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## FOREWORD

The SUZUKI GS850G has been developed as a companion motorcycle to the GS750 and GS1000. It is packed with highly advanced design concepts including a maintenance-free shaft drive mechanism. Combined with precise control and easy handling, the GS850G provides excellent performance and outstanding riding comfort.

## IMPORTANT

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set standards for emission control, and also set specific servicing requirements. This manual contains all of the necessary information that is required to properly inspect and service the GS850G in accordance with the EPA regulations.

Primarily, the emission components which can effect the emission output of the GS850G consist of the carburetors and crankcase breather device. Emission control information is contained in the Fuel System chapter and the Emission Control chapter. We strongly suggest that the chapter on Emission Control be reviewed before any type of service work is performed.

Further information concerning the EPA emission regulations and U.S. Suzuki's emission control program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL.

**SUZUKI MOTOR CO., LTD.**

*Motorcycle Technical Service Department*

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**VIEW OF SUZUKI GS850G**



Right side



Left side

# GENERAL INFORMATION

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**BREAKING-IN PROCEDURE**

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

## 1. Keep to these break-in engine speed limits:

Initial 500 miles (800 km)	Below 4 000 r/min
Up to 1 000 miles (1 600 km)	Below 6 000 r/min
Over 1 000 miles (1 600 km)	Below 9 000 r/min

## 2. Upon reaching an odometer reading of 1 000 miles (1 600 km), you can subject the motorcycle to full throttle operation. However, do not exceed 9 000 r/min at any time.

Do not maintain a constant speed for a long period. Try to vary throttle position.

**ORIENTATION****CYLINDER IDENTIFICATION**

The four cylinders of this engine are identified as No. 1, No. 2, No. 3 and No. 4 cylinder, as counted from left to right (as viewed by the rider on the seat).

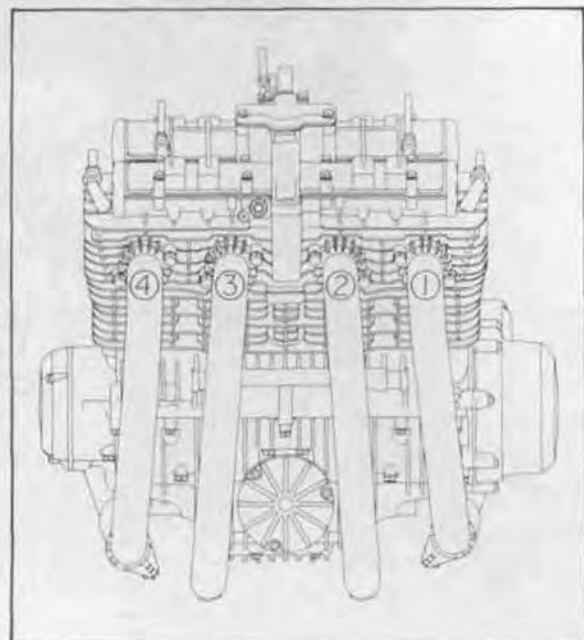


Fig. 1-3

**LOCATION OF PARTS**

- ① Tachometer
- ② Ignition switch
- ③ Choke knob
- ④ Front brake lever
- ⑤ Throttle grip
- ⑥ Rear brake pedal
- ⑦ Foot rests
- ⑧ Speedometer
- ⑨ Clutch lever
- ⑩ Fuel tank cap
- ⑪ Gear shift lever

