YAMAHA

XS400H
XS400SH

Supplementary

Service Manual

H/

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XS400H/XS400SH.
For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manuals:

XS360C Service Manual (LIT-11616-00-49)
XS400F/XS400-2F Supplementary Service Manual (LIT-11616-01-19)
XS400G/XS400SG Supplementary Service Manual (LIT-11616-01-87)

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD.

NOTE:
This Supplementary Service Manual contains information regarding periodic maintenance to the emissions control system for the XS400H/XS400SH. Please read this material carefully.

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for use and/or unsafe.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the motorcycle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his motorcycle and to conform with federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

INDEX

This manual has been combined with previous service manuals to provide complete service information for: **XS400H/SH.**

Please read and give special consideration to the "NOTICE" on the preceding page for your safety.

XS400H/SH SUPPLEMENT H/

XS360C SERVICE MANUAL

Particularly important information is distinguished in this manual by the following notations:

NOTE: A NOTE provides key information to make procedures easier or clearer.

CAUTION: A CAUTION indicates special procedure that must be followed to avoid damage to the motorcycle.

WARNING: A WARNING indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

Starting Serial Number

XS400H	4R5-000101



XS400SH	4R4-000101



MAINTENANCE AND LUBRICATION CHART

Periodic maintenance emission control system

No.	ITEM	REMARKS	INITIAL BREAK-IN		THEREAFTER EVERY	
			1,000 km or 1 month (600 mi)	5,000 km or 7 months (3,000 mi)	4,000 km or 6 months (2,500 mi)	8,000 km or 12 months (5,000 mi)
1.*	Valve Clearance	Check and adjust valve clearance when engine is cold.	○	○		○
2.	Spark Plugs	Check condition. Adjust gap. Clean. Replace after initial 13,000 km (8,000 mi).		○	○	Replace every 12,000 km or 18 months (7,500 mi)
3.*	Crankcase Ventilation System	Check ventilation hose for cracks or damage. Replace if necessary.		○		○
4.*	Fuel Hose	Check fuel hose for cracks or damage. Replace if necessary.		○		○
5.*	Exhaust System	Check for leakage. Retighten as necessary. Replace gasket(s) if necessary.		○	○	
6.*	Carburetor Synchronization	Adjust synchronization of carburetors.		○	○	
7.*	Idle Speed	Check and adjust engine idle speed. Adjust cable free play if necessary.		○	○	

* It is recommended that these items be inspected and serviced by a Yamaha Dealer or other qualified mechanic.

General maintenance/lubrication

No.	ITEM	REMARKS	TYPE	INITIAL BREAK-IN		THEREAFTER EVERY		
				1,000 km or 1 month (600 mi)	5,000 km or 7 months (3,000 mi)	4,000 km or 6 months (2,500 mi)	8,000 km or 12 months (5,000 mi)	16,000 km or 24 months (10,000 mi)
1.	Engine Oil	Warm up engine before draining.	Refer to NOTE	○	○	○		
2.	Oil Filter	Replace.	–	□	□		□	
3.*	Air Filter	Dry type filter. Clean with compressed air.	–		○		□	
4.*	Brake system	Adjust free play. Replace pads (disc brake) or shoes (drum brake) if necessary.	–	□	□	□		
5.*	Clutch	Adjust free play.	–	○	□	□		
6.	Drive Chain	Check chain condition. Adjust and lubricate chain thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	CHECK CHAIN TENSION AND LUBE EVERY 500 km (300 mi).				
7.	Control and Meter Cable	Apply cable lube thoroughly.	Yamaha chain and cable lube or 10W/30 motor oil	○	□	○		
8.	Rear Arm Pivot Shaft	Apply cable lube lightly.	Lithium soap base grease		□		○	

No.	ITEM	REMARKS	TYPE	INITIAL BREAK-IN		THEREAFTER EVERY		
				1,000 km or 1 month (600 mi)	5,000 km or 7 months (3,000 mi)	4,000 km or 6 months (2,500 mi)	8,000 km or 12 months (5,000 mi)	16,000 km or 24 months (10,000 mi)
9.	Stand Shaft Pivots/ Brake Pedal Shaft/ Change Pedal Shaft/Kick Crank Boss	Apply cable lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil.		○	○		
10.*	Front Fork Oil	Drain completely. Refill to specification.	Yamaha fork oil 20wt or equivalent					○
11.*	Steering Bearings	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi)	Medium weight wheel bearing grease.		○	○		Repack
12.*	Wheel Bearings	Check bearings for smooth rotation.	–		○	○		
13.	Battery	Check specific gravity. Check breather pipe for proper operation.	–		○	○		
14.	Brake/ Clutch Lever Pivot Shafts	Apply cable lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		

* It is recommended that these items be inspected and serviced by a Yamaha dealer or other qualified mechanic.

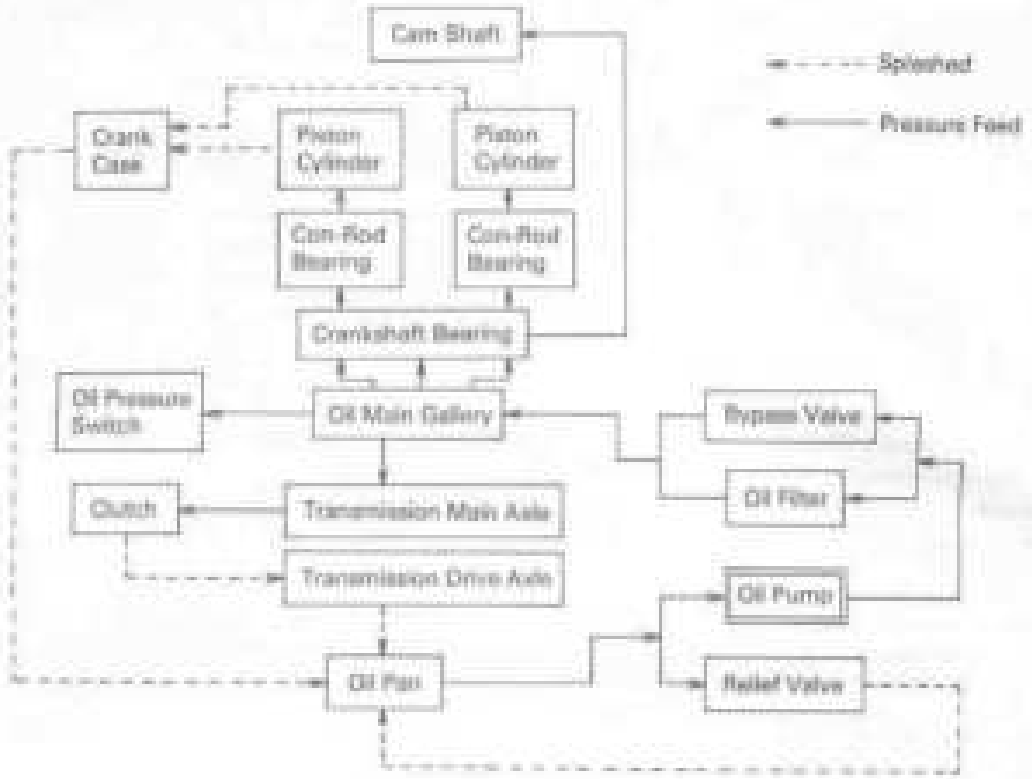
NOTE:

