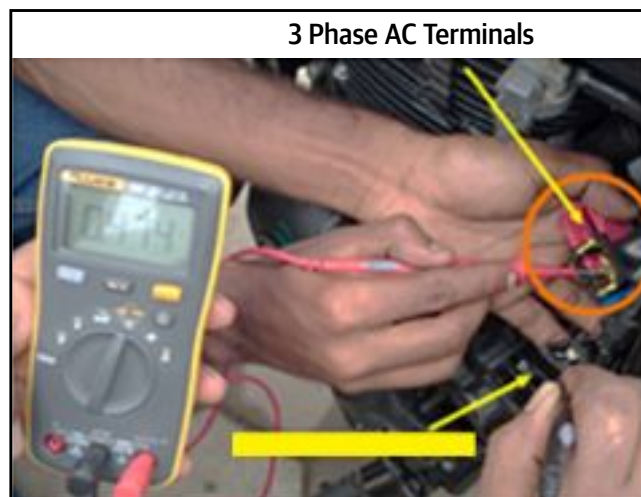
Before checking the diode, internal capacitor of RR unit to be discharged. Else, the diode drop will not be correct. So short the positive and negative terminal of RR Unit DC output(black and red wires) to discharge the capacitor.

STEP 2 :

To check the condition of 3 positive diodes of RR unit, keep the positive probe (Red) of the multimeter in any one of the 3phase terminals (yellow wire inserted in black/red connector) and the negative probe (Black) of multimeter on the positive terminal of DC output (red wire inserted in two pole connector) and check for the condition of diode as shown in the below image.

If the diode is good, then the multimeter will show a voltage drop of 0.4~0.7V.

If diode has failed, multimeter will show either open or short with beep sound, then Replace the RR unit.



STEP 3 :

The positive probe of the multimeter shall be kept on all the 3 phase terminals one by one and the condition of the 3 diodes to be checked as mentioned in Step 2.

STEP 4 :

To check the condition of other 3 negative diodes, positive probe (Red colour) of the multimeter shall be kept on the negative terminal of DC output (black wire with eyelet/single pole connector) and negative probe (Black colour) of the multimeter shall be kept on anyone of the 3 phase terminals (yellow wire).

If the diode is good, then the multimeter will show a voltage drop of 0.4~0.7V.

If diode has failed, multimeter will show either open or short with beep sound, then Replace the RR unit.

STEP 5 :

All the three diodes to be checked by keeping the multimeter negative probe on all the 3 phase terminals one by one. If the RR Unit is not working, replace with good working RR Unit.



SUPPRESSOR CAP

INSPECTION

STEP 1 :

1. Set the Multimeter in Resistance check mode.
2. Keep the positive(Red) and negative (Black) probes of the multimeter on two ends of the suppressor cap.
3. Resistance shall be 3.75 to 6.25 Kilo Ohms



4. If resistance deviates from the specification or open, Suppressor cap to be replaced.

FLYWHEEL MAGNETO

INSPECTION

A) PHASE TO PHASE RESISTANCE CHECK

1. Phase to phase resistance of the magneto shall be checked by setting multimeter in resistance mode.
2. Phase to Phase resistance - $1.5 \pm 15\%$ (0.59 to 0.79 ohms)
3. If the resistance deviates from the spec, then cover shall be opened and checked if stator coil has burnt. If stator coil is burnt then replace the magneto.

If multimeter shows open during resistance check, the coil has got cut or short with the core and magneto has to be replaced.



B) INSULATION TEST

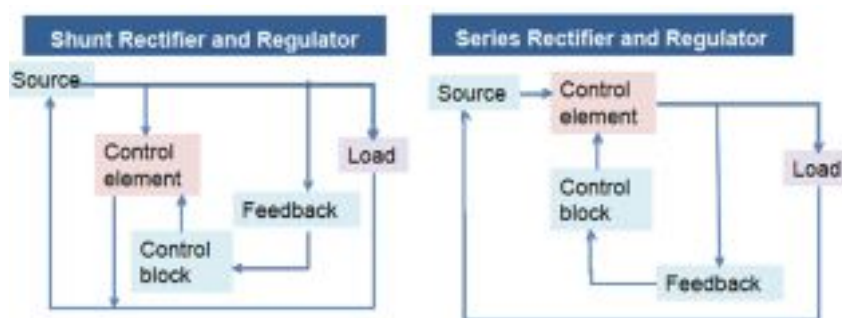
1. For checking the insulation strength, keep the multimeter in continuity mode and check continuity between any 3 phase terminals and engine body. If there is a body short (insulation failure), multimeter will indicate 0 ohms (or resistance value ~ 50 ohms) with a beep sound.

If insulation failure is observed, failed magneto to be replaced with new magneto.

2. During visual inspection, if stator coil has burnt, magneto shall be replaced with new magneto.

SL NO	COMPONENT	PART NOS	SPECIFICATION
1	IGNITION COIL(350cc)	Ignition coil RH-1040217 Ignition coil LH-581027	Primary resistance - $4.5\Omega \pm 10\%$ Secondary resistance - $13.5k\Omega \pm 10\%$
	IGNITION COIL (500cc/535cc)- High energy coil	1010013 - CLASSIC 500 1010022 - GT	Primary resistance - $2\Omega \pm 10\%$ Secondary resistance - $13.5k\Omega \pm 10\%$
2	FLYWHEEL MAGNETO ASSY (350CC)	572385 - (Varroc) 572384 - (Ducati)	Stator coil Phase to Phase resistance - $500m\Omega \pm 15\%$ (Varroc) $585m\Omega \pm 10\%$ (Ducati)
	FLYWHEEL MAGNETO ASSY(500CC/535cc)	1040062 - (Ducati)	Stator coil Phase to Phase resistance - $660m\Omega \pm 10\%$

COMPARISON



SL NO	SHUNT RR	EXISTING SERIES RR
1	In a shunt Rectifier and Regulator the control element is connected in parallel to the load.	In a series Rectifier and Regulator the control element is connected in series to the load.
2	The excess power from the magneto is returned back to the source through the control element	The excess power will not be returned back to the source
3	When magneto output voltage goes beyond the setting voltage (Eg: $14.5 \pm 0.2V$) the control element gets turned ON and shunts the power to the source.	The control device gets turned OFF when the magneto o/p volatge goes beyond the setting voltage.
4	a) can start the vehicle in batteryless condition	a) Cannot start the vehicle in Batteryless condition.
	b) Bump/push start can be done	b) Bump/push startability is not possible
5	Voltage controlled device, irrespective of the current flowing through the device.	Current controlled device, control depends on the current flowing through the device.
6	Higher current capability can be achieved	At higher current application large amount of heat is generated and component life will be reduced.

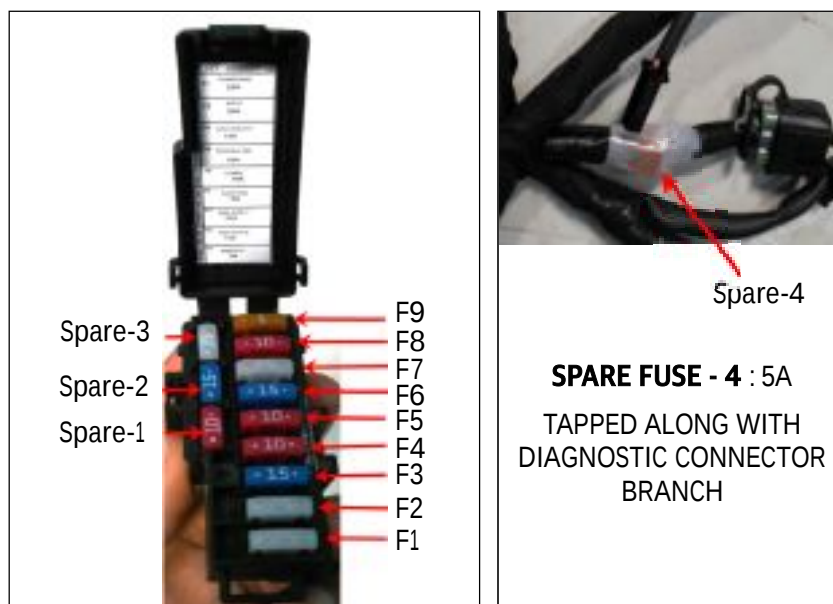
FUSES

FUSE - USAGE LIST

For easy reference the individual fuse ratings and its function is mentioned inside the lid of the fuse box.

- Whenever a spare fuse is used, please ensure it is replenished at the earliest opportunity
- Always get the circuit checked to ascertain the cause of a fuse blowout and rectify to prevent fuses blowing frequently.

BLADE FUSE USAGE LIST

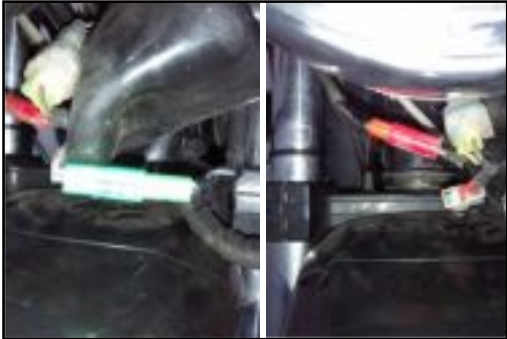


ID No.	Function	Rating
F1	CHARGING FUSE	25A
F2	MAIN FUSE	25A
F3	IGNITION - EFI FUSE	15A
F4	SIGNALLING FUSE	10A
F5	HORN FUSE	10A
F6	LIGHTING FUSE	15A
F7	ABS MAIN-1 FUSE	25A
F8	ABS MAIN-2 FUSE	10A
F9	ABS ECU	5A
SPARE-1	SPARE FUSE 1	25A
SPARE-2	SPARE FUSE 2	15A
SPARE-3	SPARE FUSE 3	10A
SPARE-4	SPARE FUSE 4	5A

SECTION 17 - ELECTRICALS

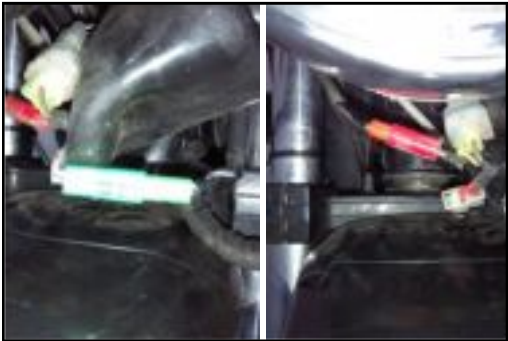
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.1	Battery ■ Remove side panel on the right side by unscrewing 2 hex socket button head screws. ■ Unlock (turn the key clockwise) and remove the pillion seat. ■ Remove front seat. ■ Disconnect battery terminals: positive terminal first & negative terminal next ■ Remove flasher unit along with its rubber holder from battery strap. ■ Disconnect starter relay couplers - White colour from wiring harness - Red colour from Battery. ■ Remove starter relay along with its rubber holder from battery strap. ■ Remove Hex screw from battery strap front. ■ Release battery strap from the slot in the rear and remove strap. ■ Remove battery from the housing.	  CAUTION: Ensure starter relay to starter motor wire is removed from the slot in battery strap before removing starter relay. Hex head screw: M6 Socket Spanner: 10mm 

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.2	Headlamp Assembly ■ Disconnect head lamp wiring coupler below head lamp. ■ Remove 2 Allen screws holding headlamp assy to LH& RH Top bracket & remove head lamp assy.	Hex Socket cap screw M8 Allen Key M6  
17.3	Instrument Cluster Assy ■ Disconnect Instrument cluster wiring coupler ■ Remove 3 Hex cap nuts along with washers. ■ Remove instrument cluster from its mounting bracket.	Hex Cap nut: M6 T spanner: 10mm  

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.4	Trafficator front LH& RH ■ Disconnect Trafficator wiring couplers below headlamp. ■ Remove Allen screw mounting the trafficator to the side support bracket. ■ Pull out the decorative cover from the rubber grommet in the side support bracket.	NOTE: The couplers are color coded as: LH side: Green RH side: Red Hex Socket Cap screw M6 Allen key: 4 mm  
17.5	Trafficator Rear LH& RH ■ Disconnect Trafficator couplers red & green ■ Remove the screw from the trafficator housing back side. ■ Remove outer lens. ■ Remove the fused bulb by pushing and turning anticlockwise.	
17.6	Tail Lamp & Number plate illuminator ■ The tail lamp has a LED lighting system. In the event of failure, the entire tail lamp assembly should be replaced.	

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.7	Battery Reassembly ■ Position battery in the battery carrier such that the terminals are facing inside. ■ Ensure ignition switch is in "OFF" condition. ■ Connect red wire to the positive terminal of the battery first. ■ Connect black wire to the negative terminal of the battery. ■ Locate starter relay along with its rubber holder from battery strap. ■ Install Hex screw on battery strap front. ■ Locate battery strap from the slot in the rear and remove strap. ■ Locate side panel on the right side by installing 2 hex socket button head screws. ■ Lock (turn the key Anti-clockwise) and locate the pillion seat. ■ Locate the front seat	NOTE: Ensure wire terminals are free of corrosion. Apply petroleum jelly over the terminals after connecting battery.  Hex head screw: M6 Socket Spanner: 10mm 

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.8	Headlamp Assembly ■ Install 2 Hex cap screws holding headlamp assy to LH& RH Top bracket & locate head lamp assy. ■ Connect head lamp wiring coupler below head lamp	Allen screw: M8 Allen Key: M6  
17.9	Instrument Cluster Assy ■ Locate instrument cluster on its mounting bracket. ■ Install 3 Hex cap nuts along with washers. ■ Connect Instrument cluster wiring coupler.	Hex Cap nut: M6 Allen Key: 5 mm  

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.10	Trafficator front LH& RH ■ Push inside the decorative cover on the rubber grommet in the side support bracket ■ Install Allen screw mounting the trafficator to the side support bracket. ■ Connect Trafficator wiring couplers below headlamp.	Hex Cap Screw M6 Allen key: 5 mm NOTE: The couplers are color coded as: LH side: Green RH side: Red  
17.11	Trafficator Rear LH& RH ■ Locate the bulb by pushing and turning clockwise. ■ Locate outer lens ■ Install the screw on the trafficator housing back side. ■ Connect Trafficator couplers red & green	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.12	Handle Bar Switch LH ■ Open cable straps to release the wiring harness. ■ Disconnect wire coupler from main cable harness near Steering stem on LH side. ■ Remove 2 Philips head screw from bottom of switch LH.	NOTE: The straps fixed in the handle bar are reusable hence do not remove them from the handle bar if not required to be removed. Screw driver 
17.13	Handle Bar Switch RH ■ Open cable straps to release the wiring harness. ■ Disconnect wire coupler from main cable harness near Steering stem on RH side. ■ Remove 2 Philips head screw from bottom of switch RH.	NOTE: The straps fixed in the handle bar are reusable hence do not remove them from the handle bar if not required to be removed. Screw driver 
17.14	Clutch Switch ■ Release coupler lock from the switch on Handle bar LH, bottom. ■ Loosen 2 screws holding clutch switch to switch module LH and remove clutch switch	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.15	Front Brake Switch ■ Remove wire connections to the front brake switch on handle bar RH bottom ■ Release lock and gently pull switch out of the front brake bracket.	
17.16	Ignition Switch ■ Disconnect ignition switch wiring coupler. ■ Remove 2 Hex screws from bottom of switch housing and remove switch.	  Hex Cap Screw: M6 Allen key: 5 mm
17.17	Side stand switch coupler ■ Remove strap to frame ■ Pull the bellows down ■ Disconnect Red coupler from LH side.	

