Maintenance Manual for Outboard Motor

F40/30 EFI

Suzhou Parsun Power Machine Co., Ltd.

Preface

This Manual is a maintenance instruction for F30/40, which is provided by Parsun to dealers for use in maintaining and repairing Parsun outboard motors. Please read this Manual carefully before maintaining and servicing the outboard motors. When repairing and maintaining the outboard motors, please use the maintenance procedures and tools recommended in the Manual. If you choose other maintenance procedures and tools, please follow the instructions of experienced maintenance personnel to avoid injuries to personnel and the outboard motor.

The materials, drawings and technical parameters used in this Manual are based on the prototype at the time of publication, so there may be some small differences between the actual motor you purchased and that described in the Manual; If necessary, our Company will distribute the revised part to the dealers in various places.

When the following characters appear in this Manual, please read the Manual carefully and execute the relevant instructions and descriptions correctly and carefully.

⚠ **Warning:**

Failure to comply with the warnings may lead to injury to maintenance personnel and bystanders, and severe cases may result in death.

Note:

Means that preventive measures must be taken to avoid damage to the outboard motor.

Note:

Key information are provided here to make your operation steps simpler and clearer.

The last part of this Manual describes the common faults and troubleshooting methods of the outboard motor. Please read it carefully; When overhauling the outboard motor, it can help you quickly judge the status of the motor and improve working efficiency.

Suzhou Parsun Power Machine Co., Ltd.

After-sales service hotline: 400-882-6659

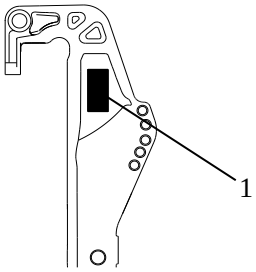
0512-66212797

Contents

Overview

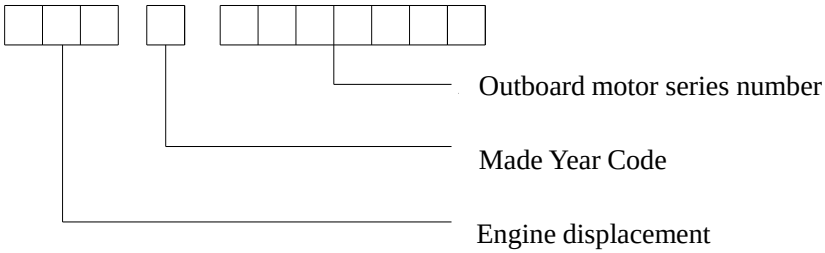
Identification Mark

The serial number is printed on a label which is fixed to the port side of the clamp bracket or the upper part of the rotary bracket. The serial number is recorded in the blank of the label to help you order spare parts from dealers or for your reference in case the engine is stolen.



1. Position of the serial number

The SN indicates the following:



Selection of propeller

The performance of the outboard motor is seriously affected by the propeller. Improper selection will have adverse effects on the motor. When the ship runs in full load, the motor will operate at low speed for a long time. At this time, the propeller with smaller pitch should be selected, whereas the propeller with larger pitch should be selected to maintain the normal operation of the engine.

When the engine is at maximum load, if the throttle is half or more of the full throttle range, the selected propeller is appropriate.

Propeller dimensions	Material
$3\text{-}11\frac{3}{8}"\times 12"$	Aluminum alloy
$3\text{-}11\frac{1}{8}"\times 13"$	Aluminum alloy

Protection at work

In order to prevent danger or accident during maintenance and improve work quality, please observe the following safety regulations.

1. Fire prevention

   Gasoline and various lubricating oils and greases are easy to burn; Keep away from heat sources, sparks and open flames during operation.

2. Ventilation

   Gasoline vapor and engine exhaust gas are highly toxic. Massive inhalation of such substances can cause shock and even death. When testing the engine indoors, please keep good ventilation conditions.

3. Self-protection

   Wear protective glasses when drilling, grinding or using air compressors. Wear protective gloves and safety shoes when necessary.

4. Use of lubricants and sealants

Only products provided or recommended by Parsun can be used when maintaining and repairing the outboard motor.

Under normal circumstances, the lubricant mentioned in this Manual will not damage your skin. However, please take protective measures before use to reduce risks.

①Apply protective cream on both hands before overhauling the outboard motor;

②Replace and clean the clothes as soon as possible after they are contaminated by the lubricant;

③Avoid skin contact;

④Wash your hands and skin carefully with soap and hot water after contact with the lubricant;

⑤Wipe the spilled grease with a clean, lint-free rag.

5. Develop good work habits

①Tighten nuts, bolts and screws according to the specified torque from large size to small size, from the center to the outside.

②Use recommended special tools to avoid damage to parts. Use the right tools in the proper way.

Disassembly and assembly

When disassembling and assembling the outboard motor, please follow the following principles:

1. Please use special tools when disassembling and assembling the parts of the outboard motor;

2. Remove dust and dirt before decomposing the parts;

3. Apply engine oil on the contact surface of moving parts before assembly;

4. When installing the bearing, place the manufacturer's mark in the specified direction and fully lubricate it;

5. Before installation, coat a thin layer of waterproof lubricating oil on the protruding part and periphery of the oil seal;

6. After assembly, check whether the moving parts work normally.

Disposable parts

Parts such as gasket, oil seal, O-ring, cotter pin and spring ring are disposable parts, and they must be replaced before reinstalling the outboard motor.

Pre-delivery inspection

To ensure the normal use by customers, please carry out the following inspection before delivery.

1. Check the fuel system.

Check whether the fuel hose is securely connected and whether the fuel tank is full.

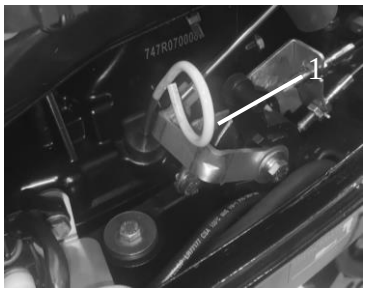
Note:

As it is a four-stroke engine, premixed fuel cannot be used.