Engine oil type:

a. If temperature does not go below 5°C (41°F): YAMALUBE 4-cycle oil or SAE 20W/40 type "SE" motor oil.

b. If temperature does not go above 15°C (59°F): SAE 10W/30 type "SE" motor oil

LUBRICATION CHART



2. Carburetion

Manufacturer	MIKUNI BS34	Fuel level	3 ± 1 mm (0.12 ± 0.004 in)
Model I.D. No.	3P8-00	Pilot screw	Preset
Main jet	#135	Air jet, Main	#45
Needle jet	Y-2	Air jet, Pilot	#155
Pilot jet	#42.5	Float valve seat	ø2.0
Starter jet	#35	Engine idle speed	1,200 r/min
Jet needle	5D29		

*: Total weight of accessories, etc. excepting motorcycle
**: XS400SH only
***: XS400SH only

3. Chassis

Wheels and tires:		
Rim run-out: vertical	2.0 mm (0.079 in)	
horizontal	2.0 mm (0.079 in)	
Tire pressure (cold):	Front	Rear
Up to 90 kg (198 lb) load*	1.8 kg/cm² (26 psi)	2.0 kg/cm² (28 psi)
90 kg (198 lb) – 159 kg (351 lb) load*	2.0 kg/cm² (28 psi)	2.3 kg/cm² (32 psi)
High speed riding	2.0 kg/cm² (28 psi)	2.3 kg/cm² (32 psi)
Minimum tire tread depth	0.8 mm (0.03 in)	0.8 mm (0.03 in)

NEW SERVICE

***ENGINE**

A. FUEL LEVEL

The carburetor is furnished with a drain screw to provide easy access to service work. Thus, the following "Fuel level measurement" should be added.

Fuel level measurement

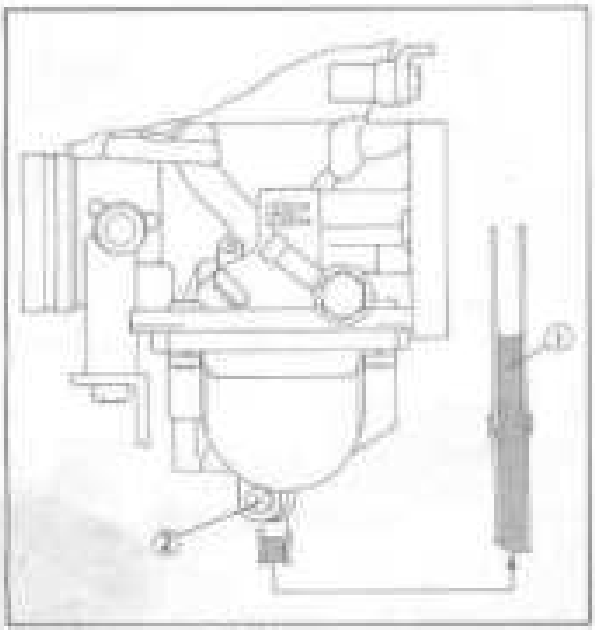
NOTE:

Before checking the fuel level, note the following:

1. Place the motorcycle on a level surface.
2. Adjust the motorcycle position by placing a suitable stand or a garage jack under the engine so that the carburetor is positioned vertically.

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1. Connect the level gauge (special tool) or a vinyl pipe of 6 mm (0.24 in) in inside diameter to the float bowl nozzle left or right side carburetor.
2. Set the gauge as shown and loosen the drain screw.



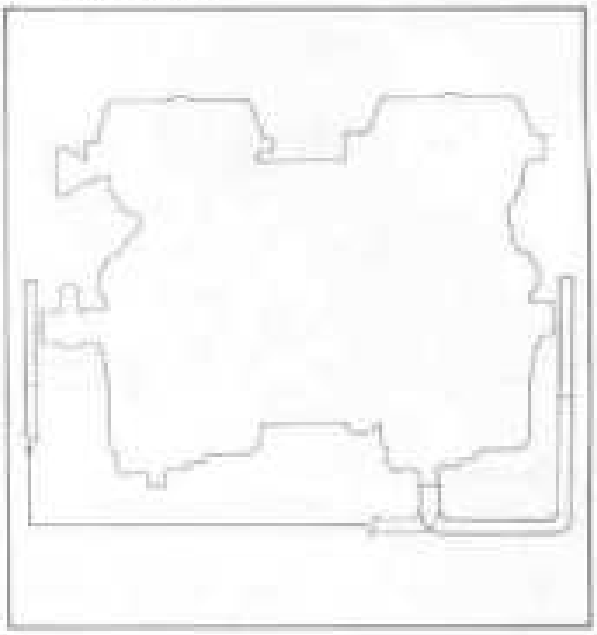
1. Level gauge 2. Drain screw

3. Start the engine and stop it after a few minutes of run. This procedure is necessary to obtain the correct fuel level.