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.18	Handle Bar Switch LH ■ Install 2 Philips head screw on bottom of switch LH ■ Connect wire coupler on main cable harness near Steering stem on LH side. ■ Close cable straps to lock the wiring harness.	NOTE: The straps fixed in the handle bar are reusable hence do not remove them from the handle bar if not required to be removed. Screw driver 
17.19	Handle Bar Switch RH ■ Install 2 Philips head screw on bottom of switch RH. ■ Connect wire coupler on main cable harness near Steering stem on RH side. ■ Close cable straps to lock the wiring harness.	NOTE: The straps fixed in the handle bar are reusable hence do not remove them from the handle bar if not required to be removed. Screw driver 
17.20	Clutch Switch ■ Install 2 screws holding clutch switch to switch module LH and locate clutch switch ■ Locate coupler lock on the switch on Handle bar LH, bottom.	

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.21	Front Brake Switch ■ Locate lock and gently push switch inside the front brake bracket. ■ Locate wire connections to the front brake switch on handle bar RH bottom	
17.22	Ignition Switch ■ Install 2 Hex screws from bottom of switch housing and locate switch. ■ Connect ignition switch wiring coupler.	Hex Cap Screw: M6 Allen key: 5 mm  
17.23	Side stand switch coupler ■ Connect Red coupler from LH side. ■ Push the bellow upwards. ■ Locate strap to frame	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.25	Headlamp Bulb ■ Remove the 2 screws holding the head lamp rim to the housing. ■ Gently pull out the head lamp rim along with reflector assembly. ■ Disconnect head lamp coupler. ■ Remove the protective rubber cap over the bulb. ■ Gently press the bulb holding clip and release it from the slot in the reflector. ■ Remove the bulb from the reflector.	     NOTE: Never touch the bulb with your fingers. Finger prints will etch the glass and decrease bulb life. Always hold the bulb with clean dry cloth during handling. Don't disturb the vent cap provided in the inner body mould. 

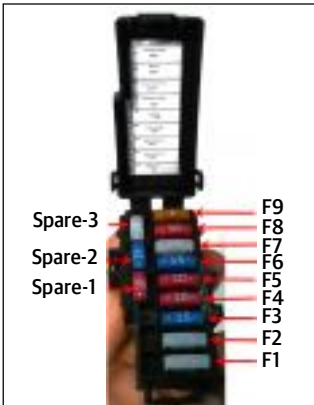
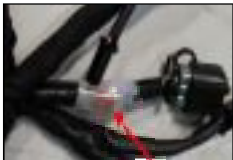
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.26	Trafficator bulbs ■ Remove the screw from the trafficator housing back side. ■ Remove outer lens. ■ Remove the fused bulb by pushing and turning in anticlockwise direction. ■ Position the new bulb inside the holder, ensuring that the pins in the bulb, match with slots in the holder. ■ Push the bulb and turn clockwise direction to lock the bulb in the holder. ■ Refit the trafficator cover with reflector and tighten the screw.	

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.27	Head Lamp Bulb ■ Locate the 3 lugs in the bulb correctly in the reflector. ■ Locate bulb holding clip over the bulb and lock it in the slot in the reflector ■ Locate protective rubber cap over the bulb correctly such that the vent pipe is facing downwards. ■ Position wiring coupler over the bulb terminals correctly and press it in gently to lock the coupler, Locate head lamp rim in the housing correctly such that it locks in place and the 2 mounting holes at the bottom of the rim are aligned. Tighten with 2 Philips head screws firmly.	      NOTE: Do Not over tighten the mounting screw as it can cause damage to the threads in the lens

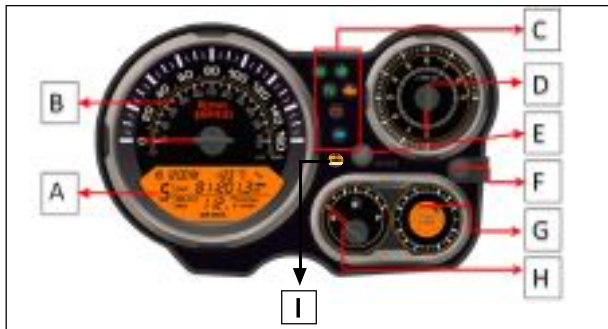
S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.28	Trafficator Bulb ■ Position bulb in the reflector, ensuring that the pins in the bulb, match with slots in the holder ■ Locate bulb correctly in the reflector, gently press bulb and turn clockwise to lock bulb in holder. ■ Refit trafficator cover with reflector into the housing and tighten the screw.	

S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
17.29	RR Unit ■ Remove single pole black connector (chassis ground). ■ Pull the bellow down on middle RH side and disconnect 2 pole T-type connector to main harness. ■ Loosen 2 hex bolts holding RR unit to frame. ■ Remove RR unit mounting from frame.	Hex Flange Bolt : M6 Socket Spanner : 10 mm
17.30	HT Coil Assy ■ Disconnect the white coupler from the main wiring harness HT coil. ■ Loosen the 2 Hex flange bolts mounted on the welded nut in frame. ■ Remove HT Coil assy from frame.	Hex Flange Bolt : M6 Socket Spanner : 10 mm

S. No.	Aggregate to Assemble/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos
1731	RR Unit ■ Position RR unit on the frame and align the mounting holes tighten RR Unit to frame using 2 hex bolts. ■ Push the bellow upwards on middle RH side and connect 2 pole T-type connector to main harness. ■ Locate single pole black connector (chassis ground)	Hex Flange Bolt : M6 Socket Spanner : 10 mm
1732	HT Coil Assy ■ Position the HT coil on the frame such that the coupler is on the left side and the HT coil is towards the rear of the frame ■ Assemble 2 Hex flange bolts M6X14 into the welded nut in frame ■ Tighten the bolts using 8 mm socket spanner to a torque of 10-12 Nm (1.0-1.2 KgM) ■ Connect the white coupler on the main wiring harness HT coil.	Hex Flange Bolt : M6 Socket Spanner : 10 mm Torque : 10 Nm

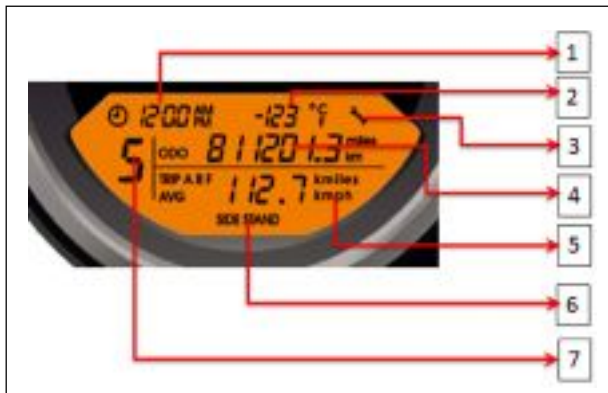
S. No.	Aggregate to Dismantle/ Instructions	Fastener, Size, Tool Usage, Precautions, Photos																																										
1733	Fuses ■ Fuse carrier is located under the rider seat. ■ Remove pillion seat & rider seat. ■ Open the fuse carrier lid & replace fuse as indicated inside the lid. ■ Replace the required fuse with the spare fuse available in the fuse carrier.	  Spare-4 SPARE FUSE - 4 : 5A TAPPED ALONG WITH DIAGNOSTIC CONNECTOR BRANCH																																										
1734	BLADE FUSE USAGE LIST	<table> <tr> <th>ID No.</th><th>Function</th><th>Rating</th></tr> <tr> <td>F1</td><td>CHARGING FUSE</td><td>25A</td></tr> <tr> <td>F2</td><td>MAIN FUSE</td><td>25A</td></tr> <tr> <td>F3</td><td>IGNITION - EFI FUSE</td><td>15A</td></tr> <tr> <td>F4</td><td>SIGNALLING FUSE</td><td>10A</td></tr> <tr> <td>F5</td><td>HORN FUSE</td><td>10A</td></tr> <tr> <td>F6</td><td>LIGHTING FUSE</td><td>15A</td></tr> <tr> <td>F7</td><td>ABS MAIN-1 FUSE</td><td>25A</td></tr> <tr> <td>F8</td><td>ABS MAIN-2 FUSE</td><td>10A</td></tr> <tr> <td>F9</td><td>ABS ECU</td><td>5A</td></tr> <tr> <td>SPARE-1</td><td>SPARE FUSE 1</td><td>25A</td></tr> <tr> <td>SPARE-2</td><td>SPARE FUSE 2</td><td>15A</td></tr> <tr> <td>SPARE-3</td><td>SPARE FUSE 3</td><td>10A</td></tr> <tr> <td>SPARE-4</td><td>SPARE FUSE 4</td><td>5A</td></tr> </table>	ID No.	Function	Rating	F1	CHARGING FUSE	25A	F2	MAIN FUSE	25A	F3	IGNITION - EFI FUSE	15A	F4	SIGNALLING FUSE	10A	F5	HORN FUSE	10A	F6	LIGHTING FUSE	15A	F7	ABS MAIN-1 FUSE	25A	F8	ABS MAIN-2 FUSE	10A	F9	ABS ECU	5A	SPARE-1	SPARE FUSE 1	25A	SPARE-2	SPARE FUSE 2	15A	SPARE-3	SPARE FUSE 3	10A	SPARE-4	SPARE FUSE 4	5A
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INSTRUMENT CLUSTER



A. Main LCD	E. Mode button
B. Speedometer miles major	F. Select button
C. Tell tales	G. Compass display
D. Tachometer	H. Fuel gauge
	I. ABS

A. MAIN LCD



1. Clock
2. Ambient Temperature
3. Service reminder
4. Odometer
5. Trip Value(A/B & F), AVG speed A/B
6. Side Stand indication
7. Gear position indication

CLOCK

- Display in 12 hour format with AM/PM indication.
- Will reset to 12:00 AM when battery is disconnected.



CLOCK SETTING

Function	Switch	Pressure time (sec)	Action
CLOCK SETTING MODE	SELECT & MODE pressed with No Speed input	≥ 3 sec	In ignition key ON position Enters into clock setting mode and hour digits starts to blink
	SELECT	< 1 sec	Hours value shall increment by 1 accordingly for no of press
	SELECT	≥ 3 sec	Hour value saved and minute digits starts to blink
	SELECT	< 1 sec	Minutes value will increase by 1 by each press of the "Select" button
	SELECT	≥ 3 sec	Minute value save and PM/AM digits starts to blink
	SELECT	< 1 sec	PM / AM is interchangeable by each press of the "Select" button
	SELECT	≥ 3 sec	PM / AM save and exit from clock set mode
	NO ACTION	20 sec	Auto exit without saving changes and continue with previous setting

WARNING

NEVER attempt to operate the select or reset buttons while riding the motorcycle. Failure to do so may cause loss of concentration and unstable riding, leading to a potential accident, resulting in serious injury to both rider and other road users, besides causing severe damage to the motorcycle.

AMBIENT TEMPERATURE INDICATION

- Ambient temperature display can be changed from Celsius to Fahrenheit and vice versa.
- The temperature indication may increase during vehicle riding/engine ON condition due to increase of engine temperature.
- Ambient temperature indication tolerance is $\pm 2^{\circ}\text{C}$



NOTE

The ambient temperature valve should be referred to only when the engine is switched "OFF" and the engine is in cold condition.

The temperature displayed will be higher if the engine is running or immediately after it is switched "OFF" since the sensor will only pickup the higher temperature surrounding it.

TEMPERATURE UNIT CHANGEOVER



Temperature sensor push button management.

Required button

- Mode

Function	Button	Pressure time (sec)	Action
TEMPERATURE UNIT CHANGE OVER	MODE	≥ 10 secs	In ignition key ON position, long press and hold MODE button for period ≥ 10 secs to reset temperature units from degree Celsius to Fahrenheit and vice versa.

SERVICE REMINDER

- Service reminder is provided to remind about service due.
- Spanner symbol will flash till vehicle is serviced at service center.
- Service reminder can be reset ONLY by authorized personnel at service center after service is completed.
- Service reminder symbol will flash on as per below distance input from odometer.
 - 1st service - 450 kms
 - 2nd service - 4900 kms
 - from there on for every 5000 kms from previous value (ex: 9900, 14900 etc.)



WARNING

DO NOT use high pressure water jet directly on instrument cluster for cleaning. Use only water spray cleaning and wipe it with soft dry cloth.

ODOMETER

- Displays the cumulative kilometers the vehicle has covered.



TRIP A/B & AVG SPEED A/B

- Trip A/B indicates distance travelled in particular trip.
- Avg A/B indicates average speed of vehicle in particular trip mode.



Function	Switch	Pressure time (sec)	Action
TRIP A	SELECT	<1sec	In ignition key ON position, Move to: AVA A
	SELECT	> 2.5 sec	TRIP A/AVG A RESET
AVG A	SELECT	<1sec	Move to: TRIP B
	SELECT	> 2.5 sec	TRIP A/AVG A RESET
TRIP B	SELECT	<1sec	Move to: AVG B
	SELECT	> 2.5 sec	TRIP B/AVG B RESET
AVG B	SELECT	<1sec	Move to: TRIP A
	SELECT	> 2.5 sec	TRIP B/AVG B RESET

TRIP "F" MODE

- The word, Trip "F" will flash when the Trip "F" mode is active
- Trip "F" is provided to measure distance travelled by the vehicle when fuel level in the vehicle is 5.5 ± 0.5 lts. in the fuel tank so that the rider can plan fuel filling accordingly based on his trip requirements, Trip "F" will get activated when needle on fuel gauge enters the red zone.

- Trip F mode would come into function automatically.
- Trip F mode would de-activate automatically if fuel is filled above 5.5 ± 0.5 lts.
- During Trip F mode rider can toggle between Trip A/B but mode will return automatically to Trip "F" after 25 ± 5 secs.



NOTE

- Trip "F" will stop displaying at approximately 90 ± 5 seconds AFTER fuel level in tank is above 5 ± 0.5 litres, side stand is fully retracted AND Ignition is switched ON.

WARNING

NEVER attempt to operate the select or reset buttons while riding the motorcycle. Doing so may cause loss of concentration and unstable riding, leading to a potential accident, resulting in serious injury to both rider and other road users, besides causing severe damage to the motorcycle.

6. SIDE STAND INDICATOR

- Indicates when side stand is extended.

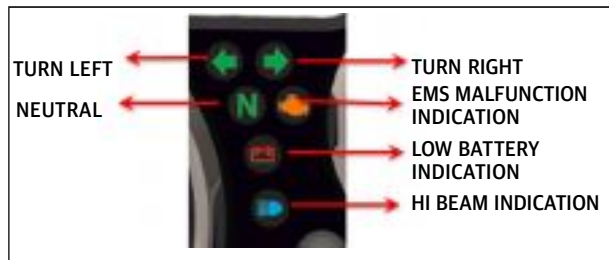


GEAR POSITION INDICATION

- Displays the gear position in which the vehicle is traveling.
- When in neutral the indication will be "0".
- When in gear the appropriate number between 1 to 5 will be displayed.



C. TELL TALES



1. **Turn Left** : Left turn signal ON.
2. **Turn right**: Right turn signal ON.
3. **Neutral** : Transmission is in Neutral.
4. **Low Battery Indication**: Indicator will glow continuously if ignition switch is ON & engine is not running. Indication will switch off as soon as engine is started. If battery voltage is below 12 V, indicator will glow continuously indicating a low battery.
5. **High Beam Indication**: Head lamp high beam ON.
6. **EMS Malfunction Indication** :
 - Will be illuminated as soon as ignition & stop switch are 'ON' and will go 'OFF' after the engine is started.
 - Will remain continuously 'ON' incase of any malfunction of the EMS.