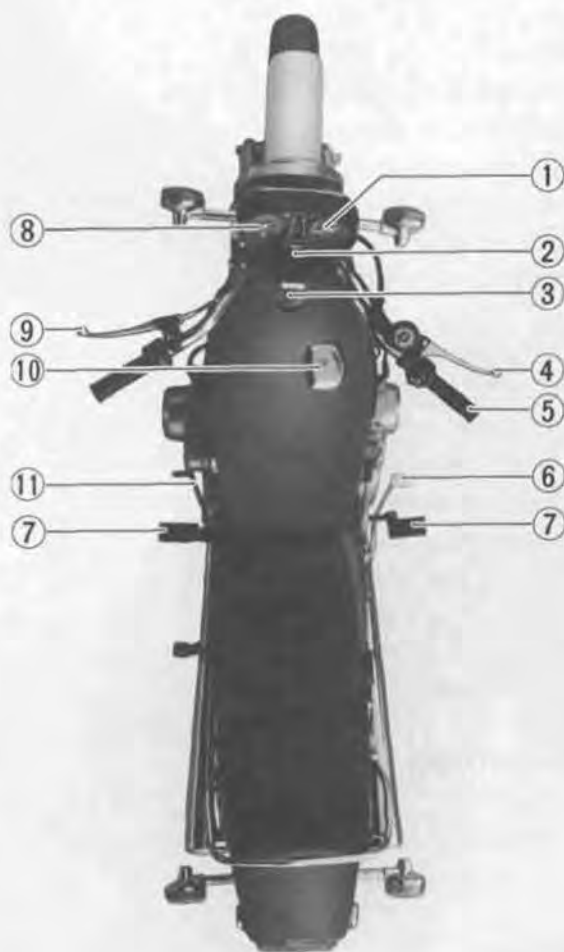


Fig. 1-4 Left → Right

## SERVICE SPECIFICATIONS

## DIMENSIONS AND WEIGHT

Overall length	2 230 mm (87.8 in)
Overall width	865 mm (34.1 in)
Overall height	1 190 mm (46.9 in)
Wheelbase	1 490 mm (58.7 in)
Ground clearance	160 mm ( 6.3 in)
Dry weight	253 kg (558 lbs)
Gross vehicle weight rating	455 kg (1 003 lbs)

## ENGINE

Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinders	4
Bore	69.0 mm (2.717 in)
Stroke	56.4 mm (2.220 in)
Piston displacement	843 cm <sup>3</sup> (51.4 cu.in)
Compression ratio	8.8 : 1
Carburetor	MIKUNI VM26SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric and kick
Lubrication system	Wet sump

## TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)

## SECONDARY DRIVE

Type	Shaft drive
Secondary reduction	1.062 (17/16)
Final reduction	3.090 (34/11)

## CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 00
Trail	113 mm (4.45 in)



Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H 19 4PR
Rear tire size	4.50H 17 4PR
Front tire pressure	1.75 kg/cm <sup>2</sup> (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm <sup>2</sup> (28 psi) (Normal solo riding)

**ELECTRICAL**

Ignition type	Battery ignition
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES
Spark plug gap	0.6—0.8 mm (0.024-0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/15A

**CAPACITIES**

Fuel tank including reserve	22 L (5.8 US gal)
Reserve fuel	4.2 L (1.1 US gal)
Engine oil	change filter change overhaul
Secondary bevel gear oil	2.8 L (3.0 US qt)
Final bevel gear oil	3.6 L (3.8 US qt)
Front fork air pressure	3.8 L (4.0 US qt)
Front fork oil	340—400 ml (11.5—13.5 US oz)
(At time of overhaul and replacement)	280—330 ml ( 9.5—11.2 US oz)
	0.6—1.2 kg/cm <sup>2</sup> (8.5—17 psi)
	251 ml (8.48 US oz) in each leg

\* Specifications subject to change without notice.

# SERVICE SPECIFICATIONS

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## SERVICE SPECIFICATIONS

## ENGINE TOP END

## VALVES + GUIDES

Unit: mm (in.)

Item		Standard	Limit
Valve lift	IN	8.0 (0.31)	—
	EX	7.5 (0.30)	—
Tappet clearance or valve clearance (cold engine)	IN/EX	0.03–0.08 (0.001–0.003)	
Valve Guide-Valve Stem Clearance	IN	0.025–0.055 (0.0009–0.0022)	0.35 (0.014)
	EX	0.040–0.070 (0.0016–0.0028)	0.35 (0.014)
Valve Guide I.D.	IN/EX	7.000–7.015 (0.2756–0.2762)	—
Valve Stem O.D.	IN	6.960–6.975 (0.2740–0.2746)	—
	EX	6.945–6.960 (0.2734–0.2740)	—
Valve Stem Runout (max.)	IN/EX	—	0.05 (0.002)
Valve Head Thickness (min.)	IN/EX	—	0.5 (0.02)
Valve Seat Width	IN/EX	1.0–1.2 (0.04–0.05)	
Valve Head Radial Runout	IN/EX	—	0.03 (0.001)
Valve Spring Free Length	INNER	35.3–37.0 (1.39–1.46)	33.9 (1.33)
	OUTER	43.0–43.25 (1.69–1.70)	41.3 (1.63)
Valve Spring Tension	INNER	29.3–34.0 kg/23 mm (64.59–74.96 lbs/0.91 in)	—
	OUTER	50.4–58.3 kg/27 mm (111.11–128.53 lbs/1.06 in)	—

## CAMSHAFT

Unit: mm (in.)