NOTE:

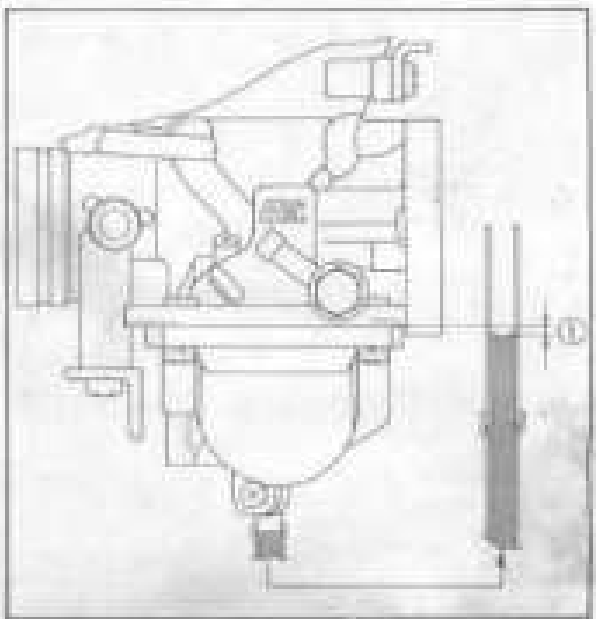
Make sure the fuel petcock is "ON" or "RES" position.

4. Note the fuel level and bring the gauge to the other end of the carburetor line and repeat step 3. Note the fuel level again compare it with the previous gauge reading. They should be equal. If not, place a suitable size of wooden piece or the like under the center stand and adjust.

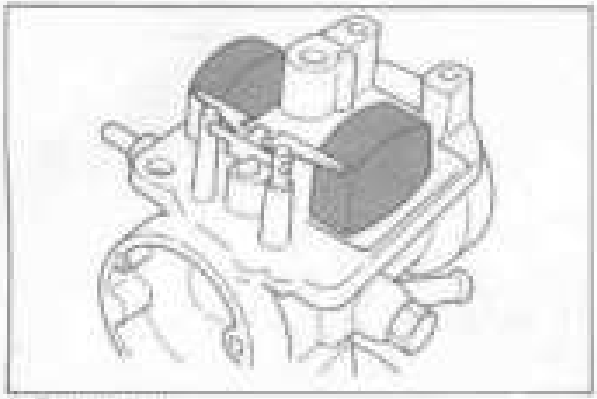


5. Check the fuel level one by one. The level should be in the specified range.

Fuel level:
3 ± 1 mm (0.12 ± 0.04 in) below from the carburetor mixing chamber body edge.



6. If the fuel level is incorrect, remove the carburetor assembly from the motorcycle and check the fuel valve (s) and float assembly (s) for damage.
7. If no damage is found, correct the fuel level by slightly bending the float arm tang. Recheck the fuel level.



1. Float arm tang

*CHASSIS

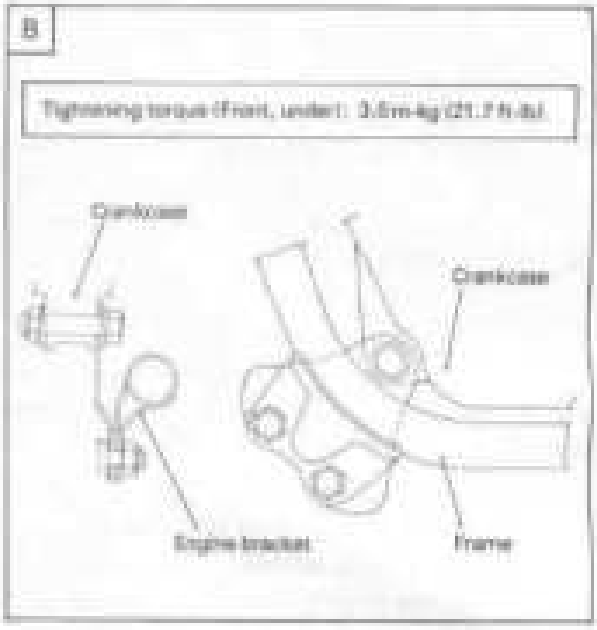
A. METHOD OF MOUNTING THE ENGINE

The method of mounting the engine assembly is changed from a rigid to an elastic type. Thus, the tightening torque should be changed accordingly as follows.

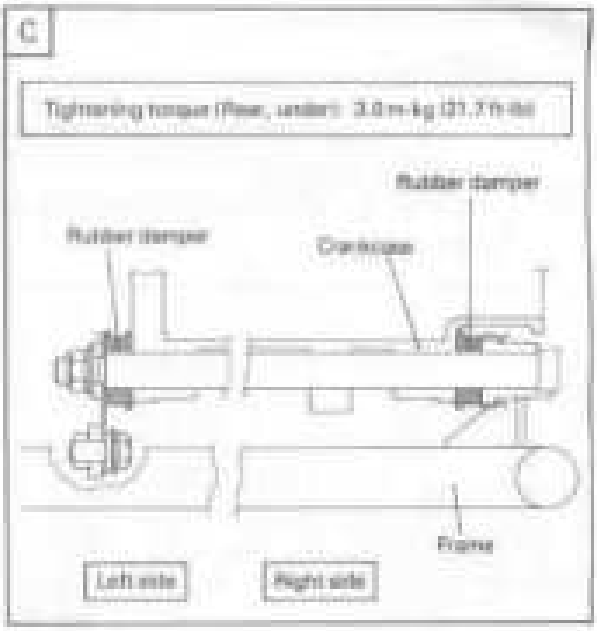


A — Tightening torque (Upper):
1.8 m-kg (13.0 ft-lb)

B



C

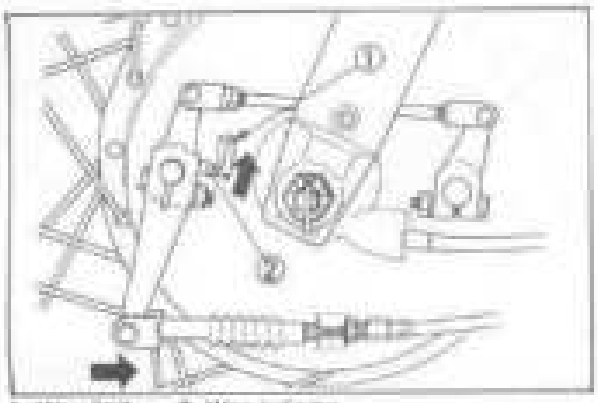


B. BRAKE LINING

The brake lining indicator is modified for easier maintenance. Thus, the following "Brake lining inspection" should be changed.