CAUTION

DO NOT run motorcycle incase the malfunction remains 'ON' continuously as it can cause severe damage to the ECU & Sensors. Please visit the nearest autorise Royal Enfield dealer to diagnose & rectify the defect in the EMS.

D. TACHO METER



1. Indicates the RPM at which engine is working.
2. Useful for right selection of gear with respect to engine RPM.

WARNING

- Do not run engine with gears in neutral as RPM will go beyond red zone.
- Do not ride motorcycle in lower gears with high acceleration as it will cause RPM to start to red zone & affect the main parts inside engine.

G. COMPASS LCD



- Useful for Navigation during riding.
- Text indicates heading direction of vehicle. (N, S, E, W, NE, NW, SE, SW)
- Arrow will always point to North.
- Eg. if heading Northwest, text will display NW and arrow will be in top right corner to indicate North.

CAUTION

1. Avoid using magnetic key chains, magnetic/ferrous materials or electronic components with interference around cockpit area to avoid malfunctioning of digital compass.
2. If compass LCD enters into calibration mode("CA" flashing) ride vehicle in "8" direction slowly to calibrate the compass or approach nearest authorized service center for assistance and proper calibration.
3. Indication fluctuation during riding is normal operation due to impact of road irregularities.
4. Compass indication tolerance is $\pm 45^\circ$.

WARNING

DO NOT focus on the compass while riding. Doing so may cause loss of concentration and unstable riding, leading to a potential accident, resulting in serious injury to both riders & other road users besides causing severe damage to the motorcycle.

H. FUEL GAUGE



- Indicates fuel level in tank

WARNING

Do not use the motorcycle for long duration with the fuel indication in red zone. Refuel at the earliest.

Failure to do so may cause the motorcycle to run out of fuel and get stranded, in addition to causing serious damage to the fuel pump.

SECTION 18 - NACS II DIAGNOSIS

1. HARDWARE COVERAGE

1. NACS II-ROYAL Interface
2. Main cable (Transfer cable)
3. Diagnostic cable (6 PIN)



4. USB Hi-speed cable
5. Cigarette lighter cable
6. SD memory Card



7. SD card reader
8. Carrying Box
9. Installation CD
10. User Manual (Included on CD)



2. NACS II-ROYAL DIAGNOSTIC TOOL KIT

NACS II-ROYAL Interface

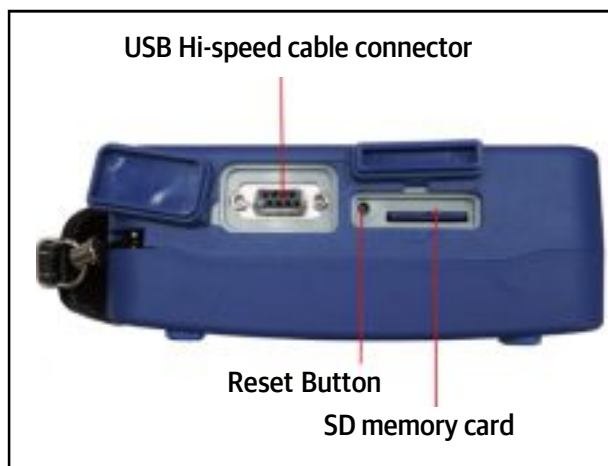


USB Hi-speed cable connector



Reset Button

SD memory card



Diagnostic connector



3. PRODUCT SPECIFICATION

Dimension	L:173.78mm x W:134.66mm x H:60.91mm
Weight	660g
Operating Voltage	DC 8-18V
Operating Current	300mA
Operating Temperature	0°C~+70°C
Dust and water resistance	IP55 Standard

4. HARDWARE CONNECTION DIAGRAM

Connect NACS II-ROYAL diagnostic tool kit as below before performing diagnosis.

1. HAND-HELD

NACS II - ROYAL interface → Main cable → Diagnostic cable → Motorcycle (IG ON)



2. PC

PC → USB Hi-Speed Cable → NACS II-ROYAL interface → Main Cable → Diagnostic Cable → Motorcycle (IG ON)



5. WARNING

- When NACS II is already connected to the motorcycle, do NOT plug in AC Adaptor.
- Do not remove SD card when you are using NACS II.
- The failure caused by the use of unapproved cables, accessories is out of warranty.
- The warranty will become void if NACS II is disassembled or altered.
- We recommend you to back up the SD-card data to avoid data loss due to various reasons.

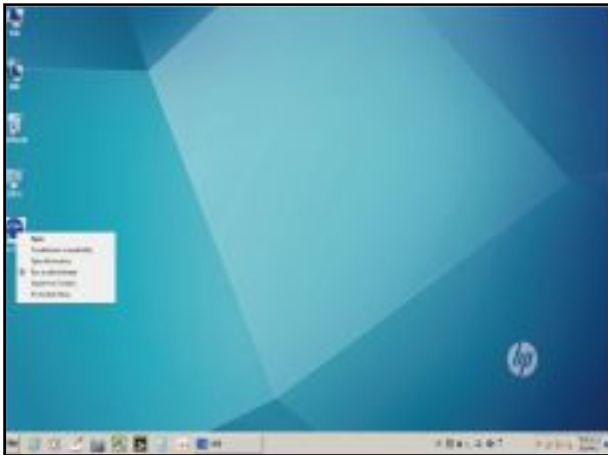
6. TROUBLE SHOOTING

▲ Why I can not install the software successfully?

A: If you are using Windows 7, 8, 10, please check whether you have turned UAC off before installation. (Please refer to item No. 8, PC settings.)

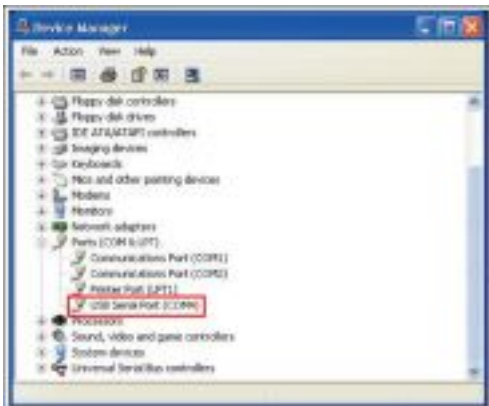
▲ I have already installed the software. Why the software can not be opened?

A: Check whether you have run the software as administrator. Right click ICM logo on the desktop. Choose 'Run as administrator'.



▲ Why there is a pop-up-window displaying "cannot find COM port".?

A: Check whether the driver of USB Hi-speed cable is installed. If USB port is not recognized, please install USB driver.



▲ There is a warning message showing on the screen. What's wrong?

A: It means communication breakdown. Please check whether the cables are connected well.



7. PC REQUIREMENTS

Operating system	Windows XP, Vista, Windows 7 / 8 / 10
CPU	CPU 1.6 GHz or higher
RAM	2GB or larger
Display	Resolution 1024*768
Hard Disk Space	Free space more than 1GB (on C driver)
Notes	When you use Windows Vista or Windows 7/8, you need to close "User Account Control (UAC)" first. Please refer to item No. 7. PC Settings.

8. PC SETTINGS

When you use Windows 7 / 8 / 10, please finish the setting below to run out software successfully.

First, you need to disable "User Account Control (UAC)" before installing our software. The way to disable UAC is as follows.

8.1

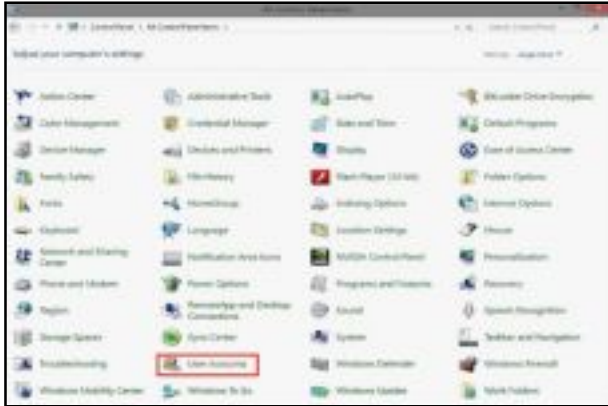
Click 'Start button' and select 'Control Panel'.



ROYAL ENFIELD NACS II DIAGNOSIS

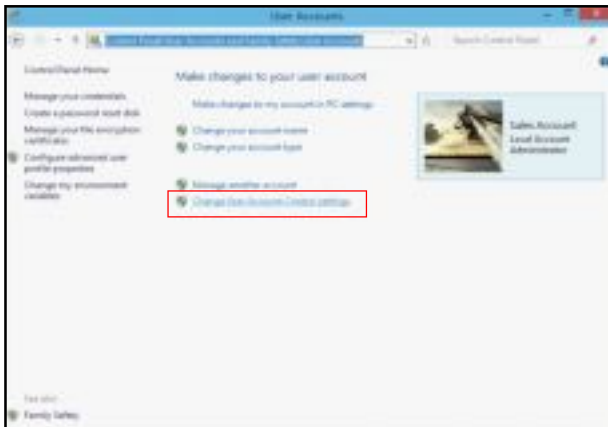
8.2.

Click 'User Accounts'



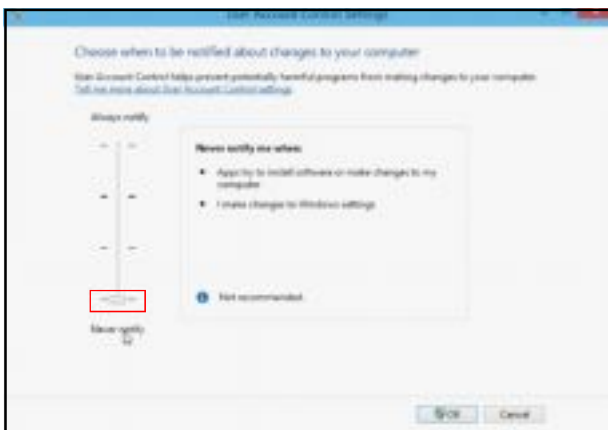
8.3.

Click 'Change User' Account Control Settings".



8.4.

Move the slider to the Never notify position, Click "OK" to make the change effective.

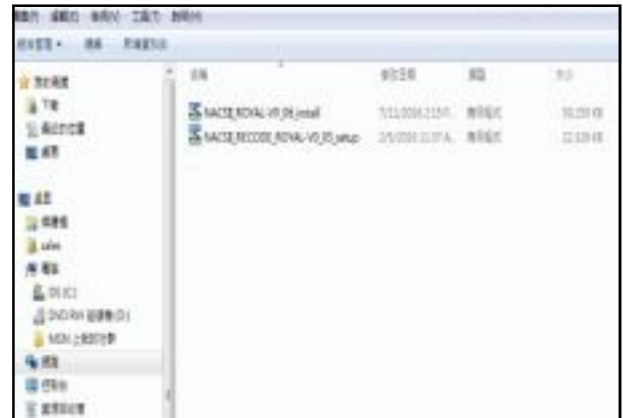


9. SOFTWARE INSTALLATION

9.1. Start the computer.

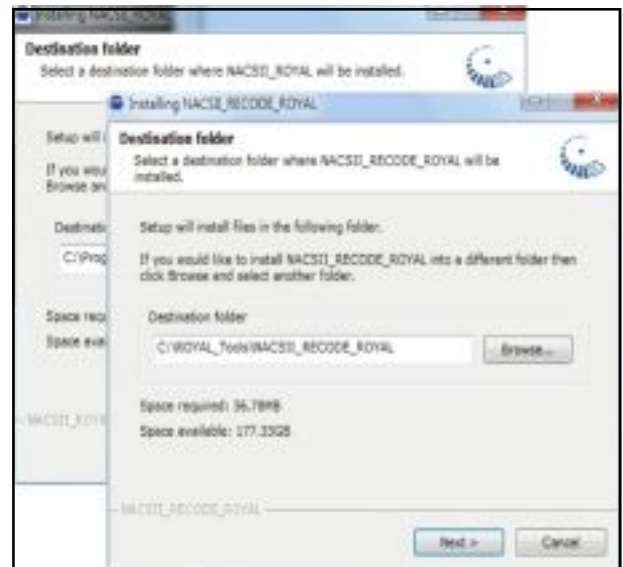
9.2. Insert installation CD to CD-ROM drive and install following software.

- Main software: NACSII_ROYAL_VO.03_install.exe
- Recording data analyzing software: NACSII-RECORD_ROYAL-VO_01_setup



9.3.

Click 'Finish' to complete the installation



ROYAL ENFIELD NACS II DIAGNOSIS

9.4.

Click 'Finish' to exit installation



9.5.

After installing Firmware program, USB high speed driver will start installation. Click 'Extract' to install.



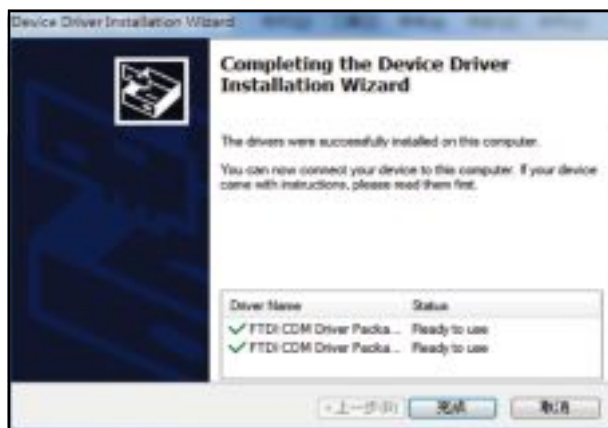
9.6.

Click 'Next' to continue



9.7.

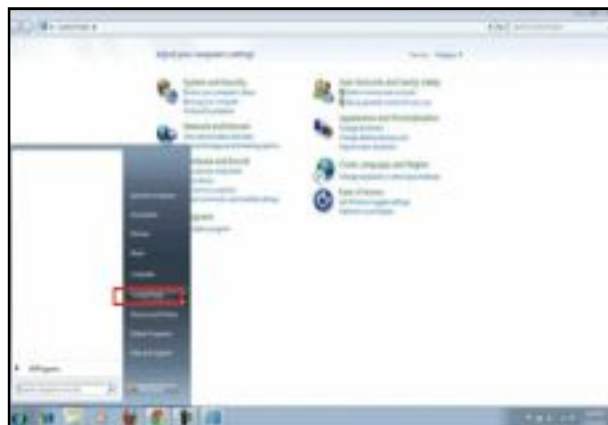
Click 'Finish' to complete the installation



10. SOFTWARE REMOVAL

10.1.

Click 'Star Menu' - 'All Programs' - 'Control Panel'



10.2.

Click 'Uninstall' a program'



ROYAL ENFIELD NACS II DIAGNOSIS

10.3.

Find 'NACSII_ROYAL' and click 'Change / Remove'.



10.4.

When 'Uninstalling NACSII_ROYAL' window pops up, please click 'Next'.



10.5.

Click 'Finish' to exit uninstall.



11. DIAGNOSTIC SOFTWARE FOR HANDHELD TOOL

11-A.

Diagnosis

11-A1.

Please connect your NACSII-ROYAL diagnostic tool kit with your motorcycle. NACSII-ROYAL interface-maincable → Diagnostic cable → Motc/cle
Orange light indicates whether the system is communicating.



11-A2.