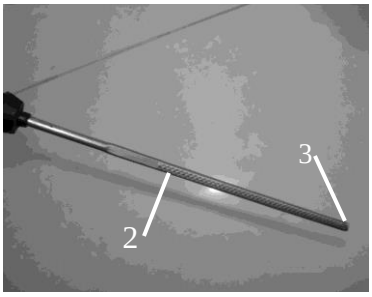
2. Check the oil level.

①Check engine oil level.

Pull out the oil dipstick and observe the oil level through the dipstick.



1. Oil dipstick



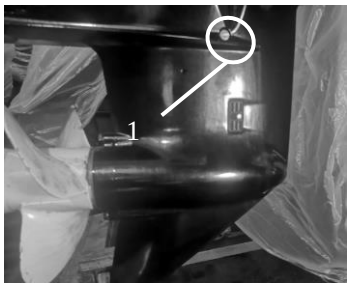
2. High mark 3. Low mark

Make sure the oil level is between the high mark and the low mark; Drain oil when the oil level is above the high mark and add oil when the oil level is below the low mark.

②Check gear oil level

Unscrew the oil level plug and observe whether the gear oil overflows in the oil level plug.

If yes, install the oil level plug and tighten it according to the specified torque; If not, fill with gear oil.



1. Oil level plug

3. Check the steering system.
   Check whether the steering is smooth;

4. Check shift and throttle operation.
   Check whether the shift operation is smooth; Check whether the throttle grip operates smoothly from the full-close position to the full-open position.

5. Check the emergency stop switch assembly.
   Check whether the engine stops when the emergency stop switch assembly is pressed and hold or the engine stop safety line is pulled out.

6. Check the cooling water peep door.
   Check the cooling water while the motor is running
   Check whether the cooling water flows out of the cooling water observation hole.

1. Cooling water observation hole

7. Running-in operation.
   ①1st hour: The engine runs at 2000 rpm or about half of the throttle.
   ②2nd hour: Run the engine at 3000 rpm or about 3/4 of the throttle.
   ③The next 8 hours: Avoid running at full throttle for 5 minutes continuously.

8. Inspection after running-in operation
   ①Check the gear oil for water.
   ②Check the fuel line for leaks.

③After running-in operation, run the engine at idle speed and use the washing tool to flush the cooling water channel with fresh water.

9. After running-in operation, check the idle speed of the engine.

①Preheat the engine for 5 minutes.

②Measure the idle speed using tachometer.

If the specified value is not met, adjust it. Idle speed value: 900~1000rpm.

③After idle adjustment, accelerate the speed several times to check the engine stability.

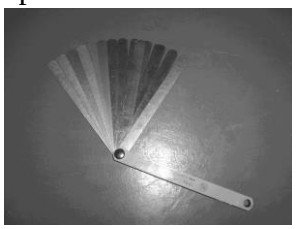
Note:

Idle adjustment needs to be done by qualified maintenance personnel with professional equipment; Adjusting at will may cause startup difficulty, weakness, jitter and other faults of the engine.

Special tools and testing equipment

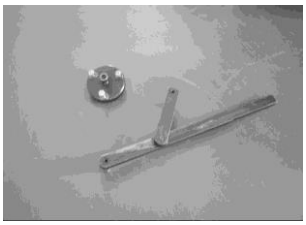
Various special tools and testing equipment will be used when repairing and maintaining the outboard motor. Using these tools and equipment expertly and correctly can improve your work efficiency and effectively avoid injuries to personnel and the outboard motor.

Special tools:



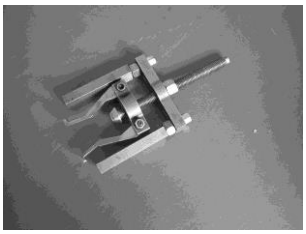
Clearance gauge

Piston slideway

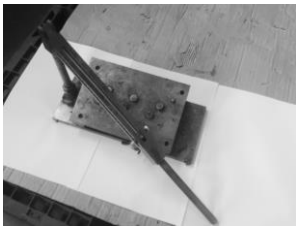


Flywheel gripper and flywheel puller

Oil filter spanner



Bearing puller



Valve spring compressor kit

Underwater unit housing cover bearing installation tool

Underwater unit housing cover oil seal installation tool

Underwater unit housing cover needle bearing installation tool

Underwater unit housing cover assembly installation tool

Underwater unit needle bearing installation tool

Drive shaft bearing jacket installation tool

Drive shaft bearing installation tool

Drive shaft seal oil seal installation kit

Forward gear bearing casing installation kit

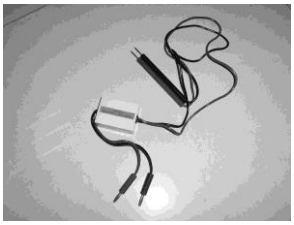
Drive shaft spline sleeve

Pinion nut spanner

Testing equipment:

Digital tachometer

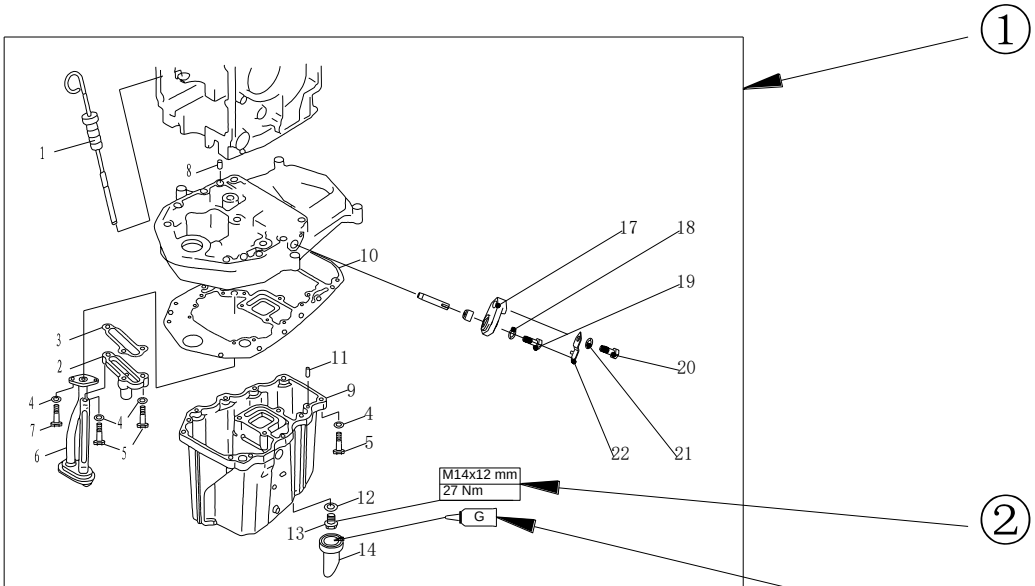
Digital multimeter



Peak voltage adapter

Disassembly schematic diagram and symbol description

Description of disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量	REMARKS 备注
1	F25-00000100	机油尺组件	PLUG,OIL LEVEL	1	
2	F25-02010100	溢流阀组件	RELIEF VALVE AUY	1	
3	F25-02010006	溢流阀垫片	GASKET,RELIEF VALVE	1	
4	GB/T97.1-2000	平垫圈6	WASHER ,PLAIN	15	
5	GB/T5783-2000	六角螺栓M6x25	HEXAGON BOLT	13	
6	F25-02010200	粗滤器组件	STRAINER,OIL	1	
7	GB/T5783-2000	六角螺栓M6X16	HEXAGON BOLT	2	
8	F25-00000014	定位销8x12	PIN,DOWEL	2	
9	F25-02000006	油底壳	OIL SUMP	1	
10	F25-02010007	排气歧管座垫	HEXAGON BOLT	1	
11	F15-00000006	定位销6x12	PIN,DOWEL	2	
12	F15-04000003	放油螺塞垫片	GASKET	1	
13	F15-04000002	放油螺塞	BOLT,OIL DRAIN	1	
14	F25-02000007	放油口胶套	JACKET,OIL DRAIN	1	
15	F25-02010005	阳极	ANODE	1	
16	F15-07010009	阳极密封圈	SEAL.ANODE	1	
17	F15-07010011	阳极盖板	COVER ,ANODE	1	
18	GB/T97.1-1985	平垫圈5	WASHER	1	
19	GB/T5783-2000	六角螺栓M5x12	BOLT	1	
20	GB/T5783-2000	六角螺栓M6x20	BOLT	1	
21	GB/T97.1-1985	平垫圈6	WASHER	1	
22	F15-07010012	阳极锁止片	PLATE ,ANODE	1	

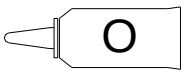
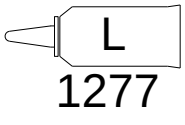
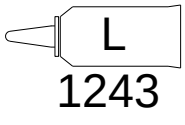
①Exploded view of parts.

②Thread specification and specified torque.

③Points where oil, sealant or locking agent are applied

Parts list.

Symbol description

				
Apply engine oil	Apply waterproof grease	Apply thread locker 1277	Apply thread locker 1243	Apply sealant

Specification

Outboard motor parameters

Item			Data	Item			Data
Overall dimensions	Overall length (B/F)		1173/768 mm	Engine	Spark plug		DPR7EA-9 (NGK)
	Overall width (B/F)		426/410 mm		Firing order		1-2-3
	Overall height	L	1361 mm		Maximum generator output		12 V, 17A
		S	1234 mm		Cooling system		Water cooling
	Stem board height	L	508 mm		Exhaust system		Through the propeller hub
		S	381 mm	Fuel and oil	Lubrication system		Wet lubrication
Weight	BWL-D		101.5 kg		Fuel type		Regular unleaded petrol
	BWS-D		99.9 kg		Fuel grade		RON 91
	FWL-T		100.6 kg		Type of engine oil		Four-stroke engine oil
	FWS-T		99 kg		Engine oil grade	API	SE, SF, SG, SH, SJ
Performance	Maximum output	F30	22 Kw@5500r/min			SAE	10W30, 10W40
		F40	29.4 Kw@5500r/min		Engine oil level		1.9 L(Change oil filter)
	Full throttle operating range		5000～6000 r/min				1.7 L (without changing oil filter)
	Maximum fuel consumption	F30	10.5 L/h@6000 r/min		Type of gear oil		Hypoid gear oil
		F40	13.8 L/h@6000 r/min		Gear oil grade	API	GL-4
	Idle (neutral position)		950±50 r/min			SAE	90
	Engine type		In-line four-stroke, overhead cam		Gear oil level		0.43 L
	Number of cylinders		3	Bracket	Inclined angle		64 °
Engine	Displacement		747 cm^3		Steering angle		45 °+45 °
	Cylinder bore × stroke		65 mm×75 mm		Trim angle		-3 °～16 °(when the stem board is 12 °)
	Compression ratio		9.4	Driving device	Gear		F-N-R
	Oil supply mode		Electronic fuel injection		Transmission ratio		2.0 (26/13)
	Control mode	B	Steering handle		Gear type		Spiral bevel gear
		F	Remote control		Clutch type		Claw clutch
	Start-up mode		Electric start		Propeller shaft type		Spline
	Ignition system		ECU		Propeller direction		Clockwise (rear view)

Maintenance information

Engine

Item		Data	Item		Data
Power unit	Minimum compression pressure	840 kPa	Cylinder block	Taper limit	0.08mm
	Lubricating oil pressure (idle speed)	230 kPa		Roundness limit	0.05mm
Cylinder cover	Buckling limit	0.1mm	Piston	Diameter of piston	64.930~64.945mm
	Inner diameter of camshaft hole	37.00~37.025mm		Height of measuring point	3mm (from bottom of piston)
				Piston to cylinder clearance	0.055~0.085mm
Cylinder block	Cylinder bore	65.00~65.013mm		Piston pin bore aperture	16.002~15.985mm
	Wear limit	65.1mm	Outside diameter of piston pin		15.965~16.008mm