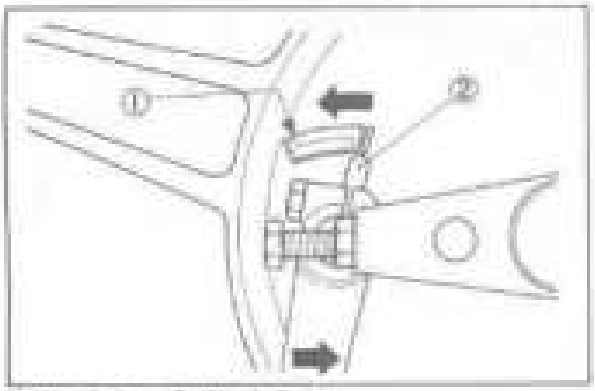
Brake lining inspection

1. Front brake lining (For XS400H)
   To check, see the wear indicator position while pulling the brake lever. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

2. Rear brake lining (For XS400H/XS400SH)
To check, see the wear indicator position while depressing the brake pedal. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

ELECTRICAL

A. STARTING CIRCUIT CUT-OFF SYSTEM

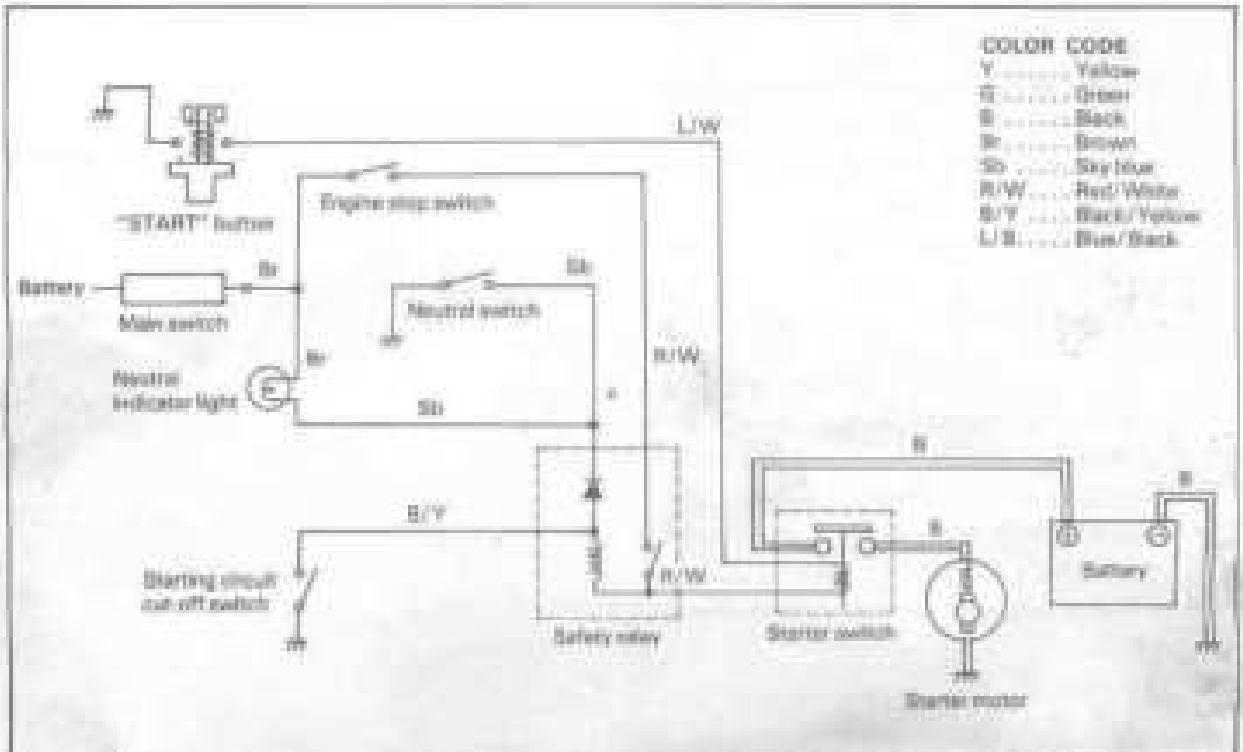
The starting circuit cut-off system is employed. Hence, the following description.

Description

This model is equipped with a starting circuit cut-off switch. The starter motor is so designed that it can be started only when the transmission is in Neutral or the clutch is disengaged.
Accordingly, the starter motor will not start when the transmission is shifted into any position other than neutral, unless the clutch lever is pulled in.

Function of the Diode in the Relay

When the transmission is in a position other than Neutral:
Turning on the clutch lever switch (Clutch is disengaged by pulling the clutch lever) makes the safety relay to turn on.
In this case, the diode interrupts the flow of current from the main switch to the neutral indicator light and to the relay, and thus the light will not come on.



Operation

1. When the transmission is in Neutral:

Neutral switch	ON
Clutch lever switch	OFF or ON

- ○ When the main switch is turned on while the transmission is in neutral the starting circuit cut-off relay circuit is closed and the relay is actuated.
- ○ When the "START" button is pressed, the circuit from the main switch to the relay — starter switch assembly — "START" (button) is closed, and the starter switch assembly is turned on, thus causing the starter motor to start.

2. When the clutch lever is released while the transmission is in position other than neutral:

Neutral switch	OFF
Clutch lever switch	OFF

- ○ Since the starting circuit cut-off is kept open, the relay is not actuated, and it is impossible to turn on the starter switch assembly by pushing the "START" button.
  As a result, the starter motor does not run.

3. When the clutch lever is disengaged by pulling in the clutch lever while the transmission is in a position other than neutral:

Neutral switch	OFF
Clutch lever switch	ON

- ○ Since the clutch lever switch is on while the neutral switch is off, the following circuit — main switch — starting circuit cut-off relay — clutch lever switch is closed and the relay is actuated.
  The subsequent operation is the same as 3.

