

# DF40A/50A/60A (110001 and later)

## FOREWORD

This SUPPLEMENTARY SERVICE MANUAL is a supplement to SUZUKI DF60A SERVICE MANUAL. It has been prepared exclusively for the following models.

**Applicable model and effective serial No.:**

**DF40AT/QH (04003F-110001 and Later)**

**DF40AST (04004F-110001 and Later)**

**DF50AT/TH (05003F-110001 and Later)**

**DF60AT/TH/QH (06002F-110001 and Later)**

This supplementary service manual describes only service information which differ from that of the main manual. Therefore, whenever servicing the above applicable model, consult this supplementary service manual first. And for any section, item or description not found in this manual, refer to the main manual below.

**Main Manual:**

Manual Name	Manual No.
DF60A SERVICE MANUAL	99500-88L00-01E

*Other information considered as generally known is not included.*

*Read the GENERAL INFORMATION section to familiarize yourself with the outboard motor and its maintenance.*

*Use this section as well as other sections to use as a guide for proper inspection and service.*

*This manual will help you to know the outboard motor better so that you can assure your customers of fast and reliable service.*

*\* This manual has been prepared using the latest information available at the time of publication. Differences may exist between the content of this manual and the actual outboard motor.*

*\* Illustrations in this manual are used to show the basic principles of operation and work procedures and may not represent the actual outboard motor in exact detail.*

*\* This manual is intended for use by technicians who already possess the basic knowledge and skills to service SUZUKI Outboard motors.*

*Persons without such knowledge and skills should not attempt to service Suzuki Outboard engines by relying on this manual only and should contact an authorized SUZUKI Outboard motor dealer.*

**SUZUKI MOTOR CORPORATION**

# IMPORTANT NOTICE

## WARNING / CAUTION / NOTICE / NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol and the words **⚠ WARNING**, **⚠ CAUTION**, **NOTICE** and **NOTE** have special meanings.

Pay special attention to the messages highlighted by these signal words.

### **⚠ WARNING**

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Indicates a potential hazard that could result in death or serious injury.

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### **⚠ CAUTION**

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Indicates a potential hazard that could result in minor or moderate injury.

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### **NOTICE**

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Indicates a potential hazard that could result in damage to the motor or boat.

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### **NOTE**

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Indicates special information to make maintenance easier or instructions clearer.

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Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the outboard motor. In addition to the **⚠ WARNING**, **⚠ CAUTION**, and **NOTICE** stated, you must also use good judgment and observe basic mechanical safety principles.

### **⚠ WARNING**

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This service manual is intended for authorized Suzuki outboard motor dealers and qualified service technicians only.

Apprentice mechanics or do-it-yourself mechanics that don't have the proper tools and equipment may not be able to properly perform the services described in this manual. Improper repair may result in injury to the mechanic and may render the engine unsafe for the boat operator and passengers.

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Section 0

General Information

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# General Information

## Specifications

### Specifications (DF40A/50A)

CENBJ6110107004

#### NOTE

These specifications are subject to change without notice.

#### Model Pre-fix

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
PRE-FIX		04003F		05003F	

#### Dimensions and Weight

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Overall length (front to back)	mm (in.)	699 (27.5)	819 (32.2)	699 (27.5)	819 (32.2)
Overall width (side to side)	mm (in.)	377 (14.8)			
Overall height	S mm (in.)	1 266 (49.8)	—	1 266 (49.8)	—
	L mm (in.)	1 387 (54.6)			
	X mm (in.)	—			
Weight (without engine oil)	S kg (lbs)	102 (225)	—	102 (225)	—
	L kg (lbs)	104 (229)	106 (234)	104 (229)	108 (238)
	X kg (lbs)	—			
Transom height	S mm (in. type)	401 (15)	—	401 (15)	—
	L mm (in. type)	522 (20)			
	X mm (in. type)	—			

#### Performance

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Maximum output	kW (PS)	29.4 (40)		36.8 (50)	
Recommended operating range	r/min	5 000 – 6 000		5 300 – 6 300	
Idle speed	r/min	800 ± 50 (in-gear: Approx. 800)			

#### Powerhead

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Engine type		4-stroke DOHC			
Number of cylinders		3			
Bore	mm (in.)	72.5 (2.85)			
Stroke	mm (in.)	76.0 (2.99)			
Total displacement	cm <sup>3</sup> (cu. in)	941 (57.4)			
Compression ratio	: 1	9.7			
Spark plug	NGK	DCPR6E			
Ignition system		Full-transistorized ignition			
Fuel supply system		Multi-point sequential electronic fuel injection			
Exhaust system		Through prop exhaust			
Cooling system		Water cooled			
Lubrication system		Wet sump by trochoid pump			
Starting system		Electric			
Throttle control		Remote control	Twist grip	Remote control	Twist grip

**Fuel and Oil**

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Fuel		Suzuki highly recommends the use of alcohol-free unleaded gasoline with a minimum pump octane rating of 87 (R/2+M/2 method) or 91 (Research method). However, blends of unleaded gasoline and alcohol with equivalent octane content may be used.			
Engine oil		<ul style="list-style-type: none"> <li>API classification: SG, SH, SJ, SL, SM or NMMA FC-W classification: SG, SH, SJ, SL, SM</li> <li>Viscosity rating: SAE 10W-40 or NMMA FC-W 10W-40</li> </ul>			
Engine oil amounts	L (US/Imp. qt)	2.7 (2.9 / 2.4): Oil change only 2.9 (3.0 / 2.6): Oil filter change			
Gear oil		SUZUKI Outboard Motor Gear Oil or SAE 90 hypoid gear oil, API classification GL-5.			
Gearcase oil capacity	ml (US/Imp. oz)	610 (20.6/21.5)			

**Bracket**

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Trim and Tilt system		DF40AT/50AT/TH: PTT System DF40AQH: Manual Trim and Gas Assisted Tilt System			
Trim angle	degree	0 – 19 (–6 to 13)	0 – 20 (–6 to 14)	0 – 19 (–6 to 13)	0 – 20 (–6 to 14)
Number of trim position		PTT system	5	PTT system	
Maximum tilt angle	degree	73 (–6 to 67)	72 (–6 to 66)	73 (–6 to 67)	72 (–6 to 66)

**Lower unit**

Item	Unit	Data			
		DF40AT	DF40AQH	DF50AT	DF50ATH
Reversing system		Gear			
Transmission		Forward-Neutral-Reverse			
Reduction system		Bevel gear			
Gear ratio		11 : 25 (2.28)			
Drive line impact protection		Spline drive rubber hub			
Propeller shaft rotation (when shift into forward)		Clockwise			
Propeller		Blade x Dia. (in.) x Pitch (in.)			
		3 x 11 and 1/2 x 9			
		3 x 11 and 1/2 x 10			
		3 x 11 and 1/2 x 11			
		3 x 11 and 5/8 x 12			
		3 x 11 and 1/2 x 13			
		3 x 11 and 3/8 x 14			
		3 x 11 and 1/4 x 15			
		3 x 11 and 1/8 x 16			

## Specifications (DF40AS/DF60A)

CENBJ6110107005

## NOTE

These specifications are subject to change without notice.

## Model Pre-fix

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
PRE-FIX		04004F		06002F	

## Dimensions and Weight

Item		Unit	Data			
			DF40AST	DF60AT	DF60ATH	DF60AQH
Overall length (front to back)		mm (in.)	699 (27.5)		819 (32.2)	
Overall width (side to side)		mm (in.)	377 (14.8)			
Overall height	S	mm (in.)	1 266 (49.8)		—	
	L	mm (in.)	1 387 (54.6)			
	X	mm (in.)	—	1 514 (59.6)		
Weight (without engine oil)	S	kg (lbs)	102 (225)		—	
	L	kg (lbs)	104 (229)		108 (238)	106 (234)
	X	kg (lbs)	—	107 (236)	111 (243)	109 (240)
Transom height	S	mm (in. type)	403 (15)		—	
	L	mm (in. type)	524 (20)			
	X	mm (in. type)	—	651 (25)		

## Performance

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
Maximum output	kW (PS)	29.4 (40)	44.1 (60)		
Recommended operating range	r/min	5 300 – 6 300			
Idle speed	r/min	800 ± 50 (in-gear: Approx. 800)			

## Powerhead

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
Engine type		4-stroke DOHC			
Number of cylinders		3			
Bore	mm (in.)	72.5 (2.85)			
Stroke	mm (in.)	76.0 (2.99)			
Total displacement	cm <sup>3</sup> (cu. in)	941 (57.4)			
Compression ratio	: 1	9.7			
Spark plug	NGK	DCPR6E			
Ignition system		Full-transistorized ignition			
Fuel supply system		Multi-point sequential electronic fuel injection			
Exhaust system		Through prop exhaust			
Cooling system		Water cooled			
Lubrication system		Wet sump by trochoid pump			
Starting system		Electric			
Throttle control		Remote control		Twist grip	



**Fuel and Oil**

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
Fuel		Suzuki highly recommends the use of alcohol-free unleaded gasoline with a minimum pump octane rating of 87 (R/2+M/2 method) or 91 (Research method). However, blends of unleaded gasoline and alcohol with equivalent octane content may be used.			
Engine oil		<ul style="list-style-type: none"> <li>API classification: SG, SH, SJ, SL, SM or NMMA FC-W classification: SG, SH, SJ, SL, SM</li> <li>Viscosity rating: SAE 10W-40 or NMMA FC-W 10W-40</li> </ul>			
Engine oil amounts	L (US/Imp. qt)	2.7 (2.9 / 2.4): Oil change only 2.9 (3.0 / 2.6): Oil filter change			
Gear oil		SUZUKI Outboard Motor Gear Oil or SAE 90 hypoid gear oil, API classification GL-5.			
Gearcase oil capacity	ml (US/Imp. oz)	610 (20.6/21.5)			

**Bracket**

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
Trim and Tilt system		PTT System			Manual Trim and Gas Assisted Tilt System
Trim angle	degree	0 – 22 (–6 to 16)			0 – 20 (–6 to 14)
Number of trim position		PTT system			5
Maximum tilt angle	degree	75 (–6 to 69)			72 (–6 to 66)

**Lower unit**

Item	Unit	Data			
		DF40AST	DF60AT	DF60ATH	DF60AQH
Reversing system		Gear			
Transmission		Forward-Neutral-Reverse			
Reduction system		Bevel gear			
Gear ratio		11 : 25 (2.28)			
Drive line impact protection		Spline drive rubber hub			
Propeller shaft rotation (when shift into forward)		Clockwise			
Propeller		Blade x Dia. (in.) x Pitch (in.)			
		3 x 11 and 1/2 x 9			
		3 x 11 and 1/2 x 10			
		3 x 11 and 1/2 x 11			
		3 x 11 and 5/8 x 12			
		3 x 11 and 1/2 x 13			
		3 x 11 and 3/8 x 14			
		3 x 11 and 1/4 x 15			
		3 x 11 and 1/8 x 16			

## Service Data (DF40A/50A/60A)

## NOTE

- These service data are subject to change without notice.
- The following data is applied to all version of each model of DF40A/50A/60A.

## Powerhead

Item	Unit	Data		
		DF40A	DF50A	DF60A
Recommended operating range	r/min	DF40A: 5 000 – 6 000 DF40AS/DF50A/DF60A: 5 300 – 6 300		
Idle speed	r/min	800 ± 50 (in-gear: Approx. 800)		
**Cylinder compression pressure	kPa (kgf/cm <sup>2</sup> , psi.)	1 200 – 1 800 (12 – 18, 171 – 256)		
**Cylinder compression pressure max. difference between cylinders	kPa (kgf/cm <sup>2</sup> , psi.)	100 (1.0, 14)		
**Engine oil pressure	kPa (kgf/cm <sup>2</sup> , psi.)	200 – 400 (2.0 – 4.0, 28 – 57) at 3 000 r/min (at normal operating temp.)		
Engine oil		<ul style="list-style-type: none"> <li>• API classification: SG, SH, SJ, SL, SM or NMMA FC-W classification: SG, SH, SJ, SL, SM</li> <li>• Viscosity rating: SAE 10W-40 or NMMA FC-W 10W-40</li> </ul>		
Engine oil amounts	L (US/lpm. qt)	2.7 (2.9 / 2.4): Oil change only 2.9 (3.0 / 2.6): Oil filter change		
Thermostat operating temperature	°C (°F)	58 – 62 (136 – 144)		

\*\*Figures shown are guidelines only, not absolute service limits.

## Cylinder Head / Camshaft

Item		Unit	Data		
			DF40A	DF50A	DF60A
Cylinder head distortion	Limit	mm (in.)	0.06 (0.002)		
Manifold seating faces distortion	Limit	mm (in.)	0.10 (0.004)		
Cam height	IN	std.	38.200 – 38.360 (1.5039 – 1.5102)		
		Limit	38.100 (1.5000)		
	EX	std.	37.740 – 37.900 (1.4858 – 1.4921)		
		Limit	37.640 (1.4819)		
Camshaft journal oil clearance	Top, 2nd, 3rd, 4th	std.	0.045 – 0.087 (0.0018 – 0.0034)		
		Limit	0.120 (0.0047)		
Camshaft journal (housing) inside diameter	Top, 2nd, 3rd, 4th	std.	23.000 – 23.021 (0.9055 – 0.9063)		
		Limit	—		
Camshaft journal outside diameter	Top, 2nd, 3rd, 4th	std.	22.934 – 22.955 (0.9029 – 0.9037)		
		Limit	—		
Camshaft runout	Limit	mm (in.)	0.10 (0.004)		
Cylinder head bore to tappet clearance	std.	mm (in.)	0.025 – 0.062 (0.0010 – 0.0024)		
	Limit	mm (in.)	0.150 (0.0059)		
Tappet outer diameter	std.	mm (in.)	26.959 – 26.975 (1.0614 – 1.0620)		
Cylinder head tappet bore	std.	mm (in.)	27.000 – 27.021 (1.0630 – 1.0638)		

## Valve / Valve Guide

Item			Unit	Data		
				DF40A	DF50A	DF60A
Valve diameter		IN	mm (in.)	26.6 (1.05)		
		EX	mm (in.)	21.5 (0.85)		
Tappet clearance (Cold engine condition)	IN	std.	mm (in.)	0.18 – 0.22 (0.007 – 0.009)		
	EX	std.	mm (in.)	0.28 – 0.32 (0.011 – 0.013)		
Valve seat angle	IN		—	30°, 45°		
	EX		—	15°, 45°		
Valve guide to valve stem clearance	IN	std.	mm (in.)	0.020 – 0.047 (0.0008 – 0.0019)		
		Limit	mm (in.)	0.070 (0.0028)		
	EX	std.	mm (in.)	0.045 – 0.072 (0.0018 – 0.0028)		
		Limit	mm (in.)	0.090 (0.0035)		
Valve guide inside diameter	IN, EX	std.	mm (in.)	5.500 – 5.512 (0.2165 – 0.2170)		
Valve guide protrusion	IN, EX	std.	mm (in.)	10.8 – 11.2 (0.43 – 0.44)		
Valve stem outside diameter	IN	std.	mm (in.)	5.465 – 5.480 (0.2152 – 0.2157)		
	EX	std.	mm (in.)	5.440 – 5.455 (0.2142 – 0.2148)		
Valve stem deflection	IN	Limit	mm (in.)	0.14 (0.006)		
	EX	Limit	mm (in.)	0.18 (0.007)		
Valve stem runout	IN, EX	Limit	mm (in.)	0.05 (0.002)		
Valve head radial runout	IN, EX	Limit	mm (in.)	0.08 (0.003)		
Valve head thickness	IN	std.	mm (in.)	1.0 (0.04)		
		Limit	mm (in.)	0.7 (0.03)		
	EX	std.	mm (in.)	1.15 (0.045)		
		Limit	mm (in.)	0.5 (0.02)		
Valve seat contact width	IN	std.	mm (in.)	1.1 – 1.3 (0.04 – 0.05)		
	EX	std.	mm (in.)	1.1 – 1.3 (0.04 – 0.05)		
Valve spring free length			std.	33.1 (1.30)		
			Limit	31.8 (1.25)		
Valve spring preload			std.	97 – 113 (9.7 – 11.3, 21.4 – 24.9) at 28.5 mm (1.12 in)		
			Limit	89 (8.9, 19.6) at 28.5 mm (1.12 in)		
Valve spring squareness			Limit	2.0 (0.08)		

## Cylinder / Piston / Piston Ring

Item			Unit	Data		
				DF40A	DF50A	DF60A
Cylinder distortion	Limit		mm (in.)	0.06 (0.002)		
Piston to cylinder clearance	std.		mm (in.)	0.020 – 0.040 (0.0008 – 0.0016)		
	Limit		mm (in.)	0.100 (0.0039)		
Cylinder bore	std.		mm (in.)	72.500 – 72.520 (2.8543 – 2.8551)		
Cylinder measuring position			mm (in.)	50 (1.969) from cylinder top surface		
Piston skirt diameter	std.		mm (in.)	72.470 – 72.490 (2.8531 – 2.8539)		
Piston measuring position			mm (in.)	8 (0.315) from piston skirt end		
Cylinder bore wear	Limit		mm (in.)	0.10 (0.0039)		
Piston ring end gap	1st	std.	mm (in.)	0.15 – 0.30 (0.0059 – 0.0118)		
		Limit	mm (in.)	0.70 (0.028)		
	2nd	std.	mm (in.)	0.30 – 0.45 (0.0118 – 0.0177)		
		Limit	mm (in.)	1.00 (0.039)		
Piston ring free end gap	1st	std.	mm (in.)	Approx 8.8 (0.3465)		
		Limit	mm (in.)	7.0 (0.2756)		
	2nd	std.	mm (in.)	Approx 10.0 (0.3937)		
		Limit	mm (in.)	8.0 (0.3150)		
Piston ring to groove clearance	1st	std.	mm (in.)	0.030 – 0.070 (0.0012 – 0.0028)		
		Limit	mm (in.)	0.12 (0.005)		
	2nd	std.	mm (in.)	0.020 – 0.060 (0.0008 – 0.0024)		
		Limit	mm (in.)	0.10 (0.004)		

**0A-7 General Information:**

Item			Unit	Data		
				DF40A	DF50A	DF60A
Piston ring groove width	1st	std.	mm (in.)	1.02 – 1.04 (0.040 – 0.041)		
	2nd	std.	mm (in.)	1.21 – 1.23 (0.048 – 0.048)		
	Oil	std.	mm (in.)	2.01 – 2.03 (0.079 – 0.080)		
Piston ring thickness	1st	std.	mm (in.)	0.97 – 0.99 (0.038 – 0.039)		
	2nd	std.	mm (in.)	1.17 – 1.19 (0.046 – 0.047)		
Pin clearance in piston pin hole		std.	mm (in.)	0.006 – 0.019 (0.0002 – 0.0007)		
		Limit	mm (in.)	0.05 (0.0019)		
Piston pin outside diameter		std.	mm (in.)	17.995 – 18.000 (0.7085 – 0.7087)		
		Limit	mm (in.)	17.980 (0.7079)		
Piston pin hole diameter		std.	mm (in.)	18.006 – 18.014 (0.7089 – 0.7092)		
		Limit	mm (in.)	18.030 (0.7098)		
Pin clearance in conrod small end		std.	mm (in.)	0.003 – 0.018 (0.0001 – 0.0007)		
		Limit	mm (in.)	0.050 (0.0020)		
Conrod small end bore		std.	mm (in.)	18.003 – 18.013 (0.7088 – 0.7092)		