When the IG of the motorcycle is ON, the system starts to run, entering welcome page 'ROYAL ENFIELD'. Press (F1) Diagnosis.



ROYAL ENFIELD NACS II DIAGNOSIS

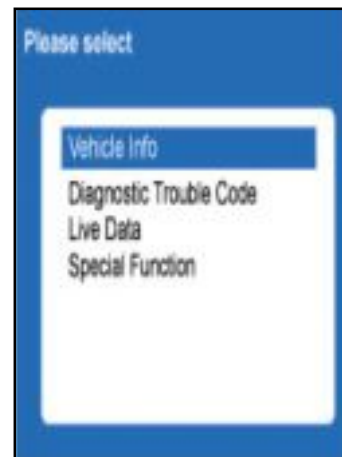
11-A3.

Select 'Royal Enfield 535 EFI'. Press **OK** to continue.



11-A6.

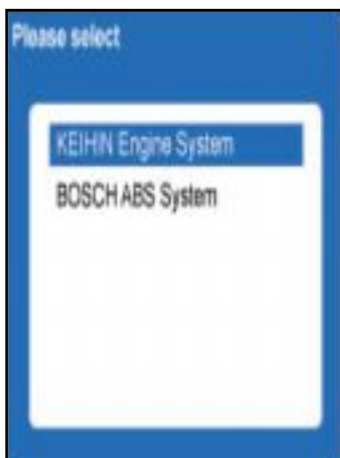
Press to **C** exit 'Vehicle Info' page. The page will return to the main menu.



11-A4.

NACS II will automatically detect which system the vehicle is. Select 'KEIHIN Engine System' or 'BOSCH ABS System'.

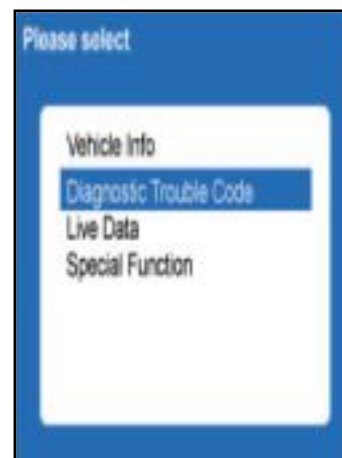
Press **OK** to continue.



11-A7.

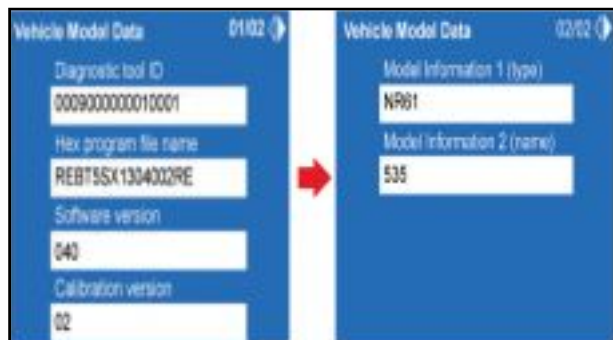
Using **←** and **→** to move the cursor. Move the cursor to select 'Diagnostic Trouble Code'.

Press **OK** to see the content.



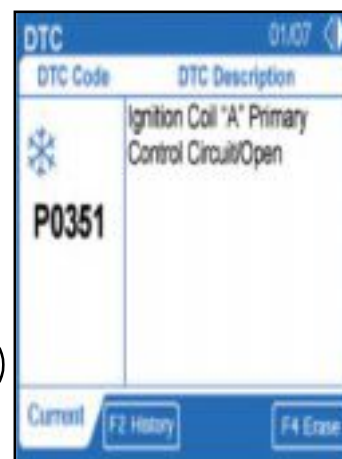
11-A5.

Take 'KEIHIN Engine System' as an example. After pressing **OK** the system will display 'Vehicle Model Data'. Press **→** to view the 2nd page of vehicle information. Press **←** to return to last page.



11-A8.

Diagnostic trouble code page includes 'F1 Current', 'F2 History' and 'F4 Erase'. 'Current' is for the DTC occurred at the time and 'History' is for DTC occurred in the past. 'Erase' is for erasing current DTC and History DTC. Press **OK** to view 'Current' DTC.



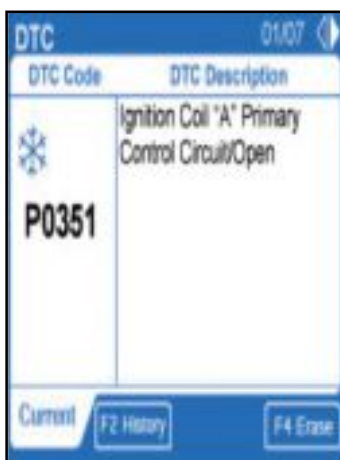
ROYAL ENFIELD NACS II DIAGNOSIS

11-A9.

Press **(F2)** to view 'History' DTC.

Press **(F1)** to view next page and press **(F3)** to view last page. After viewing all the current DTC.

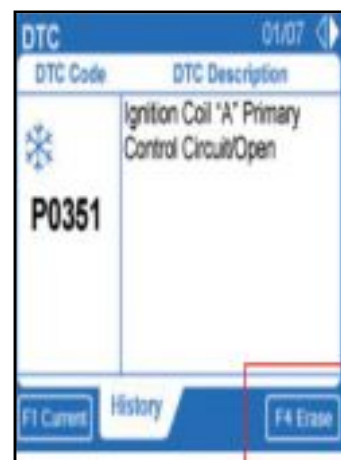
Press **(C)** to exit. The screen will return to the previous page.



11-A11.

Erase DTC. It's the function to erase Diagnostic Trouble Code in both 'Current' and 'History'.

Press **(F4)** to erase. To confirm erasing DTC. Press **(F1)** 'Yes'.

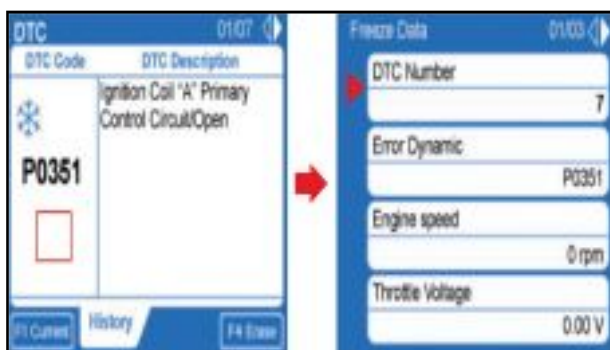


11-A10.

Freeze Data. 'Freeze Data' is the data recorded when First DTC occurred, and one time only record One DTC freeze data. It's for saving the engine dynamic data for further analysis.

When  displays on the screen, press **(OK)** to view freeze data. Press **(F1)** and to **(F3)** view next page and last page. After viewing all content, press **(C)** to exit. The screen will return to the previous page.

When  showing on the screen, it means the DTC has been erased. Press to go back to the main menu.



11-A12.

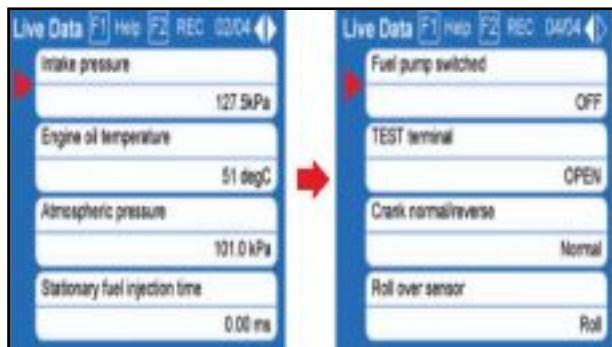
When the screen returns to the main menu, move the cursor to 'Live Data' and Press **(OK)** to view the content.



ROYAL ENFIELD NACS II DIAGNOSIS

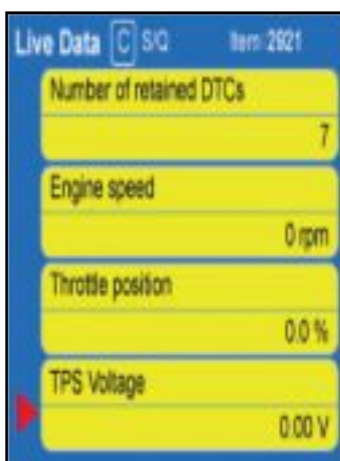
11-A13.

Press and to view all the content.



11-A14.

Record data. 'F2 REC' is for recording Live data. When viewing 'Live Data', click to record current values. Press to stop recording



11-A15.

Press to save the file.

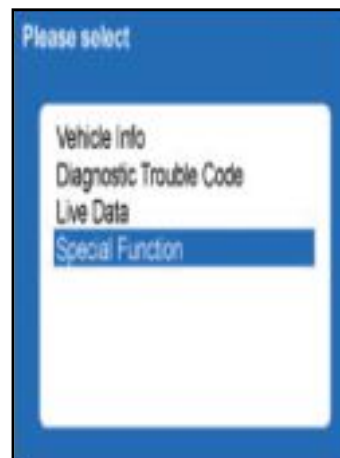


11-A16.

Back to the main menu, move the cursor to 'Special Function' and

Press .

'Special function' is customized functions provided to specific vehicles.



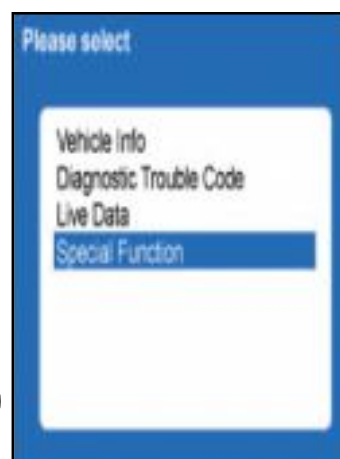
11-A17.

Select "CO Adjustment", press

and to adjust the CO value. is for increasing fuel injection value. is for decreasing fuel injection value.

After finish adjustment, press to save. Press to exit. If you want to

go back to the main page, press until the page return to the top of the page.



11-B.

11-B1.

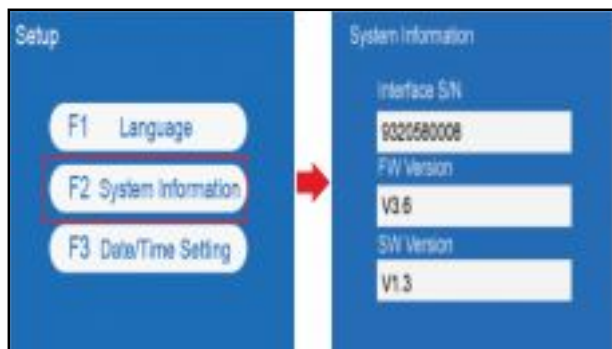
"F2 Setup" page contains setting Language, viewing System Information and setting Date / Time.



ROYAL ENFIELD NACS II DIAGNOSIS

11-B2.

Press **F2** to view System Information.



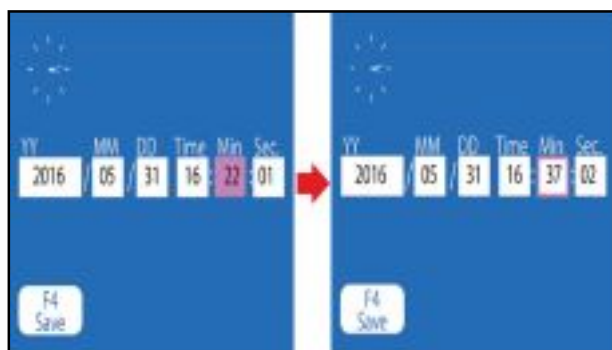
11-B3.

Press **F3** to set Date and Time.



11-B4.

Using **←** and **→** to move the cursor. Press **OK** to select the item. Change figure using **↑** or **↓** and press **OK** to confirm the item. At this time, the pink block will return to white. Press **F4** to apply the setting.



11-C.

ABS Functions

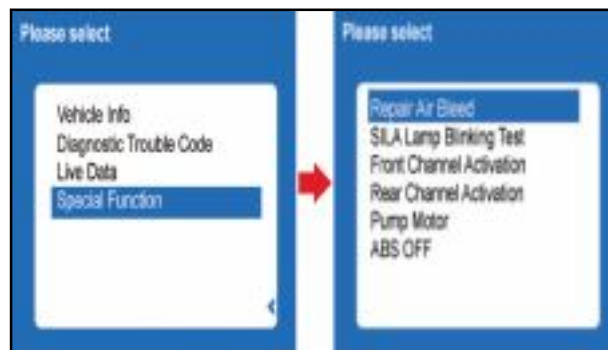
11-C1.

Select 'BOSCH ABS System'. Press **OK** to continue.



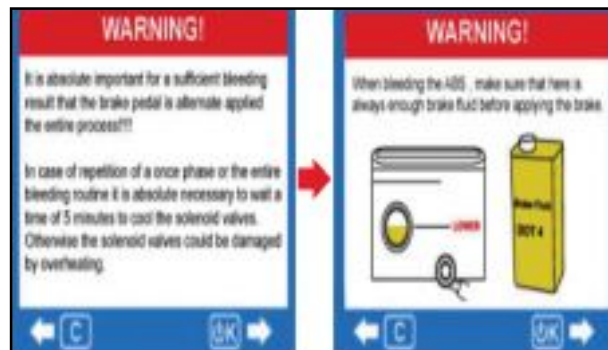
11-C2.

Select 'Special Function'. Then, select 'Repair Air Bleed'.



11-C3.

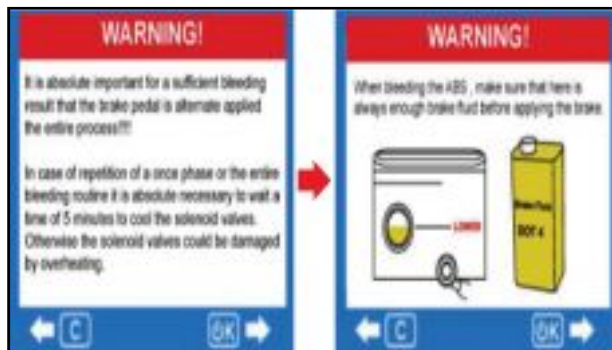
Read the warning first before start operating air bleeding.



ROYAL ENFIELD NACS II DIAGNOSIS

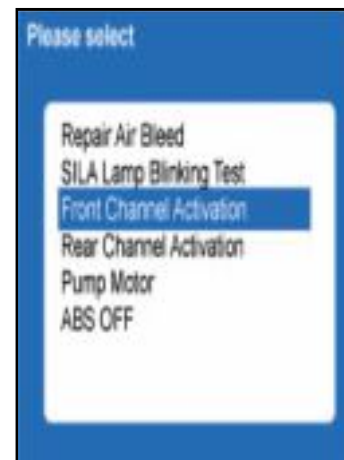
11-C3.

Read the warning first before start operating air bleeding.



11-C6.

Front Channel Activation



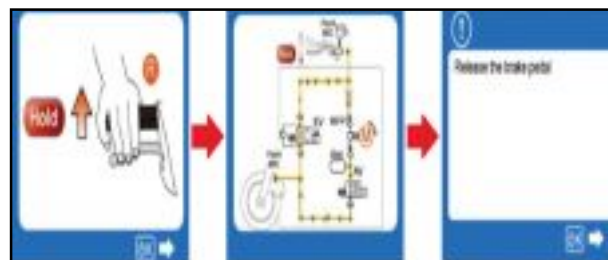
11-C4.

Follow each step on the screen to finish the procedure.



11-C7.