Item		Standard	Limit
Cam Height	IN	36.320–36.360 (1.4299–1.4315)	36.020 (1.4181)
	EX	35.770–35.810 (1.4083–1.4098)	35.470 (1.3965)
Camshaft-Journal Clearance	IN/EX	0.037–0.065 (0.0015–0.0026)	0.150 (0.0059)
Camshaft Journal Holder I.D.	IN/EX	22.012–22.025 (0.8666–0.8671)	—
Camshaft Journal O.D.	IN/EX	21.960–21.975 (0.8646–0.8652)	—
Camshaft Deflection	IN/EX	—	0.1 (0.004)
Cam Chain 20 Pitch Length		—	157.80 (6.213)

## PISTON + RING + CYLINDER

Unit: mm (in)

Item		Standard	Limit
Compression Pressure		9–12 kg/cm <sup>2</sup> (128–171 psi)	7 kg/cm <sup>2</sup> (100 psi)
Difference between Cylinders		—	2 kg/cm <sup>2</sup> (28 psi)
Piston-Cylinder Clearance		0.050–0.060 (0.0020–0.0024)	0.120 (0.0047)
Cylinder Bore		69.000–69.015 (2.7165–2.7171)	69.080 (2.7197)
Piston Dia./Measurement Point		68.945–68.960/15 (2.7144–2.7150/0.59)	68.880 (2.7118)
Cylinder Distortion		—	0.2 (0.008)
Cylinder Head Distortion		—	0.2 (0.008)
Piston Ring Free End Gap	1st	Approx. 9.0 (0.35)	7.2 (0.28)
	2nd	Approx. 9.5 (0.37)	7.6 (0.30)
Piston Ring End Gap	1st/2nd	0.1–0.3 (0.004–0.012)	0.7 (0.03)
Piston Ring–Groove Clearance	1st	0.020–0.055 (0.0008–0.0022)	0.18 (0.0071)
	2nd	0.020–0.060 (0.0008–0.0024)	0.15 (0.0059)
Piston Ring Groove Width	1st	1.21–1.23 (0.047–0.048)	—
	2nd	1.21–1.23 (0.047–0.048)	—
	Oil	2.51–2.53 (0.099–0.100)	—
Piston Ring Thickness	1st	1.175–1.190 (0.0463–0.0469)	—
	2nd	1.170–1.190 (0.0461–0.0469)	—
Piston Pin–Pin Bore Clearance		0.002–0.013 (0.0001–0.0005)	0.12 (0.0047)
Piston Pin Bore I.D.		16.002–16.008 (0.6300–0.6302)	—
Piston Pin O.D.		15.995–16.000 (0.6297–0.6300)	—



**ENGINE LOWER END****CRANKSHAFT**

Unit: mm (in)

Item	Standard	Limit
Connecting Small End Bore – Piston Pin Clearance	0.006–0.019 (0.0002–0.0007)	0.08 (0.0031)
Connecting Rod Small End Bore I.D.	16.006–16.014 (0.6302–0.6305)	—
Piston Pin O.D.	15.995–16.000 (0.6297–0.6300)	—
Connecting Rod Big End Side Clearance	0.10–0.55 (0.004–0.026)	1.0 (0.039)
Connecting Rod Big End Wear	—	0.08 (0.003)
Crankshaft Runout	—	0.05 (0.002)

**LUBRICATION SYSTEM****OIL PUMP**

Unit: mm (in)