**Crankshaft / Conrod**

Item			Unit	Data		
				DF40A	DF50A	DF60A
Conrod small end inside diameter		std.	mm (in.)	18.003 – 18.013 (0.7088 – 0.7092)		
Conrod big end oil clearance		std.	mm (in.)	0.031 – 0.049 (0.0012 – 0.0019)		
		Limit	mm (in.)	0.080 (0.0031)		
Conrod big end inside diameter		std.	mm (in.)	41.000 – 41.018 (1.6142 – 1.6149)		
Crank pin outside diameter		std.	mm (in.)	37.982 – 38.000 (1.4954 – 1.4961)		
Crank pin outside diameter difference (out-of-round and taper)		Limit	mm (in.)	0.010 (0.0004)		
Conrod bearing thickness		std.	mm (in.)	1.486 – 1.501 (0.0585 – 0.0591)		
Conrod big end side clearance		std.	mm (in.)	0.100 – 0.250 (0.0039 – 0.0098)		
		Limit	mm (in.)	0.350 (0.0138)		
Conrod big end width		std.	mm (in.)	19.950 – 20.000 (0.7854 – 0.7874)		
Crank pin width		std.	mm (in.)	20.100 – 20.200 (0.7913 – 0.7953)		
Crankshaft center journal runout		Limit	mm (in.)	0.04 (0.002)		
Crankshaft journal oil clearance		std.	mm (in.)	0.014 – 0.034 (0.0006 – 0.0013)		
		Limit	mm (in.)	0.056 (0.0022)		
Crankcase bearing holder inside diameter		std.	mm (in.)	49.000 – 49.018 (1.9291 – 1.9298)		
Crankshaft journal outside diameter		std.	mm (in.)	44.982 – 45.000 (1.7709 – 1.7717)		
Crankshaft journal outside diameter difference (out-of-round and taper)		Limit	mm (in.)	0.010 (0.0004)		
Crankshaft bearing thickness		std.	mm (in.)	1.999 – 2.015 (0.0787 – 0.0793)		
Crankshaft thrust play		std.	mm (in.)	0.11 – 0.31 (0.004 – 0.012)		
		Limit	mm (in.)	0.35 (0.014)		
Crankshaft thrust bearing thickness		std.	mm (in.)	—		

**Electrical**

Item		Unit	Data		
			DF40A	DF50A	DF60A
Ignition timing		Degrees at r/min	BTDC 2 – 22		BTDC 2 – 25
Over revolution limiter		r/min	DF40A: 6 200 DF40AS/DF50A/DF60A: 6 400		
CKP sensor resistance		$\Omega$ at 20 °C	168 – 252		
CMP sensor resistance		$\Omega$ at 20 °C	—		
Ignition coil resistance	Primary	$\Omega$ at 20 °C	—		
	Secondary	k $\Omega$ at 20 °C	—		
Battery charge coil resistance		$\Omega$ at 20 °C	0.48 – 0.72		
Battery charge coil output (12 V)		Watt	228		
Standard spark plug	Type	NGK	DCPR6E		
	Gap	mm (in.)	0.8 – 0.9 (0.031 – 0.035)		
Fuse amp. rating		A	Main: 30 Starter motor: 30 Ignition coil, Injector, ECM, IAC: 30 PTT switch: 15 Fuel pump: 15		
Recommended battery capacity (12 V)		Ah (kC)	80 (290) or larger		
Fuel injector resistance		$\Omega$ at 20 °C	10 – 14		
IAC valve resistance		$\Omega$ at 20 °C	25 – 34		
IAT sensor / Cylinder temp. sensor (Thermistor characteristic)		k $\Omega$ at 25 °C	1.8 – 2.3		
ECM main relay coil resistance		$\Omega$ at 20 °C	145 – 190		
Starter motor relay coil resistance		$\Omega$ at 20 °C	145 – 190		
PTT motor relay coil resistance		$\Omega$ at 20 °C	25 – 37		

**Starter Motor**













Item		Unit	Data		
			DF40A	DF50A	DF60A
Max. continuous time of use		Sec.	30		
Motor output		kW	1.4		
Brush length	std.	mm (in.)	16.0 (0.63)		
	Limit	mm (in.)	12.0 (0.47)		
Commutator undercut	std.	mm (in.)	0.5 – 0.8 (0.02 – 0.03)		
	Limit	mm (in.)	0.2 (0.01)		
Commutator outside diameter	std.	mm (in.)	29.0 (1.14)		
	Limit	mm (in.)	28.0 (1.10)		

**PTT Motor**

Item		Unit	Data		
			DF40A	DF50A	DF60A
Brush length	std.	mm (in.)	9.8 (0.39)		
	Limit	mm (in.)	4.8 (0.19)		
Commutator outside diameter	std.	mm (in.)	22.0 (0.87)		
	Limit	mm (in.)	21.0 (0.83)		

**0A-9 General Information:****Self-Diagnostic Code**

0: OFF, 1: ON

Failed item	Code	Lamp flashing pattern	Fail-safe system activating
MAP sensor 1	3 – 4	 MCODE00D34-0-01	YES
Cylinder temp. sensor	1 – 4	 MCODE00D14-0-01	YES
IAT sensor	2 – 3	 MCODE00D23-0-01	YES
CKP sensor	4 – 2	 MCODE00D42-0-01	NO
CMP sensor	2 – 4	 MCODE00D24-0-01	NO
Air intake system	2 – 2	 MCODE00D22-0-01	YES
MAP sensor 2	3 – 2	 MCODE00D32-0-01	NO
Fuel injector	4 – 3	 MCODE00D43-0-01	NO
Throttle position sensor	2 – 1	 MCODE00D21-0-01	YES
Trim sensor	3 – 7	 MCODE00D37-0-01	NO
Oil pressure switch	5 – 3	 MCODE00D53-0-01	NO
Rectifier/Regulator (Over-charging)	1 – 1	 MCODE00D11-0-01	NO

## Tightening Torque Specifications (DF40A/50A/60A)

## Important Fasteners

Item		Thread Diameter	Tightening Torque		
			N·m	kgf-m	lbf-ft
Cylinder head cover bolt		6 mm	11	1.1	8.0
Cylinder head bolt		8 mm	23	2.3	16.5
		10 mm	59	5.9	42.7
Crankcase bolt	Outside	8 mm	25	2.5	18.0
	Inside	10 mm	46	4.6	33.3
Conrod cap bolt		7 mm	15 N·m (1.5 kgf-m, 10.8 lbf-ft), then plus turn in 65 degrees.		
Camshaft housing bolt		6 mm	11	1.1	8.0
Oil pump bolt		6 mm	11	1.1	8.0
IN. camshaft timing sprocket		10 mm	65	6.5	47.0
Chain tensioner adjuster bolt		6 mm	11	1.1	8.0
Timing chain guide bolt		6 mm	11	1.1	8.0
Intake manifold bolt / nut		8 mm	23	2.3	16.5
Oil pressure switch		—	13	1.3	9.5
Fuel delivery pipe bolt		6 mm	11	1.1	8.0
Fuel delivery pipe plug / union bolt (DF60A)	Upper	12 mm	35	3.5	25.5
	Lower	14 mm	35	3.5	25.5
Low pressure fuel pump bolt		6 mm	10	1.0	7.2
Thermostat cover bolt		6 mm	10	1.0	7.2
Flywheel bolt		14 mm	166	16.6	120.0
Starter motor mounting bolt		8 mm	23	2.3	16.5
Engine oil filter		—	14	1.4	10.0
Engine oil drain plug		12 mm	13	1.3	9.5
Power unit mounting bolt		8 mm	23	2.3	16.5
		10 mm	50	5.0	36.0
Driveshaft housing bolt		10 mm	50	5.0	36.0
Upper mount nut		12 mm	60	6.0	43.4
Upper mount cover bolt		10 mm	50	5.0	36.0
Lower mount nut		12 mm	60	6.0	43.4
Clamp bracket shaft nut		7/8-14 UNF	43	4.3	31.0
Water pump case nut		6 mm	8	0.8	5.8
Gearcase bolt		8 mm	23	2.3	16.6
Propeller shaft bearing housing bolt		8 mm	23	2.3	16.6
Pinion gear nut		12 mm	45	4.5	32.5
Propeller nut		18 mm	55	5.5	40.0
Tiller handle pivot bolt		10 mm	25	2.5	18.0
Tiller handle pivot nut		10 mm	45	4.5	32.0
Tiller handle mounting bolt		10 mm	50	5.0	36.0

# Maintenance and Tune-Up

## Scheduled Maintenance

### Periodic Maintenance Schedule Chart (DF40A/50A/60A)

CENBJ6110205003

**Effective serial No.**

04003F-110001 and Later

04004F-110001 and Later

05003F-110001 and Later

06002F-110001 and Later

**NOTE**
**I = Inspect and clean, adjust, lubricate or replace, if necessary**
**T = Tighten**
**R = Replace**

Item to be serviced	Interval			
	Initial 20 hrs. or 1 month	Every 50 hrs. or 3 months	Every 100 hrs. or 6 months	Every 200 hrs. or 12 months
Spark plug	—	—	I	R
Breather hose and fuel line	I	I	I	I
Engine oil	R	—	R	R
Gear oil	R	—	R	R
Lubrication	—	I	I	I
Anodes and bonding wires	—	I	I	I
Battery	—	I	I	I
Engine oil filter	R	—	—	R
Low pressure fuel filter	—	I	I	I
	Replace every 400 hours or 2 years.			
Ignition timing	—	—	—	I
Idle speed	I	—	—	I
Tappet clearance	—	—	—	I
Water pump	—	—	—	I
Water pump impeller	—	—	—	R
Propeller nut and pin	I	—	I	I
Bolt and Nuts	T	—	T	T



## Section 1

## Power Head

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# Fuel System

## Diagnostic Information and Procedures

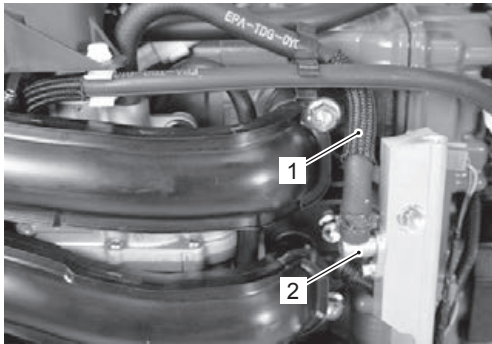
### Fuel Pressure Inspection (DF40A/50A)

CENBJ6111704004

#### ⚠ WARNING

Before starting the following procedure, be sure to observe "Precautions on Fuel System Service": in related manual in order to reduce the risk of fire and personal injury.

- 1) Relieve fuel pressure in fuel feed line.  
Refer to "Fuel Pressure Relief Procedure": in related manual.
- 2) Loosen clamp and place a large cloth over end of the high pressure fuel feed hose (1).  
Slowly pull fuel feed hose (1) from the fuel delivery pipe main joint (2).  
Drain any excess fuel in hose into a small container.






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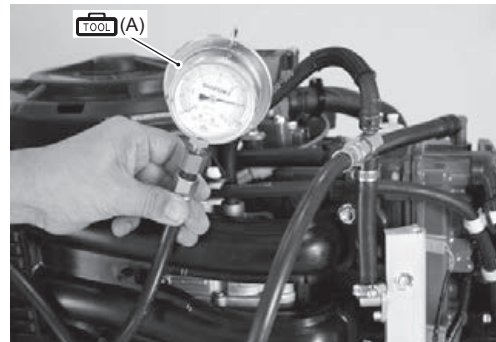
- 3) Connect special tools (pressure gauge, pressure hose and pressure joint) between fuel feed hose (1) and fuel delivery pipe main joint as shown in figure. Clamp the hose securely to ensure that no leaks occur during checking.

#### ⚠ CAUTION

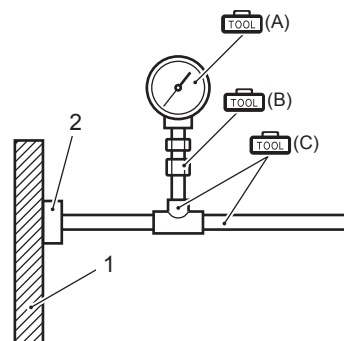
A small amount of fuel may be released when the fuel feed hose is disconnected. Place container under the fuel feed hose or fuel delivery pipe main joint with a shop cloth so that the released fuel is caught in the container or absorbed by the cloth. Place the fuel soaked cloth in an approved container.

#### Special tool

-  (A): 09912-58442 (Fuel pressure gauge)  
 (B): 09912-58432 (Fuel pressure hose)  
 (C): 09912-58490 (3-way joint & hose)



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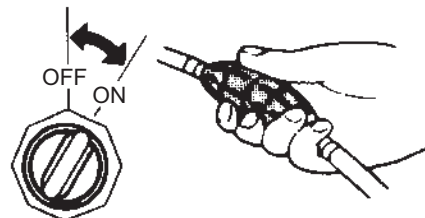


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1. Fuel delivery pipe

2. Delivery pipe main joint

- 4) Ensure the emergency stop switch lock plate is in place.  
Shift into "Neutral" position.
- 5) Squeeze fuel primer bulb until you feel resistance.
- 6) Turn ignition switch "ON" for 3 seconds (to operate the fuel pump), then turn it "OFF".
- 7) Repeat this ("ON" and "OFF") procedure 3 or 4 times to pressurize the fuel system and then check the fuel pressure.



I9J011170018-01

- 8) Check for any signs of fuel leakage.

**⚠ WARNING**

**When the engine is running, keep your hands, hair, clothing, etc., away from the engine.**

- 9) Measure fuel pressure at cranking or idle speed operation.  
If out of specification, check each possibly defective parts (high pressure fuel pump, fuel pressure regulator, fuel injector, etc.).  
Replace if found defective.

**Fuel pressure**

**Standard: Approx. 295 kPa (2.95 kg/cm<sup>2</sup>, 42 psi.)**

- 10) Stop engine and wait 5 minutes.  
Check the residual fuel pressure in line.

**Residual fuel pressure**

**Standard: 200 kPa (2.0 kg/cm<sup>2</sup>, 28.4 psi.) or more**

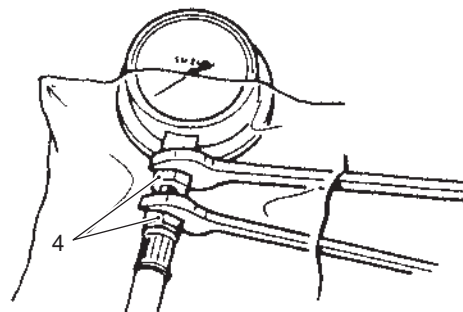
**⚠ CAUTION**

**The fuel feed line is under high fuel pressure, make sure to release fuel pressure according to the fuel pressure relief procedures mentioned earlier.**

**Use the following procedures to remove the fuel pressure gauge.**

- Place a container under the joint to catch the fuel.
- Cover the joint with rag and loosen joint nut slowly to gradually release any residual fuel pressure.

- 11) After checking fuel pressure, remove fuel pressure gauge.



I9J011170019-01

4. Joint nut

- 12) Reconnect fuel line.  
13) With the engine not running and ignition switch "ON", check the fuel system for leaks.

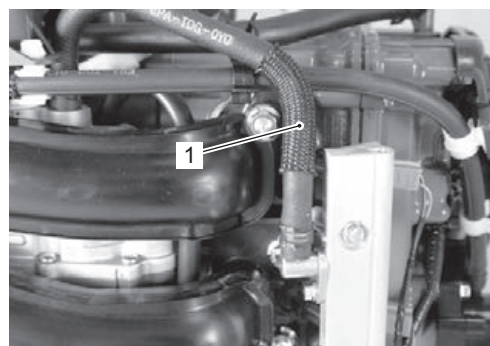
## Service Instructions

### Fuel Injector Removal and Installation (DF40A/50A)

CENBJ6111706016

#### Removal

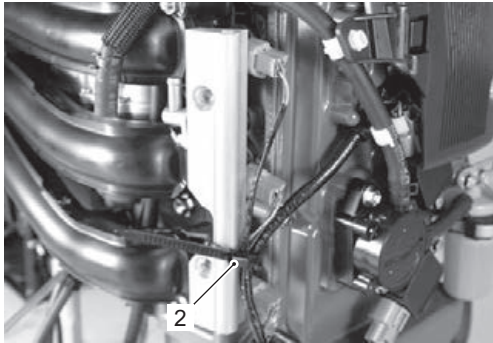
- 1) Relieve the fuel pressure in the fuel feed line according to "Fuel Pressure Relief Procedure". Refer to "Fuel Pressure Relief Procedure": in related manual.
- 2) Loosen the clamp and place a large cloth over the end of the fuel feed hose (1). Slowly pull the fuel feed hose from the fuel delivery pipe.  
Drain any excess fuel in the hose into a small container.



IBJ611170006-01

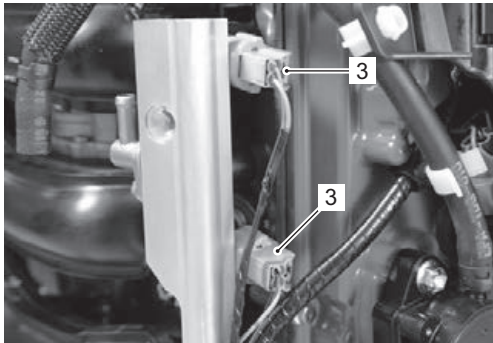
## 1G-3 Fuel System:

- 3) Unfasten cable tie (2).



IBJ611170007-01

- 4) Disconnect the three fuel injector connectors (3).



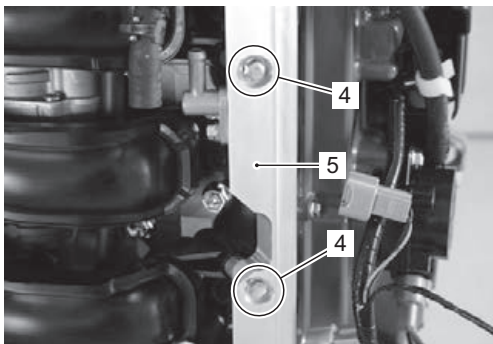
IBJ611170008-01

- 5) Remove the two bolts (4) and the fuel delivery pipe (5) (with the fuel injectors).

### ▲ CAUTION

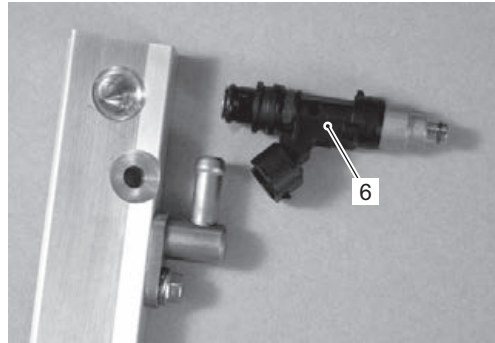
A small amount of fuel may be released when the fuel injector is removed from delivery pipe.

Place a shop cloth under the fuel injector before removal to absorb any fuel released. Dispose of the fuel soaked cloth in appropriate container.



IBJ611170009-01

- 6) Remove each injector (6) from the delivery pipe.



IBJ611170010-01

### Installation

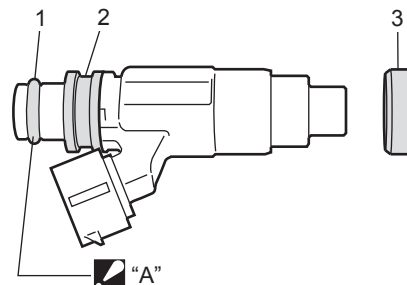
Installation is in the reverse order of removal with special attention to the following steps.

### NOTICE

**Do not re-use O-ring and cushion once removed.**

**Always use new parts.**

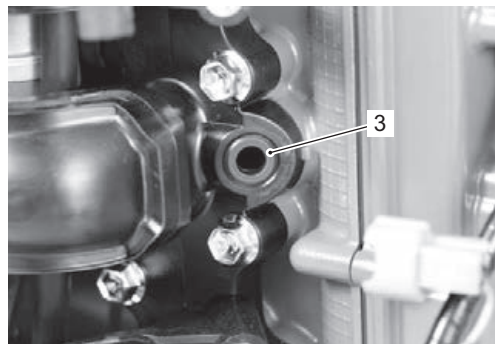
- 1) Replace the injector O-ring (1) with a new one using care to avoid nicks or cuts during installation. Install grommet (2) to injector.



IBJ611170002-01

“A”: Apply fuel to O-ring.

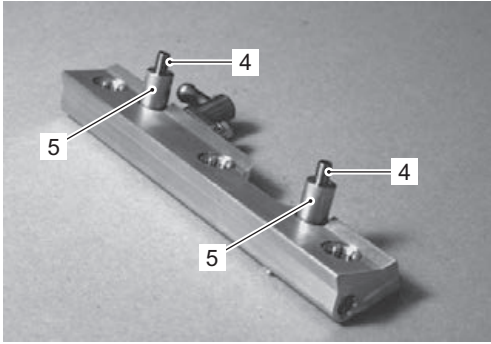
- 2) Replace the injector cushion (3) with a new one and install to the intake manifold.