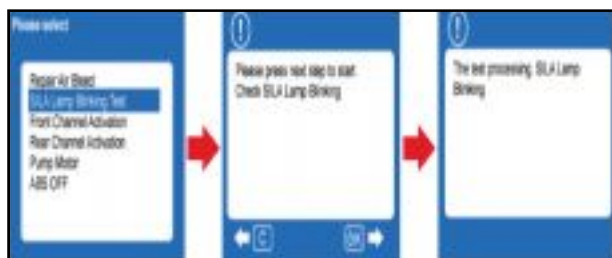
Follow the instructions on screen to finish the activation.



11-C5.

SILA Lamp Blinking Test

Follow the screen guide to finish the test.



11-C8.

Follow the instructions on screen to finish the activation.



ROYAL ENFIELD NACS II DIAGNOSIS

12. Diagnostic software for PC base

12-1.

Before diagnosis, please connect your NACSII-ROYAL diagnostic tool kit with your motor cycle.

PC → USB Hi-Speed Cable → NACSII-ROYAL interface → Main Cable → Diagnostic Cable → Motorcycle (IG ON)



12-2.

Double click NACSII_ROYAL on the desktop to open diagnostic software.



12-3.

When the first time you use software, the software will enter register process automatically. 'Please make sure your PC is connected to the internet. When the window displays 'Product key', click 'NEXT'. Software will get the password by itself.



12-4.

Registration is completed. Click 'EXIT'.



12-5.

This is the page showing your connected system.



ROYAL ENFIELD NACS II DIAGNOSIS

12-6.

Click  to show Interface info and Contact info of I.C.M.



12-9.

There are various green buttons on the right.  button is for displaying all the vehicle info.



12-7.

Click  to switch language.

After selecting language.

Click  to confirm setting

Click  to continue.



12-10.

Click to read the Diagnostic Trouble code. Click  'Current' to read current DTC. Click 'History' to read history DTC.



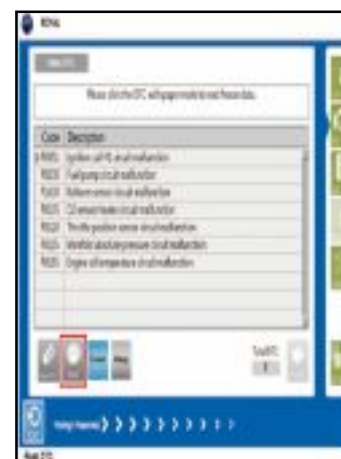
12-8.

Connecting to engine system.
Please wait...



12-11.

If you want to print trouble code, click  to print DTC data. It will take a moment.



ROYAL ENFIELD NACS II DIAGNOSIS

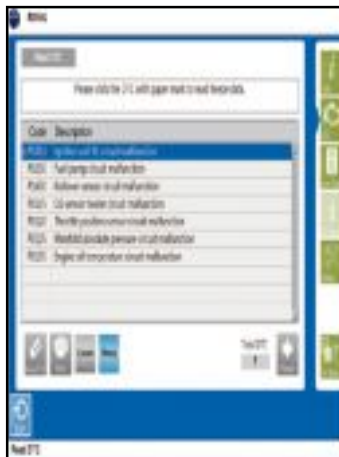
12-12.

The window will pop up for selecting printer.



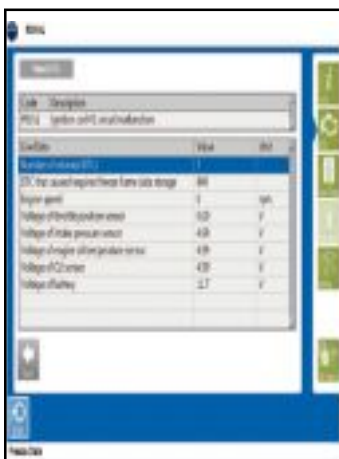
12-13.

If you want to freeze DTC data, select the code which has  mark. Click  to freeze data



12-14.

This is the page of freeze data. 'Freeze Data' is the data recorded when FIRST Diagnostic Trouble Code occurred, and one time only record one Diagnostic Trouble Code freeze data, it's for saving the engine dynamic data for further analysis. [Click to return to Diagnostic Trouble Code page.](#)



12-15.

To erase the Diagnostic Trouble Code, click 

Note : if you click the erase button, all Diagnostic Trouble Code in 'Current' and 'History' will be erased!



12-16.

Click  to see specification of live data.



12-17.

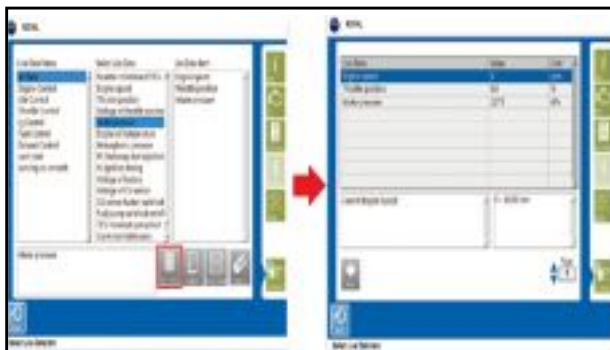
Click  to see the live data. You can select 'All Data' to view all live data or select the item which used often. Selected items will be listed in the block of 'Live Data Item'.



ROYAL ENFIELD NACS II DIAGNOSIS

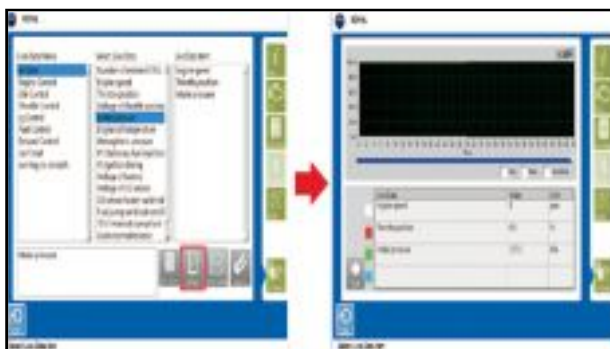
12-17-A.

Click  to view selected data values.



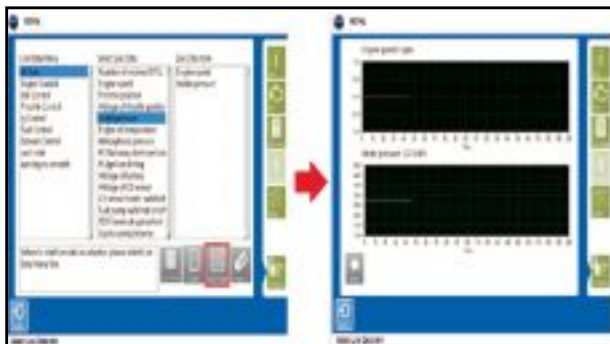
12-17-B.

Click  to view wave chart.



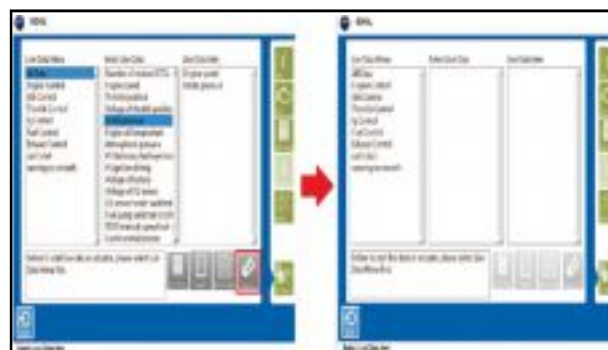
12-17.

Click  to view chart of 2 live data items at the same time.



12-17-D.

Click  to erase ALL selected live data. If you want to erase only one item, please press and hold 'Shift' key and select the item that you want to delete. Then, click  button. The selected item will be erased.



12-18.

This button  is for special function. Functions depend on ECU type. Take 'CO adjustment' as an example. Select the item and click .



12-19.

The page will display 'What to do' for next step. Click  to continue.



ROYAL ENFIELD NACS II DIAGNOSIS

12-20.

Adjust CO value
by clicking



and click



to save
adjusted value.



13-2.

Select Record Date
and File name, then
click



13. RECORD ANALYZING SOFTWARE

This software is for reading NACS II handheld
recorded data. Please take out SD card from NACS II
handheld tool and insert SD card to PC.



13-3.

Select the items
which used often.
Selected items will be
listed in the block of
'Live Data Item'.
Click to view
wave chart of
selected items.



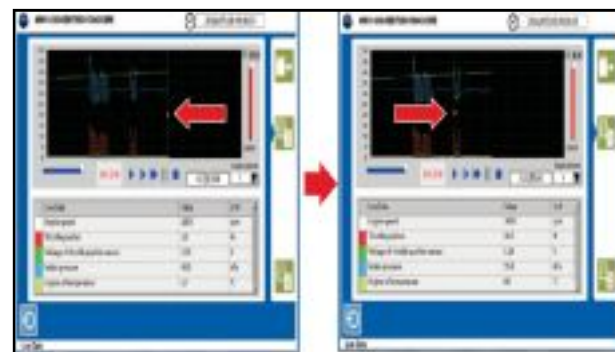
13.1.

Open the
software of
'NACSII_Record_Royal'.
Select 'Analyze
Record Data'.



13-4.

Wave chart starts running until press 'Stop' button.
Drag Yellow line forward and back to view recorded
live data values.



ROYAL ENFIELD NACS II DIAGNOSIS

13-5.

To slow down the playing speed of wave chart, please drag the slider down.



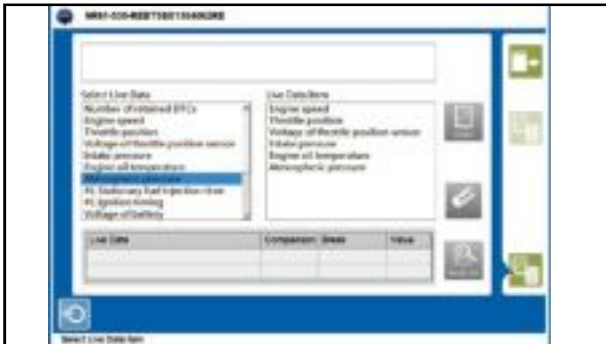
13-6.

To view different sections of wave chart, please click to select page number. Click the 2nd icon to go back to last page.



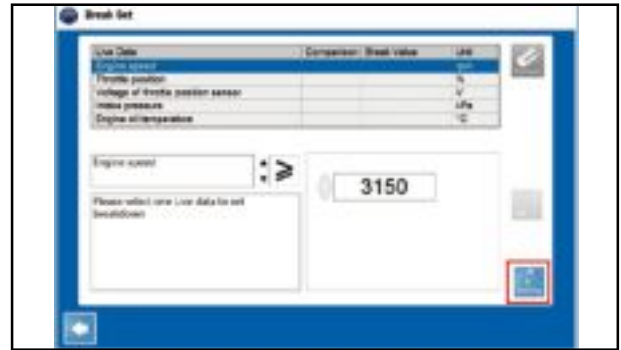
13-7.

Select items to set breakdown point for analysis. After selecting items, click



13-8.

For example, setting Engine speed greater than 3150, enter 3150 in the right block. Click the icon to confirm the setting value.



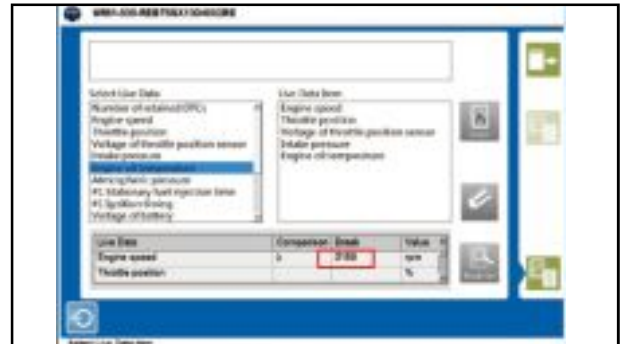
13-9.

When window pops up 'Setting OK', the setting is completed.



13-10.

The setting value will display in the block under 'Break'. Click the icon to view wave chart.



ROYAL ENFIELD NACS II DIAGNOSIS

13-11.

Click  to quickly find matched point of setting value.



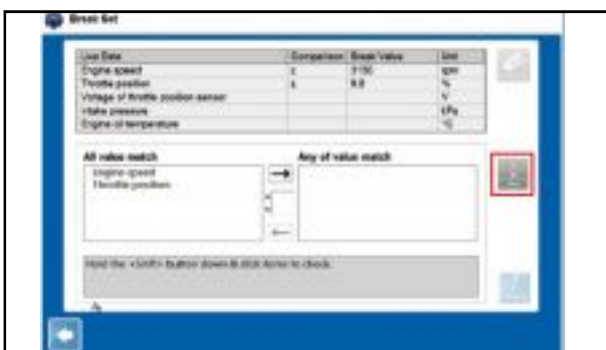
13-12.

Sometimes, setting only one value still can not find the main problem which causes malfunction. In this case, setting the 2nd value or more values can help user to find satisfied conditions. To set the second value please select Live data item. Take throttle position as an example. Enter throttle position greater than 9.8 in the right block and click  to finish setting.



13-13.

After Setting 2 values of the 2 items, the 2 items will be listed in the block of 'All value match' Click  to go back to Live data selection page.



13-14.

Back to Live data selection page, click  to view wave chart of the 2 setting values.



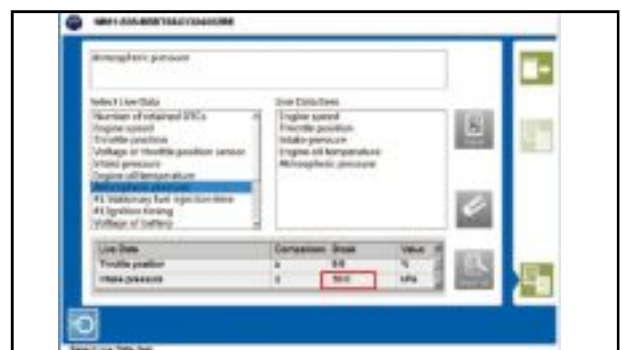
13-15.

Click  to quickly find the 2 matched conditions.



13-16.

Back to Live data selection page, setting the 3rd value as the same way as step 18-8. Click  to finish setting.



ROYAL ENFIELD NACS II DIAGNOSIS

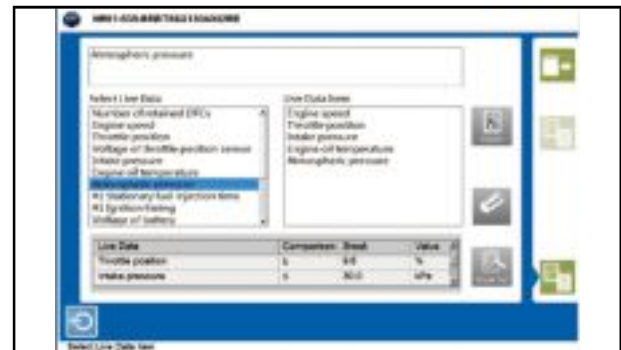
13-17.

The 3 setting items will be listed in 'All value match' block. To analyze conditions and differences of values, it's necessary to select match items. Select the items and then  The selected items will be listed in 'Any of value match' block. Continue to set match conditions : AND, OR &&, AND : All conditions of setting items must be satisfied.

