

SERVICING INFORMATION

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TROUBLESHOOTING ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start or is hard to start.	<p>Compression too low</p> <ol style="list-style-type: none"> Worn cylinder. Worn piston ring. Worn valve guide or improper valve seating. Loose spark plug. Broken, cracked, or damaged piston. Slow cranking starter motor. Mistimed valves. Valve clearance out of adjustment. 	<p>Replace. Replace. Repair or replace. Tighten. Replace. See electrical section. Adjust. Adjust.</p>
	<p>Spark plug not sparking</p> <ol style="list-style-type: none"> Damaged spark plug. Damaged spark plug cap. Fouled spark plug. Wet spark plug. Defective ignition coil. Open or short in high-tension circuit. Defective pick-up coil or igniter unit. <p>No fuel reaching the carburetor</p> <ol style="list-style-type: none"> Clogged hole in the fuel tank cap. Defective fuel pump. Clogged or defective fuel valve. Defective carburetor needle valve. Clogged fuel hose. Clogged fuel filter. 	<p>Replace. Replace. Clean and dry or replace. Replace. Replace. Replace. Clean or replace. Replace. Clean or replace. Clean or replace. Clean or replace. Clean or replace. Clean. Adjust.</p>
Engine stalls easily.	<ol style="list-style-type: none"> Fouled spark plug. Defective signal coil or ignitor unit. Defective fuel pump. Clogged or defective fuel valve. Clogged carburetor jet. Valve clearance out of adjustment. 	<p>Clean or replace. Replace. Replace. Clean or replace. Clean. Adjust.</p>

Complaint	Symptom and possible causes	Remedy	
Engine is noisy.	<p>Excessive valve chatter</p> <ol style="list-style-type: none"> Excessive valve clearance. Weak or broken valve spring. Worn camshaft. Worn or burnt camshaft journal. <p>Noise seems to come from the piston</p> <ol style="list-style-type: none"> Worn piston. Worn cylinder. Carbon buildup in combustion chamber. Worn piston pin or piston pin bore. Worn piston ring or ring groove. <p>Noise seems to come from the cam chain</p> <ol style="list-style-type: none"> Stretched cam chain. Worn cam chain sprocket. Improperly working cam chain tensioner. <p>Noise seems to come from the clutch</p> <ol style="list-style-type: none"> Worn countershaft spline. Worn clutch hub spline. Worn clutch plate teeth. Distorted clutch plate. Weak clutch damper. Weak clutch spring. <p>Noise seems to come from the crankshaft</p> <ol style="list-style-type: none"> Rattling bearing. Worn or burnt crank pin bearing. Worn or burnt journal bearing. Excessive thrust clearance. <p>Noise seems to come from the transmission</p> <ol style="list-style-type: none"> Worn or rubbing gear. Worn countershaft spline. Worn driveshaft spline. Worn or rubbing primary gear. Worn bearing. 	<p>Adjust. Replace. Replace. Replace. Replace. Replace. Clean. Replace. Replace. Replace. Replace cam chain and sprockets. Replace cam chain and sprockets. Repair or replace. Replace countershaft. Replace clutch hub. Replace clutch plate. Replace. Replace primary driven gear. Replace. Replace. Replace. Replace. Replace thrust bearing. Replace. Replace countershaft. Replace driveshaft. Replace. Replace.</p>	
	Clutch drags.	<ol style="list-style-type: none"> Clutch out of adjustment. Clutch release screw out of adjustment. Some clutch springs are weak, while others are not. Worn or distorted clutch pressure plate. Distorted clutch plate. 	<p>Adjust. Adjust. Replace. Replace. Replace.</p>
	Transmission will not shift.	<ol style="list-style-type: none"> Broken gearshift cam. Distorted gearshift fork. Worn gearshift pawl. 	<p>Replace. Replace. Replace.</p>
	Transmission will not shift back.	<ol style="list-style-type: none"> Broken gearshift shaft return spring. Rubbing or stuck gearshift shaft. Worn or distorted gearshift fork. 	<p>Replace. Repair or replace. Replace.</p>

Complaint	Symptom and possible causes	Remedy
Transmission jumps out of gear.	<ol style="list-style-type: none"> Worn gear. Worn or distorted gearshift fork. Weakened gearshift stopper spring. Worn gearshift pawl. 	<p>Replace. Replace. Replace. Replace.</p>
Engine idles poorly.	<ol style="list-style-type: none"> Valve clearance out of adjustment. Improper valve seating. Worn valve guide. Worn camshaft. Excessive spark plug gap. Defective ignition coil. Defective generator. Defective ignitor unit. Incorrect float chamber fuel level. Clogged carburetor jet. 	<p>Adjust. Repair or replace. Replace. Replace. Adjust or replace. Replace. Replace. Replace. Adjust float height. Clean.</p>
Engine runs poorly in high-speed range.	<ol style="list-style-type: none"> Weak valve spring. Worn camshaft. Insufficient spark plug gap. Mistimed valves. Ignition not advanced sufficiently due to poorly working timing advance circuit. Defective ignition coil. Defective generator. Defective ignitor unit. Low float chamber fuel level. Dirty air cleaner element. Clogged fuel hose, resulting in inadequate fuel supply to carburetor. 	<p>Replace. Replace. Regap or replace. Adjust. Replace ignitor unit. Replace. Replace. Replace. Adjust float height. Clean or replace. Clean and prime.</p>
Exhaust smoke is dirty or thick.	<ol style="list-style-type: none"> Excessive amount of engine oil. Worn cylinder. Worn piston ring. Worn valve guide. Scored or scuffed cylinder wall. Worn valve stem. Defective valve stem oil seal. Worn oil ring side rail. 	<p>Check level and drain. Rebore or replace. Replace. Replace. Replace. Replace valve. Replace. Replace oil ring.</p>
Engine lacks power.	<ol style="list-style-type: none"> Insufficient valve clearance. Weak valve spring. Mistimed valves. Worn cylinder. Worn piston ring. Improper valve seating. Fouled spark plug. Incorrect spark plug. Clogged carburetor jet. Incorrect float chamber fuel level. Dirty air cleaner element. Air leakage from intake pipe. Excessive amount of engine oil. 	<p>Adjust. Replace. Adjust. Replace. Replace. Repair or replace. Clean or replace. Replace. Clean. Adjust float height. Clean or replace. Tighten or replace. Check level and drain.</p>

Complaint	Symptom and possible causes	Remedy
Engine overheats.	<ol style="list-style-type: none"> Carbon buildup on piston crown. Insufficient amount of engine oil. Defective oil pump. Clogged oil circuit. Float chamber fuel level too low. Air leakage from intake pipe. Incorrect engine oil. 	<p>Clean. Check level and add. Replace. Clean. Adjust float height. Tighten or replace. Change.</p>