IBJ611170011-01



- 3) Place delivery pipe bolts (4) and collars (5) in position.



IBJ611170012-01

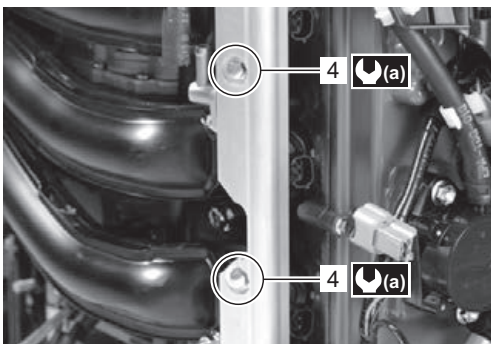
- 4) Apply a thin coat of fuel to injector O-rings, then install the injectors into the delivery pipe and intake manifold. Make sure that the injectors rotate smoothly.
- 5) Tighten the delivery pipe bolts (4) and make sure that the injectors rotate smoothly.

**Tightening torque**

**Fuel delivery pipe bolt (a): 11 N·m (1.1 kgf-m, 8.0 lbf-ft)**

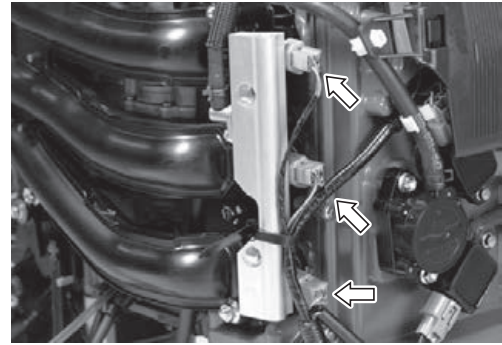


IBJ611170013-01



IBJ611170014-01

- 6) Reconnect the fuel feed hose and fuel line securely.
- 7) Connect the lead wire connector to the injectors securely.



IBJ611170015-01

- 8) Make sure the emergency stop switch lock plate is in place. Shift into "Neutral" position.
- 9) Squeeze the fuel primer bulb until you feel resistance. Turn ignition switch "ON" for 3 seconds (to operate fuel pump), then turn it "OFF". Repeat this ("ON" and "OFF") procedure 3 or 4 times to pressurize the fuel system. Check for fuel leaks around the fuel injectors.





## Section 2

## Mid Unit

## CONTENTS

## NOTE

For the items with asterisk (\*) in the “CONTENTS” below, refer to the same section of the service manual mentioned in the “FOREWORD” of this manual.

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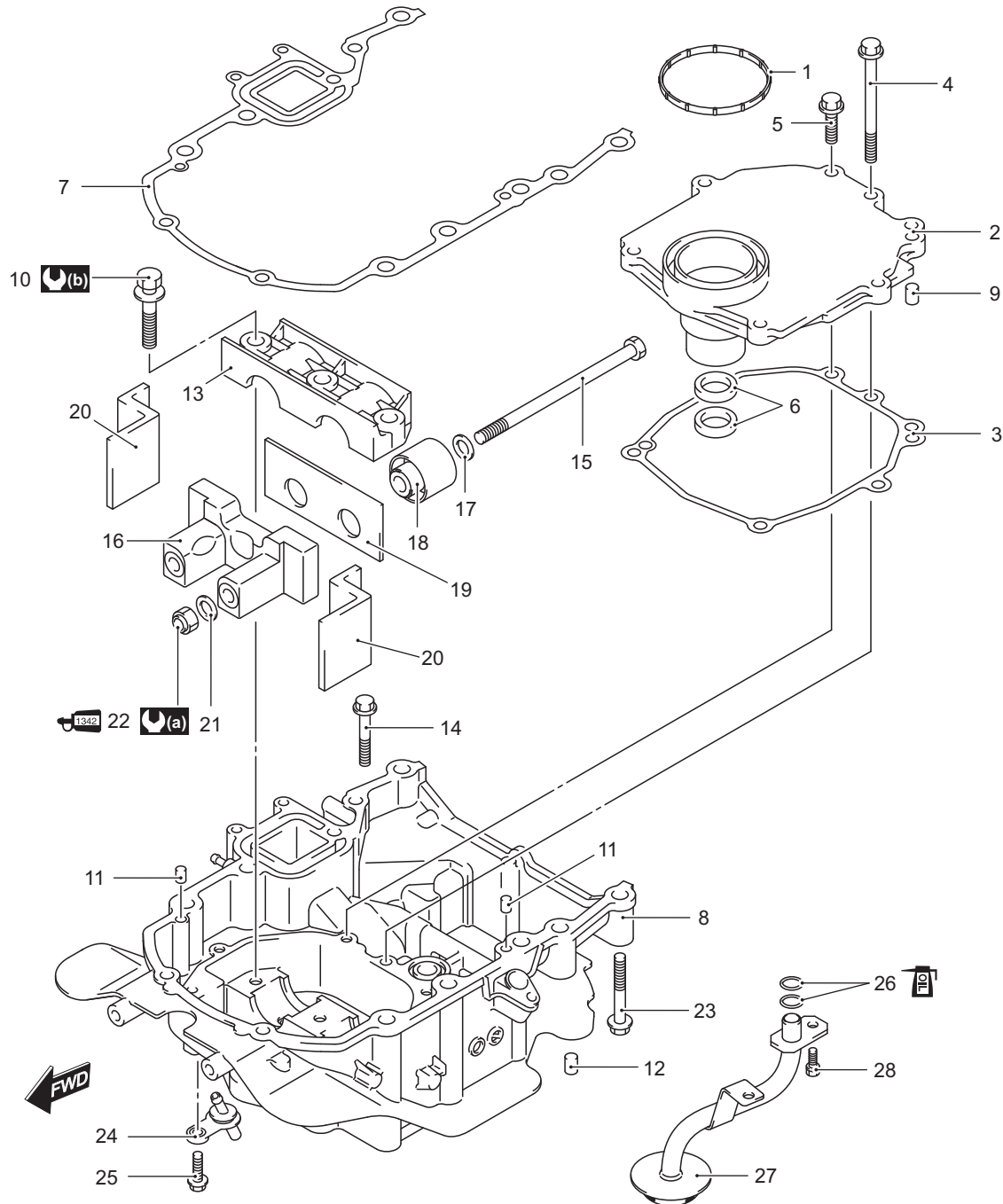
Power Trim and Tilt Unit Removal and  
Installation (DF40A/50A) .....2B-1

# Housing and Bracket

## Service Instructions

Engine Holder / Oil Pan / Driveshaft Housing / Mounts Components (DF40A/50A/DF60AQH)

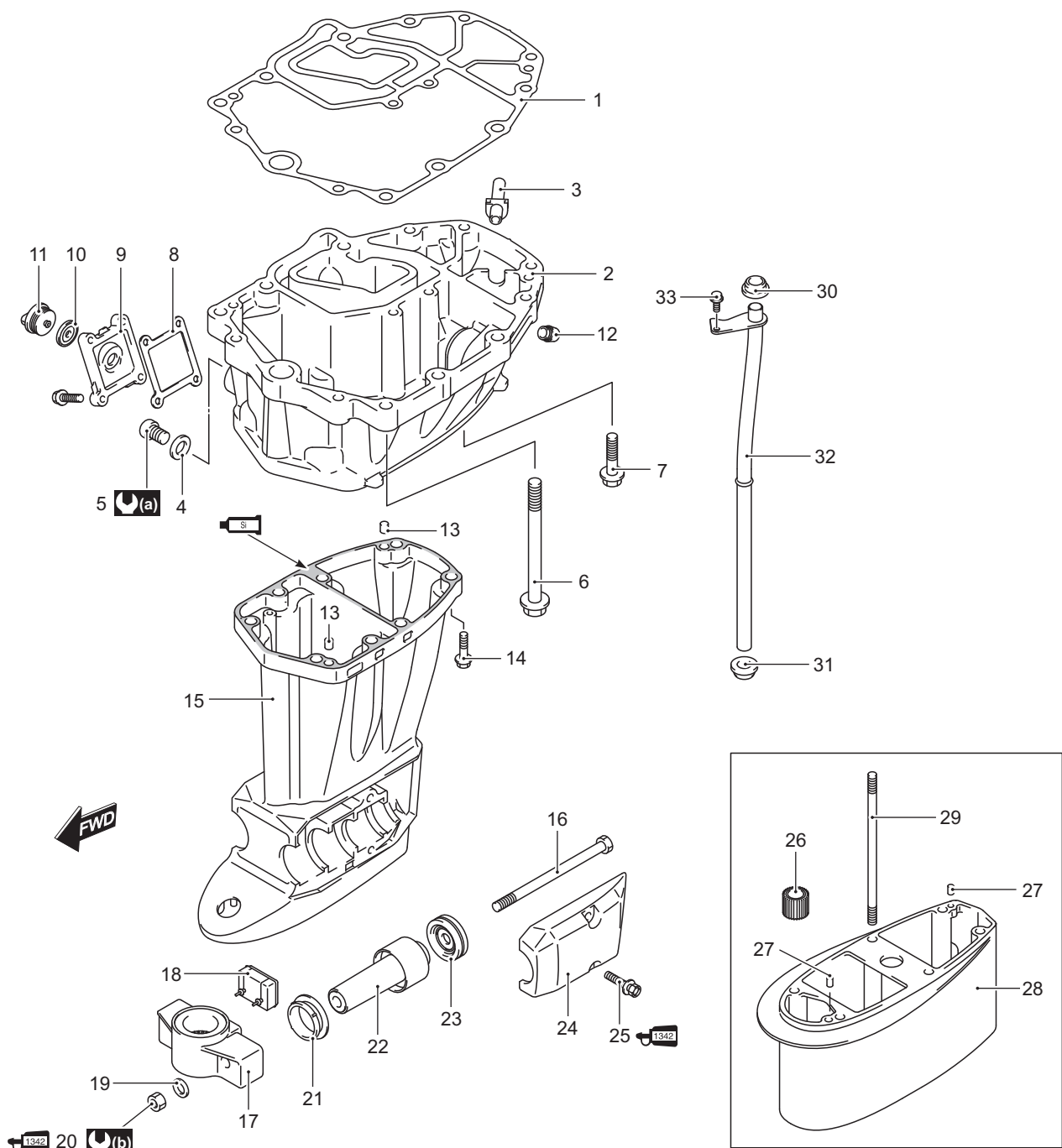
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IBJ611210021-02

1. Gasket	10. Bolt	19. "R" upper thrust mount	28. Bolt
2. Mount case cover	11. Dowel pin	20. "F" upper thrust mount	(a) : 60 N·m (6.0 kgf-m, 43.4 lbf-ft)
3. Gasket	12. Dowel pin	21. Washer	(b) : 50 N·m (5.0 kgf-m, 36.0 lbf-ft)
4. Bolt	13. Upper mount cover	22. Nut	: Apply engine oil.
5. Bolt	14. Bolt	23. Bolt	: Apply SUZUKI water resistant grease.
6. Oil seal	15. Upper mount Bolt	24. Water indicator	: Apply SUZUKI thread lock 1342.
7. Gasket	16. Upper thrust mount	25. Bolt	
8. Engine holder	17. Washer	26. O-ring	
9. Dowel pin	18. Upper mount	27. Oil strainer	

2A-2 Housing and Bracket:



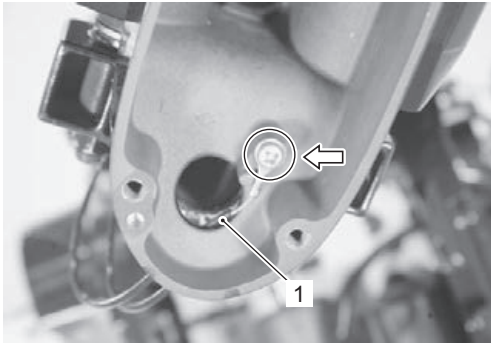
IBJ611210022-03

1. Gasket	11. Water plug	21. Lower side mount	31. Grommet
2. Oil pan	12. Exhaust pipe	22. Lower mount	32. Water tube
3. Exhaust silencer	13. Dowel pin	23. Damper	33. Bolt
4. Gasket	14. Bolt	24. Lower mount cover	(a) : 13 N·m (1.3 kgf-m, 9.5 lbf-ft)
5. Oil drain plug	15. Driveshaft housing	25. Bolt	(b) : 60 N·m (6.0 kgf-m, 43.4 lbf-ft)
6. Bolt	16. Lower mount bolt	26. Bush (Transom: X)	1342 : Apply SUZUKI thread lock 1342.
7. Bolt	17. Lower mount bracket	27. Dowel pin (Transom: X)	Si : Apply SUZUKI silicon seal.
8. Gasket	18. Lower thrust mount	28. Extension case (Transom: X)	
9. Water jacket cover	19. Washer	29. Bolt (Transom: X)	
10. Gasket	20. Nut	30. Grommet	

## Engine Holder / Oil Pan / Driveshaft Housing / Mounts Disassembly (DF40A/50A/DF60AQH)

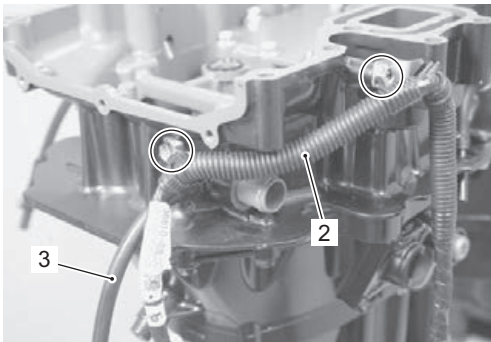
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- 1) Remove the power unit. Refer to "Power Unit Removal and Installation": in Section 1D in related manual.
- 2) Remove the lower unit. Refer to "Lower Unit Removal and Installation": in Section 3A in related manual.
- 3) Remove the screw and bonding wire (1).



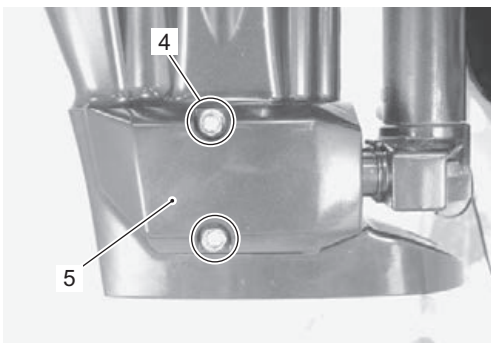
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- 4) Remove the bolts securing harness clamp plates to engine holder, then remove the engine wiring harness (2). Disconnect the fuel cooler water hose (3) from engine holder.



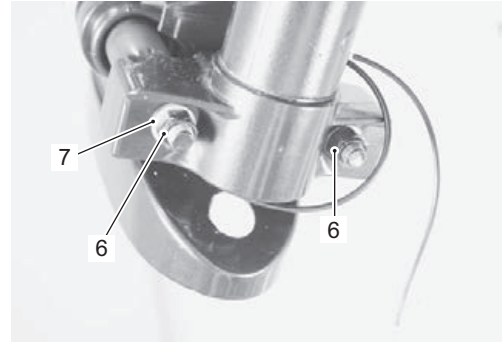
IAJ611210033-01

- 5) Remove the four bolts (4) securing the STBD / PORT lower mount covers, then detach the mount covers (5).



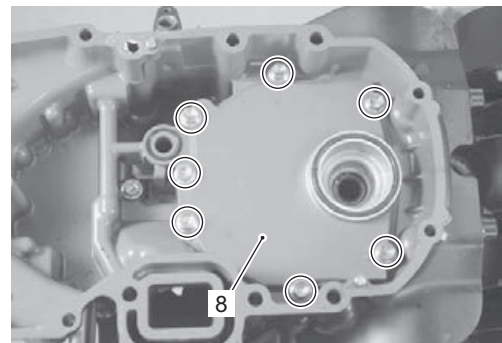
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- 6) Unscrew and remove STBD / PORT lower mount nuts (6) and washers (7).



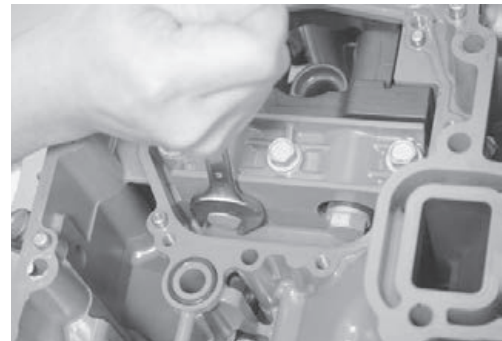
IAJ611210035-01

- 7) Remove the seven bolts and the mount case cover (8).

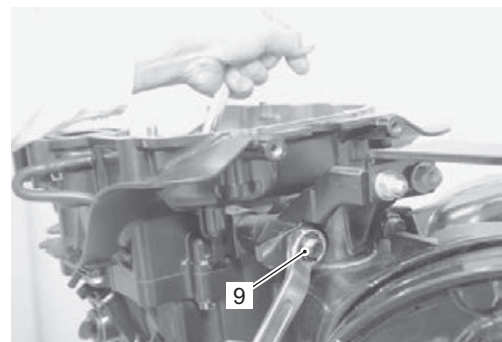


IAJ611210036-01

- 8) Remove STBD / PORT upper mount nuts (9) and washers.



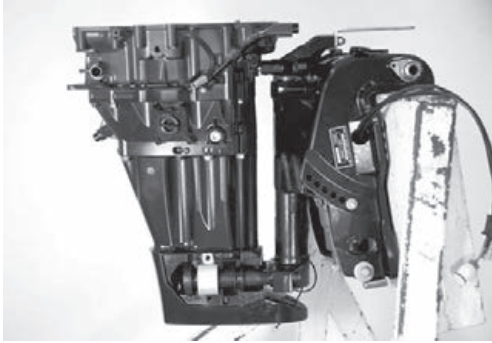
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IAJ611210038-01

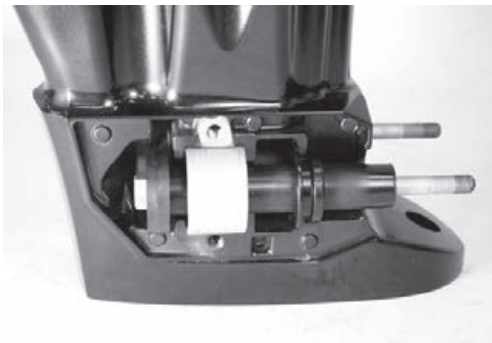
## 2A-4 Housing and Bracket:

- 9) Remove the driveshaft housing with oil pan.

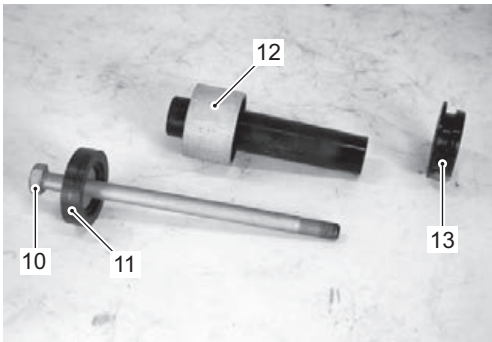


IBJ611210023-01

- 10) Remove the lower mount assembly.  
Account for lower mount bolt (10), forward damper (11), lower mount (12) and lower side mount (13).