Item	Standard	Limit
Oil Pressure (For 60°C)	Above 0.1 kg/cm <sup>2</sup> (1.4 psi), Below 0.5 kg/cm <sup>2</sup> (7.1 psi) at 3 000 r/min	
Tip Clearance	—	0.20 (0.008)
Outer Rotor Clearance	—	0.25 (0.010)
Side Clearance	—	0.15 (0.006)
Oil Pump Reduction Ratio	$87/49 \times 33/34 = 1.723$	

**CLUTCH**

Unit: mm (in)

Item	Standard	Limit
Drive Plate Thickness	2.7–2.9 (0.106–0.114)	2.4 (0.094)
Driven Plate Thickness	2.0 (0.08)	—
Driven Plate Distortion	—	0.1 (0.004)
Drive Plate Claw Width	11.8–12.0 (0.46–0.47)	11.0 (0.43)
Clutch Spring Free Length	40.4 (1.59)	38.8 (1.53)

**TRANSMISSION**

Unit: mm (in)

Item	Standard	Limit
Primary Reduction	1.775 (87/49)	
Secondary Reduction	1.062 (17/16)	
Final Reduction	3.090 (34/11)	
Gear Ratios	Low	2.500 (35/14)
	2nd	1.777 (32/18)
	3rd	1.380 (29/21)
	4th	1.125 (27/24)
	Top	0.961 (25/26)
Shift Fork—Groove Clearance	0.4–0.6 (0.016–0.024)	0.8 (0.031)
Shift Fork Groove Width	5.45–5.55 (0.215–0.219)	—
Shift Fork Thickness	4.95–5.05 (0.195–0.199)	—

**SHAFT DRIVE**

Unit: mm (in)

Item	Standard	Limit
Secondary Bevel Gear Backlash	0.08–0.13 (0.003–0.005)	—
Final Bevel Gear Backlash	0.03–0.64 (0.001–0.025)	—
Secondary Drive Bevel Gear Preload	3–5 kg·cm (2.60–4.35 lb·in)	
Secondary Driven Bevel Gear Preload	4–7 kg·cm (3.45–6.05 lb·in)	
Final Drive Bevel Gear Preload	4–8 kg·cm (3.45–6.95 lb·in)	

**CARBURETOR**

Unit: mm (in)

Item	Specification
Idle R/MIN	950-1 150 r/min
Carburetor Type	MIKUNI VM26SS
I.D. Number	45100
Bore Size	26 (1.0)
Float Height	23-25 (0.91-0.98)
Fuel Level	3-5 (0.12-0.20)
Air Screw	PRE SET
Pilot Screw	PRE SET
Pilot Air Jet	1.2
Pilot Jet	#15
Cut Away	1.5
Jet Needle	5DL36-2
Needle Jet	0-4
Pilot Outlet	0.6
Main Jet	#102.5
By-pass	0.8

**ELECTRICAL**

Unit: mm (in)

Item	Standard	Limit
Ignition Timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min	
Firing Order	1, 2, 4, 3	
Spark Plug	NGK B8ES or NIPPON DENSO W24ES	
Spark Plug Gap	0.6-0.8 (0.024-0.031)	
Contact Point Gap	0.3-0.4 (0.012-0.016)	
Dwell Angle	180°	
Spark Performance	Over 8 mm (0.3 in) at 1 atm	
Condenser Capacity	0.16-0.20 $\mu$ F	
Ignition Coil Resistance (primary)	Approx. 4 $\Omega$	
Ignition Coil Resistance (secondary)	Approx. 15 k $\Omega$	
Battery Capacity	12 V 50.4 kC (14 Ah)/10 HR	
Specific Gravity	1.28 at 20°C (68°F)	
Regulated Voltage	14-15.5 V at 5 000 r/min	
Alternator No-Load Data	More than 75 V (AC) at 5 000 r/min	
Fuse Size	10/10/10/15A	
Starter Motor Brush Length	12-13 (0.47-0.51)	6 (0.24)

**BRAKE + WHEEL**

Unit: mm (in)