STOPPING DISTANCE

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

FULL OPERATIONAL SERVICE BRAKE

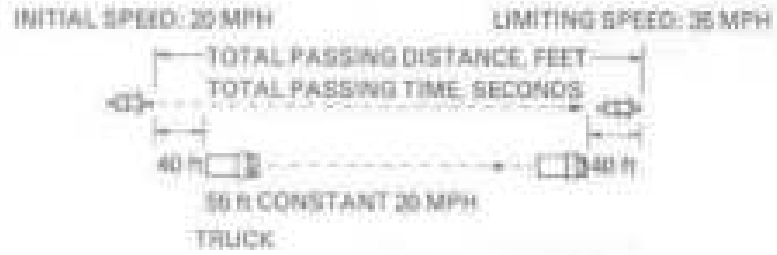
("Partial failure" information is not applicable and is not included)



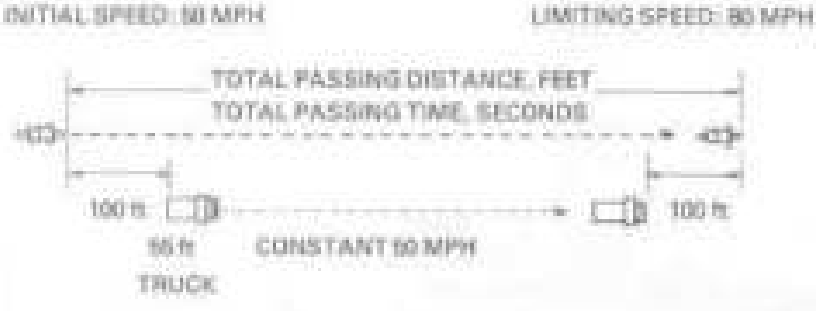
ACCELERATION AND PASSING ABILITY

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below. The low-speed pass assumes an initial speed of 20 mph. and a limiting speed of 35 mph. This high-speed pass assumes an initial speed of 50 mph. and a limiting speed of 80 mph.

LOW-SPEED PASS



HIGH-SPEED PASS



SUMMARY

Low-speed pass . . . . . 353.0 feet: 7.2 seconds (XS400H/XS400SH)

High-speed pass . . . . . 1,053.6 feet: 10.6 seconds (XS400H/XS400SH)

SPECIFICATIONS

General Specifications

	XS400SH	XS400H
Basic color	BLACK RED or CARDINAL RED	NEW CATALINE BLUE
Dimensions:		
Overall length	2,070 mm (81.5 in)	←
Overall width	870 mm (34.3 in)	860 mm (33.9 in)
Overall height	1,140 mm (44.9 in)	1,105 mm (43.5 in)
Seat height	770 mm (30.3 in)	←
Wheelbase	1,375 mm (54.1 in)	←
Minimum ground clearance	135 mm (5.3 in)	←
Caster (steering head angle)	27°30'	←
Trail	87 mm (3.43 in)	←
Weight:		
Net	170 kg (375 lb)	167 kg (368 lb)
Engine:		
Type	4 stroke air-cooled, gasoline	←
Bore × stroke × cylinders	69 × 52.4 mm × 2 (2.717 × 2.063 in × 2)	←
Displacement	391 cc (23.86 cu. in)	←
Compression ratio	9.3 : 1	←
Lubrication:		
Lubrication system	Pressure lubricated, wet sump	←
Delivery pump type	Trochoid	←
Carburetion:		
Manufacturer	MIKUNI	←
Type	BS34, constant velocity	←
Air filter:	Dry type element	←
Ignition:		
Type	Battery ignition (Full transistor ignition)	←
Spark plug	BP7ES (NGK) or N-7Y (CHAMPION)	←
Charging:		
Type	Three-phase, regulated alternator	←
Manufacturer, I.D. No.	ND 021000-728	←
Maximum output	14.5V, 12A	←
Battery type	12N12A-4A	←
Battery dimensions	134 × 160 × 80 mm (5.28 × 6.30 × 3.15 in)	←
Rectifier	DF3804-1 or D510TEY-L full wave	←
Regulator	026000-3280 IC type	←
Regulating voltage (No. load)	14.0 – 14.7 V	←
Starting:	Electric and kick starter	←
Primary drive:		
Type	Gear	←
Teeth, ratio	78/24 (3.250)	←
Clutch:	Wet, multiple disc	←
Transmission:		
Type	Constant mesh, 6-speed, drum	←

		XS400SH	XS400H
Teeth, ratio 1st		35/14 (2.500)	←
2nd		32/18 (1.777)	←
3rd		29/21 (1.380)	←
4th		27/24 (1.125)	←
5th		25/26 (0.961)	←
6th		26/30 (0.866)	←
Secondary drive:			
Type		Chain DID 50DS-102L	←
Teeth, ratio		37/16 (2.312)	←
Chassis:			
Frame		Tubular steel, semi-double cradle	←
Suspension:	Front	Telescopic fork	←
	Rear	Swing arm	←
Tires:	Front	3.00S 18-4PR (Tubeless)	3.00S 18-4PR
	Rear	120/90-18 63S (Tubeless)	120/90-18 63S
Brakes:	Front	Hydraulic disc	Drum brake
	Rear	Drum brake	←
Fuel tank:	Total	14.0 lit (3.67 US. gal)	←
	Reserve	3.3 lit (0.87 US. gal)	←
Wheels:	Front	Cast wheel	Spoke wheel
	Rear	Cast wheel	Spoke wheel

Maintenance Specifications

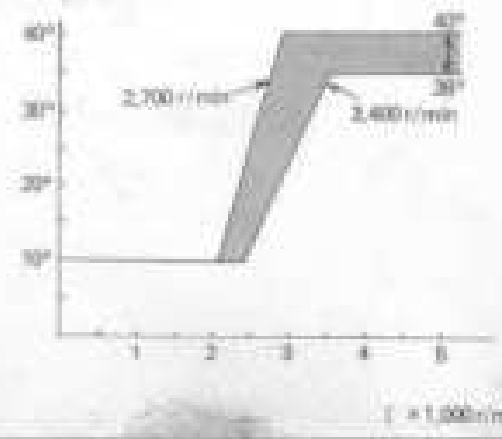
1. Engine

Engine oil capacity:	
Dry	2.6 lit (2.7 US. qt)
Oil and filter change	2.3 lit (2.4 US. qt)
Oil change	2.0 lit (2.1 US. qt)
Recommended lubricant:	
If temperature does not go below 5°C (40°F)	YAMALUBE 4-cycle oil or SAE 20W/40 SE motor oil
If temperature does not go above 15°C (60°F)	SAE 10W/30 SE motor oil
Cranking pressure (at sea level)	11 kg/cm² (156 psi)
Maximum difference between cylinders	1 kg/cm² (14 psi)