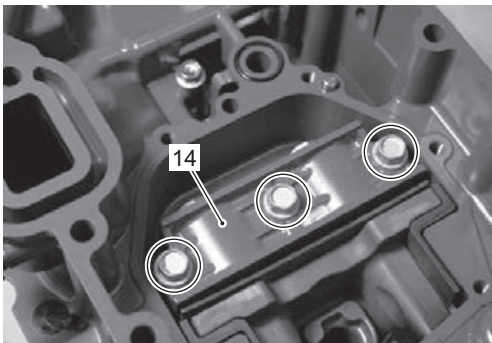


IBJ611210024-01



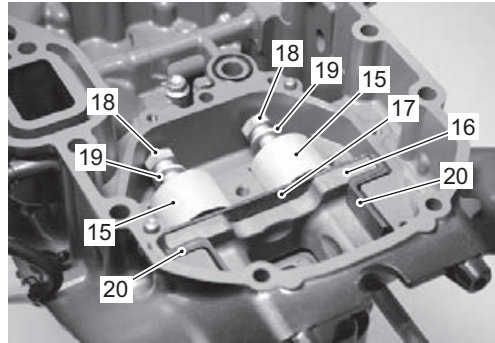
IBJ611210025-01

- 11) Remove the three bolts and upper mount cover (14).



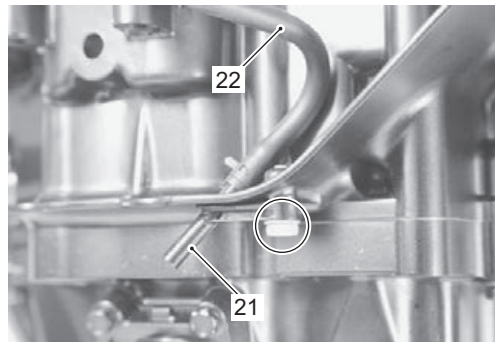
IBJ611210027-01

- 12) Remove the upper mounts (15), upper thrust mount (16), "R" upper thrust mount (17), upper mount bolts (18) and washers (19).  
Remove the "F" upper thrust mounts (20).



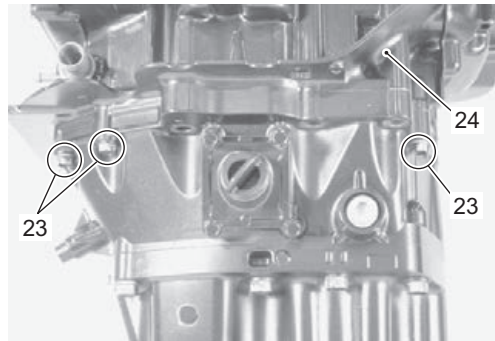
IBJ611210028-01

- 13) Remove the bolt and water indicator union (21) and water hose (22) (if necessary).

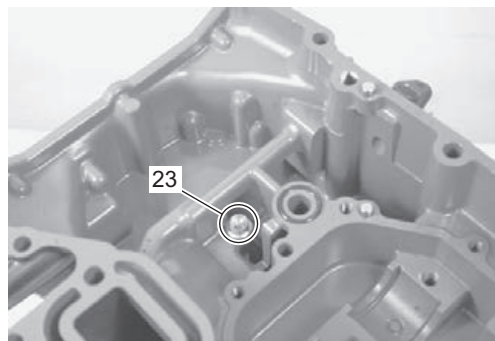


IBJ611210002-01

- 14) Remove the seven bolts (23) and engine holder (24).



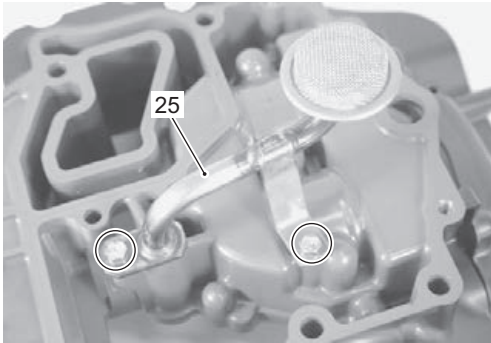
IBJ611210003-02



IBJ611210004-01

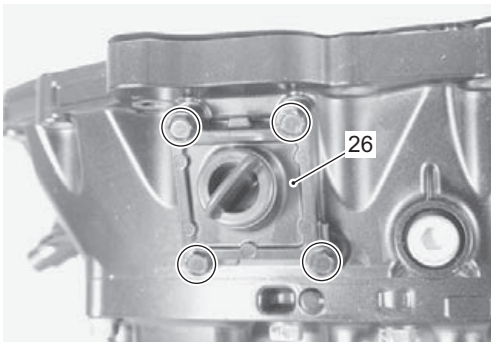


15) Remove the two bolts and oil strainer (25).



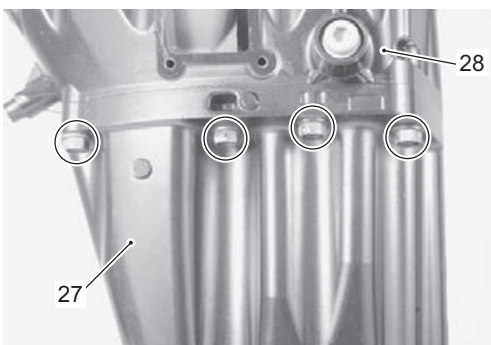
IBJ611210005-01

16) Remove the four bolts and water jacket cover (26) (if necessary).



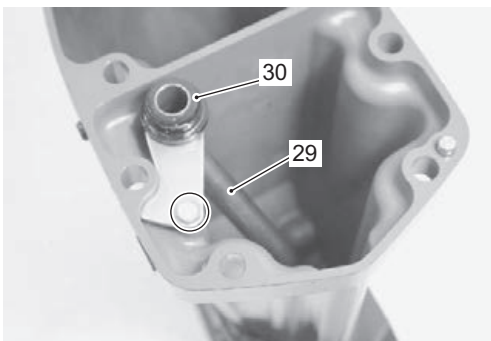
IBJ611210006-01

17) Remove the eight bolts securing the driveshaft housing (27) to oil pan, then remove the oil pan (28).



IBJ611210007-01

18) Remove the bolt, water tube (29) and water tube grommets (30).



IBJ611210008-02

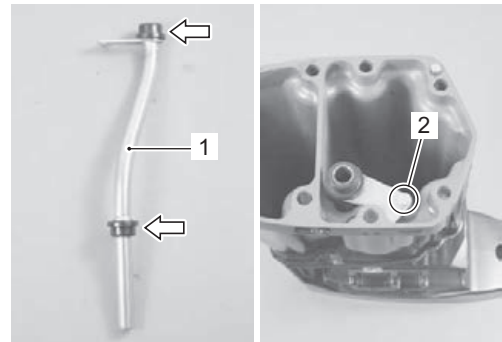
## Engine Holder / Oil Pan / Driveshaft Housing / Mounts Assembly (DF40A/50A/DF60AQH)

CENBJ6112106016

Assembly is in reverse order of disassembly with special attention to the following steps.

### Oil Pan to Driveshaft Housing

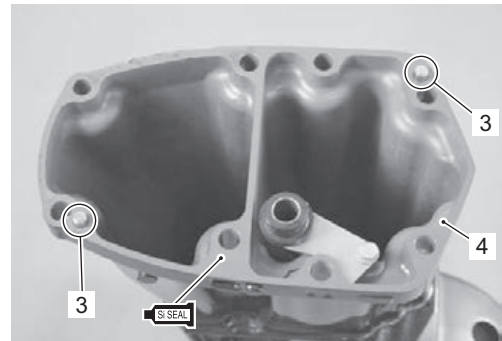
- Install water tube (1) with bushings, then tighten bolt (2).



IAJ611210051-01

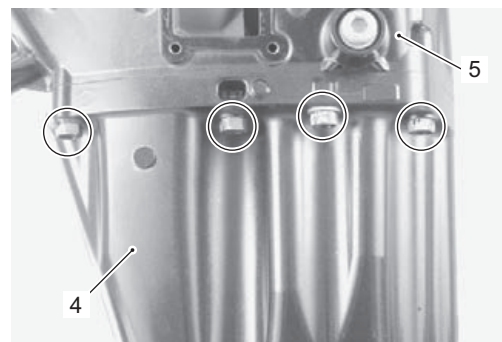
- Install two dowel pins (3) to driveshaft housing (4). Apply sealant to mating surfaces of driveshaft housing and oil pan.

**SEAL** : Sealant 99000-31120 (SUZUKI Silicone Seal (50 g))



IAJ611210052-01

- Install the oil pan (5) to driveshaft housing (4), then tighten eight bolts securely.

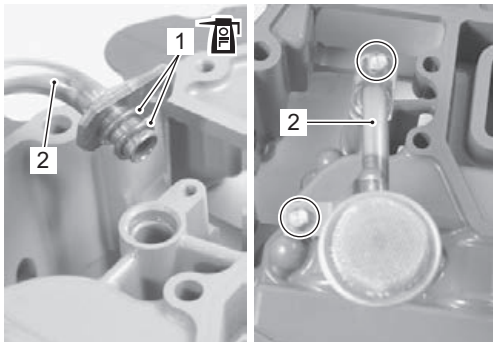


IAJ611210053-01

## 2A-6 Housing and Bracket:

### Engine Holder to Oil Pan

- Apply engine oil to O-rings (1), then install O-rings to oil strainer (2).
- Install oil strainer to engine holder, then tighten bolts securely.

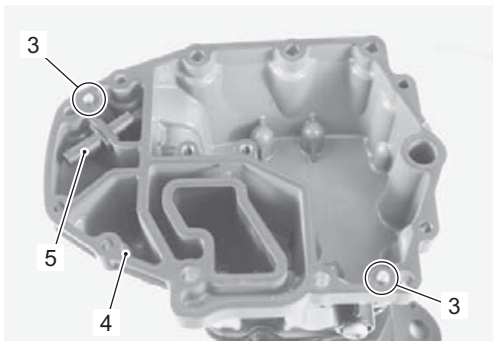


IAJ611210054-02

- Install the two dowel pins (3), gasket (4) and exhaust silencer (5) to oil pan.

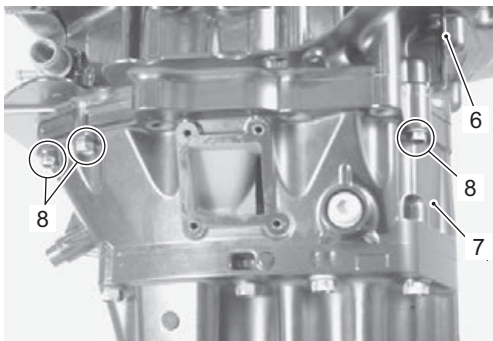
#### **NOTICE**

**Do not reuse gasket. Always assemble with a new gasket.**

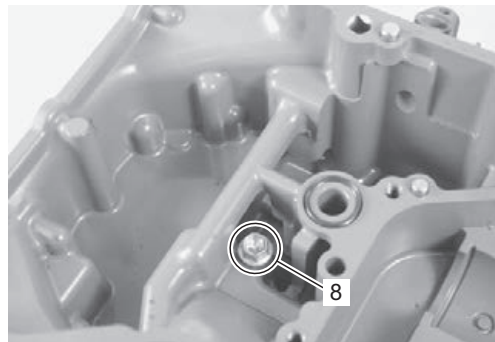


IAJ611210055-01

- Install engine holder (6) to oil pan (7), then securely tighten it with engine holder bolts (8).



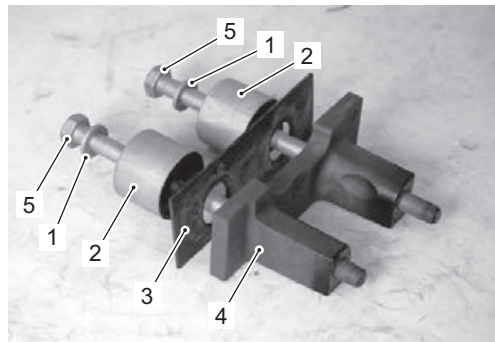
IAJ611210056-01



IAJ611210057-02

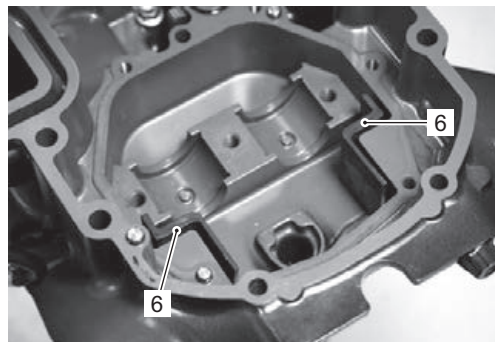
### Upper Mount and Mount Cover

- Assemble these items in the following sequence: Place the washers (1), upper mounts (2), "R" upper thrust mount (3), upper thrust mount (4) on upper mount bolts (5).



IBJ611210029-02

- Place the "F" upper thrust mounts (6) into position.



IBJ611210030-01

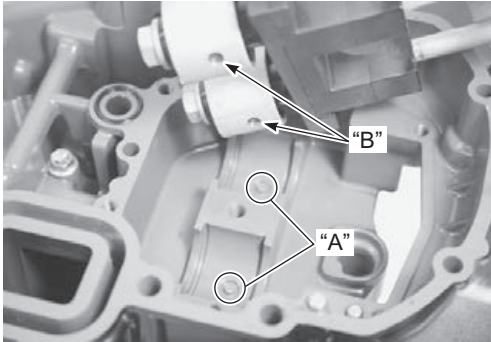


- Place upper mount / thrust mount assembly into position.

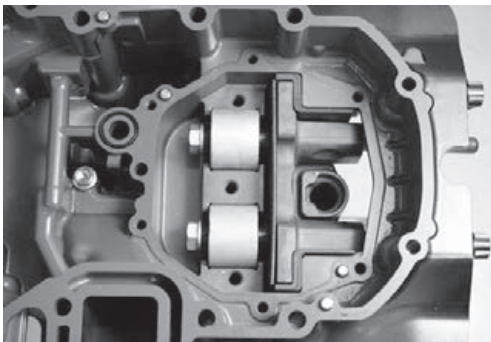
**NOTE**

**Position the retaining pin hole on upper mount facing downward.**

- Be sure the retaining pin "A" on the engine holder properly fits into the retaining pin hole "B" on the mount.



IAJ611210059-01




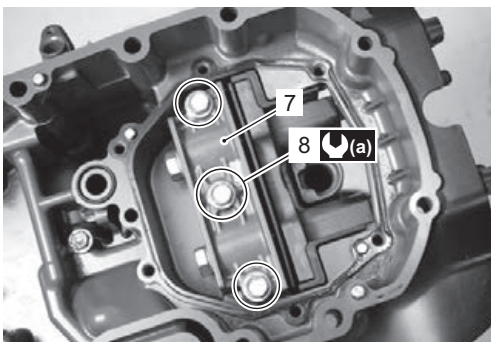
IBJ611210031-01

- Install the upper mount cover (7).
- Tighten upper mount cover bolts (8), pre-coated with thread lock, to specified torque.

**Tightening torque**

**Upper mount cover bolt (a): 50 N·m (5.0 kgf-m, 36.0 lbf-ft)**

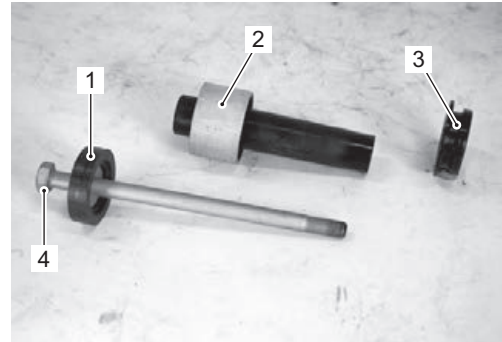
 : Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))



IBJ611210032-01

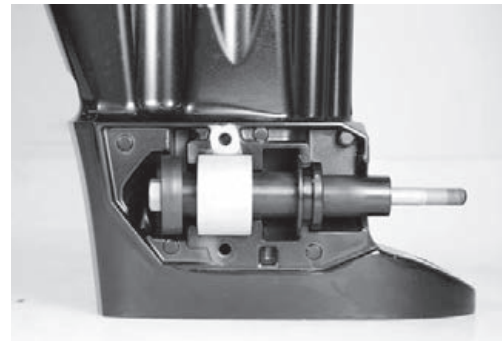
**Lower Mount / Bolt / Nut**

- Assemble these items in the following sequence: Place the forward damper (1), lower mount (2), side lower mount (3) on lower mount bolt (4).



IBJ611210033-01

- Place the lower mount and bolt assembly into position.




IBJ611210034-01

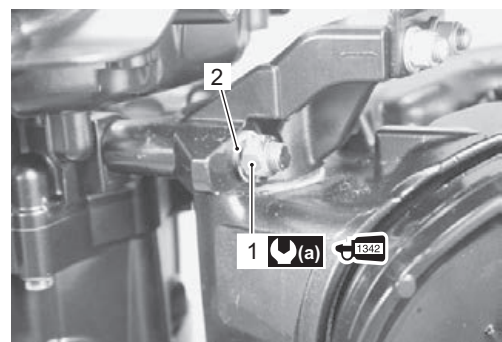
**Upper Mount Nut and Lower Mount Nut**

- Install the engine holder/ oil pan/ drive shaft housing assembly to steering bracket.
- Install washer (2) and upper mount nut (1), then tighten two nuts, pre-coated with thread lock, to specified torque.

**Tightening torque**

**Upper mount nut (a): 60 N·m (6.0 kgf-m, 43.4 lbf-ft)**

 : Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))




IAJ611210064-01

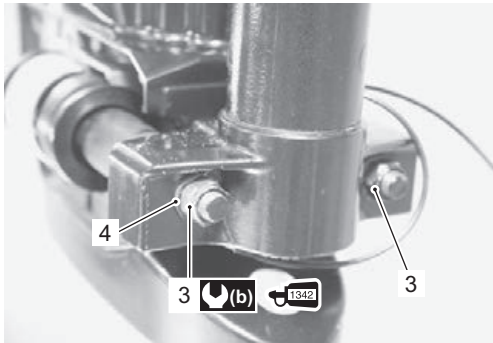
## 2A-8 Housing and Bracket:

- Install washer (4) and lower mount nut (3), then tighten two nuts, pre-coated with thread lock, to specified torque.

### Tightening torque

Lower mount nut (b): 60 N·m (6.0 kgf-m, 43.4 lbf-ft)


 : Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))



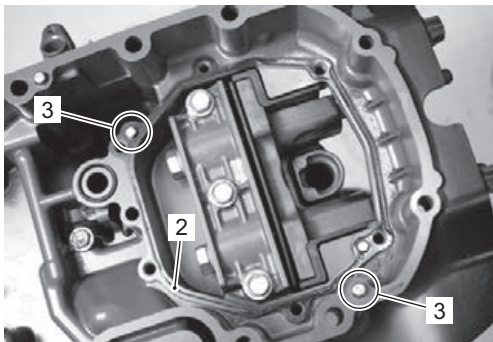
IAJ611210065-01

### Mount Case Cover

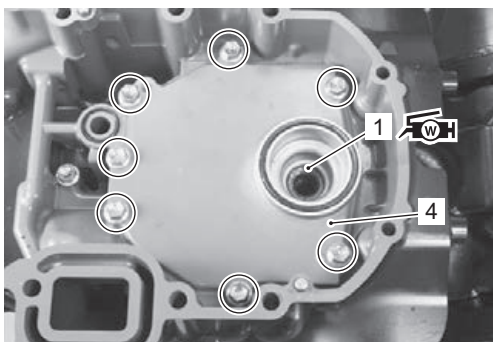
- Apply water resistant grease to oil seal (1).

 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))

- Install the gasket (2), dowel pins (3) and mount case cover (4), then tighten seven cover bolts securely.



IBJ611210065-01



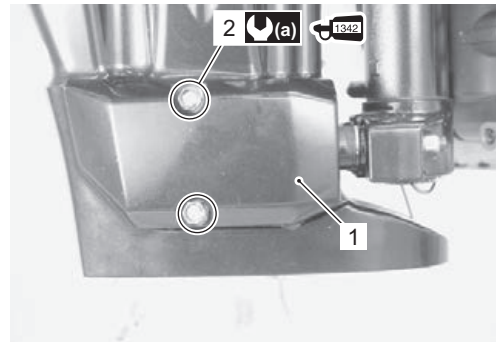
IAJ611210067-01

### Lower Mount Cover

- Install lower mount cover (1) and cover bolts (2), then tighten bolts, pre-coated with thread lock, to specified torque.