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Starting difficulty.	<ol style="list-style-type: none"> Clogged starter jet. Clogged starter jet passage. Air leaking from carburetor joint or vacuum hose joint. Improperly working starter (enricher) plunger. 	<p>Clean. Clean. Tighten or replace defective part. Adjust.</p>
Idling or low-speed trouble.	<ol style="list-style-type: none"> Clogged or loose pilot jet. Clogged or loose pilot air jet. Air leaking from carburetor joint, vacuum pipe joint, or starter. Clogged pilot outlet port. Clogged bypass port. Starter (enricher) plunger not fully closed. 	<p>Clean or tighten. Clean or tighten. Tighten or replace defective part. Clean. Clean. Adjust.</p>
Medium or high-speed trouble.	<ol style="list-style-type: none"> Clogged main jet. Clogged main air jet. Clogged needle jet. Improperly working throttle valve. Clogged fuel filter. 	<p>Clean. Clean. Clean. Adjust. Clean or replace.</p>
Overflow and fuel level fluctuations.	<ol style="list-style-type: none"> Worn or damaged needle valve. Broken needle valve spring. Improperly working float. Foreign matter on the needle valve. Incorrect float chamber fuel level. 	<p>Replace. Replace. Adjust or replace. Clean or replace with needle valve seat. Adjust float height.</p>

SHAFT DRIVE

Complaint	Symptom and possible causes	Remedy
Noisy shaft drive.	<p>Noise seems to come from secondary bevel gear and final bevel gear assemblies.</p> <ol style="list-style-type: none"> Oil level too low. Drive and driven bevel gears damaged or worn. Excessive backlash. Improper tooth contact. Damage to bearings. 	<p>Refill. (Check oil jet/replace oil seal) Replace. Adjust. Adjust. Replace.</p>
	<p>Noise seems to come from propeller shaft area.</p> <ol style="list-style-type: none"> Propeller shaft universal joint damaged. Propeller shaft splines damaged or worn. Insufficient lubricant. Cam dog contacting surface damaged or worn. 	<p>Replace. Replace. Refill. (Replace oil seal) Replace.</p>

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering is heavy.	<ol style="list-style-type: none"> 1. Overtightened steering stem nut. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Low tire pressure. 	<p>Adjust. Replace. Replace. Regulate.</p>
Handlebar wobbles.	<ol style="list-style-type: none"> 1. Loss of balance between right and left front forks. 2. Distorted front fork. 3. Distorted front axle. 4. Twisted tire. 	<p>Adjust or replace. Repair or replace. Replace. Replace.</p>
Front wheel wobbles.	<ol style="list-style-type: none"> 1. Bistorted wheel rim. 2. Worn front wheel bearing. 3. Defective or incorrect tire. 4. Loose front axle nut. 5. Incorrect fork oil level. 	<p>Replace. Replace. Replace. Tighten. Adjust.</p>
Front suspension too soft.	<ol style="list-style-type: none"> 1. Weak spring. 2. Insufficient fork oil. 	<p>Replace. Check level and add.</p>
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Excessively viscous fork oil. 2. Excessive fork oil. 	<p>Replace. Check level and drain.</p>
Front suspension too noisy.	<ol style="list-style-type: none"> 1. Insufficient fork oil. 2. Loose front suspension fastener. 	<p>Check level and add. Tighten.</p>
Rear wheel wobbles.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn rear wheel bearing. 3. Defective or incorrect tire. 4. Worn swingarm bearing. 5. Loose rear axle nut. 6. Loose rear suspension fastener. 	<p>Replace. Replace. Replace. Replace. Tighten. Tighten.</p>
Rear suspension too soft.	<ol style="list-style-type: none"> 1. Weak rear shock absorber spring. 2. Rear shock absorber leaks oil. 3. Improper suspension setting. 	<p>Replace. Replace. Adjust.</p>
Rear suspension too stiff.	<ol style="list-style-type: none"> 1. Improper suspension setting. 2. Bent rear shock absorber shaft. 3. Worn swingarm bearing and rear suspension related bearing. 	<p>Adjust. Replace. Replace.</p>
Rear suspension too noisy.	<ol style="list-style-type: none"> 1. Loose rear suspension fastener. 2. Worn swingarm bearing and rear suspension related bearing. 	<p>Tighten. Replace.</p>

BRAKES

Complaint	Symptom and possible causes	Remedy
Brake power insufficient.	<ol style="list-style-type: none"> 1. Leakage of brake fluid. 2. Worn brake pad/shoe. 3. Oil on brake pad surface. 4. Worn brake disc. 5. Air in hydraulic system. 	<p>Repair or replace. Replace. Clean brake disc and brake pads. Replace. Bleed.</p>
Brake squeaks.	<ol style="list-style-type: none"> 1. Carbon adhesion on brake pad/shoe surface. 2. Tilted brake pad. 3. Damaged wheel bearing. 4. Worn brake pad/shoe. 5. Foreign material in brake fluid. 6. Clogged return port of master cylinder. 7. Loose front or rear axle nut. 	<p>Clean surface with sandpaper. Readjust brake pad position or replace. Replace. Replace. Change brake fluid. Disassemble and clean master cylinder. Tighten.</p>
Brake lever or pedal stroke excessive.	<ol style="list-style-type: none"> 1. Air in hydraulic system. 2. Insufficient brake fluid. 3. Incorrect brake fluid. 	<p>Bleed. Check level and add. Bleed any air. Change.</p>
Brake fluid leaks.	<ol style="list-style-type: none"> 1. Loose connection joint. 2. Cracked hose. 3. Worn piston seal. 4. Worn secondary cup. 	<p>Tighten. Replace. Replace. Replace.</p>
Brake drags.	<ol style="list-style-type: none"> 1. Rusty part. 2. Insufficient brake lever or brake pedal pivot lubrication. 	<p>Clean and lubricate. Lubricate.</p>