Continued：

Item			Data	Item			Data
Piston ring	Top ring	Thickness	1.17~1.19mm	Valve	Stem diameter	Intake valve	5.475~5.490mm
		End face width	2.25~2.4mm			Exhaust valve	5.460~5.475mm
		End gap	0.15~0.30mm		Inner diameter of valve guide		5.500~5.518mm
		Lateral clearance	0.02~0.06mm		Clearance between guide and valve stem		0.025~0.058mm
	Second ring	Thickness	1.47~1.49mm		Valve stem roundness limit		0.03mm
		End face width	2.60~2.80mm	Valve spring	Free length		40.0mm
		End gap	0.30~0.50mm		Minimum free length		38.4mm
		Lateral clearance	0.02~0.06mm		Tilt limit		1.7mm
	Oil ring	Thickness	2.36~2.48mm	Connecting rod	Inner diameter of small end		15.985~15.998mm
		End face width	2.75mm		Inner diameter of large end		36.000~36.016mm
		End gap	0.20~0.70mm		Oil clearance of large end		0.020~0.052mm
		Lateral clearance	0.04~0.18mm		Thickness of big-end bearing	A Black	1.496~1.490 mm
Camshaft	Height	Intake cam	30.83~31.09mm			B Brown	1.490~1.484mm
		Exhaust cam	30.83~31.09mm	Crankshaft	Diameter of crankshaft main journal		42.984~43.000 mm
	Diameter of base circle		25.90~26.10mm		Crank pin diameter		32.984~33.000 mm
	Journal diameter		36.935~36.955mm		Crank pin width		21.00~21.07mm
	Roundness limit		0.03mm		Large end backlash of crankshaft		0.05~0.22mm

	Journal oil clearance		0.045~0.085mm		Roundness limit		0.05mm
Valve	Valve clearance (cold position)	Intake valve	0.15~0.25mm	Thermostat	Open temperature		58~62℃
		Exhaust valve	0.25~0.35mm		Full open temperature		70℃
	Valve cone Width	Intake valve	1.84~2.97mm		Minimum opening height of valve		3mm
		Exhaust valve	1.98~3.11mm	Crankcase	Inner diameter of crankshaft main journal		46.000~46.016mm
	Contact width with seat ring		0.9~1.1mm		Crankshaft main journal oil clearance		0.012～0.044mm
	Edge thickness	Intake valve	0.8mm		Thickness of crankshaft spindle bearing bush	A Black	1.500~1.494 mm
		Exhaust valve	0.9mm			B Brown	1.494~1.488mm
	Head diameter	Intake valve	31.9~32.1mm				
		Exhaust valve	25.9~26.1mm				

Measurement conditions:
The ambient temperature is 20 ℃.

Underwater unit

Item		Data	Item	Data
Backlash	Pinion to forward gear	0.18~0.66mm	Optional gear shim	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50mm
	Pinion to reverse gear	0.75~1.23mm		

Electrical system

Ignition and ignition control system

Item		Data	Item		Data
Ignition timing	At idle speed	TDC 2 º±0.5 °	Peak output voltage of ignition coil	Secondary output voltage	≥34KV
	5000 r/min	BTDC 25 °±0.5 º		Primary resistance	1.2±0.12Ω
Spark plug clearance		0.8~0.9mm		Secondary resistance	12±1.2KΩ
Peak output voltage of magneto	1500 r/min (no-load)	47.2 V	Output peak voltage converter of rectifier regulator	1500 r/min (no-load)	41.9 V
	3500 r/min (no-load)	106 V		3500 r/min (no-load)	99.8 V
Magneto resistance (green-green)		0.59±0.1Ω			

* Data for reference only

Measurement conditions:
Unless otherwise specified, the ambient temperature is 20℃ during measurement.

Charging system

Item			Data	Item		Data
Lighting Coil	Output peak voltage	Start (no-load)	14.0 V	Fuse		30 A
		1500 r/min (no-load)	45.0 V	Output peak voltage of rectifier regulator	1500 r/min (no-load)	13.0 V
		3500 r/min (no-load)	102.0 V		3500 r/min (no-load)	13.0 V
	Resistance		0.561～0.759 Ω			

Seating torque

Specified torque

Mounting position			Name	Thread specification	Torque
Engine	Spark plug		-	-	18 Nm
	Flywheel		Nut	M20	157 Nm
	Cylinder cover	Frist tightening	Bolt	M9	23 Nm
		Second tightening			47 Nm
		Frist tightening	Bolt	M6	6 Nm
		Second tightening			12 Nm
	Oil filter		-	-	18 Nm
	Oil filter stud		-	-	40 Nm
	Lock nut (rocker arm)		Nut	M6x0.75	13.5Nm
	Engine assembly		Bolt	M8	21 Nm
	Exhaust cover plate	Frist tightening	Bolt	M6	6 Nm
		Second tightening			12 Nm
	Thermostat cover		Bolt	M6	7Nm
	Crankcase	Frist tightening	Bolt	M8	15 Nm
		Second tightening			30 Nm
		Frist tightening	Bolt	M6	6 Nm
		Second tightening			12 Nm

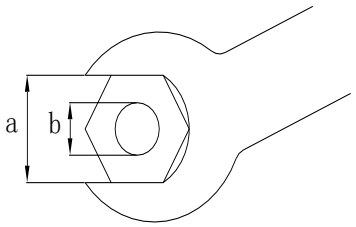
Continued：

Mounting position			Name	Thread specification	Torque
Engine	Connecting rod	Frist tightening	Bolt	M6	6 Nm
		Second tightening			17 Nm
	Driven pulley		Bolt	M10	38 Nm
Underwater unit	Underwater unit assembly		Bolt	M10	40 Nm
			Bolt	M8	40 Nm
	Water intake		Screw	M5	1 Nm
	Oil drain bolt		Bolt	-	9 Nm
	Oil inspection hole		Bolt	-	9 Nm

	Pinion	Nut	M22	74 Nm
	Propeller nut	Nut	M14	35 Nm
Above water	Steering handle	Nut	M10	10 Nm
	Steering handle	Self-locking nut	M10	22 Nm
	Exhaust manifold	Bolt	M6	10 Nm
	Throttle grip	Screw	M5	2 Nm
	Shift linkage bracket	Bolt	M6	10 Nm
	Gear spring plate	Bolt	M6	10 Nm
	Small cover plate of bottom cover	Bolt	M6	10 Nm
	Clamp bracket	Self-locking nut	-	45 Nm
	Oil drain bolt	Bolt	M14	27 Nm