### Tightening torque

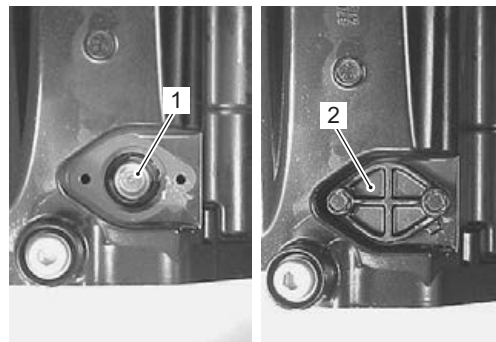
Lower mount cover bolt (a): 50 N·m (5.0 kgf-m, 36.0 lbf-ft)



IAJ611210068-01

### Water Pressure Valve

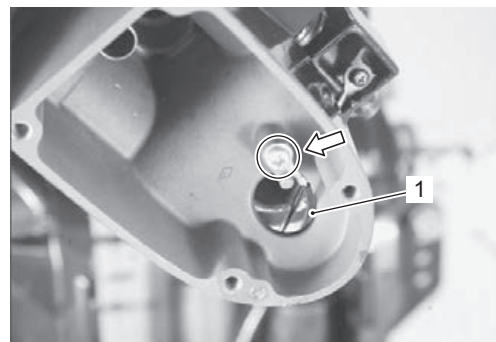
- Install water pressure valve (1) and cover (2). Refer to "Water Pressure Valve Removal and Installation": in Section 1F in related manual.



I9J011210052-01

### Bonding Wire

- Reattach the bonding wire (1), then tighten screw securely.



IAJ611210069-01

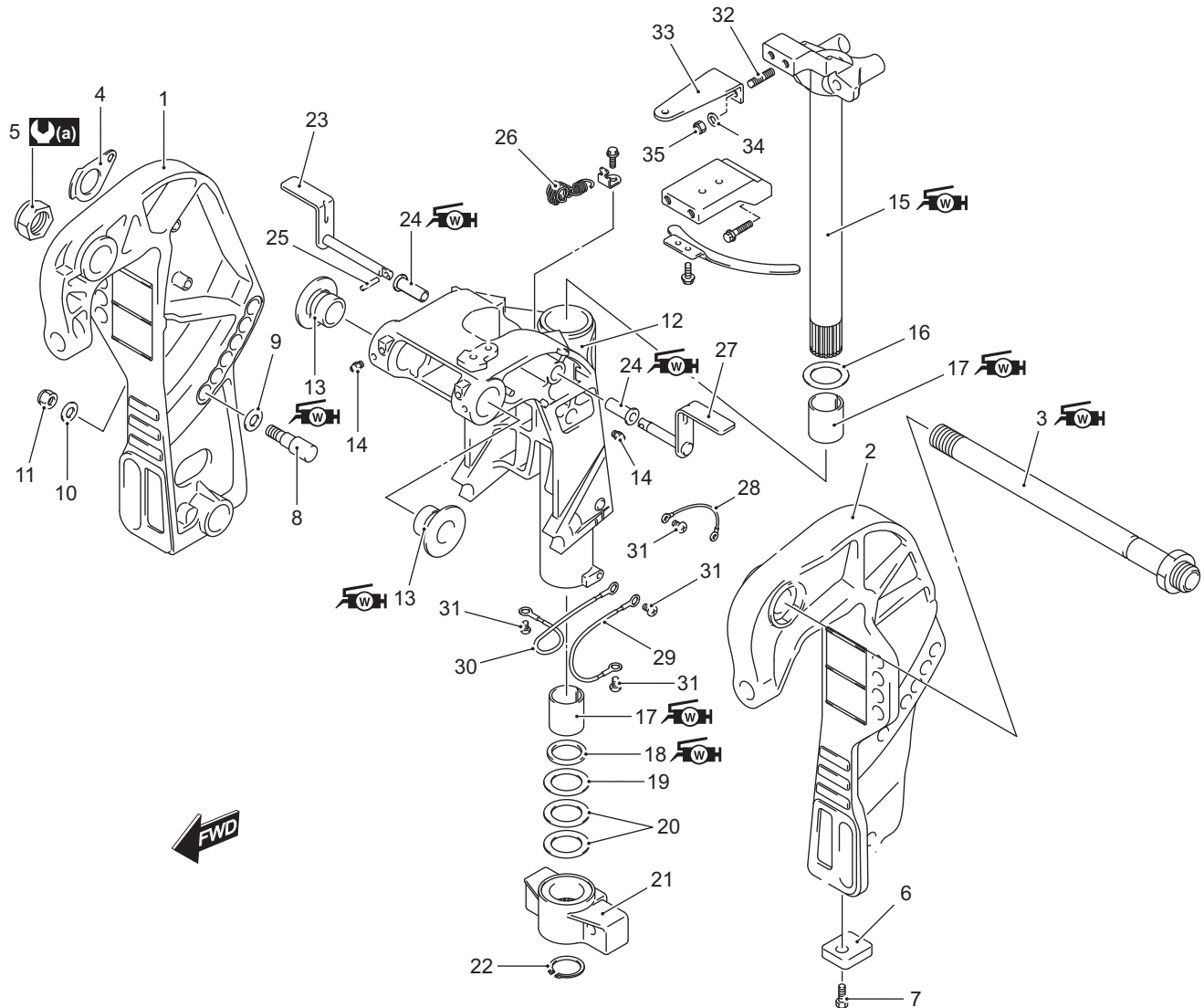
# Engine Holder / Oil Pan / Driveshaft Housing / Mounts Related Component Inspection (DF40A/50A/DF60AQH)

CENBJ6112106017

Refer to “Engine Holder / Oil Pan / Driveshaft Housing / Mounts Related Component Inspection”: in related manual.

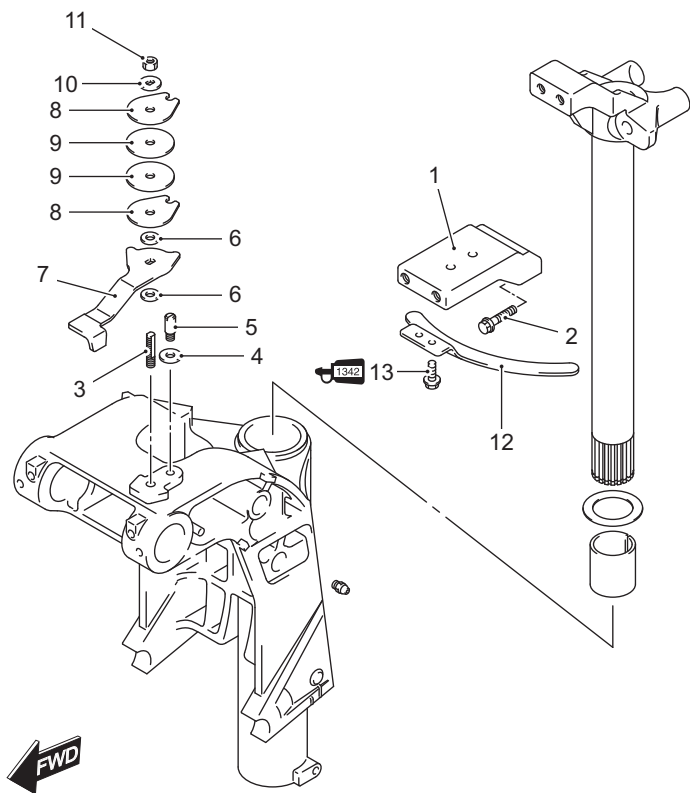
## Clamp / Swivel / Steering Brackets Components (DF40A/50A/DF60AQH)

CENBJ6112106018




IBJ611210035-04

1. Clamp bracket STBD	11. Nut	21. Lower mount bracket	31. Screw
2. Clamp bracket PORT	12. Swivel bracket	22. Circlip	32. Bolt
3. Clamp bracket shaft	13. Bush	23. Tilt lock lever	33. Steering bracket attachment
4. Washer	14. Grease nipple	24. Bush	34. Washer
5. Nut	15. Steering bracket	25. Pin	35. Nut
6. Anode	16. Washer	26. Spring	(a) : 43 N·m (4.3 kgf-m, 31.0 lbf-ft)
7. Bolt	17. Bush	27. Tilt lock lever PORT	WH : Apply SUZUKI water resistance grease.
8. Tilt lock pin	18. Seal	28. Bonding wire	
9. Washer	19. Washer	29. Bonding wire	
10. Washer	20. Shim	30. Bonding wire	



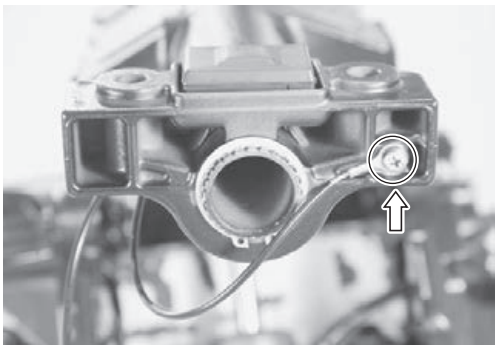
IBJ611210036-02

1. Steering bracket extension (QH model)	6. Washer (QH model)	11. Nut (QH model)
2. Bolt (QH model)	7. Steering adjuster (QH model)	12. Steering adjuster plate (QH model)
3. Shaft (QH model)	8. Plate (QH model)	13. Bolt (QH model)
4. Spacer (QH model)	9. Washer (QH model)	 : Apply SUZUKI thread lock 1342.
5. Bolt (QH model)	10. Washer (QH model)	

Clamp / Swivel / Steering Brackets Disassembly (DF40A/50A/DF60AQH)

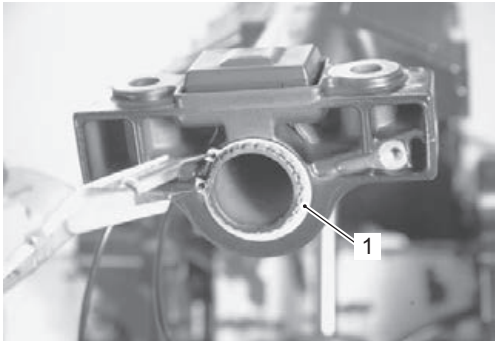
CENBJ6112106019

- 1) Remove engine holder / oil pan and driveshaft housing. Refer to “Engine Holder / Oil Pan / Driveshaft Housing / Mounts Disassembly”: in related manual.
- 2) Remove screw and bonding wire from lower mount bracket.



IAJ611210078-01

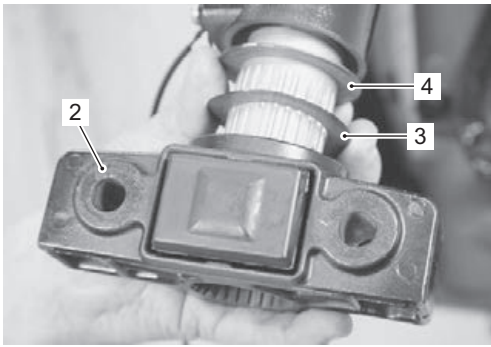
- 3) Remove circlip (1).



IAJ611210079-01

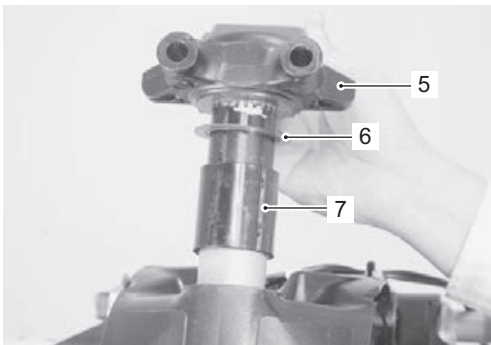


- 4) Remove lower mount bracket (2), shims (3), and washer (4) from the steering shaft.



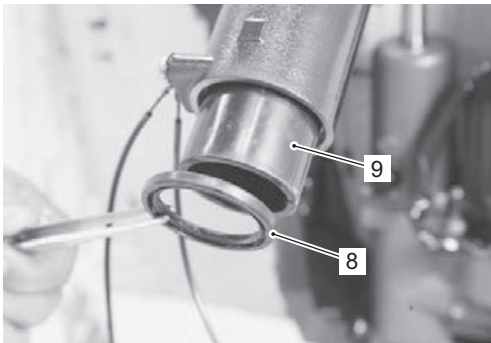
IAJ611210080-02

- 5) Lift steering bracket (5) upward to remove from swivel bracket.  
Remove washer (6) and upper bushing (7).



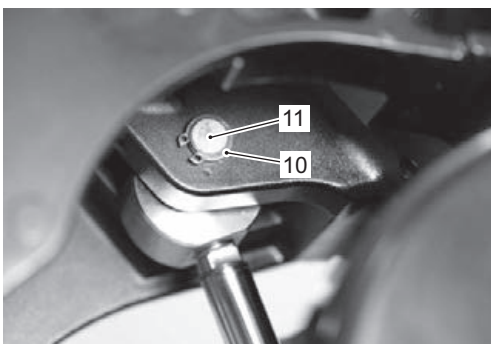
IAJ611210081-01

- 6) Remove swivel bracket seal (8) and lower bushing (9).



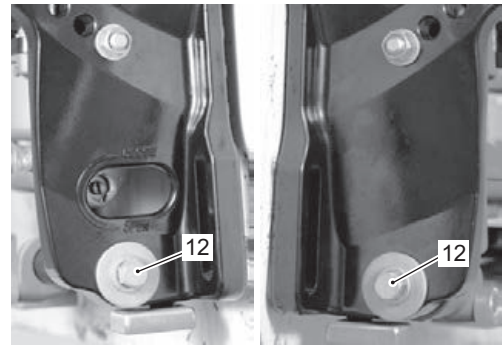
IAJ611210082-01

- 7) Remove circlip (10) and push out tilt cylinder upper rod (11).



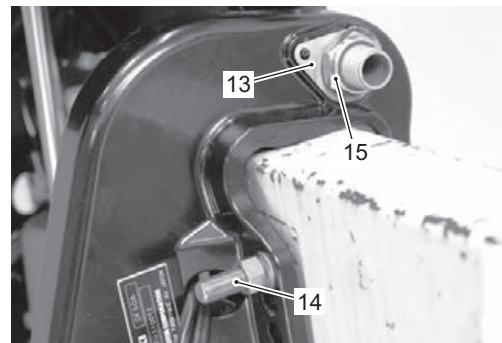
IBJ611210018-02

- 8) Remove the two bolts (12) securing PTT lower shaft to STBD and PORT clamp brackets.



IBJ611210011-05

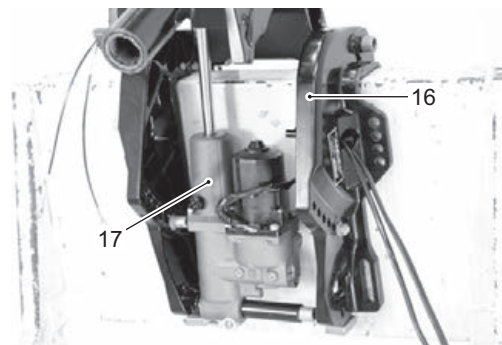
- 9) Using flat blade screw driver, drive locking edge of lock washer (13) to clamp bracket side.  
10) Remove the two STBD motor mounting bolts (14).  
Remove the clamp bracket shaft nut (15) and washer.



IBJ611210037-01

- 11) Slide STBD clamp bracket (16) off clamp bracket shaft.

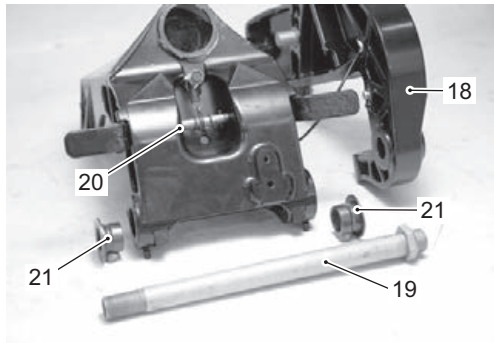
- 12) Remove the PTT unit (17).



IBJ611210038-01

## 2A-12 Housing and Bracket:

- 13) Pull PORT clamp bracket (18) outward to remove clamp bracket and bracket shaft (19) from swivel bracket (20). Remove bushing (21) from each side of swivel bracket.



IBJ611210014-03

### Clamp / Swivel / Steering Brackets Assembly (DF40A/50A/DF60AQH)


CENBJ6112106020

Assembly is reverse order of disassembly with special attention to the following steps.

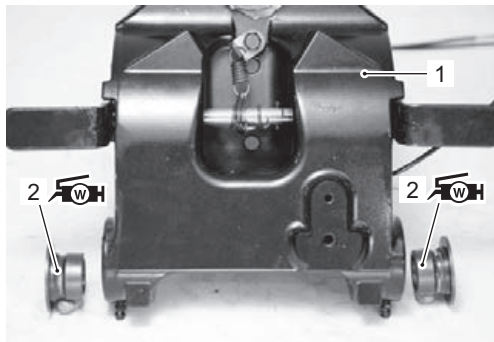
#### Clamp Bracket / Swivel Bracket

##### NOTE

**Before installing clamp bracket to swivel bracket, apply grease to clamp bracket shaft and bushings.**

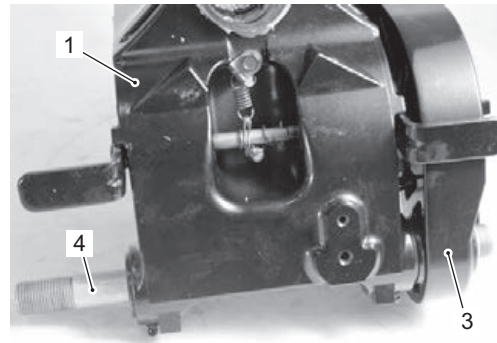
 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))

- Insert PORT and STBD bushings (2) into the swivel bracket (1).



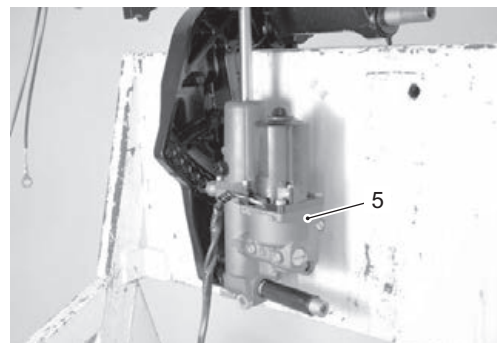
IBJ611210039-01

- Assemble PORT clamp bracket (3), clamp bracket shaft (4) and swivel bracket (1).



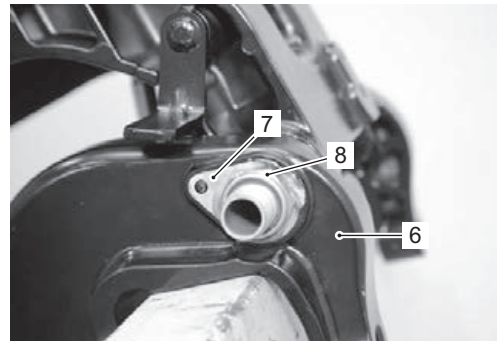
IBJ611210040-01

- Install PTT unit and lower shaft assembly (5). Refer to "Power Trim and Tilt Unit Removal and Installation": in Section 2B in related manual.



IBJ611210041-01

- Install STBD clamp bracket (6), lock washer (7) and clamp bracket shaft nut (8).

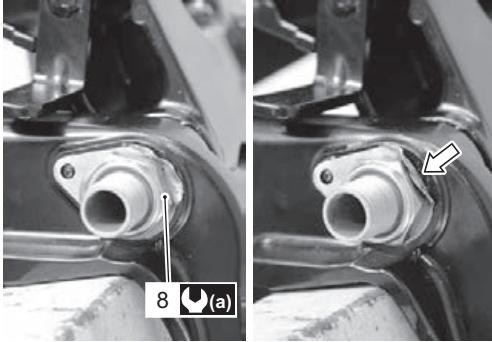


IBJ611210042-01

- Tighten clamp bracket shaft nut (8) to specified torque.
- After tightening clamp bracket shaft nut to specified torque, bend lock washer edge toward nut to secure nut.