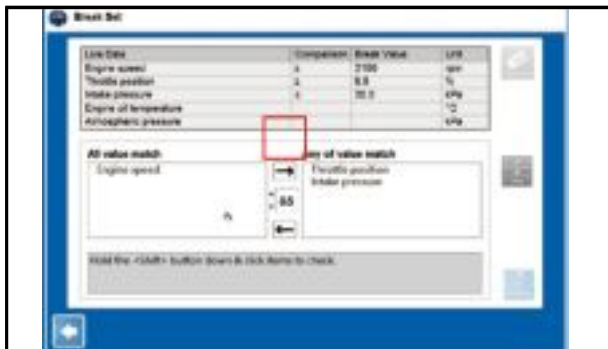
OR : One of or any of selected items must be satisfied. && : Setting items listed in 'All value match' and 'Any of value match' must be satisfied. If there is no matched condition, the window will pop up showing condition can't match.

13-18.

Click  to quick find matched conditions.

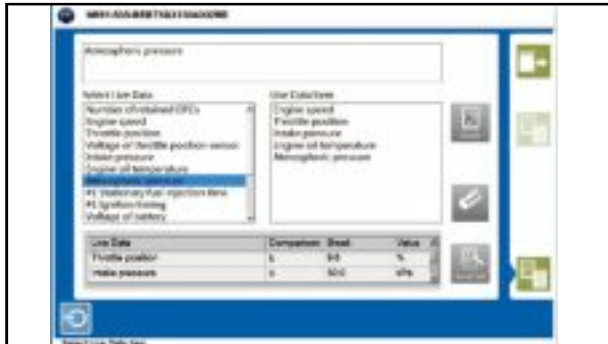


After setting condition, click  to go back to Live data selection page.



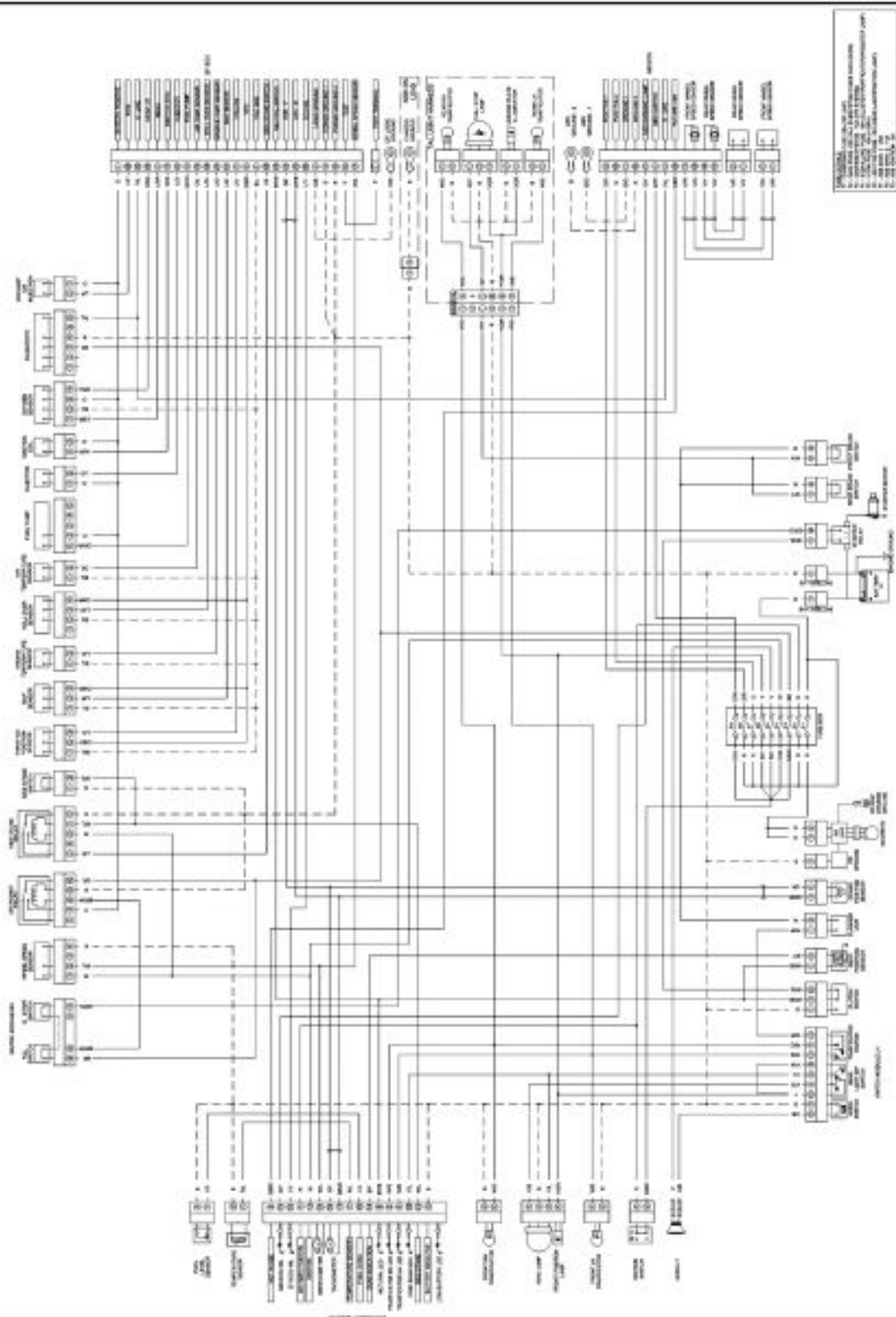
13-18.

Click  to wave chart.



SECTION 19 - WIRING HARNESS

HIMALAYAN EURO IV WIRING HARNESS SCHEMATICS EFI (D1)+ABS+AHO



HIMALAYAN EURO IV WIRING HARNESS - HORN SYSTEM

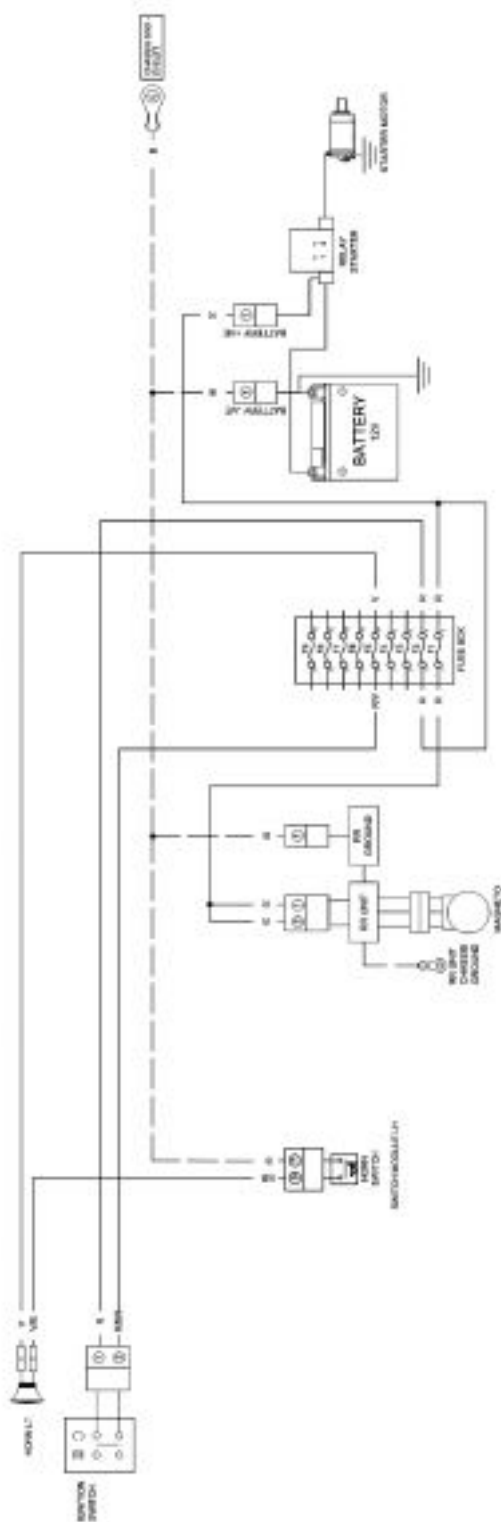
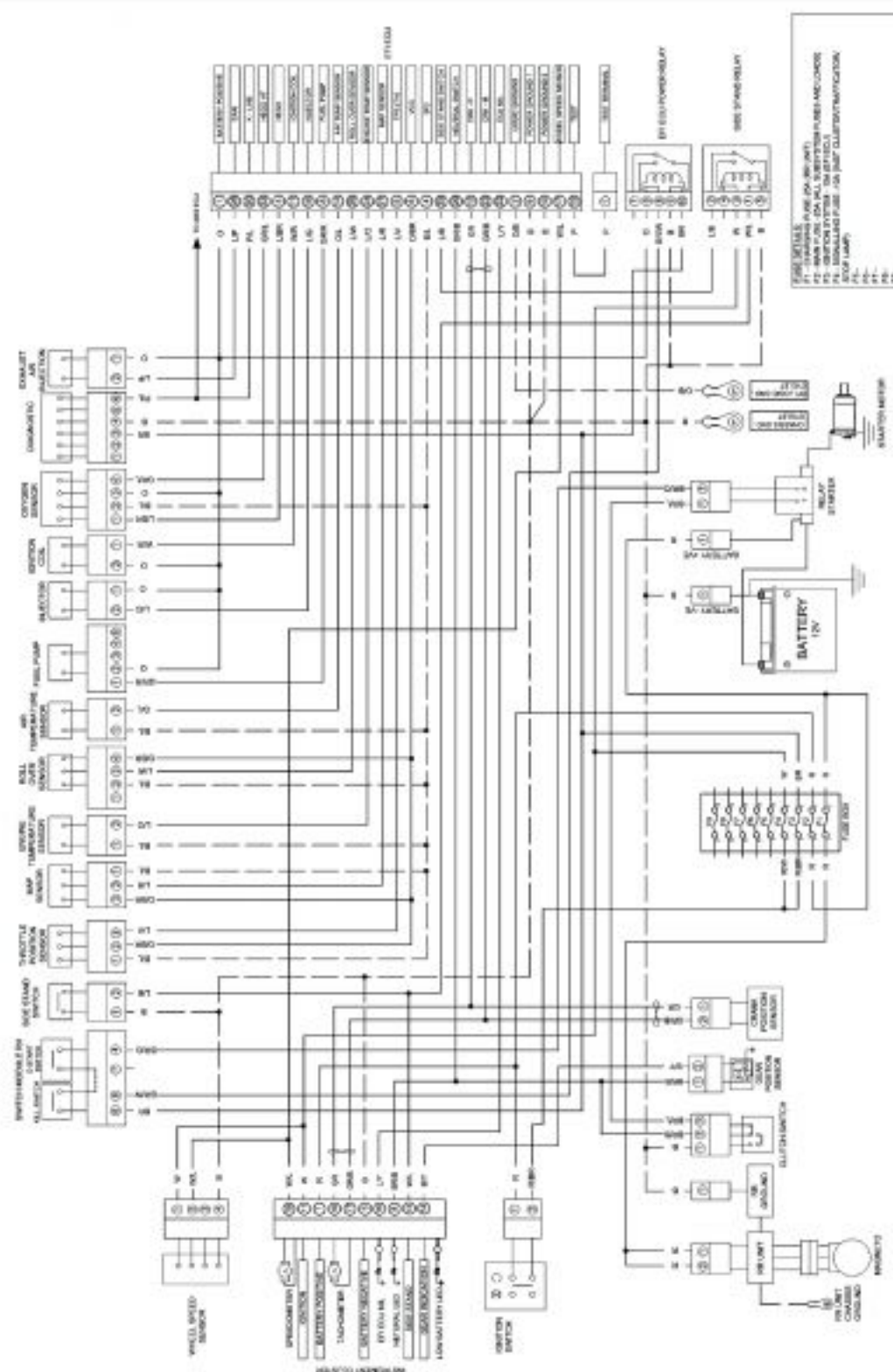


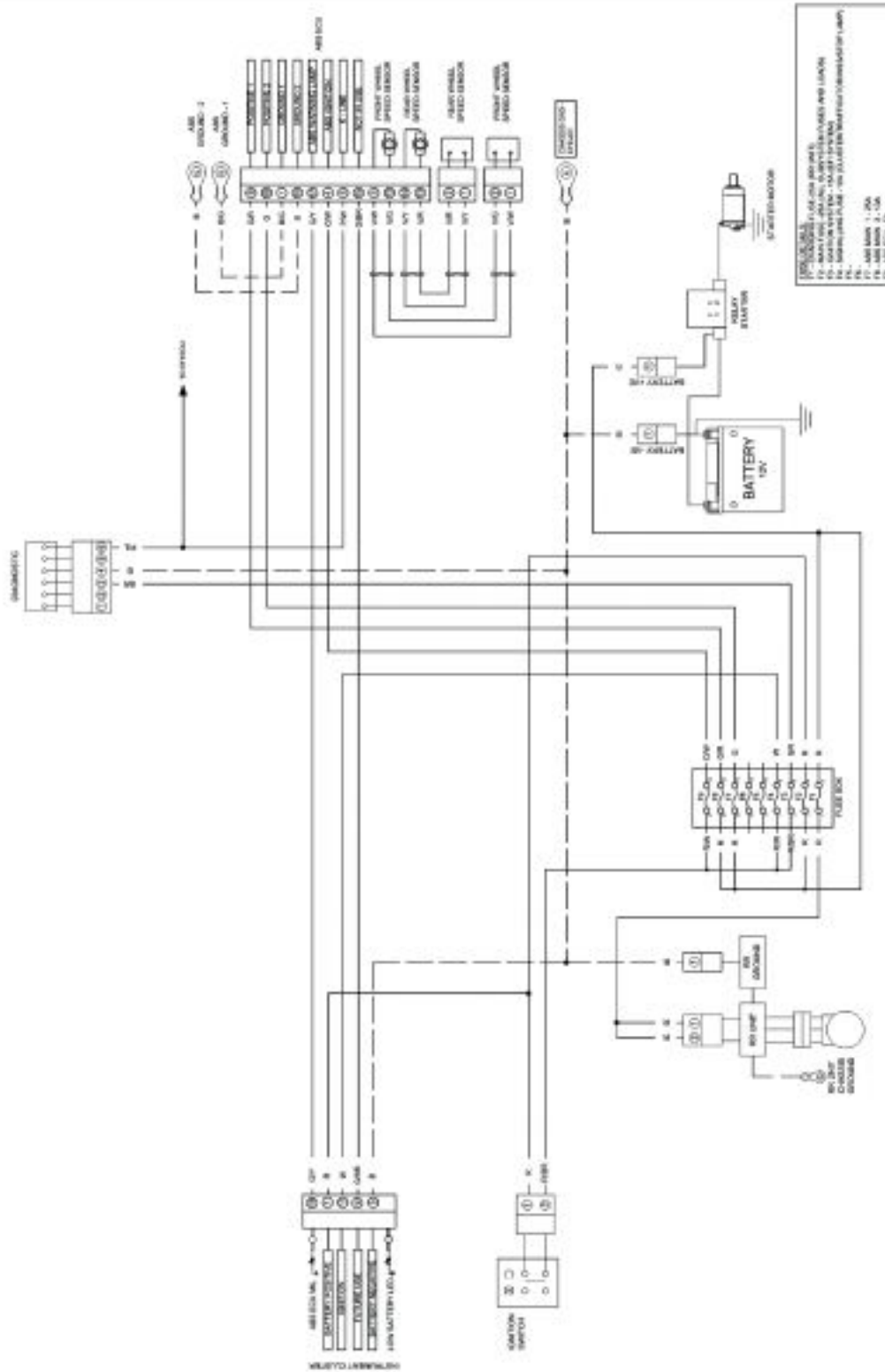
TABLE 26.26.26.1
WIRING HARNESS - HORN SYSTEM
1. BATTERY (12V)
2. BATTERY (12V)
3. BATTERY (12V)
4. BATTERY (12V)
5. BATTERY (12V)
6. BATTERY (12V)
7. BATTERY (12V)
8. BATTERY (12V)
9. BATTERY (12V)
10. BATTERY (12V)
11. BATTERY (12V)
12. BATTERY (12V)
13. BATTERY (12V)
14. BATTERY (12V)
15. BATTERY (12V)
16. BATTERY (12V)
17. BATTERY (12V)
18. BATTERY (12V)
19. BATTERY (12V)
20. BATTERY (12V)

[illegible]

HIMALAYAN EURO IV WIRING HARNESS - STARTING, CHARGING & IGNITION (EFI) SYSTEM



HIMALAYAN EURO IV WIRING HARNESS - ABS SYSTEM



SECTION 20.1 - VEHICLE TROUBLE SHOOTING



WARNING

The trouble shooting section of this Owner's Manual is intended solely as a guide for diagnosing problems. Carefully read the appropriate sections of this manual before performing any work.