Spark plug: Type Electrode gap	 BP7ES (NGK) or N-7Y (CHAMPION) 0.7 ~ 0.8 mm (0.028 ~ 0.032 in)
Spark plug cap resistance:	10kΩ
Pick-up coil: Resistance	 760Ω ± 20% at 20°C (68°F)
Ignition coil type: Spark gap Primary resistance Secondary resistance	HITACHI CM11-54 8 mm (0.24 in) or more at 500 r/min (10 kV/ 100 r/min, 15 kV/ 9,500 r/min) 3.0Ω ± 10% at 20°C (68°F) 8.6kΩ ± 20% at 20°C (68°F)
Starter motor type: Armature coil resistance Field coil resistance Brush length: standard minimum Brush spring pressure Armature mica undercut	MITSUBA SM-223B 0.005Ω at 20°C (68°F) 0.011Ω at 20°C (68°F) 11.0 mm (0.433 in) 6.0 mm (0.236 in) 550 ± 55g (19.40 ± 1.94 oz) 0.7 mm (0.028 in)
Battery type: Charging rate	GS 12N12A-4A 1.2 Amps for 10 Hours
Generator type: Output Field (inner) coil resistance Stator (outer) coil resistance	ND 021000-7781 14.5V 12A at 5,000 r/min 4.0Ω ± 10% at 20°C (68°F) 0.72Ω ± 10% at 20°C (68°F)
Regulator type: Regulated voltage	ND 038000-3280 14.35 ± 0.35V
Starter relay switch: Cut-in voltage Winding resistance	HITACHI A104-70 6.5V 3.5Ω at 20°C (68°F)
Lighting system: Headlight Tail/brake light Flasher light Licence light Pilot lights Flasher High beam Neutral Oil pressure Meter light	 12V, 50W/35W 12V, 8W (3CP)/27W (32CP) × 3 12V, 27W (32CP) × 4 12V, 3.8W × 2 12V, 3.4W × 1 12V, 3.4W × 1 12V, 3.4W × 1 12V, 3.4W × 1 12V, 3.4W × 2

Brakes:	
Front brake ***:	
Type	Hydraulic disc type
Disc size (Outside dia. × thickness)	267 × 5.0 mm (10.51 × 0.20 in)
Disc wear limit	4.5 mm (0.18 in)
Pad wear limit	0.5 mm (0.20 in)
Master cylinder inside dia.	14.00 mm (0.551 in)
Caliper cylinder inside dia.	42.85 mm (1.687 in)
Brake fluid type/quantity	DOT #3 Brake fluid/24 cc (0.81 oz)
Front brake **:	
Type	Drum brake (Two leading)
Actuating method	Wire
Brake drum I.D.	160 mm (7.09 in)
Brake shoe dia. × width	160 × 30 mm (7.09 × 1.18 in)
Lining thickness/wear limit	4 mm/2 mm (0.16 in/0.08 in)
Shoe spring free length	68 mm (2.68 in)
Rear brake:	
Type	Drum brake (Leading trailing)
Actuating method	Link rod
Brake drum I.D.	160 mm (6.30 in)
Brake shoe dia. × width	160 × 30 mm (6.30 × 1.18 in)
Lining thickness/wear limit	4 mm/2 mm (0.16 in/0.08 in)
Shoe spring free length	68 mm (2.68 in)
Front forks:	
Travel	140 mm (5.51 in)
Spring free length	502 mm (19.76 in)
Spring preload length	472 mm (18.58 in)
Spring rate: 0 – 100 mm (0 – 3.94 in)	0.4 kg/mm (22.4 lb/in)
100 – 140 mm (3.94 – 5.51 in)	0.575 kg/mm (32.2 lb/in)
Fork oil capacity (each side)	142 cc (4.80 oz)
Oil type	Yamaha Fork Oil 20 Wt or equivalent
Rear shock absorbers:	
Spring free length	216 mm (8.50 in)
Spring preload length	204 mm (8.03 in)
Spring rate: 0 – 55 mm (0 – 2.17 in)	1.7 kg/mm (95.2 lb/in)
55 – 80 mm (2.17 – 3.15 in)	2.10 kg/mm (117.6 lb/in)
Travel	100 mm (3.94 in)

4. Electrical

Ignition timing retarded:	10° at 1,200 r/min
Ignition timing advance:	

Valve:







INTAKE

Clearance (Cold engine)	0.10 mm (0.0039 in)
"A" head diameter	36.5 ± 0.1 mm (1.398 ± 0.0039 in)
"B" face width	2.3 mm (0.091 in)
"C" seat width	1.0 ± 0.1 mm (0.039 ± 0.0039 in)
"D" margin thickness (minimum)	1.0 ± 0.2 mm (0.039 ± 0.0079 in)
Stem diameter (O.D.)	7 $^{-0.022}_{-0.037}$ mm (0.276 $^{-0.0009}_{-0.0015}$ in)
Guide diameter (I.D.)	7 $^{+0.015}_{0}$ mm (0.276 $^{+0.0006}_{0}$ in)
Stem-to-guide clearance	0.015 – 0.037 mm (0.0006 – 0.0015 in)

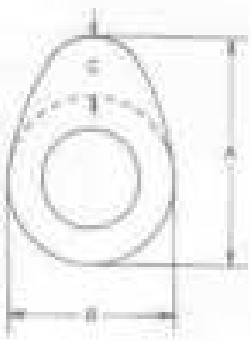
EXHAUST

Clearance (Cold engine)	0.18 mm (0.007 in)
"A" head diameter	30.0 ± 0.1 mm (1.18 ± 0.004 in)
"B" face width	2.3 mm (0.91 in)
"C" seat width	1 ± 0.1 mm (0.039 ± 0.004 in)
"D" margin thickness (minimum)	1 ± 0.2 mm (0.039 ± 0.008 in)
Stem diameter (O.D.)	7 $^{-0.030}_{-0.045}$ mm (0.276 $^{-0.001}_{-0.0018}$ in)
Guide diameter (I.D.)	7 $^{+0.015}_{0}$ mm (0.276 $^{+0.0006}_{0}$ in)
Stem-to-guide clearance	0.030 – 0.060 mm (0.0012 – 0.0022 in)

Cylinder and piston:	
Cylinder material	Aluminum alloy
Cylinder liner	Pressed in; special cast iron
Bore size: standard	69.00 mm (2.717 in)
wear limit	70.10 mm (2.760 in)
Cylinder taper limit	0.05 mm (0.0020 in)
Cylinder out-of-round limit	0.01 mm (0.0004 in)
Piston clearance: standard	0.030 – 0.050 mm (0.0012 – 0.0020 in)
maximum	0.1 mm (0.0039 in)
Piston weight (include rings, pin and clips)	186.1 g (6.56 oz)