#### Tightening torque

Clamp bracket shaft nut (a): 43 N·m (4.3 kgf-m, 31.0 lbf-ft)



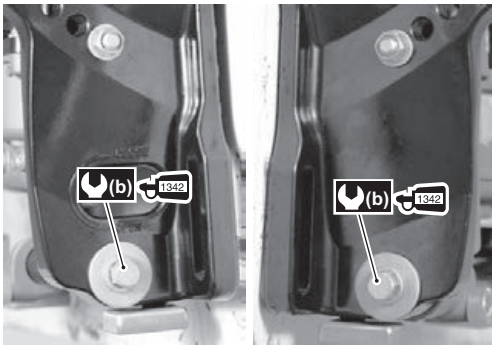
IBJ611210020-02

- Tighten two PTT lower shaft bolts, pre-coated with thread lock, to specified torque.

#### Tightening torque

PTT lower shaft bolt (b): 50 N·m (5.0 kgf-m, 36.0 lbf-ft)

: Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))



IBJ611210043-01

#### Steering Bracket

- Apply water resistant grease to steering bracket shaft.

: Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))

#### NOTE

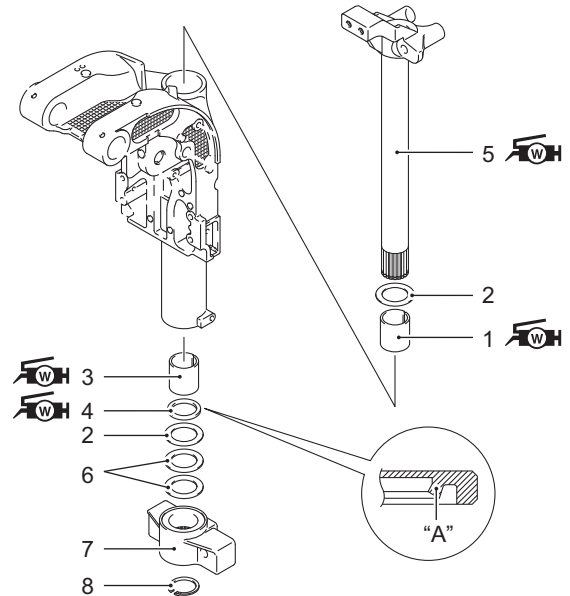
Apply grease to bushings, oil seal lip and pilot shaft portion of steering bracket.

- Install upper bushing (1) and washer (2) to swivel bracket.
- Install lower bushing (3) and swivel bracket seal (4) to swivel bracket.

#### NOTE

Install bracket seal (4) with oil seal lip (spring side) facing downward.

- Install steering bracket (5) to swivel bracket.

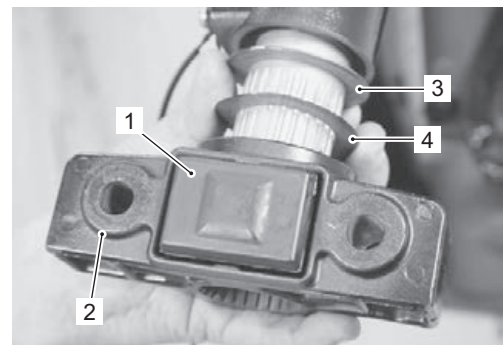


IAJ611210099-01

1. Upper bushing	6. Shim
2. Washer	7. Lower mount bracket
3. Lower bushing	8. Circlip
4. Swivel bracket seal	"A": Seal lip
5. Steering bracket	

#### Lower Mount Bracket

- Install lower thrust mount (1) to lower mount bracket (2).
- Install washer (3) and shim (4), and then slide the lower mount bracket (2) upward on the splines until it contacts the shim.

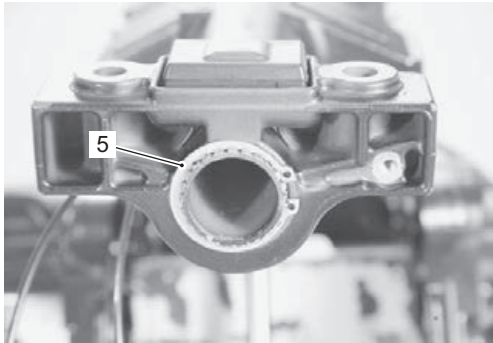


IAJ611210100-01



## 2A-14 Housing and Bracket:

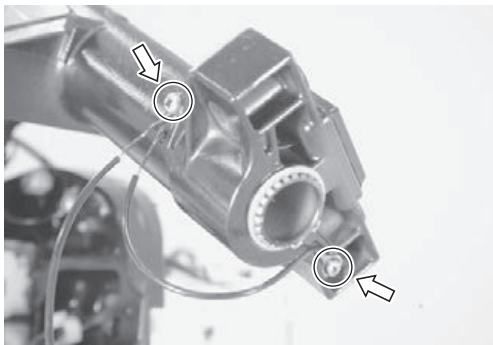
- Install circlip (5) to retain bracket.



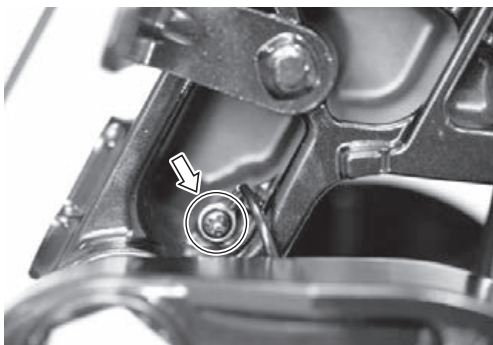
IAJ611210101-01

### Bonding Wire

Reattach bonding wire to swivel bracket and tighten screw securely.




IAJ611210102-01

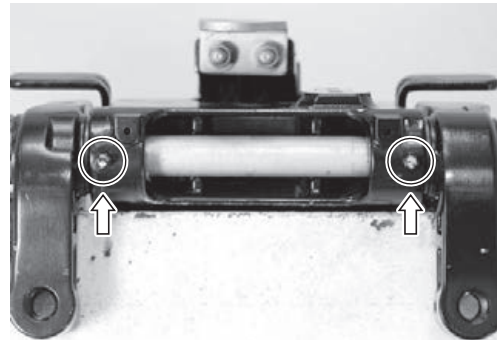


IBJ611210044-01

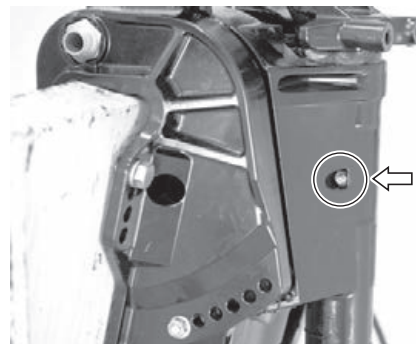
### Lubrication

After completing reassembly of the mid unit, apply grease through each grease nipple.

 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))



IBJ611210045-01



IBJ611210046-01

### Clamp / Swivel / Steering Brackets Related Components Inspection (DF40A/50A/DF60AQH)

CENBJ6112106021

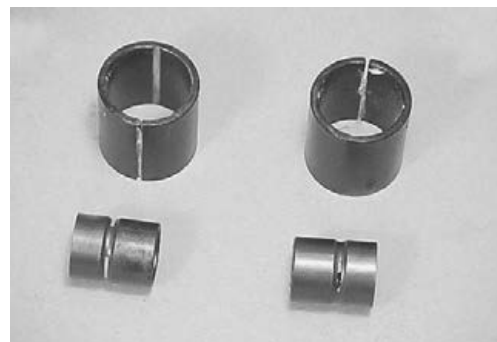
Refer to "Clamp / Swivel / Steering Brackets Disassembly": in related manual and "Clamp / Swivel / Steering Brackets Assembly": in related manual.

### NOTE

**If any component is found to be excessively worn, cracked, defective or damaged in any way, it must be replaced.**

### Bushings

Check all bushings. If excessive wear or other damage is found, replace bushing. If bushing fit is loose when installing, replace bushing.



I9J011210117-01



**Oil Seal**

Check swivel bracket seal. If excessive wear or other damage is found, replace seal.



I9J011210118-01

**Clamp Bracket Shaft**

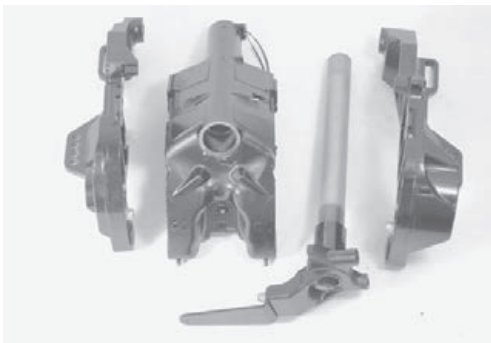
Check clamp bracket shaft.  
If clamp bracket shaft is bent or twisted, replace shaft.



I9J011210120-01

**Bracket**

Check clamp brackets, steering bracket and swivel bracket.  
If cracks or other damage is found, replace bracket (s).



IAJ611210106-01

**Gas Cylinder Removal and Installation (DF40AQH/60AQH)**

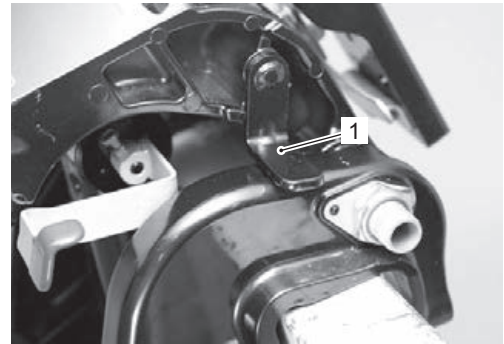
CENBJ6112106022

**⚠ WARNING**

This unit contains high pressure gas and it must not be disassembled, punctured, incinerated or exposed to heat.

**Removal**

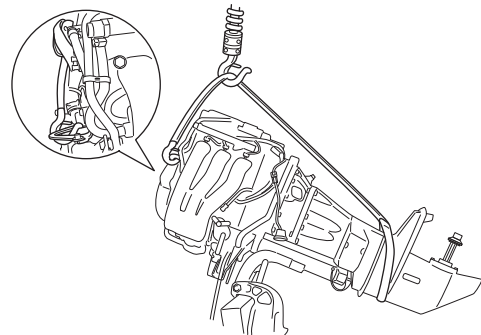
- 1) Remove the lower side cover.  
Refer to "Lower Side Cover Removal and Installation": in related manual.
- 2) Raise the engine to the full tilt up position and lower the manual tilt lock levers (1).



IBJ611210047-01

**⚠ WARNING**

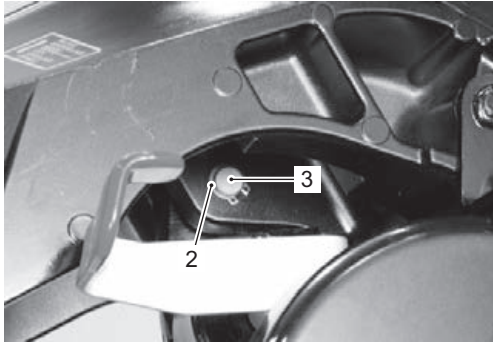
During the following procedures, the engine must be firmly secured and its weight fully supported. (See below)



IAJ611220019-02

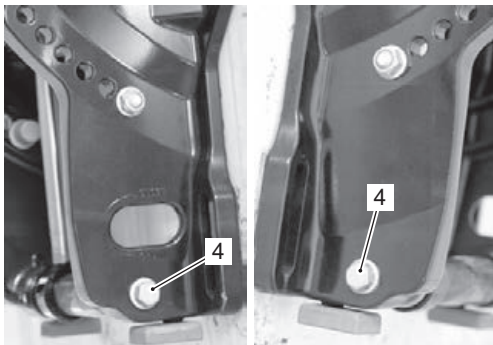
## 2A-16 Housing and Bracket:

- 3) Remove the snap ring (2) and push the tilt cylinder upper shaft pin (3) out.



IBJ611210048-01

- 4) Remove the two bolts (4) securing gas cylinder lower shaft to STBD/PORT clamp brackets.



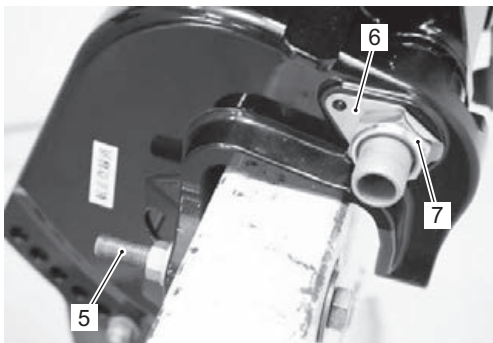
IBJ611210049-01

- 5) Remove two STBD motor mounting bolts (5). Using flat screw driver, drive locking edge of lock washer (6) to clamp bracket side. Loosen the clamp bracket shaft nut (7).

### NOTE

**Complete removal of the clamp bracket shaft nut is not required.**

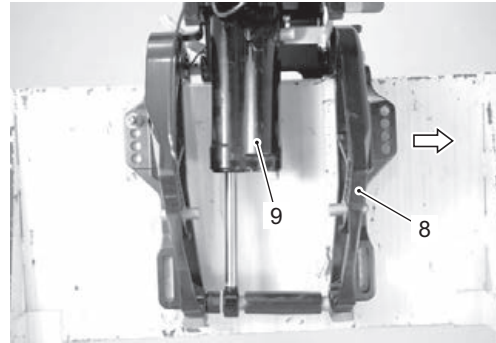
**Nut should only be loosened as far as the end of the shaft threads to facilitate removal of the tilt aid gas cylinder.**



IBJ611210050-01

- 6) Slide the STBD clamp bracket (8) fully outward to the right hand side.

Remove the tilt aid gas cylinder (9) and cylinder lower shaft from between the clamp brackets.




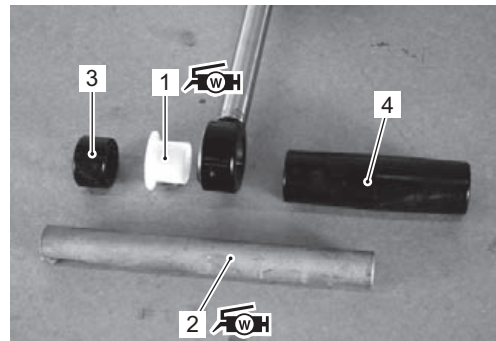
IBJ611210051-02

### Installation

Installation is reverse order of removal with special attention to the following steps.

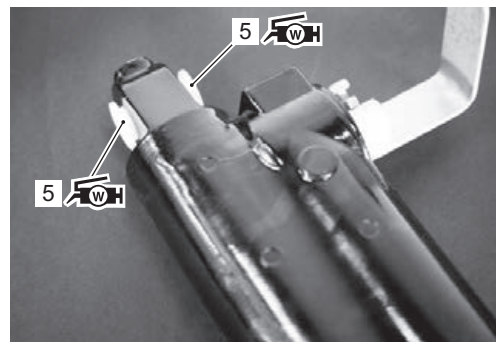
- Apply water resistant grease to the gas cylinder lower shaft and lower shaft bushing. Install the lower shaft bushing (1) and cylinder lower shaft (2) to gas cylinder. Install the spacer (3) and (4) to cylinder lower shaft.

 : **Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))**



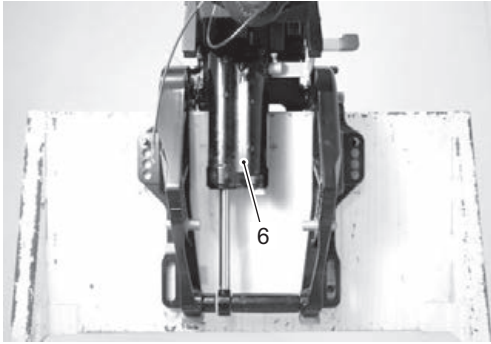
IBJ611210052-01

- Apply water resistant grease to gas cylinder upper bushings (5), then install bushings in cylinder upper eyelet.



IBJ611210053-01

- Place gas cylinder (6) in position between the clamp brackets.



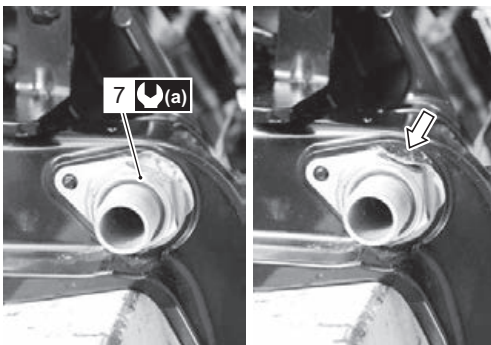
IBJ611210054-01

- Tighten clamp bracket shaft nut (7) to specified torque.

#### Tightening torque

**Clamp bracket shaft nut (a): 43 N·m (4.3 kgf-m, 31.0 lbf-ft)**

- After tightening clamp bracket shaft nut to specified torque, bend lock washer edge toward nut to secure nut.



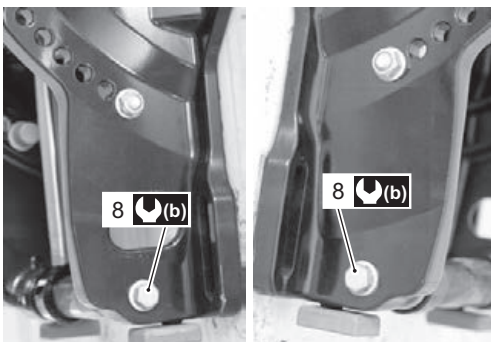
IBJ611210055-01

- Tighten cylinder lower shaft bolts (8), pre-coated with thread lock, to specified torque.

**1342 : Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))**

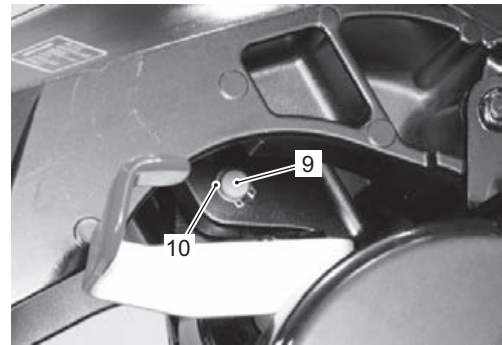
#### Tightening torque

**Cylinder lower shaft bolt (b): 50 N·m (5.0 kgf-m, 36.0 lbf-ft)**



IBJ611210056-01

- Align the cylinder upper eyelet with the hole in the swivel bracket, then insert the upper shaft (9) through the swivel bracket and gas cylinder. Secure the upper shaft with the snap ring (10).



IBJ611210057-01

### Gas Cylinder Related Items Inspection (DF40AQH/60AQH)

CENBJ6112106023

#### Gas Cylinder

Check the gas cylinder.

If cracks, defects or other damage is found, replace the gas cylinder assembly complete.



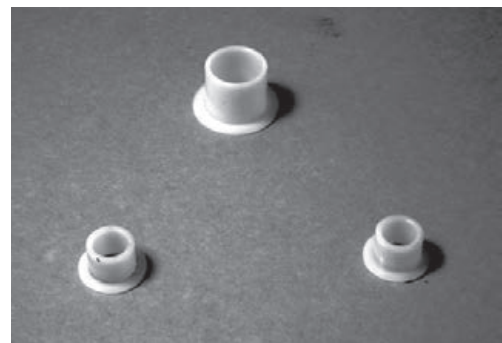
IBJ611210058-01

#### Bushings

Check all bushings.

If excessive wear or other damage is found, replace bushing.

If bushing fit is loose when installing, replace bushing.

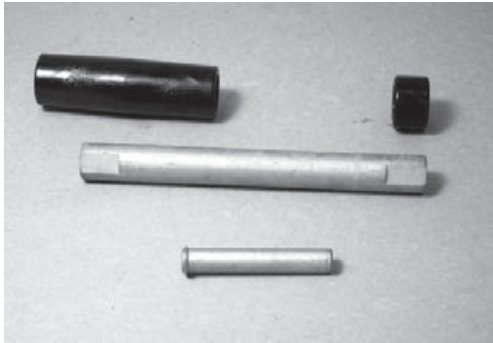


IBJ611210059-01

## 2A-18 Housing and Bracket:

### Upper Shaft / Lower Shaft

Inspect lower shaft and upper shaft for bends, twists or other damage. Replace if necessary.