ELECTRICAL

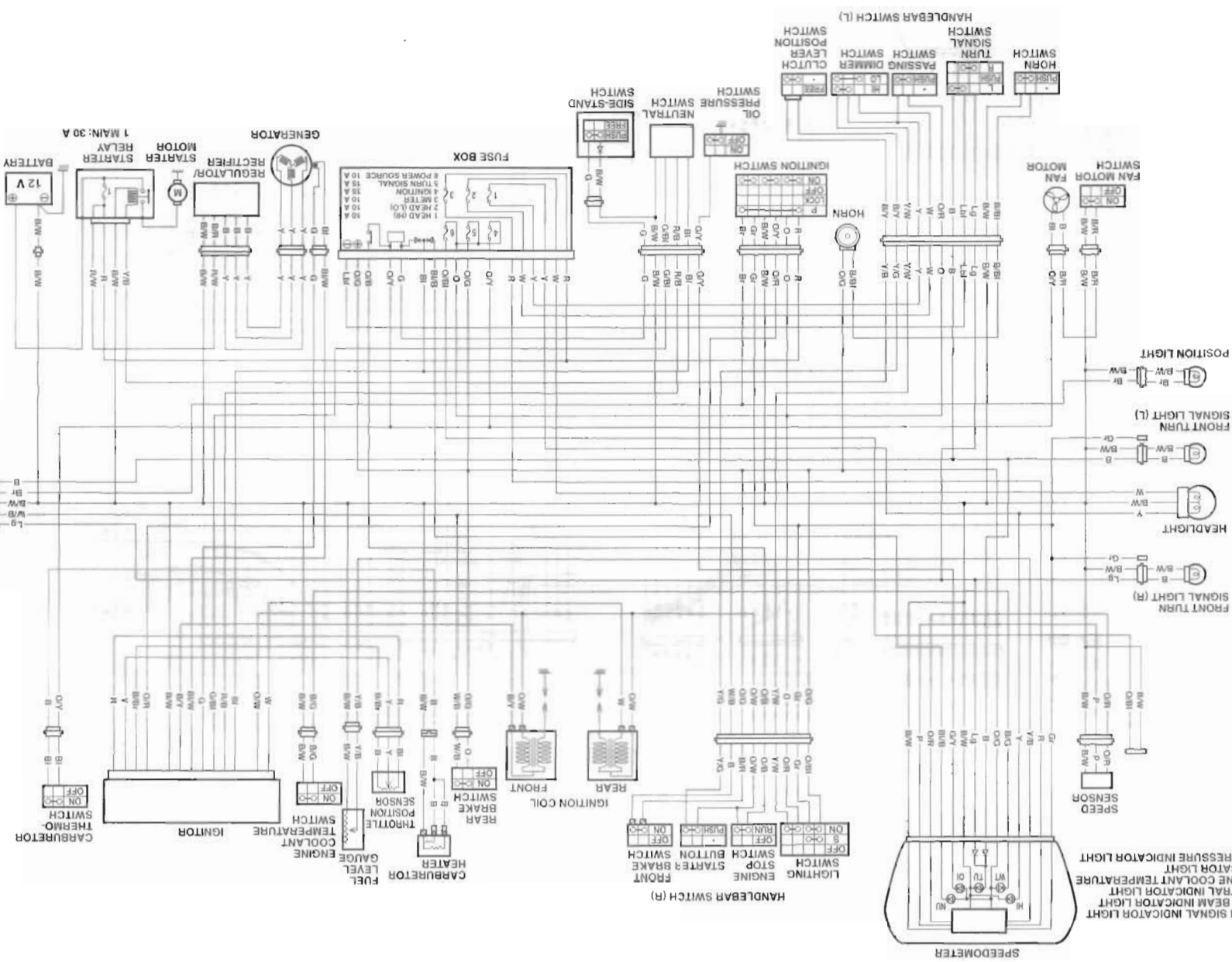
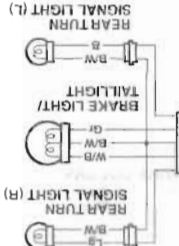
Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coil. 2. Defective spark plug. 3. Defective pick-up coil. 4. Defective ignitor unit. 	<p>Replace. Replace. Replace. Replace.</p>
Spark plug is wet or quickly becomes fouled with carbon.	<ol style="list-style-type: none"> 1. Excessively rich air/fuel mixture. 2. Excessively high idling speed. 3. Incorrect gasoline. 4. Dirty air cleaner element. 5. Incorrect spark plug (cold type). 	<p>Adjust carburetor. Adjust carburetor. Change. Clean or replace. Change to hot type spark plug.</p>
Spark plug quickly becomes fouled with oil or carbon.	<ol style="list-style-type: none"> 1. Worn piston ring. 2. Worn piston. 3. Worn cylinder. 4. Excessive valve-stem-to-valve-guide clearance. 5. Worn valve stem oil seal. 	<p>Replace. Replace. Replace. Replace. Replace.</p>
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Incorrect spark plug (hot type). 	<p>Change to cold type spark plug. Tune-up. Tighten. Adjust carburetor.</p>
Generator does not charge.	<ol style="list-style-type: none"> 1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded, or open generator coil. 3. Shorted or punctured regulator/rectifier. 	<p>Repair, replace, or connect properly. Replace. Replace.</p>
Generator charges but charging rate is below the specifications.	<ol style="list-style-type: none"> 1. Lead wires tend to get shorted or open-circuited or loosely connected at terminal. 2. Grounded or open-circuited stator coils or generator. 3. Defective regulator/rectifier. 4. Defective battery cell plates. 	<p>Repair or tighten. Replace. Replace. Replace battery.</p>
Generator overcharges.	<ol style="list-style-type: none"> 1. Internal short-circuit in the battery. 2. Damaged or defective regulator/rectifier. 3. Poorly grounded regulator/rectifier. 	<p>Replace battery. Replace. Repair, replace, or connect properly.</p>
Unstable charging.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting. 2. Internally shorted generator. 3. Defective regulator/rectifier. 	<p>Repair or replace. Replace. Replace.</p>
Starter button does not work.	<ol style="list-style-type: none"> 1. Run down battery. 2. Defective switch contact. 3. Brushes do not seat properly on the commutator in the starter motor. 4. Defective starter relay. 5. Defective turn signal/side stand relay. 6. Wiring connections loose or disconnected. 	<p>Recharge or replace. Replace. Repair or replace. Replace. Replace. Tighten or repair.</p>

BATTERY

Complaint	Symptom and possible causes	Remedy
Sulfation or spots on surfaces of cell plates.	<ol style="list-style-type: none"> 1. Cracked battery case. 2. Battery has been left in a run-down condition for a long time. 	<p>Replace. Replace.</p>
Battery runs down quickly.	<ol style="list-style-type: none"> 1. Incorrect charging method. 2. Battery cell plates have lost much of their active material as a result of overcharging. 3. Internally shorted battery. 4. Excessively low battery voltage. 5. Battery is too old. 6. Dirty container top and sides. 	<p>Check generator, regulator/rectifier circuit connections, and make necessary adjustment to obtain specified charging operation. Replace battery and correct charging system. Replace. Charge. Replace. Clean.</p>
Battery sulfation.	<ol style="list-style-type: none"> 1. Incorrect charging rate. (When not in use, the battery should be checked at least once a month and properly charged if necessary, to avoid sulfation.) 2. The battery was left unused in a cold climate for too long. 	<p>Replace. Replace the battery if badly sulfated.</p>