CAUSES	REMEDIES
I. ENGINE FAILS TO START	
1) Stop switch in 'OFF' Position	Push stop switch to 'ON' position.
2) Side stand not retrieved	Retrieve side stand.
3) Vent hole clogged in fuel tank cap	Clean vent hole.
4) Spark plug cap / lead not connected	Fix cap / lead firmly
5) Spark plug electrode dirty / fouled	Clean spark plug
6) Spark plug insulation cracked	Replace spark plug
7) Clutch slipping	Adjust clutch cable free play
8) Main or EFI Fuse failed.....	Replace with new fuse
II. ENGINE MISFIRING	
1) Loose spark plug cap	Fix cap / lead firmly
2) Spark plug fouled	Clean spark plug or non specified heat range plug.
3) Any sensor loose connections	Check MAP or EOT or TPS sensor wiring / coupler loose connections
4) Water in petrol tank	Clean petrol tank. Fill tank with fresh petrol.
III. POOR PICKUP	
1) Brake pedal adjusted too tight	Re-adjust properly
2) Choked air filter	Clean / Replace air filter
3) Rear chain adjusted too tight	Re-adjust properly
4) Under inflated tyres	Inflate to correct pressure
5) Accelerator cable free play excessive	Adjust cable free play
6) Clutch Slipping	Adjust clutch cable free play
7) Faulty fuel supply Fuel pump, filter / injector blocked	Remove fuel pump & clean.

CAUSES	REMEDIES
IV. WHITE/BLUE SMOKE	
1) Oil level in sump above the Top line. in the oil level window	Check and drain excess oil
V. ENGINE OVERHEATING	
1) Low engine oil level	Check and top-up if necessary
2) Clutch slipping	Check and correct
3) Cylinder fins not clean	Clean the cylinder fins at regular intervals
VI. EXCESSIVE FUEL CONSUMPTION	
1) Under inflated tyres	Inflate to correct pressure
2) Choked air filter	Clean / Replace
3) Fuel leakage	Check and rectify, tank float unit, drain pipe, breather pipe, fuel line / pump.
VII. BRAKES POOR	
1) Brake pad worn / Uneven wear	Replace Brake pads
2) Oil/grease on disc.	Clean and refit
3) spongy brake	fill brake fluid & remove air from the system.
VIII. MOTORCYCLE WOBBLER	
1) Under inflated tyres	Inflate to correct pressure
2) Loose / Broken spokes	Tighten / Replace spokes
3) Wheels misaligned	Ensure proper alignment
4) Wheel rim runout	Rectify
5) Tyres not fitted correctly	Refit tyres correctly
IX. ELECTRICALS	
Bulbs do not glow	
1) Bulb fused	Replace bulb
2) Fuse blown	Check and Replace fuse.
3) Loose / improper connection	Check and correct
Horn not working	
1) Fuse blown	Check and correct
2) Loose connections	Check and correct
Trafficators not working	
1) Loose / improper connections	Check and correct
2) Bulb fused	Replace

CAUSES	REMEDIES
Brake light remains on	
1) Switch not adjusted properly	Adjust connecting links properly
2) Switch sticky	Replace switch
Horn not working	
1) Fuse blown	Check and correct
2) Loose connections	Check and correct
Trafficators not working	
1) Loose / improper connections	Check and correct
2) Bulb fused	Replace
Brake light remains on	
(1) Switch not adjusted properly	Adjust connecting links properly
(2) Switch sticky	Replace switch
X. ELECTRONIC FUEL INJECTION (EFI)	
Malfunctioning Indicator Lamp (MIL) glowing continuously	
(1) Sensor Coupler Loose Connection	Check for any EFI sensor coupler loose connection and correct them
(2) Any EFI Sensor Failure	Check & replace the same
XII. ABS (ANTI LOCK BRAKING SYSTEM)	
1) ABS lamp continuously ON.	Take the vehicle to service center for diagnosis

1. ENGINE CRANKS BUT DOES NOT START

Symptom	Probable Cause	Remedy
A. Ignition spark weak	Battery voltage low	Recharge/ replace battery
	Spark plug cap / high tension wire loose / shorted / defective	Check & correct
	Spark plug incorrect	Replace with correct spark plug
	Spark plug sooty / wet	Check & clean spark plug
	Spark plug gap incorrect	Correct spark plug gap
	Spark plug insulator cracked	Replace spark plug
	No spark from Ignition coil	Check & Replace Ignition coil
	Pulsar coil defective	Check & Replace
B. No Ignition spark	Battery dead	Recharge/ replace battery
	Spark plug cap / high tension wire shorted / defective / disconnected	Check & correct
	Spark plug insulator cracked	Replace spark plug
	No spark from Ignition coil	Check & Replace Ignition coil
	Pulsar coil defective	Check & Replace
C. Fuel related	No Fuel in fuel tank	Fill fuel tank.
	Stale / adulterated fuel	Clean fuel tank Fill with fresh fuel
	Air vent blocked in fuel cap	Clean air vent/s
	Fuel filter clogged	Clean fuel filter
	Fuel line pinched	Check & correct fuel line
	Ambient temperature too low for engine to start	Use Bi starter for starting in cold conditions
D. Compression related	Spark plug loose	Tighten spark plug to torque
	Tappets adjusted too tight	Check & adjust tappets to specn
	Cylinder head gasket blown	Check & replace
	Cylinder head nuts loose	Check & tighten to torque
	Cylinder head warped	Check & replace
	Valve stem bent, seating area burnt, excess carbon deposit on seating area, Valve springs broken	Check & replace
	Piston rings sticky / worn-out	Check & replace
	Cylinder barrel / Piston excess clearance.	Check & replace

2. ENGINE DOES NOT CRANK

Symptom	Probable Cause	Remedy
A. Starter motor does not rotate	Ignition key not in ON position	Switch ON ignition key
	Engine Kill switch in OFF position	Switch ON engine Kill switch
	Gears not in neutral (neutral lamp not glowing)	Depress clutch / shift to correct neutral & start
	Battery voltage low	Check battery. Recharge replace battery
	Starter circuit Fuse blown	Check all fuses & replace blown fuse
	Starter motor connections loose	Check & tighten connections
	Starter relay connections loose	Check & tighten connections
	Ignition Switch defective	Check & replace Ignition switch
	Starter button defective	Check & replace RH switch.
	Starter relay failed	Check & replace starter relay
	Starter motor failed	Check & replace starter motor
	Major short in Wiring harness	Check & correct wiring harness
B. Starter motor rotates BUT engine does not crank	Motor rotates slowly due to low battery / worn out starter motor brush	Check & correct battery / starter motor
	Magneto rotor woodruff key broken	Check & replace woodruff key
	Starter clutch assembly slipping	Check & replace starter clutch assy
C. Engine does not crank and sounds locked.	Inlet / Exhaust rocker arm seized in rocker shaft	Investigate cause of seizure, check & correct as required
	Cam shaft seized in cylinder head / cover	Investigate cause of seizure, check & correct as required
	Cam chain jammed in sprocket gears	Investigate cause of seizure, check & correct as required
	Piston Seized in cylinder barrel	Investigate cause of seizure, check & correct as required
	Piston Pin seized in connecting rod small end	Investigate cause of seizure, check & correct as required
	Big end bearing seized in Crank pin / connecting rod big end	Investigate cause of seizure, check & correct as required
	Crankshaft bearings in LH / RH crankcases seized	Investigate cause of seizure, check & correct as required

3. IDLING ERRATIC / ENGINE MISFIRING AT LOW RPM

Attribute	Probable Cause	Remedy
A. Ignition related	Battery voltage low	Recharge/ replace battery
	Suppressor cap / H T lead loose	Check & correct as required
	Suppressor cap / H T lead defective	Check & correct as required
	Spark plug fouled / wet	Replace / clean spark plug
	Electrode gap too less / excessive	Check and correct electrode gap
	Spark plug wrong specifications	Replace with correct spark plug
	Ignition coil defective	Check & replace
	Pulsar coil / Magneto defective	Check & replace
B. Fuel / Induction related	Adulterated / Bad fuel	Clean fuel tank. Fill with fresh fuel
	Air vent holes in Fuel tank cap	Check & clean air vents partially blocked
	Fuel flow partially blocked	Check & clean Fuel filter
	Air filter dirty / clogged	Check & clean / replace
	Pulse air valve pipe connections loose / cracked	Check & correct
C. Compression related	Spark plug loose	Check & tighten to torque
	Inlet / Exhaust tappets adjusted wrongly	Check & correct
	Cylinder head gasket blown	Check & correct
	Cylinder head studs loose	Check & tighten to torque
	Cylinder head seating area warped	Check & replace
	Cam shaft sticky rotation / seized in cylinder head	Check & correct
	Valve spring broken or weak	Check & replace
	Valve not seating properly (stem bent. Heavy carbon deposit on seating surface)	Check & replace
	Piston rings worn out/ broken / stuck in ring groove	Check & replace
	Cylinder / piston worn	Check & replace

4. PICKUP POOR / SLUGGISH

Attribute	Probable Cause	Remedy
A. Ignition related	Suppressor cap / H T lead defective	Check & correct as required
	Spark plug fouled / wet	Replace / clean spark plug
	Electrode gap too less / excessive	Check and correct electrode gap
	Spark plug wrong specifications	Replace with correct spark plug
	Ignition coil defective	Check & replace
	Pulsar coil / Magneto defective	Check & replace
B. Fuel/Induction related	Adulterated / Bad fuel	Clean fuel tank. Fill with fresh fuel
	Fuel flow partially blocked	Check & clean Fuel filter
	Air filter dirty / clogged	Check & clean / replace
	Pulse air valve pipe connections loose / cracked	Check & correct
C. Compression related	Spark plug loose	Check & tighten to torque
	Inlet / Exhaust tappets adjusted wrongly	Check & correct
	Cylinder head gasket blown	Check & correct
	Cylinder head studs loose	Check & tighten to torque
	Cylinder head seating area warped	Check & replace
	Cam shaft sticky rotation /seized in cylinder head	Check & correct
	Valve spring broken or weak	Check & replace
	Valve not seating properly (stem bent. Heavy carbon deposit on seating surface)	Check & replace
	Piston rings worn out/ broken / stuck in ring groove	Check & replace
	Cylinder / piston worn	Check & replace
D. Transmission related	Rear chain tension too slack / tight	Check & correct
	No free play in clutch / clutch release sticky	Check & correct
	Engine oil quantity too high	Check & correct
	Engine oil wrong grade/ high viscosity	Check & correct
	Clutch plates worn out / warped / sticky release / burnt	Check & correct
E. Others	Front / rear brakes jamming	Check & correct
	Front / rear wheel bearing jammed	Check & correct

5. ENGINE MISFIRING AT HIGH SPEEDS/ HIGH RPM.

Attribute	Probable Cause	Remedy
A. Ignition related	Spark plug electrode gap too less/ excessive	Check and correct electrode gap
	Spark plug wrong specifications	Replace with correct spark plug
	Spark plug insulator cracked	Check & replace
	Suppressor cap / H T lead loose	Check & correct as required
	Suppressor cap / H T lead defective	Check & correct as required
	Ignition coil defective	Check & Replace
	Pulsar coil / Magneto defective	Check & replace
B. Fuel / Induction related	Adulterated / stale fuel / water content in fuel	Check, Clean fuel tank. Fill with fresh fuel
	Fuel flow partially blocked	Check & clean Fuel filter
	Inlet manifold loose / cracked	Check & tighten / replace inlet manifold
	Spark plug loose	Tighten spark plug to torque
C. Compression Related	Tappets adjusted too tight	Check & adjust tappets correctly
	Cylinder head bolts loose	Check & tighten to torque
	Cylinder head gasket damaged	Check & Replace
	Cylinder head warped	Check & Replace
	Valve spring broken or weak	Check & Replace
	Valve not seating properly (valve bent, worn, carbon accumulation on the seating surface.)	Check & Replace
	Excessive Carbon in combustion chamber	Check & Clean
	Piston ring bad (worn, weak, broken, or sticking)	Check & Replace
	Piston rings clearance excessive	Check & Replace
	Cylinder, piston worn	Check & Replace

6. EXHAUST SMOKE EXCESS

Symptom	Probable Cause	Remedy
A. Black smoke	Adulterated / Bad fuel	Clean fuel tank Fill with fresh fuel
	Spark plug Electrode gap too less	Check and correct electrode gap
	Spark plug wrong specifications	Replace with correct spark plug
	Air Filter element clogged	Check & Clean
	Pulse air valve pipe connections loose / cracked	Check & correct
	Ignition coil defective	Check & replace
B. Brown smoke	Adulterated / Bad fuel	Clean fuel tank. Fill with fresh fuel
	Air filter box poorly sealed / element partially clogged	Check & correct
C. Bluish/White smoke	Engine oil level too high	Check & Maintain Oil level as Recommended
	Valve stem seal damaged	Check & correct
	Excess clearance between valve stem & guide	Check & correct
	Oil scrapper ring worn out	Check & correct
	Cylinder barrel / piston clearance high	Check & replace

7. ENGINE HEAT EXCESSIVE

Attribute	Probable Cause	Remedy
A. Driving/traffic related	Prolonged driving in low gear at High speeds / High gear at Low speeds	Ride in appropriate gear as required by traffic conditions
	Engine in Idling RPM for prolonged periods	Switch off Engine if required to be in standstill traffic for more than 2 minutes.
	Vehicle in standstill with gear engaged and clutch depressed for prolonged periods	Shift to neutral & release clutch
	Engine RPM high when vehicle at standstill position	Allow engine to run in idling RPM when in neutral
	Riding in traffic with brakes partially engaged for prolonged periods	Release both brakes and drive at appropriate speeds
B. Ignition Related	Spark plug electrode gap too less/excessive	Check and correct electrode gap
	Spark plug wrong specifications	Replace with correct spark plug
	Spark plug insulator cracked	Check & replace
	Suppressor cap / H T lead loose	Check & correct as required
	Suppressor cap / H T lead defective	Check & correct as required
	Ignition coil defective	Check & Replace
	Pulsar coil / Magneto defective	Check & replace
C. Fuel / Induction related	Adulterated / Bad fuel	Clean fuel tank Fill with fresh fuel
	Air filter dirty / clogged	Check & clean / replace
D. Compression Related	Spark plug loose	Tighten spark plug to torque
	Tappets adjusted too tight	Check & adjust tappets correctly
	Excessive Carbon in combustion chamber	Check & Clean
	Poor compression due to cyl. head gasket blown, Valve seating improper, Piston rings worn out / broken, Piston / Cyl. worn out	Check & correct
E. Others	Engine oil less viscous / wrong specification / level too low	Check & correct
	Oil cooler fins dirty / blocked	Check & clean oil cooler fins
	Clutch slipping	Check & correct
	Front / Rear brakes jammed	Check & correct
	Engine oil pressure less	Check & correct
	Silencer choked	Check & clean