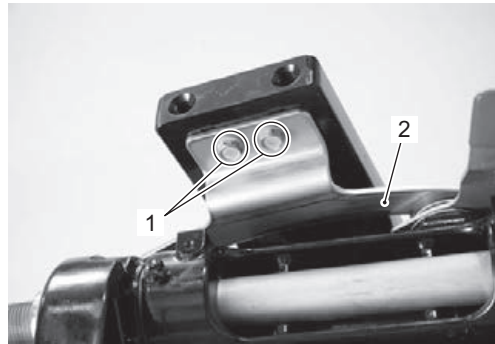
IBJ611210060-01

### Steering Friction Adjuster Disassembly and Assembly (DF40AQH/50ATH/60AQH)

CENBJ6112106024

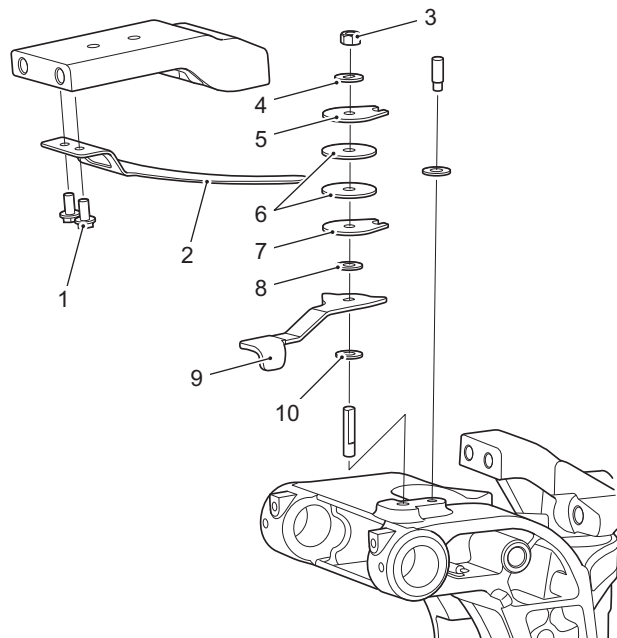
#### Disassembly

- 1) Remove the bolts (1) and steering adjuster plate (2).



IBJ611210061-01

- 2) Remove the nut (3), washer (4).
- 3) Remove the friction plate (5), washer (6), washer (6) and friction plate (7).
- 4) Remove the washer (8), steering adjuster (9) and washer (10).



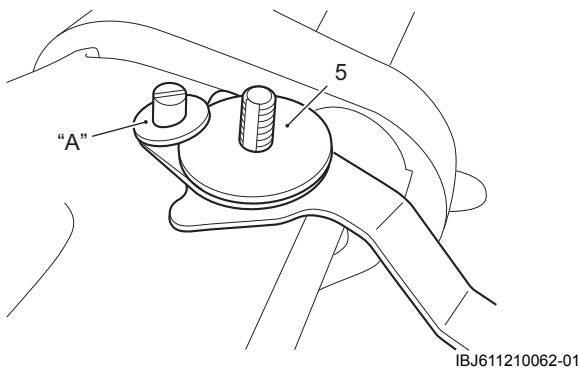
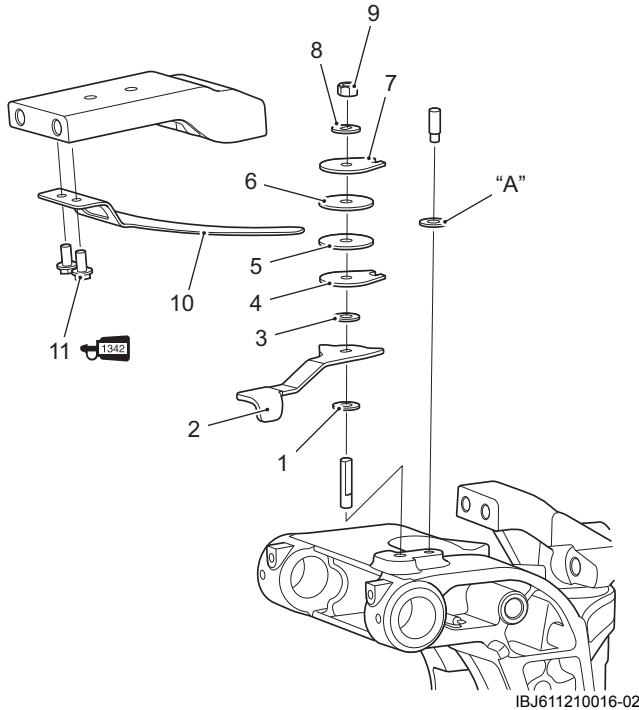
IBJ611210015-03



## Assembly

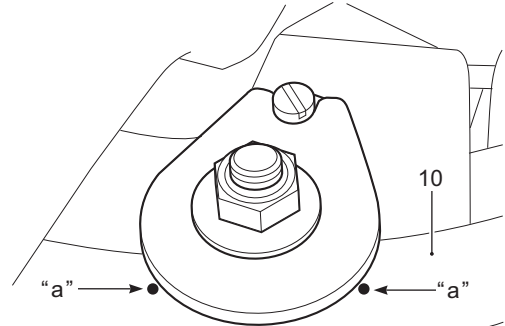
Assemble the steering friction adjuster set in the following sequence:

- 1) Install the washer (1), steering adjuster (2) and washer (3).
- 2) Install the friction plate (4) and washer (5). Place the spacer (A) onto the washer (5).
- 3) Install the washer (6), friction plate (7) and washer (8), then temporarily tighten the nut (9).
- 4) Install the steering adjuster plate (10) and temporarily tighten the two bolts (11), pre-coated with thread lock.



## NOTE

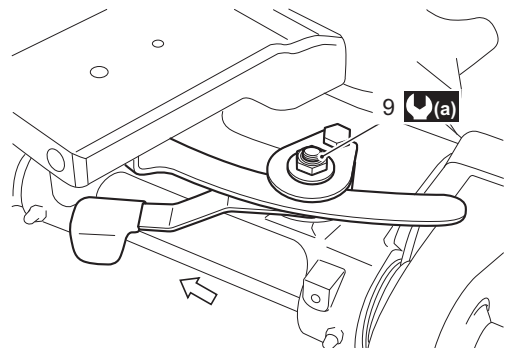
**After temporarily tightening the two bolts (11), confirm that the edge of washer (6) is located between the punch marks "a" on the adjuster plate (10).**



- 5) Tighten the adjuster plate bolts (11) securely.
- 6) Move the steering adjuster lever to fully left position. Tighten the nut (9) to specified torque.

## Tightening torque

**Nut (a): 5 N·m (0.5 kgf-m, 3.6 lbf-ft)**



# Power Trim and Tilt

## Service Instructions

### Setting of Trim Down Position Limit (DF40A/50A/60A)

CENBJ6112206016

Refer to “Setting of Trim Down Position Limit”: in related manual.

### Setting Tilt Up Limit Position (DF40A/50A)

CENBJ6112206017

DF40A/50A can not be adjusted tilt up Limit position.

#### NOTE

The DF40A/50A are equipped with trim down limit setting system as same as the DF60A, so that the trim down limit position setting can be done but not the tilt upper limit.

### Power Trim and Tilt Unit Removal and Installation (DF40A/50A)

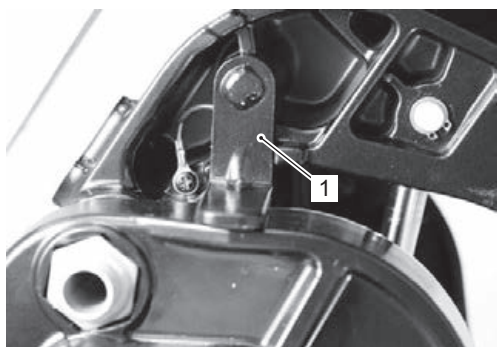
CENBJ6112206015

#### Removal

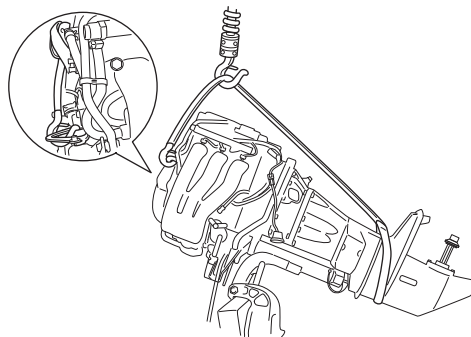
- 1) Remove the lower side cover.  
Refer to “Lower Side Cover Removal and Installation”: in Section 2A in related manual.
- 2) Raise the engine to the full tilt up position and lower the manual tilt lock levers (1).

#### ⚠ WARNING

During the following procedures, the engine must be firmly secured and its weight fully supported. (See below)

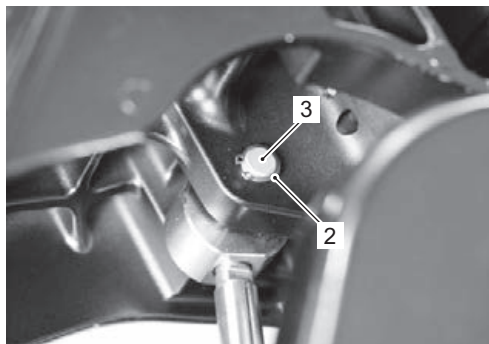


IBJ611220001-01



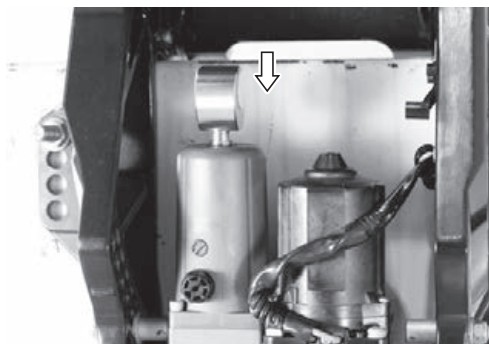
IAJ611220019-02

- 3) Remove the tilt rod snap ring (2) and push the tilt cylinder upper shaft pin (3) out.



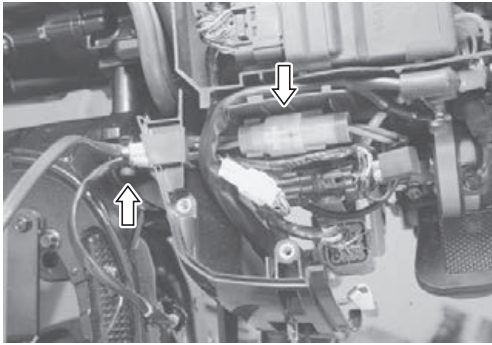
IBJ611220002-01

- 4) Lower the tilt rod to the full down position and disconnect the battery cable.



IBJ611220003-01

- 5) Disconnect the PTT motor cable wire connector from the PTT relay. Cut the cable tie binding PTT motor cable and trim sensor lead. Remove the PTT motor cable from engine lower cover.

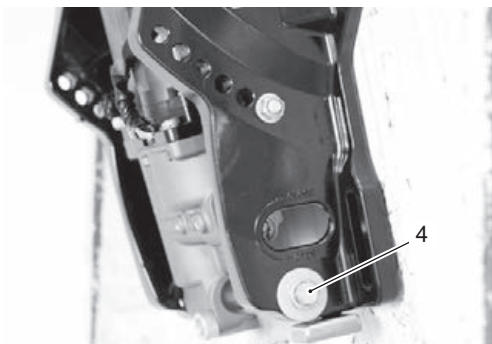


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- 6) Remove the two bolts (4) securing PTT cylinder lower shaft to STBD / PORT clamp brackets.



IBJ611220004-01



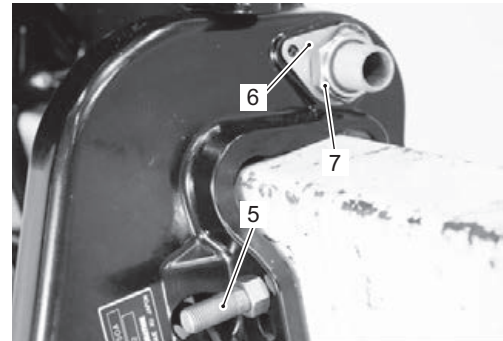
IBJ611220005-01

- 7) Remove two STBD motor mounting bolts (5). Using flat screw driver, drive locking edge of lock washer (6) to clamp bracket side. Loosen the clamp bracket shaft nut (7).

#### NOTE

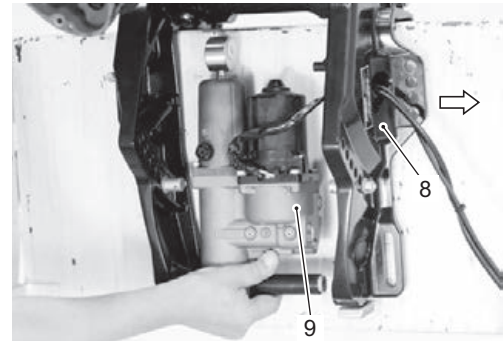
**Complete removal of the clamp bracket shaft nut is not required.**

**Nut should be loosened as far as the end of the shaft threads only to facilitate removal of the PTT unit.**



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- 8) Slide the STBD clamp bracket (8) fully outward to the right hand side. Remove the PTT unit (9) and cylinder lower shaft from between the clamp brackets.




IBJ611220013-01

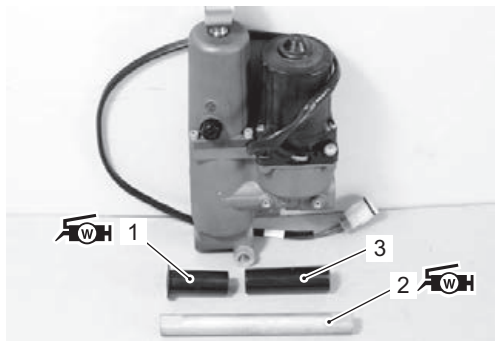
## 2B-3 Power Trim and Tilt:

### Installation

Installation is reverse order of removal with special attention to the following steps.

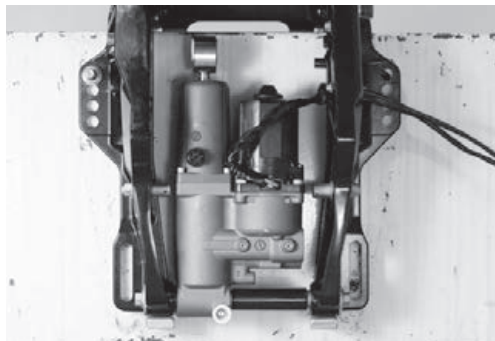
- Lower tilt rod to full down position.
- Apply water resistant grease to the tilt cylinder lower shaft and lower shaft bushing. Install the lower shaft bushing (1) and cylinder lower shaft (2) to PTT unit. Install the spacer (3) to cylinder lower shaft.

 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))



IBJ611220007-02

- Place PTT unit in position between the clamp brackets.



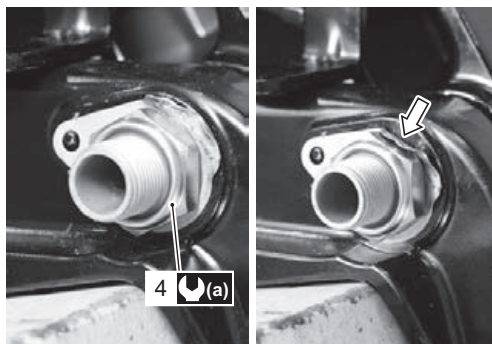
IBJ611220008-01

- Tighten clamp bracket shaft nut (4) to specified torque.

### Tightening torque


**Clamp bracket shaft nut (a): 43 N·m (4.3 kgf-m, 31.0 lbf-ft)**

- After tightening clamp bracket shaft nut to specified torque, bend lock washer edge toward nut to secure nut.



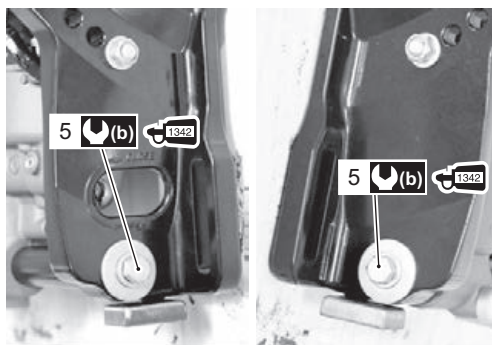
IBJ611220009-01

- Tighten cylinder lower shaft bolts (5), pre-coated with thread lock, to specified torque.

 : Thread lock cement 99000-32050 (SUZUKI Thread Lock 1342 (50 g))

### Tightening torque


**Cylinder lower shaft bolt (b): 50 N·m (5.0 kgf-m, 36.0 lbf-ft)**

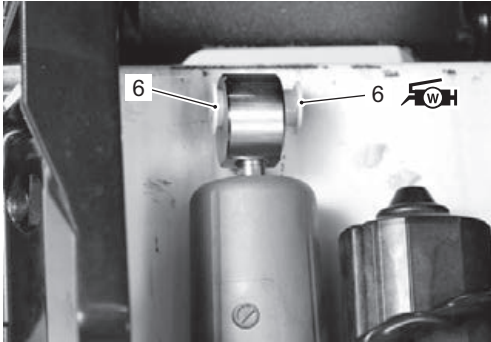


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- Apply water resistant grease to tilt rod upper bushings (6), then install bushings in tilt rod. Operate the PTT motor to extend the PTT rod upward. Align the tilt rod with the hole in the swivel bracket as the tilt rod extends.

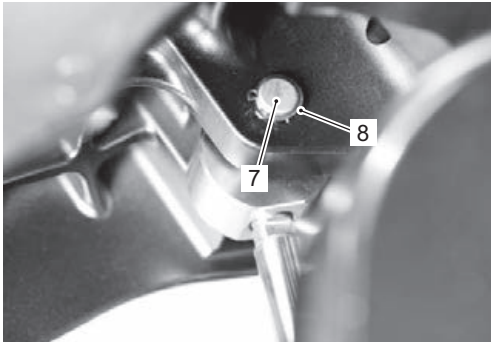
 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))



IBJ611220011-01

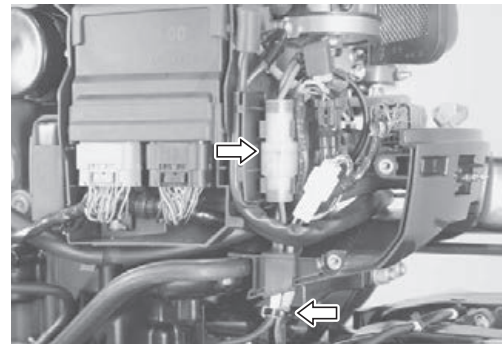
- Apply water resistant grease to the PTT rod upper shaft (7), then insert the shaft through the swivel bracket and tilt rod. Secure the upper shaft with the snap ring (8).

 : Grease 99000-25161 (SUZUKI Water Resistant Grease (250 g))



IBJ611220012-01

- Route the PTT motor cable in through the lower cover and connect the PTT cable connector to the PTT relay. Refer to "Wiring Harness Routing Diagram": in Section 4A in related manual.



IAJ611220037-01

- Final assembly check  
Perform the following checks to ensure proper and safe operation of repaired unit:
  - All parts removed have been returned to their original positions.
  - Wire routing matches service manual illustration.



Section 4

Wire / Hose Routing

CONTENTS

NOTE

For the items with asterisk (\*) in the “CONTENTS” below, refer to the same section of the service manual mentioned in the “FOREWORD” of this manual.