For E-02, -19

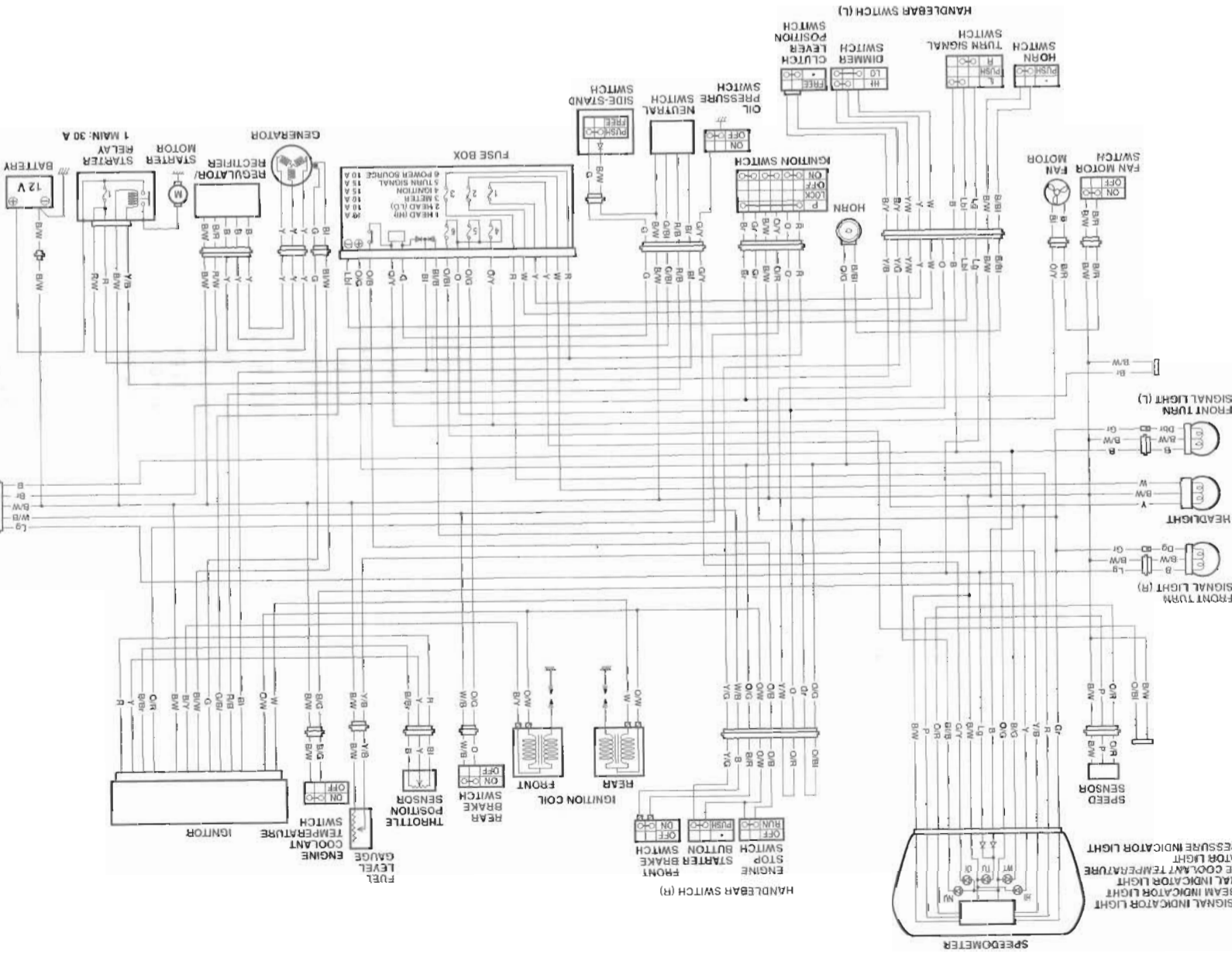
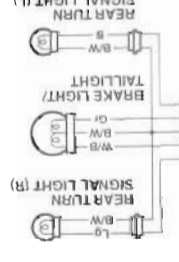
- WIRE COLORS**
- Y/W Yellow with White tracer
 - Y/G Yellow with Green tracer
 - Y/B Yellow with Black tracer
 - W/B White with Black tracer
 - R/W Red with White tracer
 - R/B Red with Black tracer
 - O/Y Orange with Yellow tracer
 - O/W Orange with White tracer
 - O/R Orange with Red tracer
 - O/G Orange with Green tracer
 - O/B Orange with Blue tracer
 - G/Y Green with Yellow tracer
 - G/W Green with White tracer
 - G/B Green with Black tracer
 - B/W Blue with White tracer
 - B/Y Blue with Yellow tracer
 - B/R Blue with Red tracer
 - B/G Black with Green tracer
 - B/B Black with Brown tracer
 - B/W Black with White tracer
 - B/L Black with Light blue tracer
 - Y Yellow
 - W White
 - R Red
 - P Pink
 - O Orange
 - LG Light green
 - LB Light blue
 - GR Gray
 - G Green
 - DG Dark green
 - DB Dark brown
 - B Brown
 - BL Black



- TU : TURN SIGNAL INDICATOR LIGHT
- HI : HIGH BEAM INDICATOR LIGHT
- NI : NEUTRAL INDICATOR LIGHT
- WT : ENGINE COOLANT TEMPERATURE INDICATOR LIGHT
- OI : OIL PRESSURE INDICATOR LIGHT

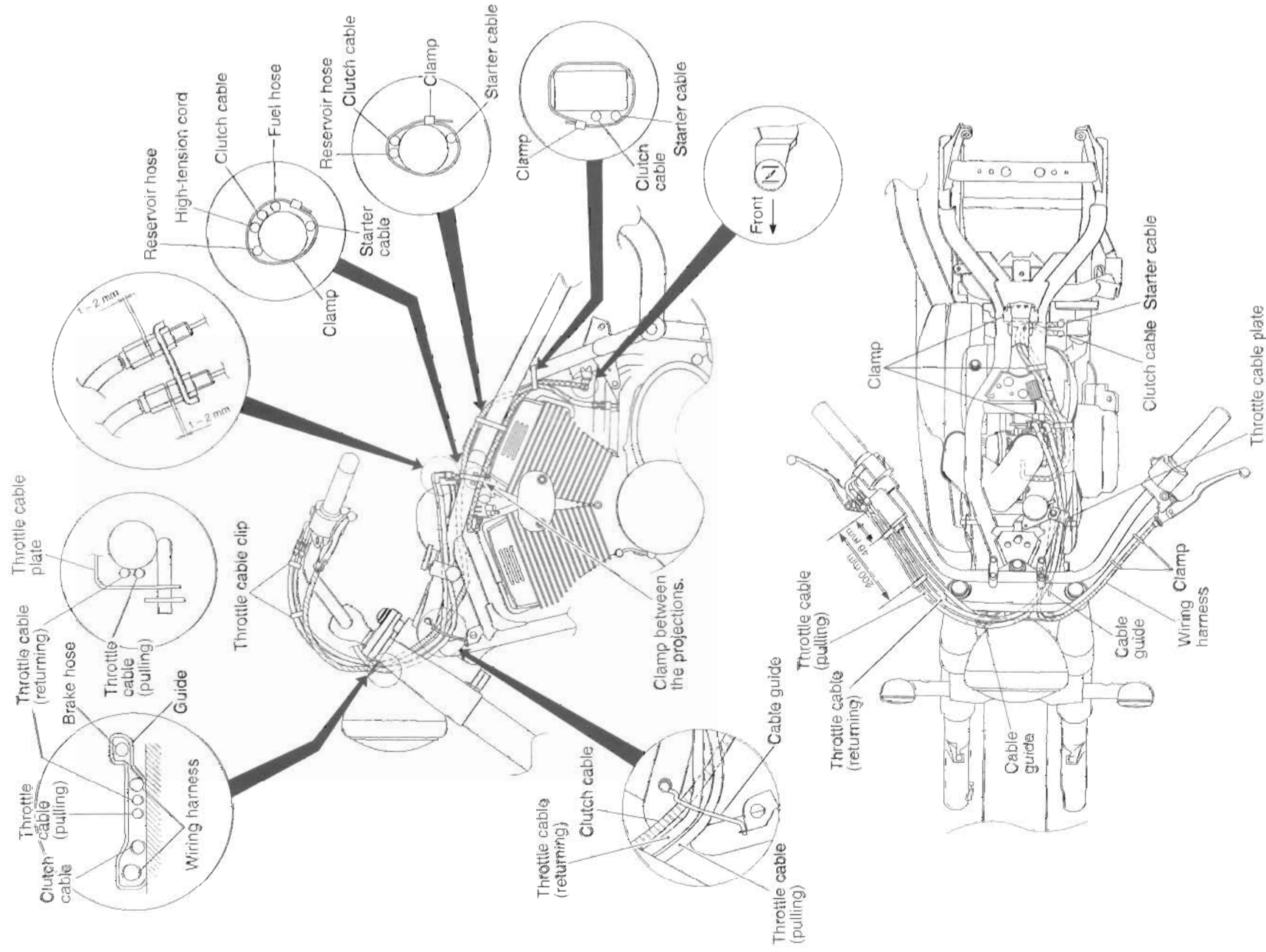
WIRING DIAGRAM For E-03, -28, -33

- WIRE COLORS**
- Y/W Yellow with White tracer
 - Y/G Yellow with Green tracer
 - Y/B Yellow with Black tracer
 - W/B White with Black tracer
 - R/W Red with White tracer
 - R/B Red with Black tracer
 - O/Y Orange with Yellow tracer
 - O/W Orange with White tracer
 - O/R Orange with Red tracer
 - O/G Orange with Green tracer
 - O/B Orange with Blue tracer
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 - B/W Blue with White tracer
 - B/Y Blue with Yellow tracer
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 - B/W Black with White tracer
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 - Y Yellow
 - W White
 - R Red
 - P Pink
 - O Orange
 - LG Light green
 - LB Light blue
 - GR Gray
 - G Green
 - DG Dark green
 - DB Dark brown
 - B Brown
 - BL Black