Piston rings:	Top	2nd	Oil
Design			
End gap (installed): standard	0.2 – 0.4 mm (0.0078 – 0.016 in)	0.2 – 0.4 mm (0.0078 – 0.016 in)	0.2 – 0.9 mm (0.0078 – 0.035 in)
limit	1.0 mm (0.0394 in)	1.0 mm (0.0394 in)	1.5 mm (0.0591 in)
Side clearance: standard	0.04 – 0.08 mm (0.0016 – 0.0031 in)	0.03 – 0.07 mm (0.0012 – 0.0028 in)	—
limit	0.18 mm (0.0059 in)	0.18 mm (0.0059 in)	—
Crankshaft:			
Crank journal/bearing oil clearance	0.020 – 0.044 mm (0.0008 – 0.0017 in)		
Main journal run-out (maximum)	0.030 mm (0.0012 in)		
Connection rods:			
Rod bearing oil clearance	0.021 – 0.045 mm (0.0008 – 0.0018 in)		
Oil pump:			
Housing-to-outer rotor clearance	0.10 – 0.18 mm (0.0039 – 0.0071 in)		
Outer rotor-to-inner rotor clearance	0.03 – 0.09 mm (0.0012 – 0.0035 in)		
Clutch:			
Friction plate thickness: standard	3.0 mm (0.12 in)		
minimum	2.8 mm (0.11 in)		
Clutch plate: thickness	1.6 mm (0.06 in)		
warp limit	0.05 mm (0.0020 in)		
Clutch spring length: standard	34.6 mm (1.362 in)		
minimum	32.6 mm (1.323 in)		
Spring rate	2.8 kg/mm (146 lb/in)		
Clutch lever free play (at lever pivot point)	2 – 3 mm (0.08 – 0.12 in)		
Transmission shaft run-out (maximum)	0.08 mm (0.0031 in)		
Oil pump:			
Type	Trochoid pump		
Housing inside diameter	40.86 – 40.71 mm (1.6083 – 1.6028 in)		
Housing depth	12.03 – 12.07 mm (0.4736 – 0.4752 in)		
Rotor diameter	40.53 – 40.56 mm (1.597 – 1.5968 in)		
Rotor thickness	11.98 – 12.00 mm (0.4717 – 0.4724 in)		
Rotor and housing clearance	0.10 – 0.18 mm (0.0039 – 0.0071 in)		
Side clearance	0.03 – 0.09 mm (0.0012 – 0.0035 in)		
Tip clearance	0.03 – 0.09 mm (0.0012 – 0.0035 in)		
Bypass valve opening pressure	1.0 kg/cm² (14.2 lb/in²)		
Oil filter type	Paper type		

Camshafts:

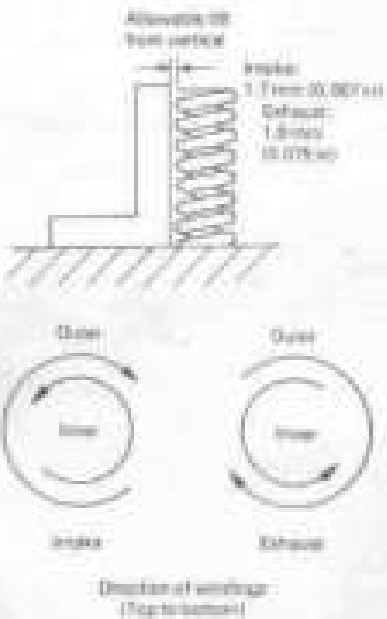


Dimensions		Standard size	Wear limit
Intake	A	35.93 ± 0.06 mm (1.508 ± 0.002 in)	35.39 mm (1.393 in)
	B	32.37 ± 0.05 mm (1.270 ± 0.002 in)	32.12 mm (1.265 in)
	C	7.52 mm (0.296 in)	—
Exhaust	A	36.57 ± 0.09 mm (1.998 ± 0.002 in)	36.42 mm (1.662 in)
	B	32.12 ± 0.05 mm (1.265 ± 0.002 in)	31.87 mm (1.255 in)
	C	7.57 mm (0.298 in)	—

Camshaft bearing surface diameter	22.967 – 22.980 mm (0.9042 – 0.9047 in)
Camshaft-to-cap clearance:	
Standard	0.020 – 0.054 mm (0.0008 – 0.0021 in)
Maximum	0.180 mm (0.006 in)
Camshaft run-out limit	0.1 mm (0.004 in)
Valve timing:	
Intake: Open	BTDC 30°
Close	ABDC 70°
Duration	280°
Exhaust: Open	BBDC 70°
Close	ATDC 30°
Duration	280°
Valve overlap	60°

Rocker arm and rocker shaft:	
Rocker arm bearing dia. (I.D.)	13.000 – 13.018 mm (0.5118 – 0.5125 in)
Rocker arm shaft dia. (O.D.)	12.985 – 12.991 mm (0.5112 – 0.5115 in)
Clearance	0.009 – 0.033 mm (0.00035 – 0.00130 in)

Valve spring:

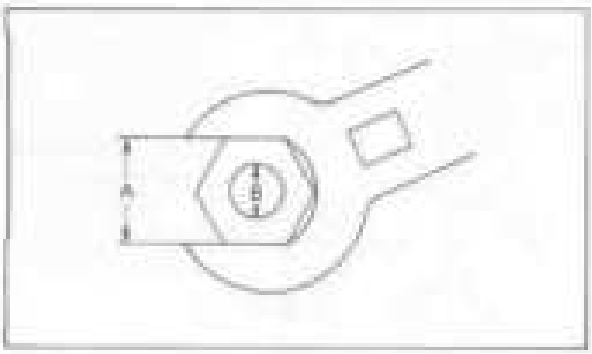


	Inner Intake/Exhaust	Outer Intake/Exhaust
Free length	39.3 mm (1.547 in)	42.8 mm (1.685 in)
Spring rate	K_1 = 1.97 kg/mm (109 lb/in) K_2 = 2.47 kg/mm (138 lb/in)	K_1 = 4.18 kg/mm (230 lb/in) K_2 = 5.48 kg/mm (307 lb/in)
Installed length (valve closed)	33.0 mm (1.299 in)	37.0 mm (1.457 in)
Installed pressure (valve closed)	52.1 ± 1.3 kg (90.7 ± 2.9 lb)	39.4 ± 1.7 kg (103.8 ± 3.7 lb)
Compressed length (valve open)	26.0 mm (0.984 in)	29.0 mm (1.142 in)
Wire diameter	3.6 mm (0.118 in)	4.4 mm (0.173 in)
Number of windings	7.75	6.25
Winding O.D.	22.4 mm (0.882 in)	32.5 mm (1.280 in)

Valve stem run-out maximum	0.03 mm (0.0012 in)
Valve seat width standard/maximum	1.1 mm (0.043 in)/2.0 mm (0.080 in)

General Torque Specifications

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.