Item		Standard	Limit
Axle Runout	Front/Rear	—	0.25 (0.010)
Brake Disc Thickness	Front	5.9–6.1 (0.23–0.24)	5.5 (0.22)
	Rear	6.5–6.9 (0.26–0.27)	6.0 (0.24)
Brake Disc Runout	Front/rear	—	0.30 (0.012)
Master Cylinder Bore Dia.	Front	15.87 (0.625)	—
	Rear	14.00 (0.551)	—
Master Cylinder Piston Dia.	Front	15.80 (0.622)	—
	Rear	13.96 (0.550)	—
Brake Caliper Cylinder Bore	Front	42.85 (1.687)	—
	Rear	38.18 (1.503)	—
Brake Caliper Piston Dia.	Front	42.82 (1.686)	—
	Rear	38.15 (1.502)	—
Wheel Rim Runout (Radial & Axial)		—	2.0 (0.08)
Tire Size	Front	3.50H19 4PR	
	Rear	4.50H17 4PR	
Tire Tread Depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

**TIRE PRESSURE**

COLD INFLATION TIRE PRESSURE	FRONT						REAR					
	SOLO RIDING			DUAL RIDING			SOLO RIDING			DUAL RIDING		
	kPa	kg/cm <sup>2</sup>	P.S.I.	kPa	kg/cm <sup>2</sup>	P.S.I.	kPa	kg/cm <sup>2</sup>	P.S.I.	kPa	kg/cm <sup>2</sup>	P.S.I.
NORMAL RIDING	175	1.75	25	175	1.75	25	200	2.00	28	225	2.25	32
CONTINUOUS HIGH SPEED RIDING	200	2.00	28	200	2.00	28	225	2.25	32	280	2.80	40

**SUSPENSION**

Unit: mm (in)

Item	Standard	Limit
Front Fork Stroke	160 (6.3)	
Rear Wheel Travel	100 (3.9)	
Front Fork Spring Free Length	421 (16.6)	416 (16.4)
Front Fork Oil Level	140 (5.5)	



**FUEL AND OIL CAPACITY**

Item	Specification
Fuel Tank Including Reserve	22 L (5.8 US gal)
Fuel Tank Reserve	4.2 L (1.1 US gal)
Engine Oil (Change)	2.8 L (3.0 US qt)
(Filter change)	3.6 L (3.8 US qt)
(Overhaul)	3.8 L (4.0 US qt)
Front Fork Oil (Each Leg)	251 ml (8.48 US oz)
Front Fork Air Pressure	0.6–1.2 kg/cm <sup>2</sup> (8.5–17 psi)
Fuel Type	Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ( $\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method.
Engine Oil Type	SAE 10 W/40
Front Fork Oil Type	SAE 10 W/20
Secondary Bevel Gear Oil	340–400 ml (11.5–13.5 US oz)
Final Bevel Gear Oil	280–330 ml (9.5–11.2 US oz)
Bevel Gear Oil Type	Hypoid Gear oil SAE 90, API grade GL-5

\* These specifications subject to change without notice.

# TORQUE TABLE

## ENGINE

	Thread dia.	kg-m	lb-ft
Camshaft holder bolt	6	1.0	7.5
Cylinder head bolt	6	0.9	6.5
Cylinder head nut	10	3.7	27.0
Cylinder head cover bolt	6	0.9	6.5
Crankcase bolt	6	1.0	7.5
Crankcase bolt	8	2.0	14.5
Starter motor bolt	6	0.6-0.9	4.5-6.5
Oil pan nut	6	0.6-0.9	4.5-6.5
Engine mounting bolt	10	3.5	25.5
Engine mounting bolt	12	3.5	25.5
Starter clutch bolt	8	1.5-2.0	11.0-14.5
Cam chain guide No. 2 bolt	6	0.4-0.7	3.0-5.0
Cam chain idler bolt	6	0.6-1.0	4.5-7.5
Air cleaner bolt	6	0.4-0.7	3.0-5.0
Exhaust pipe bolt	8	0.9-1.4	6.5-10.0
Muffler bolt	10	1.8-2.8	13.0-20.0
Oil pressure switch housing bolt	6	0.6-0.9	4.5-6.5
Clutch spring bolt	6	1.1-1.3	8.0-9.5
Clutch sleeve hub nut	24	5.0-7.0	36.0-50.5
Clutch release arm bolt	6	0.6-1.0	4.5-7.5
Gear shifting cam stopper spring holder bolt	14	1.8-2.8	13.0-20.0
Gear shift lever bolt	8	1.3-2.3	9.5-16.5
Generator rotor bolt	12	9.0-10.0	65.0-72.5
Secondary drive gear nut	32	12.0-15.0	87.0-108.5
Secondary drive gear housing bolt	8	2.0-2.6	14.5-19.0
Secondary driven gear nut	14	9.0-11.0	65.0-79.5
Secondary driven gear housing bolt	8	2.0-2.6	14.5-19.0