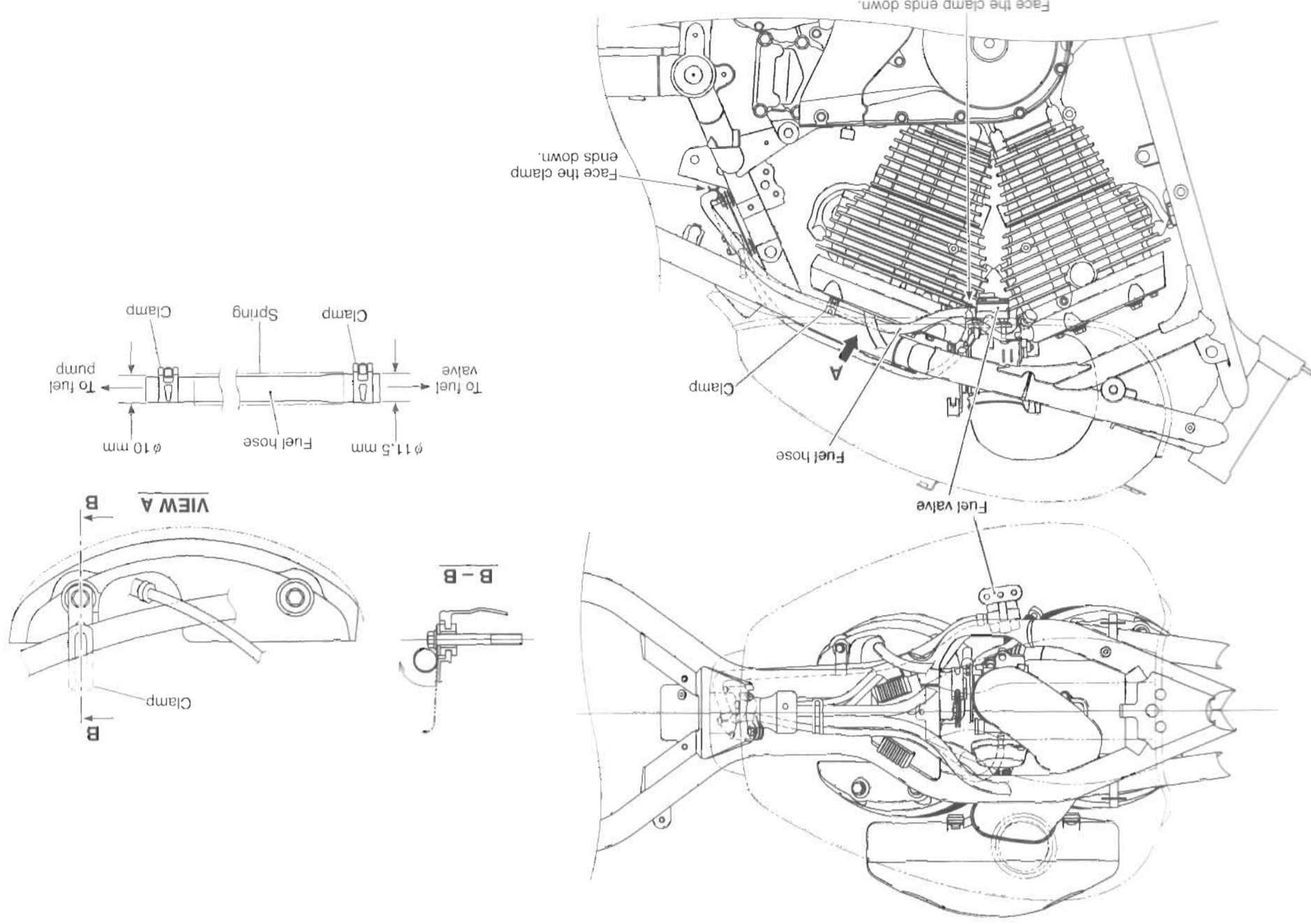


- TU : TURN SIGNAL INDICATOR LIGHT
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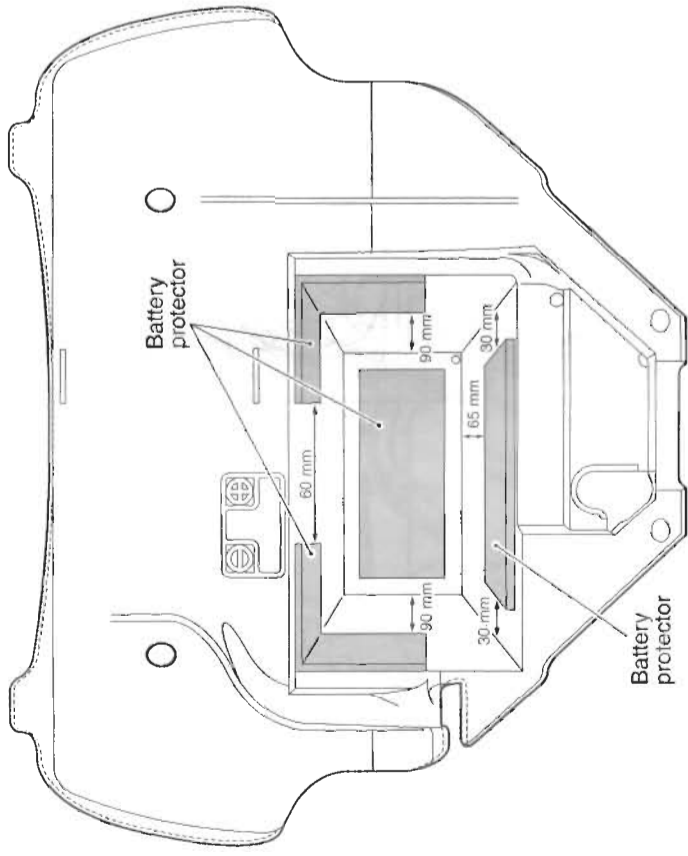
CABLE ROUTING