Average torque

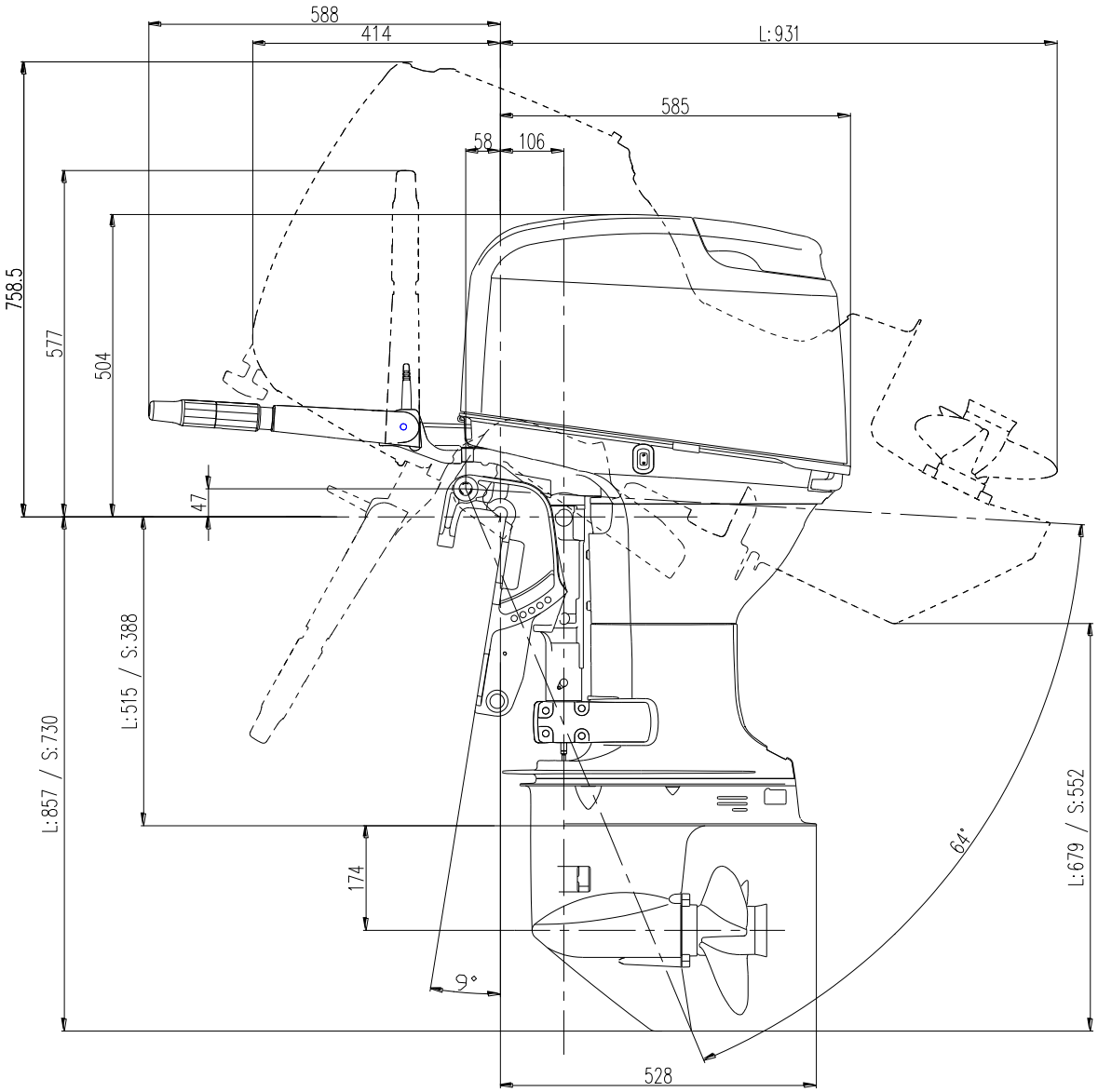
Nut a	Bolt b	Torque
8mm	M5	5Nm
10mm	M6	8 Nm
12mm	M8	18 Nm
14mm	M10	36 Nm
17mm	M12	43 Nm