## CHASSIS

	Thread dia.	kg-m	lb-ft
Handle holder bolt	8	1.2-2.0	8.5-14.5
Front fork upper bracket rear bolt	8	1.5-2.5	11.0-18.0
Front fork tube upper pinch bolt (R, L)	10	2.0-3.0	14.5-21.5
Front fork tube lower pinch bolt (R, L)	8	1.5-2.5	11.0-18.0
Steering stem head nut	18	3.5-5.0	25.5-36.0
Front axle shaft nut	12	3.6-5.2	26.0-37.5
Front axle holder nut	8	1.5-2.5	11.0-18.0
Swinging arm pivot shaft bolt	24	0.35-0.45	2.5-3.5
Swinging arm pivot shaft nut	24	11.0-13.0	79.5-94.0
Rear torque link nut	10	2.0-3.0	14.5-21.5
Rear axle nut	16	8.5-11.5	61.5-83.0
Rear shock absorber nut	10	2.0-3.0	14.5-21.5
Rear wheel driven joint nut	10	5.0-6.0	36.0-43.5
Front step bolt	10	2.7-4.3	19.5-31.0

	Thread dia.	kg-m	lb-ft
Front brake caliper mounting bolt	10	2.5-4.0	18.0-29.0
Front and rear brake disc plate bolt	8	1.5-2.5	11.0-18.0
Front brake caliper axle bolt	10	2.5-3.5	18.0-25.5
Front brake master cylinder mounting bolt	6	0.5-0.8	3.5-6.0
Front and rear brake hose union bolt	10	1.3-1.8	9.5-13.0
Front and rear brake oil bleeder bolt	8	0.6-0.9	4.5-6.5
Rear brake caliper mounting bolt	10	2.0-3.0	14.5-21.5
Rear brake caliper axle bolt	10	2.5-3.5	18.0-25.5
Rear brake master cylinder mounting bolt	8	1.5-2.5	11.0-18.0
Final drive gear housing nut	10	3.5-4.5	25.5-32.5
Final drive gear nut	14	9.0-11.0	65.0-79.5
Propeller shaft bolt	8	2.5-3.0	18.0-21.5
Final case oil filler plug	14	2.0-3.0	14.5-21.5
Final gear bearing case bolt	8	2.0-2.6	14.5-19.0
Final gear case shock mount stud bolt	16	9.0-11.0	65.0-79.5

## TIGHTENING TORQUE CHART

For other bolts and nuts not listed above, refer to this chart:

### TIGHTENING TORQUE

Thread diameter A (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1 - 2	0.1 - 0.2	0.7 - 1.5	1.5 - 3	0.15 - 0.3	1.0 - 2.0
5	2 - 4	0.2 - 0.4	1.5 - 3.0	3 - 6	0.3 - 0.6	2.0 - 4.5
6	4 - 7	0.4 - 0.7	3.0 - 5.0	8 - 12	0.8 - 1.2	6.0 - 8.5
8	10 - 16	1.0 - 1.6	7.0 - 11.5	18 - 28	1.8 - 2.8	13.0 - 20.0
10	22 - 35	2.2 - 3.5	16.0 - 25.5	40 - 60	4.0 - 6.0	29.0 - 43.5
12	35 - 55	3.5 - 5.5	25.5 - 40.0	70 - 100	7.0 - 10.0	50.5 - 72.5
14	50 - 80	5.0 - 8.0	36.0 - 58.0	110 - 160	11.0 - 16.0	79.5 - 115.5
16	80 - 130	8.0 - 13.0	58.0 - 94.0	170 - 250	17.0 - 25.0	123.0 - 181.0
18	130 - 190	13.0 - 19.0	94.0 - 137.5	200 - 280	20.0 - 28.0	144.5 - 202.5