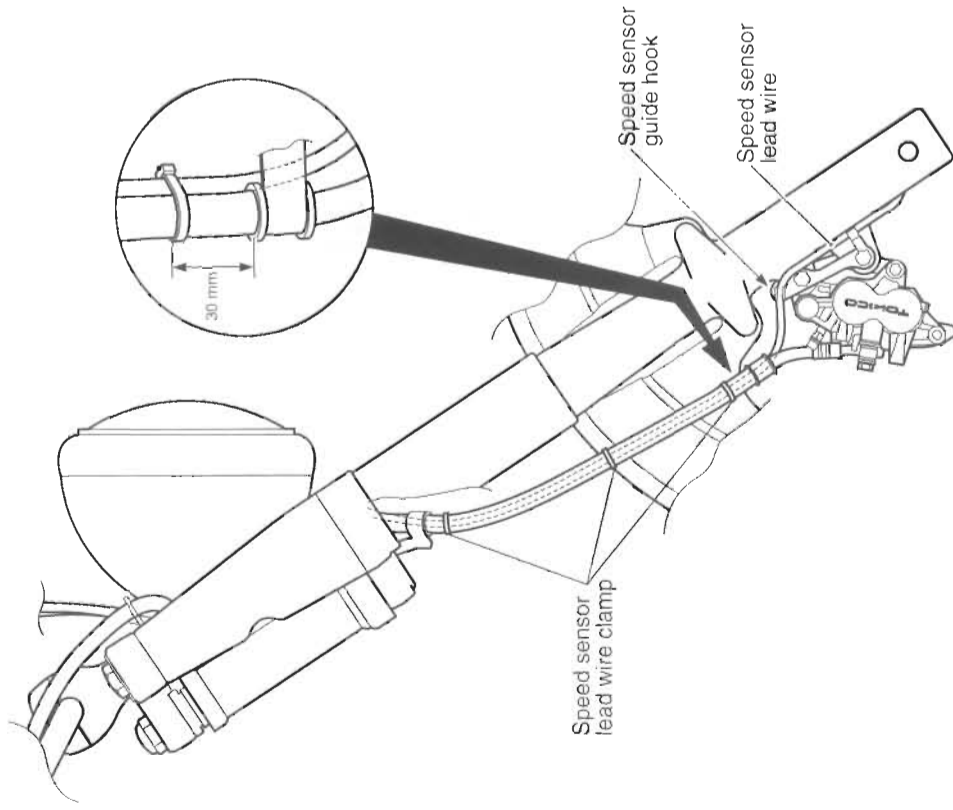
FUEL HOSE ROUTING



BATTERY PROTECTOR



SPEED SENSOR LEAD WIRE ROUTING



SPECIAL TOOLS

TIGHTENING TORQUE ENGINE

ITEM	N·m	kgf·m	lb-ft
Rocker arm shaft	27	2.7	19.5
Cylinder head cover bolt	6 mm	1.0	7.0
	8 mm	2.5	18.0
Cylinder head bolt and nut	Initial	1.0	7.0
	Final	2.5	18.0
	Initial	2.5	18.0
	Final	3.8	27.5
Cam sprocket bolt	15	1.5	11.0
Cam chain tension adjuster mounting bolt	10	1.0	7.0
Cam chain tensioner bolt	10	1.0	7.0
Primary drive gear bolt	95	9.5	68.5
Clutch spring set bolt	10	1.0	7.0
Clutch sleeve hub nut	60	6.0	47.0
Driveshaft bolt	65	6.5	44.2
Secondary drive gear shaft nut	105	10.5	76.0
Secondary gear case bolt	Initial	1.5	11.0
	Final	2.2	16.0
Generator rotor bolt	160	16.0	115.5
Starter clutch allen bolt	26	2.6	19.0
Crankcase bolt	6 mm	1.1	8.0
	Initial	1.5	11.0
Conrod cap nut	Final	2.2	16.0
	Initial	2.5	18.0
Oil pressure regulator	Final	5.1	37.0
	Initial	2.8	20.0
Oil pump mounting bolt	11	1.1	8.0
Oil pressure switch	14	1.4	10.0
Oil drain plug	21	2.1	15.0

ITEM	N·m	kgf·m	lb-ft
Oil plug	6	0.6	4.3
	18	1.8	13.0
	15	1.5	11.0
	23	2.3	16.5
	35	3.5	25.5
Engine mounting bolt	79	7.9	57.0
Engine mounting bracket bolt	23	2.3	16.5
Frame mounting bolt/nut	8 mm	2.3	16.5
	10 mm	5.0	36.0
Exhaust pipe clamp bolt	23	2.3	16.5
Muffler mounting bolt	23	2.3	16.5
Speed sensor rotor bolt	100	10.0	72.5
Spark plug	18	1.8	13.0

SECONDARY AND FINAL

ITEM	N·m	kgf·m	lb-ft
Secondary drive bevel gear bearing retainer bolt	23	2.3	16.5
Secondary driven bevel gear bolt	23	2.3	16.5
Secondary driven bevel gear bearing stopper	105	10.5	76.0
Final gear case mounting nut	40	4.0	29.0
Final drive bevel gear coupling nut	100	10.0	72.5
Final drive bevel gear bearing stopper	110	11.0	79.5
Final gear case oil drain plug	8 mm	2.3	16.5
	10 mm	2.3	16.5
Final gear case bolt	50	5.0	36.0
Final driven bevel gear bearing retainer screw	9	0.9	6.5

CHASSIS

ITEM	N·m	kgf·m	lb-ft
Front axle	65	6.5	47.0
Front axle pinch bolt	33	3.3	24.0
Brake disc bolt	23	2.3	16.5
Front fork cap bolt	45	4.5	33.1
Front fork spring stopper nut	35	3.5	25.5
Front fork damper rod bolt	20	2.0	14.5
Front fork lower clamp bolt	33	3.3	24.0
Steering stem head nut	90	9.0	65.0
Front master cylinder mounting bolt	10	1.0	7.0
Front brake caliper mounting bolt	39	3.9	28.0
Brake hose union bolt	23	2.3	16.5
Air bleeder valve	7.5	0.75	5.5
Handlebar set bolt	23	2.3	16.5
Handlebar holder nut	70	7.0	50.5
Front footrest bolt	55	5.5	40.0
Frame down tube mounting bolt (M8)	23	2.3	16.5
Frame down tube mounting bolt (M10)	50	5.0	36.0
Rear brake pedal bolt	11	1.1	8.0
Rear swingarm pivot bolt (Left)	100	10.0	72.5
Rear swingarm pivot bolt (Right)	9.5	0.95	7.0
Rear swingarm pivot bolt lock nut	100	10.0	72.5
Rear shock absorber mounting nut (Upper and Lower)	50	5.0	36.0
Rear cushion lever/rod mounting nut	78	7.8	57.5
Rear axle nut	65	6.5	47.0
Rear torque link nut (front)	35	3.5	25.5
Rear torque link nut (rear)	25	2.5	18.0
Rear brake cam lever bolt	10	1.0	7.3
Driven joint stopper bolt	10	1.0	7.0
Frame handle grip mounting bolt (M10)	50	5.0	36.0
Fuel level gauge mounting bolt	10	1.0	7.0

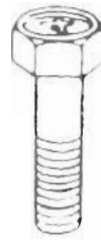
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

Bolt Diameter (A) (mm)	Conventional or "4" marked bolt		"7" marked bolt	
	N·m	kgf·m	lb-ft	N·m
4	1.5	0.15	1.0	2.3
5	3	0.3	2.0	4.5
6	5.5	0.55	4.0	10
8	13	1.3	9.5	23
10	29	2.9	21.0	50
12	45	4.5	32.5	85
14	65	6.5	47.0	135
16	105	10.5	76.0	210
18	160	16.0	115.5	240