Dimensions

Overall dimensions

BWL-D: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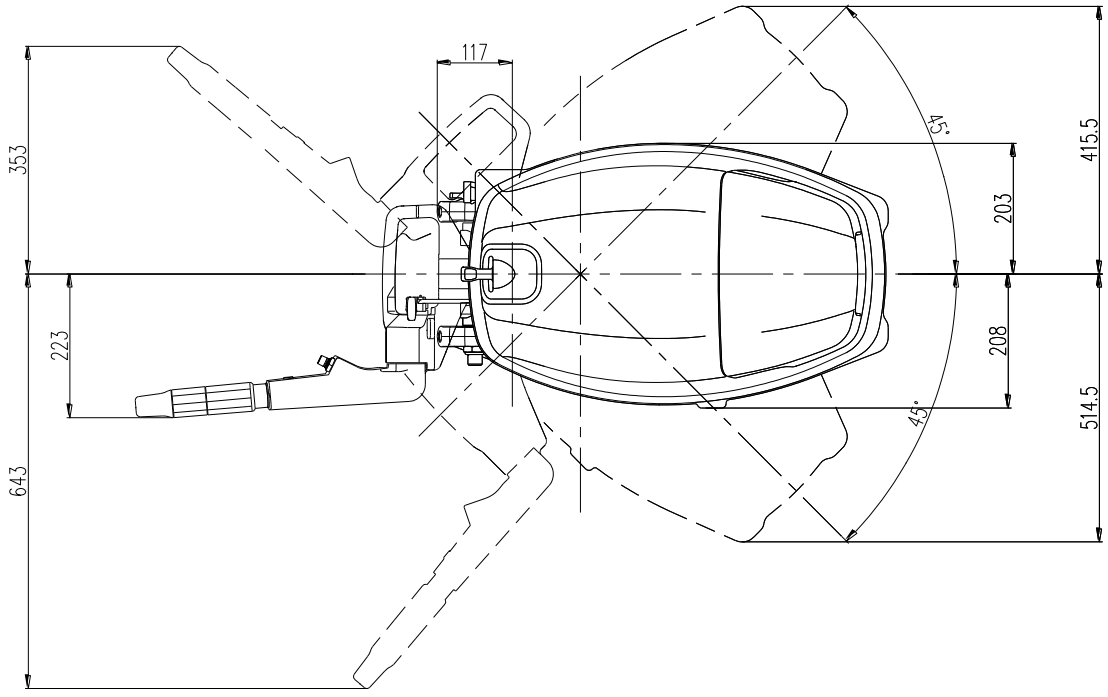
L:679 / S:552
528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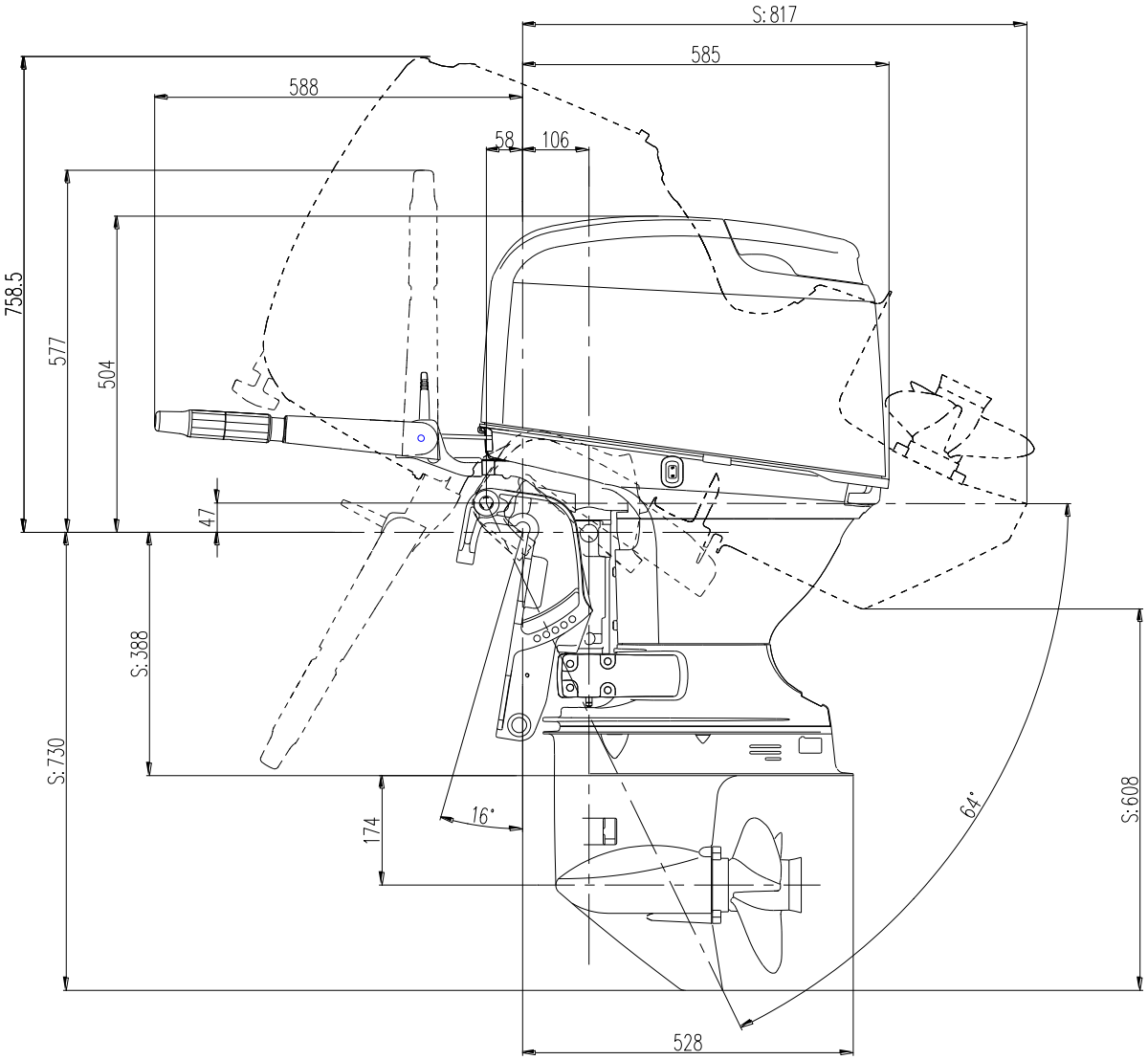
BWS-D: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