8. ENGINE NOISY

Attribute	Probable Cause	Remedy
A. Knocking noise	Prolonged driving in low gear at High speeds / High gear at Low speeds	Ride in appropriate gear as required by traffic conditions
	Excessive Engine heat	Check & correct
	Adulterated / Bad fuel	Clean fuel tank. Fill fresh fuel
	Incorrect plug gap. Wrong spec spark plug	Check & correct gap
	Excessive carbon in combustion chamber	Check & correct
	Pulse air valve pipe connections loose / cracked	Check & correct
	Exhaust pipe & cylinder head joint not sealed correctly	Check & tighten exhaust flange nuts / replace gasket
B. Lubrication related	Engine oil less viscous/wrong specification / level too low	Check & correct
	Oil filter element blocked	Replace filter element
	Oil pressure low	Check & correct
C. Top End noise	Tappets clearance excessive correctly	Check & adjust tappets
	Camshaft sticky rotation	Check & correct
	Cam lobes in camshaft uneven wear	Check & replace
	Cylinder head gasket blown	Check & replace
	Valve spring broken / weak	Check & replace
	Valve stem squeaky noise	Replace stem seals
	Valve stem to guide clearance high	Check & replace
D. Cylinder barrel/central portion noise	Piston rings broken	Check & replace
	Cylinder / Piston scored / housing also for damages	Check & replace. Check air filter
	Excess clearance between piston / barrel (Piston slap)	Check & replace
	Cam chain pads worn out	Check & replace
	Auto chain tensioner jammed	Check & replace
	Excessive clearance between Cam chain / sprockets	Check & replace
	Connecting rod small end / piston pin clearance excess	Check & replace
E. Bottom end noise	Connecting rod bent	Check & replace crankshaft
	Excess clearance between connecting rod big end / crank pin	Check & replace crankshaft
	Crankshaft / balancer shaft support bearings worn	Check & replace
	Crankshaft run out excessive	Check & replace
	Balancer shaft / crankshaft gears backlash	Check & correct
F. Transmission noise	Clutch housing/friction plate clearance excessive	Check & replace
	Clutch housing gear / crank gear backlash	Replace matched gears
	Drive / counter gears backlash	Check & replace
	Drive / Countershaft bearings worn out	Check & replace
	Gears / bushes seized in drive / counter shaft	Check & replace

9. GEAR SHIFTING HARD / SLIPS

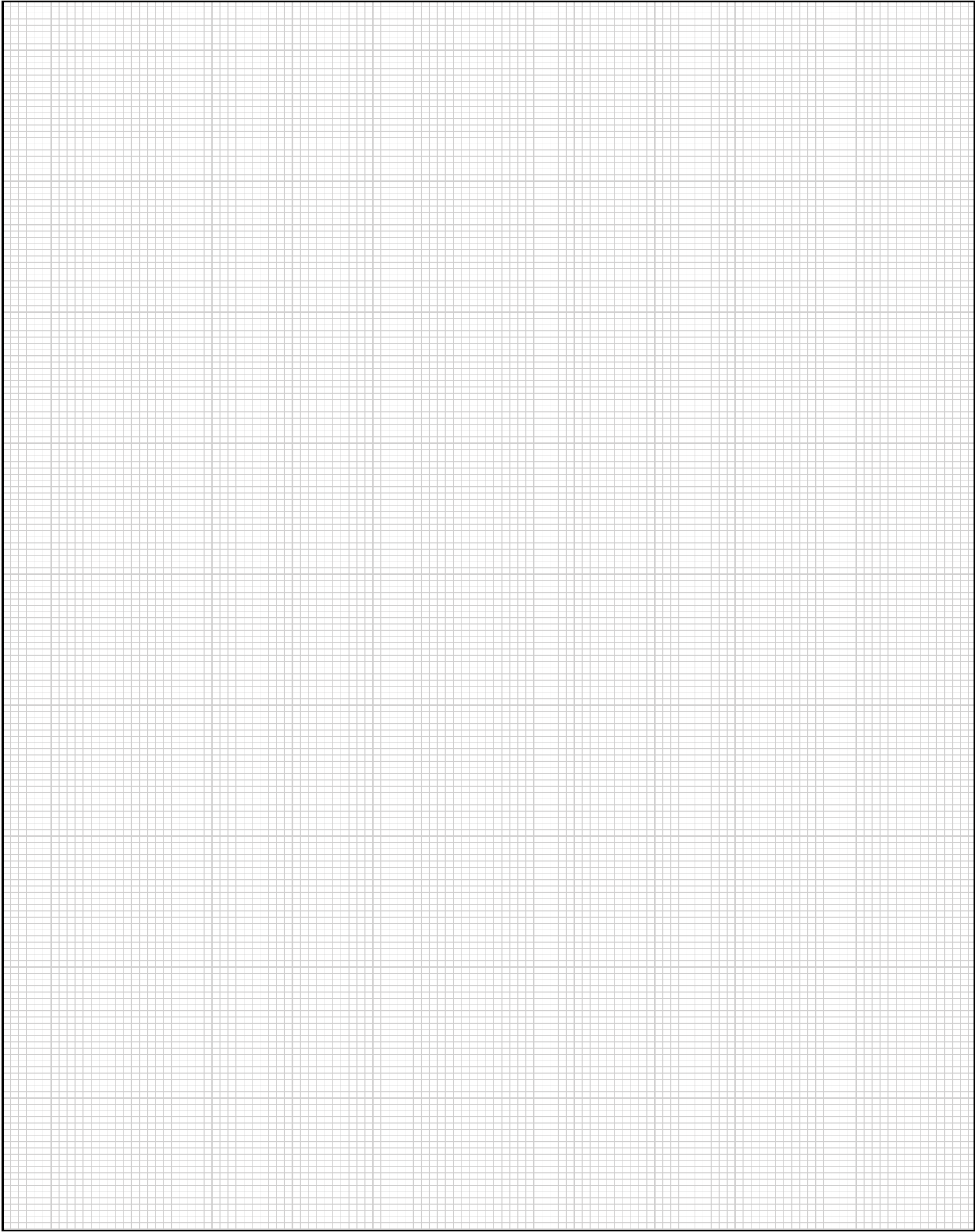
Attribute	Probable Cause	Remedy
A. Clutch cable related	Routing improper	Check & correct
	Strapped too tight to frame	Check & correct
	Inner cable sticky	Check & replace
	Inner / outer cable damaged	Check & replace
	Free play excess	Correct free play to 2-3mm
B. Oil related	Oil less / more viscous. Wrong specification	Check & correct
	Oil level too high / too low	Check & correct
C. Shift lever / linkage / shifting Mechanism related	Gear lever position incorrect	Check & correct
	Shift lever sticky / jammed on pivot pin	Check, clean & lubricate pivot pin
	Gear shift linkage ball joint stuck/worn out	Check & correct
	Return spring weak / broken	Check & replace
	Indexing pawl pins worn out	Check & replace
	Shift forks sticky in pin / selector drum	Check & correct
	Shift forks / pins worn out	Check & replace
	Selector drum grooves worn out	Check & replace
D. Clutch assembly related	Clutch pad sticky / worn out	Check & replace
	Clutch plates movement sticky	Check & correct
	Springs weak / broken	Check & replace
	Friction plates worn out / burnt	Check & replace
	Steel plates warped	Check & replace
	No end float of clutch assembly in shaft	Check & correct
E. Gears does not engage	Shift forks sticky in pin / selector drum	Check & correct
	Selector drum rotation sticky	Check & correct
	Sliding gear movement sticky in shaft	Check & correct
	Gears / bushes partially seized in shaft	Check & correct
F. Gear overshifts	Shift forks / pins worn out	Check & replace
	Selector drum grooves worn out	Check & replace
	Sliding Gear dogs worn out	Check & replace
	Drive shaft/counter shaft splines worn out	Check & replace
	Drive / counter shaft bearings wornout	Check & replace

SECTION 20.2 - EMS TROUBLE SHOOTING

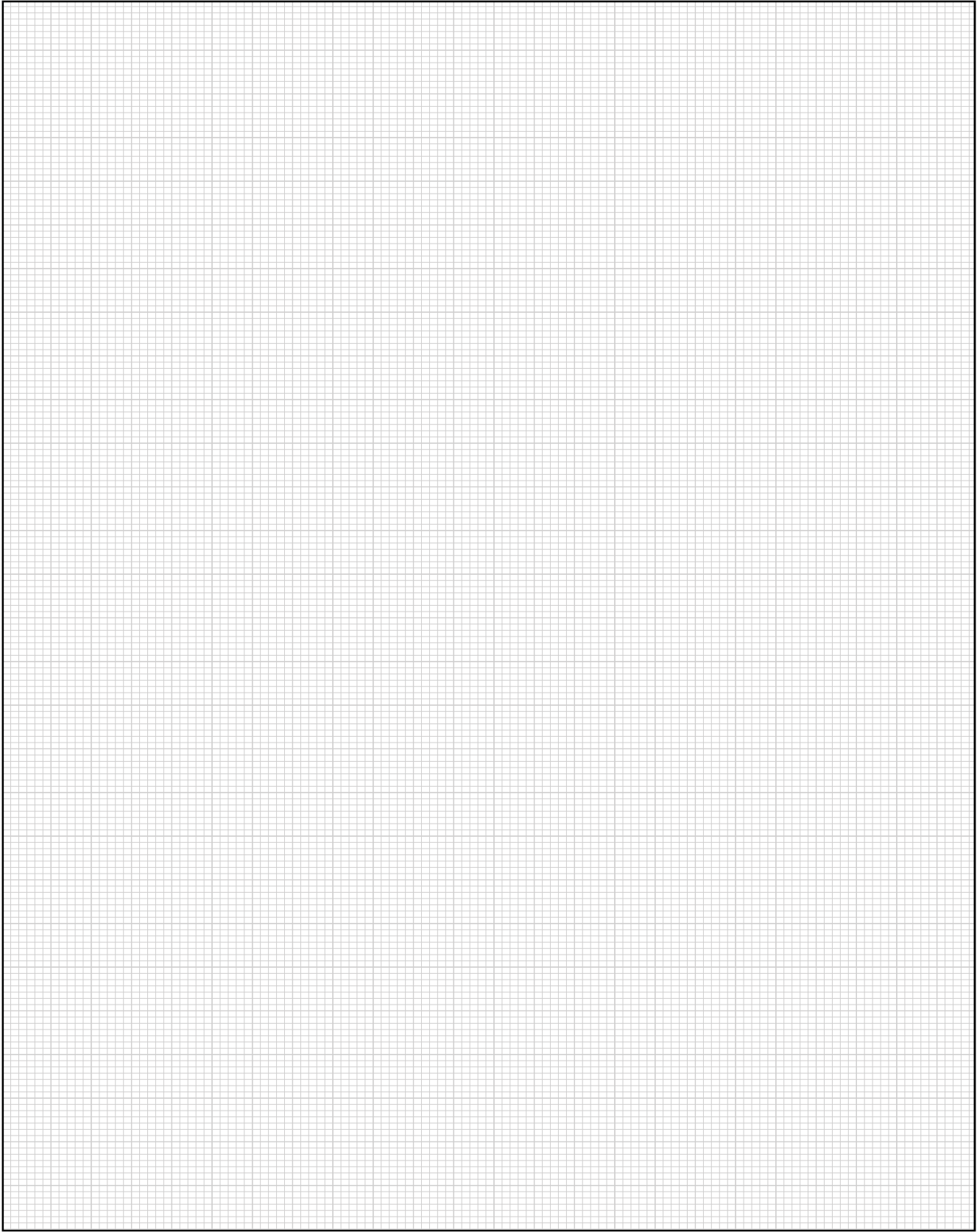
ISSUE DESCRIPTION	EMS COMPONENT	CHECK POINTS
Vehicle not starting	ECU	Check for P codes/blink pattern as mentioned in previous slide for ECU internal error or any other internal issues.
	Fuel Injector,	* Check for Connector loose fitment, terminal back out or wire cut etc.
	Roll Over Sensor	* Check for supply voltage, battery voltage etc.
	Ignition Coil	* Check for Connector loose fitment, terminal back out or wire cut etc. * Check for supply voltage, battery voltage etc.
		* Check for harness continuity.
		* Check for suppressor cap loose connection
		* Check for sparkplug contamination
	Crank Position Sensor	* Check for Connector loose fitment, terminal back out or wire cut etc.
		* Check for crank shaft position sensor resistance.
	Flywheel Magneto Assy	* Check for stator short circuit. * Check for connector loose fitment.
DTC History not able to clear	ECU	Clear DTC using only scan tool, do not re-set ECU by test pin method
Fuel pump Continuous ON	ECU	ECU internal short, replace ECU
Fuel Pump Not working	Fuel Pump	Check for Connector loose fitment, terminal back out or wire cut etc. Check for supply voltage, battery voltage etc.
Fuel pressure loss/ no fuel supply	Fuel Pump	Check for leakage near connectors Check for clogged filter
Fuel pump short Pulse	Fuel Pump	Fuel pump Primes for 2 Sec, If priming cycle is less than 2 sec check for Ignition coil Connector.
Fuel dripping through Pump Nipple	Fuel Pump	Check for Pressure Lock in tank, if pressure lock is not there replace the pump If Pressure Lock is there check for Tank Cap and EVAP Purge valve.

ISSUE DESCRIPTION	EMS COMPONENT	CHECK POINTS
Poor Feeling of acceleration, hesitation, Vehicle Could not reach Max Speed	Fuel Injector	Check for Injector Block Check if Pressure is built by pump, Check for any Kinks in Fuel hose.
Vehicle mis-firing/ tachometer fluctuation	Crank Position Sensor Throttle Position Sensor	Check for crankshaft position sensor mounting Check for supply voltage, battery voltage etc.
Low battery	Flywheel Magneto Assy	* Check for stator short circuit. * Check for connector loose fitment.
Heater Circuit Failure	HEGO Sensor	Check for Connector loose fitment, terminal back out or wire cut etc.
Sensor Circuit Failure	HEGO Sensor	Check for Connector loose fitment, terminal back out or wire cut etc.
Sensor Circuit Malfunction	Engine Oil Temperature (TE) Sensor	* Check Connectors for loose pin * If the issue still persists Replace Sensor
	TA Sensor	Check for Connector loose fitment, terminal back out or wire cut etc.
	MAP Sensor	Check for Connector loose fitment, terminal back out or wire cut etc.
	EXAI Sensor	* Check for Connector loose fitment, terminal back out or wire cut etc.
		* If terminals are in good condition replace Solenoid.
	Throttle Position Sensor	* Check for Connector loose fitment, terminal back out or wire cut etc.
		* Check for Supply Voltage
MIL distance not showing in diagnostic tool	Vehicle Speed Sensor	* Check for Connector loose fitment, terminal back out or wire cut etc. * Check for Supply Voltage

NOTES



NOTES



ROYAL ENFIELD

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