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
	IN.	EX.	
Valve diam.	30 (1.18)	26 (1.02)	—
Valve clearance (when cold)	IN.	0.08 - 0.13 (0.003 - 0.005)	—
	EX.	0.17 - 0.22 (0.007 - 0.009)	—
Valve guide to valve stem clearance	IN.	0.010 - 0.037 (0.0004 - 0.0015)	—
	EX.	0.030 - 0.057 (0.0012 - 0.0022)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve guide I.D.	IN. & EX.	5.500 - 5.512 (0.2165 - 0.2170)	—
Valve stem O.D.	IN.	5.475 - 5.490 (0.2156 - 0.2161)	—
	EX.	5.455 - 5.470 (0.2148 - 0.2154)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
Valve stem end length	IN. & EX.	—	3.1 (0.12)
Valve seat width	IN. & EX.	0.9 - 1.1 (0.035 - 0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
	INNER	—	38.3 (1.51)
Valve spring free length	OUTER	—	40.1 (1.58)
	INNER	6.51 - 7.49 kgf (14.35 - 16.51 lbs) at length 32.5 mm (1.28 in)	—
Valve spring tension	INNER	12.09 - 13.91 kgf (26.65 - 30.67 lbs) at length 36.0 mm (1.42 in)	—
	OUTER	—	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
	Front	Rear	
Cam height	IN.	35.95 - 35.99 (1.415 - 1.417)	35.65 (1.404)
	EX.	36.92 - 36.96 (1.454 - 1.455)	36.62 (1.442)
Camshaft journal oil clearance	IN.	35.50 - 35.54 (1.398 - 1.399)	35.20 (1.386)
	EX.	36.58 - 36.62 (1.440 - 1.442)	36.28 (1.428)
Camshaft journal holder I.D.	0.032 - 0.066 (0.0013 - 0.0026)		0.150 (0.0059)
Camshaft journal holder I.D.	No.1 Left side	20.012 - 20.025 (0.7879 - 0.7884)	—
	No.2 Right side	—	—
Camshaft journal O.D.	No.1 Right side	25.012 - 25.025 (0.9847 - 0.9852)	—
	No.2 Left side	—	—
Camshaft journal O.D.	No.1 Left side	19.959 - 19.980 (0.7858 - 0.7866)	—
	No.2 Right side	—	—
Camshaft journal O.D.	No.1 Right side	24.959 - 24.980 (0.9826 - 0.9835)	—
	No.2 Left side	—	—
Camshaft runout	—		0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.000 - 12.018 (0.4724 - 0.4731)	—
Rocker arm shaft O.D.	IN. & EX.	11.966 - 11.984 (0.4711 - 0.4718)	—
Cylinder head distortion	—		0.05 (0.002)
Cylinder head cover distortion	—		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
	IN.	EX.	
Compression pressure	1 300 - 1 700 kPa (13 - 17 kgf/cm ²) (185 - 242 psi)		1 100 kPa (11 kgf/cm ²) (156 psi)
Compression pressure difference	—		200 kPa (2 kgf/cm ²) (28 psi)
Piston to cylinder clearance	0.045 - 0.055 (0.0018 - 0.0022)		0.120 (0.0047)
Cylinder bore	83.000 - 83.015 (3.2677 - 3.2683)		83.085 (3.2711)
Piston diam.	82.950 - 82.965 (3.2657 - 3.2663)		82.880 (3.2630)
Cylinder distortion	Measure at 15 mm (0.6 in) from the skirt end.		0.05 (0.002)

ITEM	STANDARD		LIMIT
	1st	2nd	
Piston ring free end gap	1st	9.6 Approx. (0.38)	7.7 (0.30)
	2nd	R 11.8 Approx. (0.46)	9.4 (0.37)
Piston ring end gap	1st	0.20 - 0.35 (0.008 - 0.014)	0.70 (0.028)
	2nd	0.20 - 0.35 (0.008 - 0.014)	0.70 (0.028)
Piston ring groove clearance	1st	—	0.180 (0.007)
	2nd	—	0.150 (0.006)
Piston ring groove width	1st	1.01 - 1.03 (0.0398 - 0.0406)	—
	2nd	1.21 - 1.23 (0.0476 - 0.0484)	—
	Oil	2.51 - 2.53 (0.0988 - 0.0996)	—
	1st	0.970 - 0.990 (0.0382 - 0.0390)	—
Piston ring thickness	1st	1.170 - 1.190 (0.0461 - 0.0469)	—
	2nd	—	—
Piston pin bore		20.002 - 20.008 (0.7875 - 0.7877)	20.030 (0.7886)
Piston pin O.D.		19.992 - 20.000 (0.7871 - 0.7874)	19.980 (0.7866)

CONROD + CRANKSHAFT

ITEM	STANDARD	LIMIT
Conrod small end I.D.	20.010 - 20.018 (0.7878 - 0.7881)	20.040 (0.7890)
Conrod big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	21.95 - 22.00 (0.864 - 0.866)	—
Crank pin width	22.10 - 22.15 (0.870 - 0.872)	—
Conrod big end oil clearance	0.024 - 0.042 (0.0009 - 0.0017)	0.080 (0.0031)
Crank pin O.D.	40.982 - 41.000 (1.6135 - 1.6142)	—
Crankshaft journal oil clearance	0.020 - 0.050 (0.0008 - 0.0020)	0.080 (0.0031)
Crankshaft journal O.D.	47.965 - 47.980 (1.8884 - 1.8890)	—
Crankshaft thrust bearing thickness	1.925 - 2.175 (0.0758 - 0.0856)	—
Crankshaft thrust clearance	0.05 - 0.10 (0.002 - 0.004)	—
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 350 kPa (3.5 kgf/cm ² , 50 psi) Below 650 kPa (6.5 kgf/cm ² , 92 psi) at 3 000 r/min.	—

CLUTCH

ITEM	STANDARD	LIMIT
Clutch cable play	10 - 15 (0.4 - 0.6)	—
Clutch release screw	1/4 turn back	—
Drive plate thickness	No.1	2.92 - 3.08 (0.115 - 0.121)
	No.2	3.42 - 3.58 (0.135 - 0.141)
Drive plate claw width	15.9 - 16.0 (0.626 - 0.630)	15.1 (0.594)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	49.2 (1.94)	46.8 (1.84)

TRANSMISSION

ITEM	STANDARD	LIMIT
Primary reduction ratio	1.690 (71/42)	—
Secondary reduction ratio	1.133 (17/15)	—
Final reduction ratio	Low	3.090 (34/11)
	2nd	2.461 (32/13)
	3rd	1.631 (31/19)
	4th	1.227 (27/22)
	Top	1.000 (25/25)
Shift fork to groove clearance	No.1	0.10 - 0.30 (0.004 - 0.012)
	No.2	0.10 - 0.30 (0.004 - 0.012)
Shift fork groove width	No.1	5.50 - 5.60 (0.217 - 0.220)
	No.2	4.50 - 4.60 (0.177 - 0.181)
Shift fork thickness	No.1	5.30 - 5.40 (0.209 - 0.213)
	No.2	4.30 - 4.40 (0.169 - 0.173)