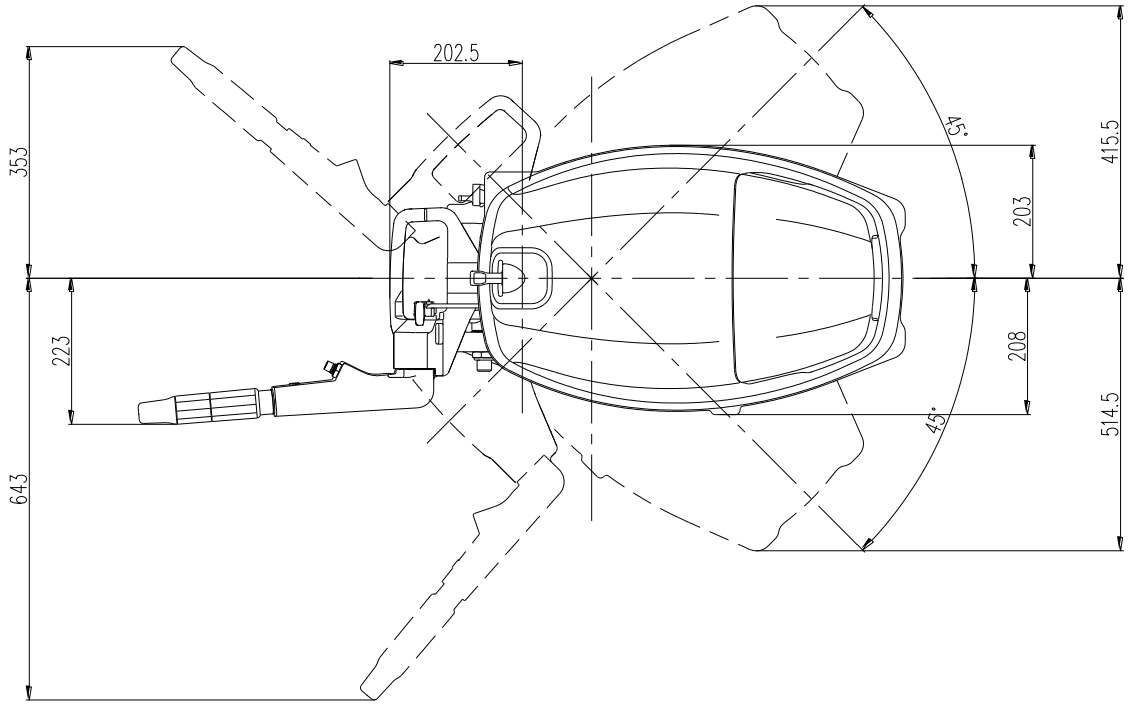
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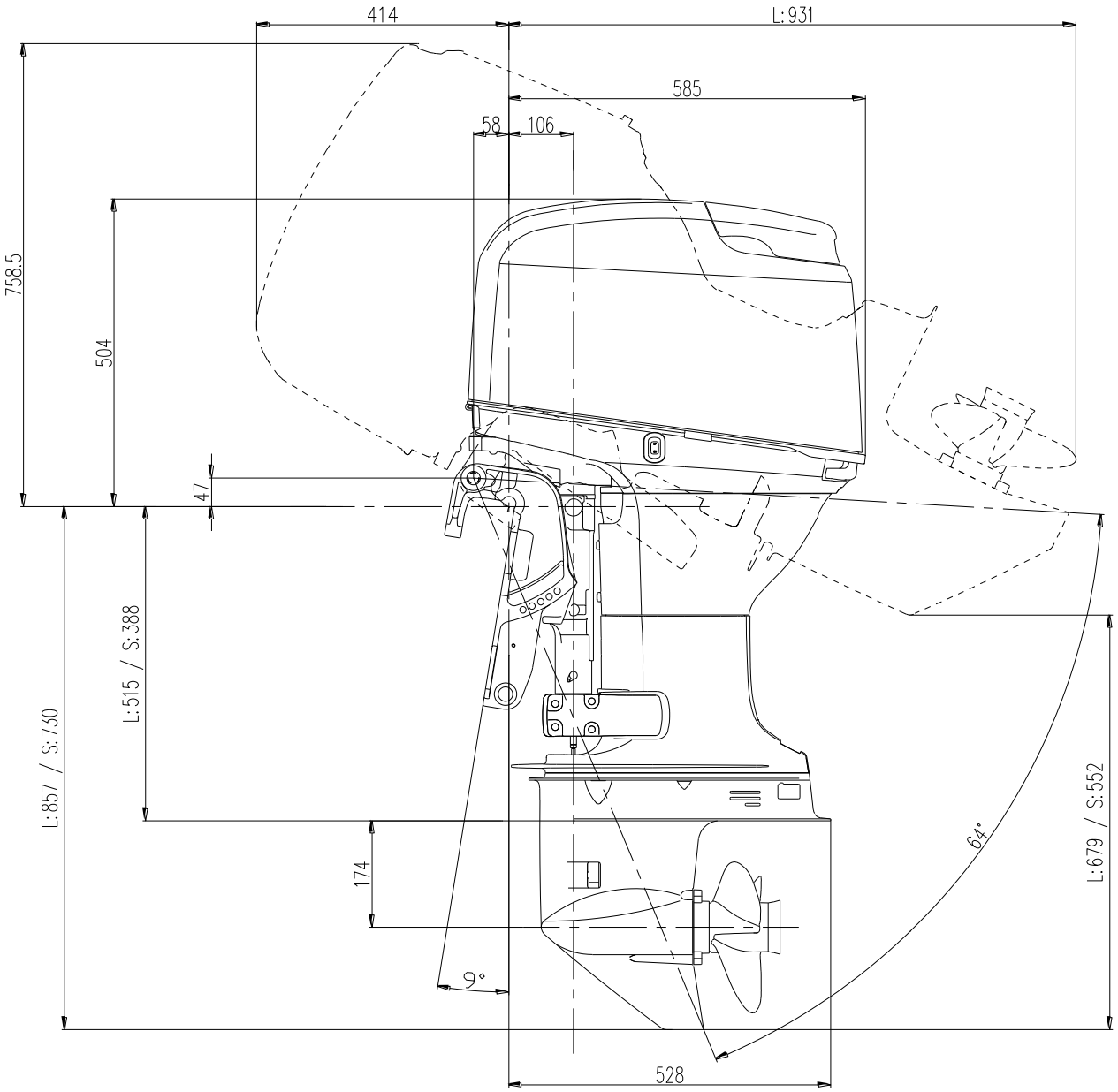
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L:515 / S:388
L:857 / S:730
174
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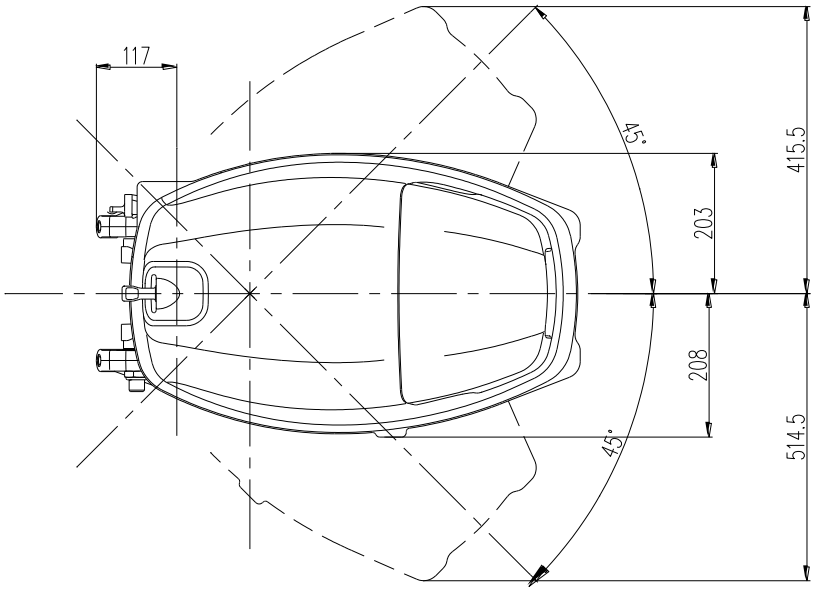