<b>Precautions</b> .....	<b>4-*</b>	Wiring Harness Routing Diagram.....	4A-*
<b>Precautions</b> .....	<b>4-*</b>	Wiring Harness Routing Diagram (DF40A/	
Precautions for Wire / Hose Routing.....	4-*	DF50A).....	4A-4
<b>Component Location</b> .....	<b>4-*</b>	<b>Fuel / Water Hose Routing</b> .....	<b>4B-1</b>
Electrical Component Location .....	4-*	<b>Precautions</b> .....	<b>4B-*</b>
<b>Wire Routing</b> .....	<b>4A-1</b>	Precautions for Fuel / Water Hose Routing.....	4B-*
<b>Schematic and Routing Diagram</b> .....	<b>4A-1</b>	<b>Schematic and Routing Diagram</b> .....	<b>4B-1</b>
Wiring Diagram .....	4A-*	Fuel Hose Routing .....	4B-*
Wiring Diagram (DF40AT/DF50AT/DF60AT).....	4A-1	Water Hose Routing.....	4B-*
Wiring Diagram (DF50ATH/DF60ATH).....	4A-2	Fuel Hose Routing (DF40A/DF50A).....	4B-1
Wiring Diagram (DF40AQH/DF60AQH).....	4A-3		

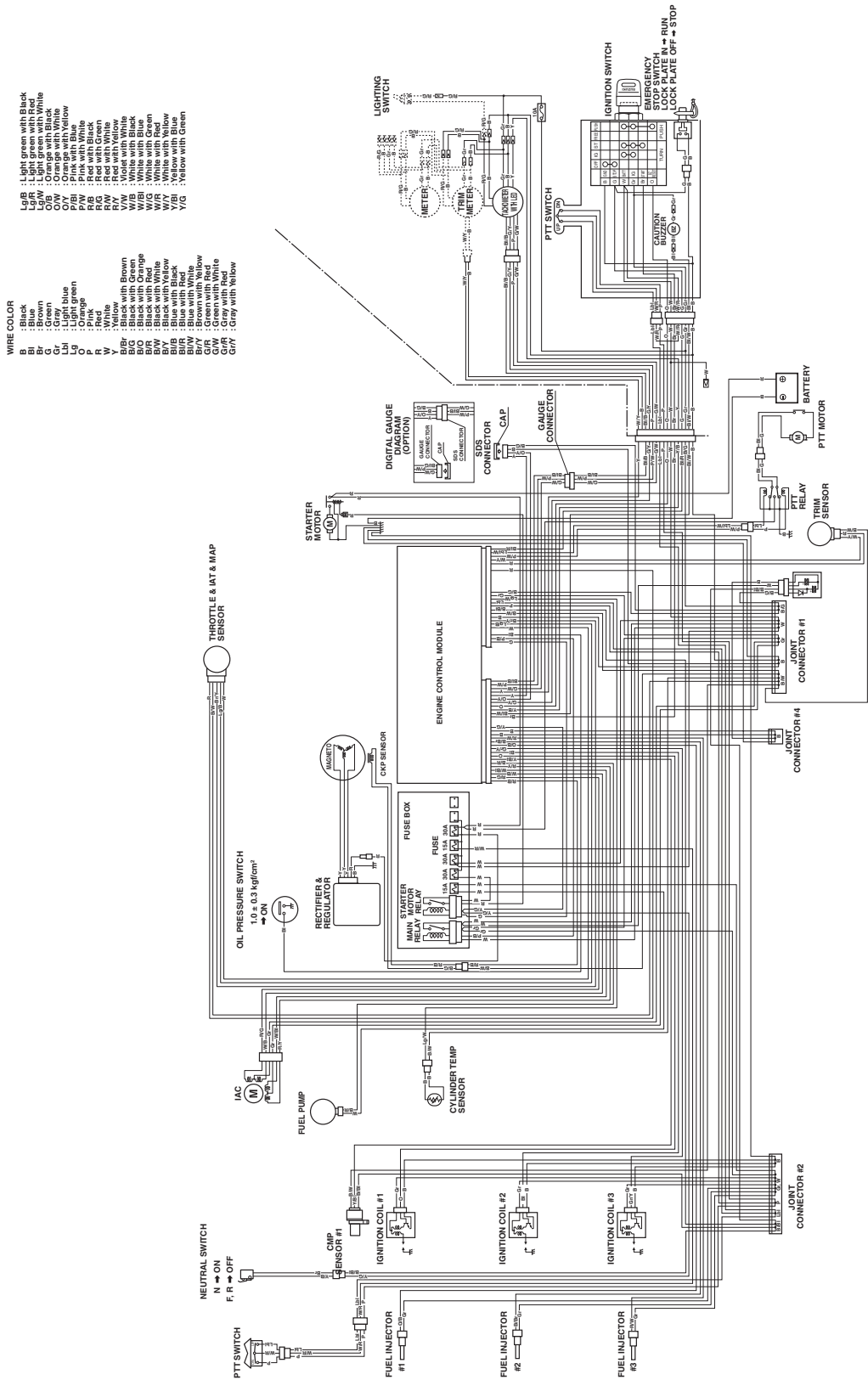
# Wire Routing

## Schematic and Routing Diagram

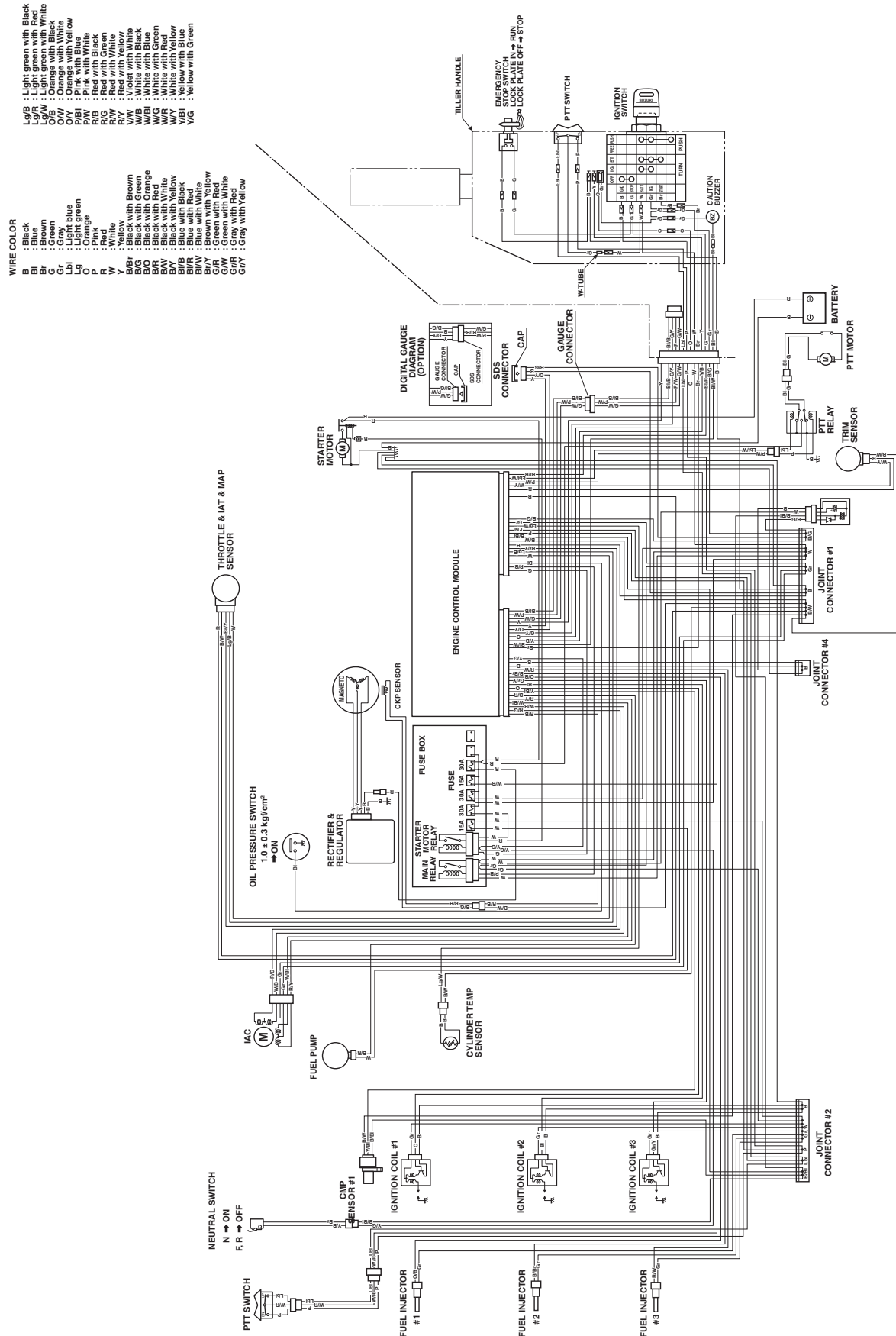
### Wiring Diagram (DF40AT/DF50AT/DF60AT)

CENBJ6114102003

Refer to “Wire Color Symbols”: in Section 0A in related manual.

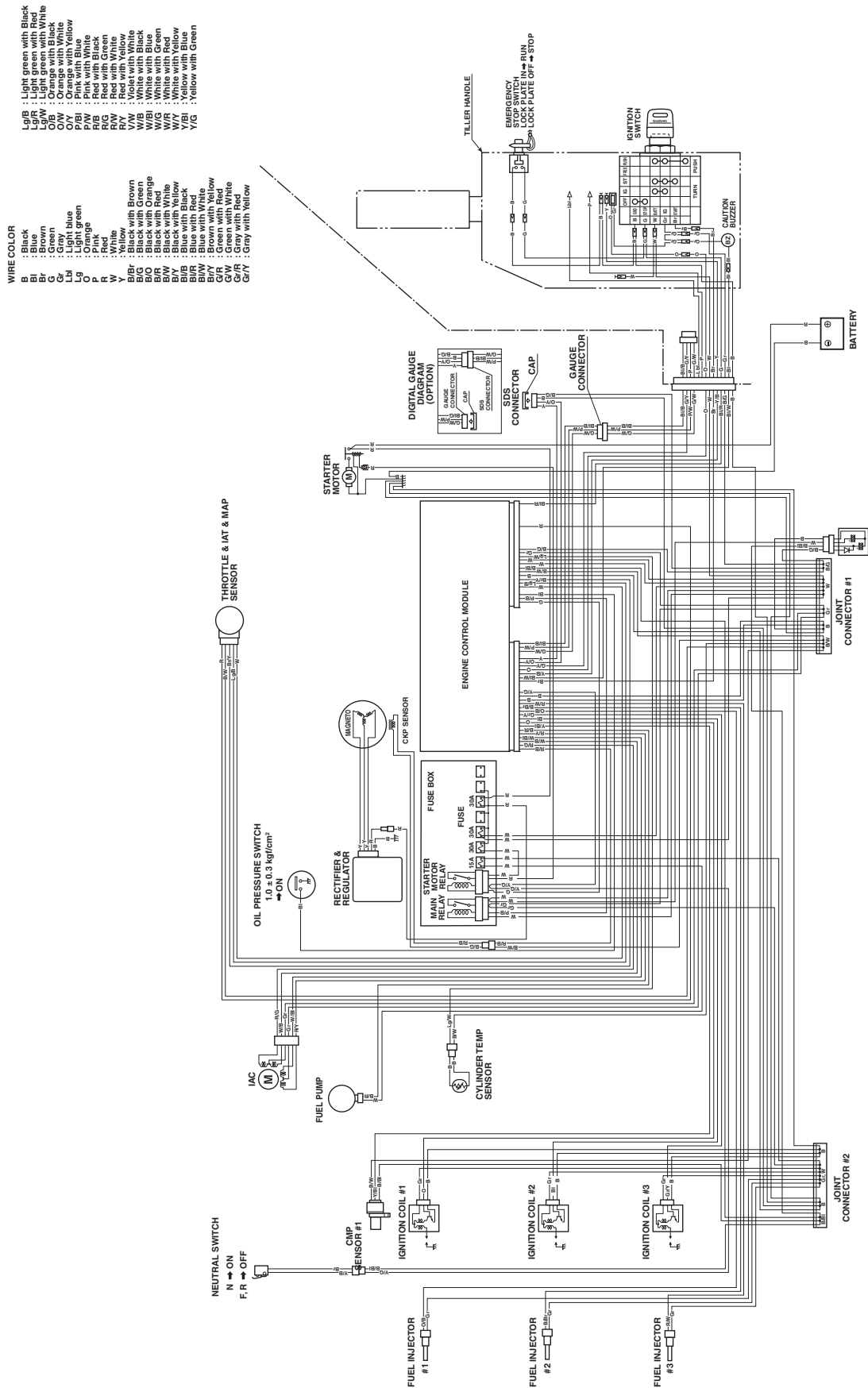


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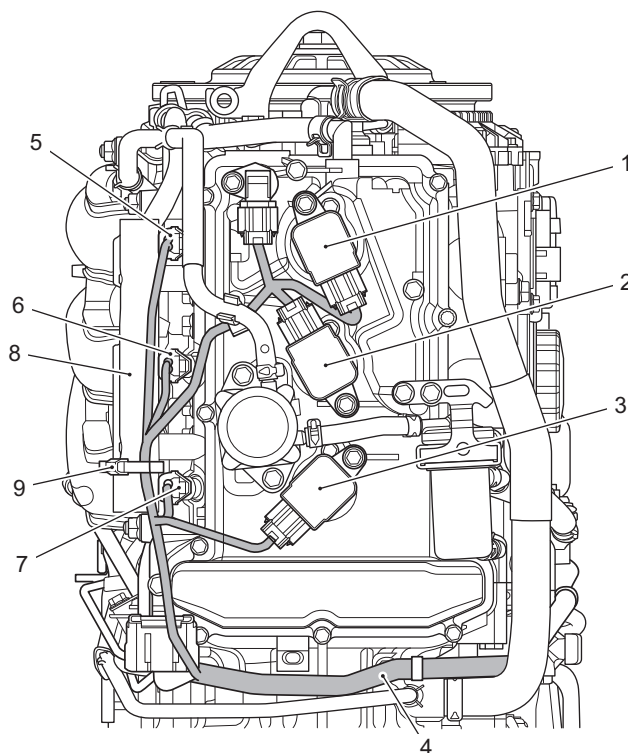
Wiring Diagram (DF40AQH/DF60AQH)

CENBJ6114102005



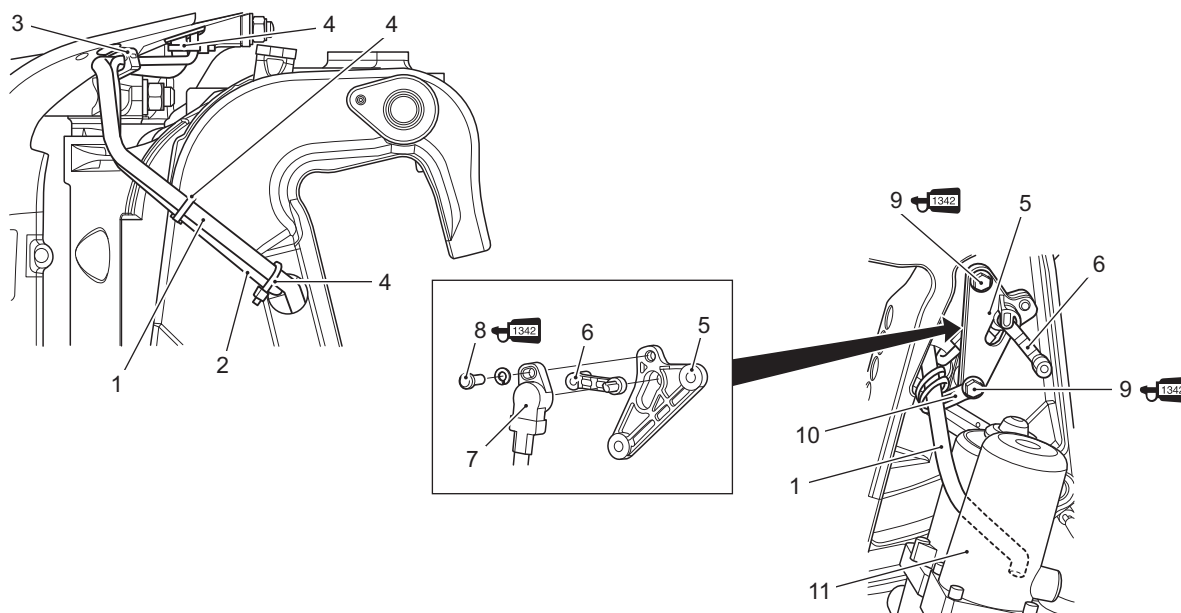
## Wiring Harness Routing Diagram (DF40A/DF50A)

CENBJ6114102006



IBJ611410004-01

1. No.1 Ign. Coil	4. Main wiring harness	7. No.3 Fuel injector
2. No.2 Ign. Coil	5. No.1 Fuel injector	8. Fuel delivery pipe
3. No.3 Ign. Coil	6. No.2 Fuel injector	9. Cable tie : Fix the main wiring harness.



IBJ611410005-01

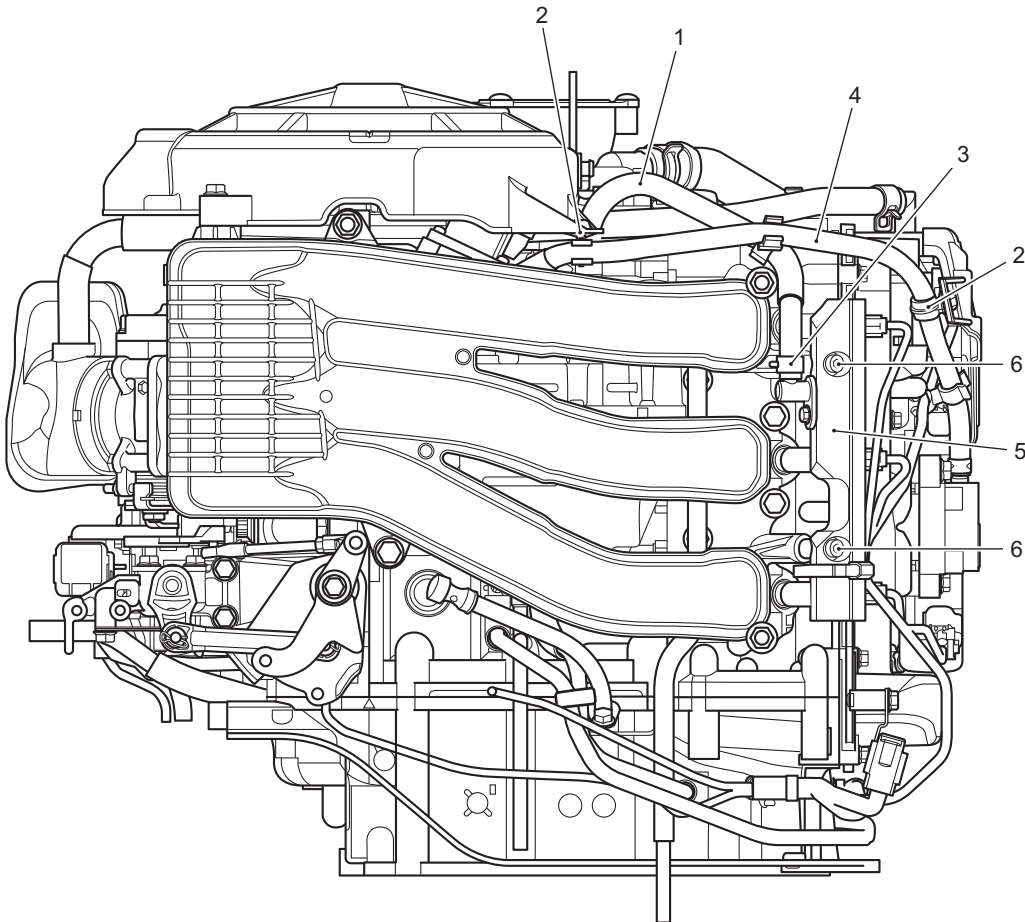
1. PTT motor cable	4. Cable tie	7. Trim sensor	10. Clamp
2. Trim sensor lead wire	5. Trim sensor bracket	8. Bolt	11. PTT motor
3. Clamp	6. Trim sensor lever	9. Bolt	: Apply SUZUKI thread lock 1342

# Fuel / Water Hose Routing

## Schematic and Routing Diagram

### Fuel Hose Routing (DF40A/DF50A)

CENBJ6114202003



IBJ611420001-02

1. Fuel hose (Fuel vapor separator to fuel delivery pipe)	3. Clip	5. Fuel delivery pipe
2. Clamp	4. Fuel hose (Low pressure fuel pump to fuel vapor separator)	6. Bolt