SHAFT DRIVE

ITEM	STANDARD	LIMIT
Secondary bevel gear backlash	0.05 - 0.32 (0.002 - 0.013)	—
Final bevel gear backlash	0.03 - 0.064 (0.001 - 0.025)	—
Damper spring free length	—	58.5 (2.30)

Unit: mm (in)

CARBURETOR

ITEM	SPECIFICATION	
	E-02, 19, 24	E-03, 28
Carburetor type	MIKUNI BDR34	←
Bore size	34 mm	←
I.D. No.	41F1	41F2
Idle r/min.	1 100 ± 100 r/min.	←
Fuel level	—	—
Float height	7.0 ± 0.5 mm (2.76 ± 0.02 in)	←
Main jet (M.J.)	#132.5	#132.5
Main air jet (M.A.J.)	φ 1.8	←
Jet needle (J.N.)	5E22-3	5E23
Needle jet (N.J.)	P-OM	P-DM
Throttle valve (Th.V.)	#95	←
Pilot jet (P.J.)	#27.5	#27.5
Pilot screw (P.S.)	PRE-SET (3.0 turns back)	PRE-SET
Throttle cable play	2 - 4 mm (0.08 ± 0.16 in)	←

THERMOSTAT + RADIATOR + FAN + ENGINE COOLANT

ITEM	STANDARD/SPECIFICATION	LIMIT
Thermostat valve opening temperature	Approximately 75 °C (167 °F)	—
Thermostat valve lift	Over 6 mm (0.24 in) at 90 °C (194 °F)	—
Engine coolant temp. switch operating temperature	OFF → ON ON → OFF	—
Radiator cap valve opening pressure	Approximately 120°C (248°F) Approximately 113°C (235.4°F) 95 - 125 kPa (0.95 - 1.25 kgf/cm ² , 13.5 - 17.8 psi)	—
Cooling fan thermostat operating temperature	OFF → ON ON → OFF	—
Engine coolant type	Use an antifreeze/coolant compatible with aluminum radiators, mixed with distilled water only, at the ratio of 50:50	—
Engine coolant capacity	1 500 ml (1.6 US qt, 1.3 imp qt)	—

ELECTRICAL

ITEM	SPECIFICATION	NOTE
Firing order	1-2	
Spark plug	Type NGK: DPR7EA-9 DENSO: X22EPR-U9	
	Gap 0.8 - 0.9 (0.031 - 0.035)	
Spark performance	Over 8 (0.3) at 1 atm.	
Ignition coil resistance	Primary 2 - 6 Ω	Terminal - Terminal
	Secondary 15 - 30 kΩ	Plug cap - Terminal
Ignition coil primary peak voltage	More than 200 V	#1 ⊕: W, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
Generator coil resistance	Pickup coil 160 - 300 Ω	G - Bl
	Charging coil 0.2 - 1.5 Ω	Y - Y
Pickup coil peak voltage	More than 1.5 V	⊕: Bl, ⊖: G
Generator no-load voltage (When engine cold)	More than 70 V (AC) at 5 000 r/min.	Y - Y
Regulated voltage	14.0 - 15.5 V at 5 000 r/min.	
Generator maximum output	375 W at 5 000 r/min.	
Starter relay resistance	3 - 7 Ω	
Battery	Type designation FTX12-BS	
	Capacity 12 V 36 kC (10Ah)/10HR	
Fuse size	Headlight HI LO	10 A
	Signal	10 A
	Ignition	15 A
	Meter	15 A
	Main	10 A
	Power source	30 A
		10 A

WATTAGE

ITEM	SPECIFICATION	
	E-03, 28, 33	E-24
Headlight	HI LO	←
Position/Parking light	60	←
Brake light/Tailight	55	←
Turn signal light	21/5	4
Speedometer light	21/5 (Front), 21 (Rear)	←
Water temp. meter light	LED	←
Turn signal indicator light	LED	←
High beam indicator light	LED	←
Neutral indicator light	LED	←
Oil pressure indicator light	LED	←

Unit: W

SUSPENSION

ITEM	STANDARD/SPECIFICATION	LIMIT
Front fork stroke	140 (5.51)	—
Front fork spring free length	551.7 (21.73)	540.6 (21.29)
Front fork oil level (without spring)	177 (6.96)	—
Front fork oil type	SUZUKI FORK OIL SS-08 or an equivalent fork oil	—
Front fork oil capacity (each leg)	412 ml (24.0 US oz, 25.0 Imp oz)	—
Front fork spring adjuster	(4)	—
Rear shock absorber spring adjuster	(4)	—
Rear wheel travel	105 (4.13)	—
Swingarm pivot shaft runout	—	0.3 (0.01)

TIRE

ITEM	STANDARD/SPECIFICATION	LIMIT
Cold inflation tire pressure (Solo riding)	Front	200 kPa (2.00 kgf/cm ² , 29 psi)
	Rear	250 kPa (2.50 kgf/cm ² , 36 psi)
Cold inflation tire pressure (Dual riding)	Front	200 kPa (2.00 kgf/cm ² , 29 psi)
	Rear	250 kPa (2.50 kgf/cm ² , 36 psi)
Tire size	Front	130/90-16 67H
	Rear	170/80-15 M/C 77H
Tire type	Front	IRC GS-23F
	Rear	IRC GS-23R
Tire tread depth	Front	—
	Rear	—

Unit: mm (in)

BRAKE + WHEEL

ITEM	STANDARD	LIMIT
Rear brake pedal free travel	20 - 30 (0.8 - 1.2)	—
Rear brake pedal height	75 - 85 (3.0 - 3.3)	—
Brake drum I.D.	—	180.7 (7.11)
Brake disc thickness	5.0 ± 0.2 (0.20 ± 0.01)	4.5 (0.18)
Brake disc runout	—	0.30 (0.012)
Master cylinder bore	12.700 - 12.743 (0.5000 - 0.5017)	—
Master cylinder piston diam.	12.657 - 12.684 (0.4983 - 0.4993)	—
Brake caliper cylinder bore	30.230 - 30.306 (1.1901 - 1.1931)	—
Brake caliper piston diam.	30.150 - 30.200 (1.1870 - 1.1889)	—
Wheel rim runout	—	2.0 (0.08)
Wheel axle runout	Radial	2.0 (0.08)
	Front	0.25 (0.010)
Wheel rim size	Rear	0.25 (0.010)
	Front	J16 x MT3.00
Rear	J15 M/C x MT4.00	

Unit: mm (in)

FUEL + OIL + COOLANT

ITEM	SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane or 91 octane ($\frac{R-2M}{2}$) or higher rated by the Research Method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.	E-03, 28, 33
Fuel tank including reserve	17.0 L (4.5/3.7 US/Imp gal)	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.
reserve (flicker)	1.5 L (0.4/0.3 US/Imp gal)	
Engine oil type	SAE 10W/40, API SF or SG	
Engine oil capacity	Change	3 000 ml
	Filter change	3 400 ml
	Overhaul	3 700 ml
Final bevel gear oil type	SAE 90 hypoid gear oil with GL-5 under API classification	
Final bevel gear oil capacity	200 - 220 ml (6.8/7.0 - 7.4/7.7 US/Imp oz)	
Brake fluid type	DOT 4	
Coolant capacity	1 500 ml (1.6/1.3 US/Imp qt)	