A (Nut)	B (Bolt)	General torque specifications	
		m-kg	ft-lb
10 mm	6 mm	0.6	4.5
12 mm	8 mm	1.5	11
14 mm	10 mm	3.0	22
17 mm	12 mm	5.5	40
19 mm	14 mm	8.5	61
22 mm	16 mm	13.0	94

Torque Specifications

	Tightening torque		Remarks
	m-kg	ft-lb	
Engine:			
Cylinder head cover and cylinder head 8 mm bolt	2.2	15.9	
6 mm bolt	1.0	7.2	
Cylinder head 10 mm nut	3.3	23.9	Apply oil
6 mm bolt	1.0	7.2	
Cylinder head cover (Tappet cover) 32 mm	1.2	8.7	
Spark plug	2.0	14.5	
Tappet adjusting screw lock nut 6 mm nut	1.4	10.1	
Cam sprocket 7 mm bolt	2.0	14.5	
Connecting rod 8 mm nut	3.6	26.0	Apply molybdenum disulfide grease
Generator (rotor) 10 mm bolt	3.3	23.9	
Starter clutch 8 mm bolt	3.0	21.7	Use LOCTITE
Reluctor 6 mm bolt	1.0	7.2	
Drain plug (engine oil)	3.8	27.5	
Oil filter	1.5	10.8	Apply oil
Strainer cover 5 mm bolt	0.7	5.1	
Oil pressure switch	1.8	13.0	Use LOCTITE
Crankcase 8 mm bolt	2.2	16.0	
Crankcase 6 mm bolt	1.0	7.2	
Clutch spring screw 6 mm bolt	1.0	7.2	
Primary drive gear 10 mm bolt	4.8	34.7	
Change pedal 8 mm bolt	1.0	7.3	
Neutral switch	2.0	14.5	
Exhaust pipe 8 mm nut	2.2	16.0	
Chassis:			
Engine mounting Front, under 10 mm bolt/nut	3.0	21.7	
Engine mounting Rear, under 10 mm bolt/nut	3.0	21.7	
Engine mounting Upper 8 mm bolt/nut	1.8	13.0	
Engine mount stay Rear upper 8 mm bolt	1.8	13.0	
Engine mount stay Upper 8 mm bolt/nut	1.8	13.0	
Handle crown and steering shaft 14 mm bolt	5.4	39.1	
Handle crown and inner tube 8 mm bolt/nut	1.1	8.0	
Handle crown and handle holder 10 mm nut	2.3	16.6	
Under bracket and inner tube 10 mm bolt	3.5	25.3	
Rear shock absorber and frame 10 mm bolt	3.0	21.7	
Rear shock absorber and rear arm 10 mm nut	3.0	21.7	
Front wheel axle 14 mm nut	10.7	77.4	
Front fork and axle holder 8 mm nut	2.0	14.5	
Pivot shaft 14 mm nut	6.5	47.0	
Rear wheel axle 14 mm nut	10.7	77.4	
Sprocket wheel 12 mm nut	4.5	32.5	
Torsion bar and brake plate 8 mm bolt/nut	1.4	10.1	
Torsion bar and rear arm 8 mm bolt/nut	1.4	10.1	
Brake cam lever and cam shaft 6 mm bolt	1.0	7.2	
Brake disc and hub (Front) 8 mm bolt (XS400SH only)	2.0	14.5	Use lock plate
Caliper and brake hose (XS400SH only)	2.6	18.8	
Caliper and bleed screw (XS400SH only)	0.6	4.3	
Master cylinder and brake hose (XS400SH only)	2.6	18.8	
Caliper and caliper bracket 8 mm bolt (XS400SH only)	2.5	18.1	Use LOCTITE
Handlebar upper holder 8 mm bolt	1.8	13.0	
Rear stay (Grab bar) and rear shock absorber 10 mm nut	3.0	21.7	
Rear stay (Grab bar) and frame 8 mm bolt	2.3	16.6	

CONVERSION TABLES

	METRIC TO INCH SYSTEM		
	KNOWN	MULTIPLIER	RESULT
TORQUE	m-kg	7.229	ft-lb
	m-kg	86.80	in-lb
	cm-kg	0.0723	ft-lb
	cm-kg	0.8680	in-lb
WT.	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/lt	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./ CAPACITY	cc (cm^3)	0.03382	oz (US liq)
	cc (cm^3)	0.06102	cu. in
	lt (liter)	2.1134	pt (US liq)
	lt (liter)	1.057	qt (US liq)
	lt (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade(°C)	9/5(°C)+32	Fahrenheit(°F)

	INCH TO METRIC SYSTEM		
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft-lb	0.13826	m-kg
	in-lb	0.01152	m-kg
	ft-lb	13.831	cm-kg
	in-lb	1.1521	cm-kg
WT.	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/lt
	mph	1.609	km/hr
	mi	1.609	km
	ft	0.3048	m
	yd	0.9141	m
	in	2.54	cm
	in	25.4	mm
VOL./ CAPACITY	oz (US liq)	29.57	cc (cm^3)
	cu. in	16.387	cc (cm^3)
	pt (US liq)	0.4732	lt (liter)
	qt (US liq)	0.9461	lt (liter)
	gal (US liq)	3.785	lt (liter)
MISC.	lb/in	0.017855	kg/mm
	psi (lb/in^2)	0.07031	kg/cm^2
	Fahrenheit(°C)	5/9(°F−32)	Centigrade(°F)

DEFINITION OF TERMS:

m-kg	=	Meter-kilogram(s) (usually torque)
g	=	Gram(s)
kg	=	Kilogram(s) (1,000 grams)
lt	=	Liter(s)
km/lt	=	Kilometer(s) per liter (fuel consumption)
cc	=	Cubic centimeter(s) (cm^3) (volume or capacity)
kg/mm	=	Kilogram(s) per millimeter (usually spring compression rate)
kg/cm^2	=	Kilogram(s) per square centimeter (pressure)

CONSUMER INFORMATION

Notice

The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

YAMAHA MOTOR CO.,LTD.
IWATA JAPAN