64°
L:679 / S:552
528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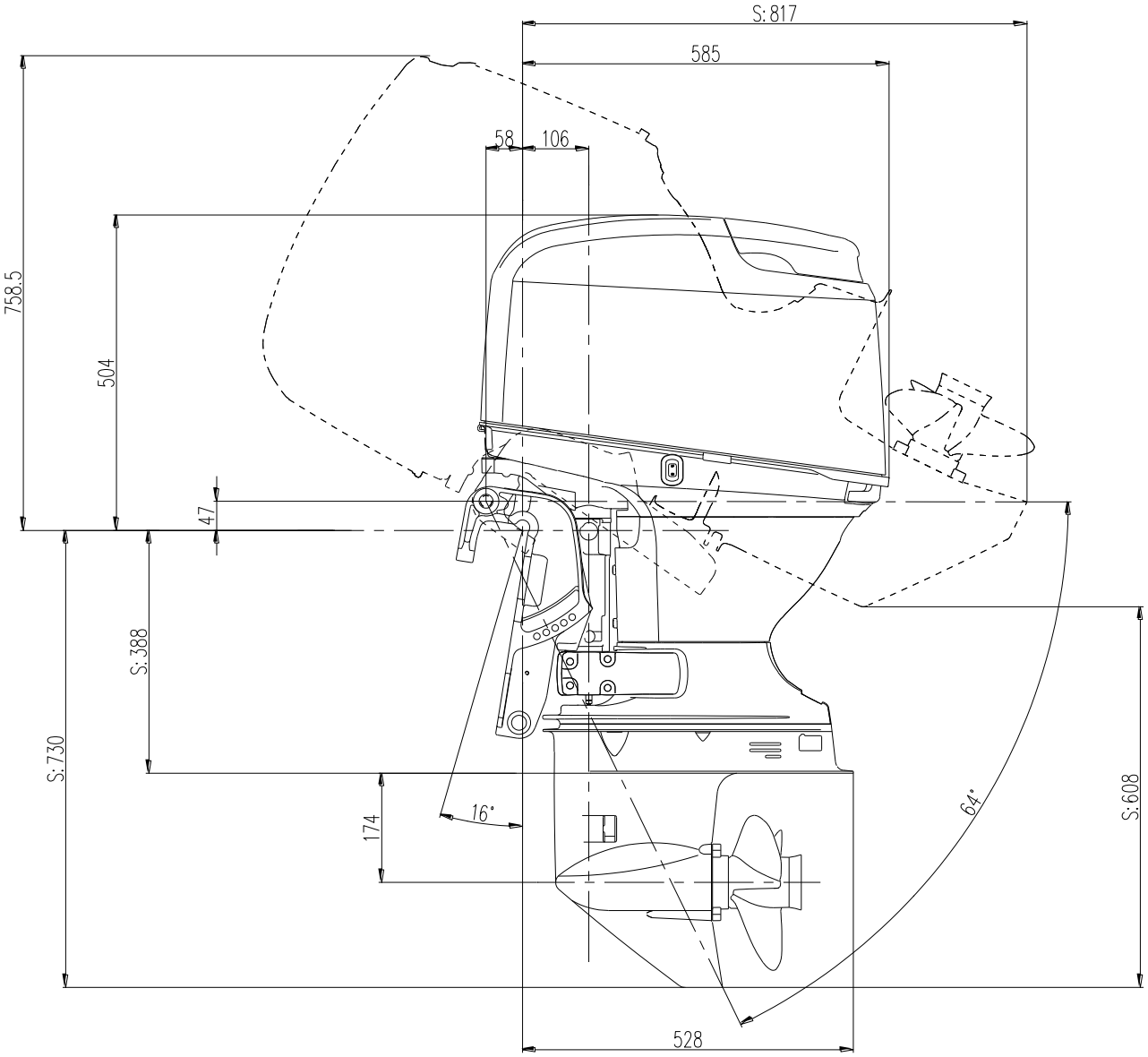
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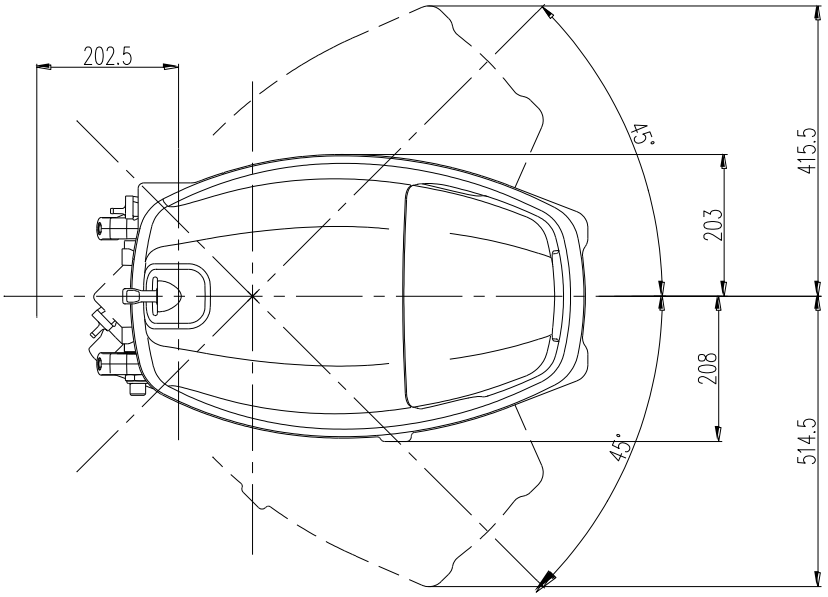
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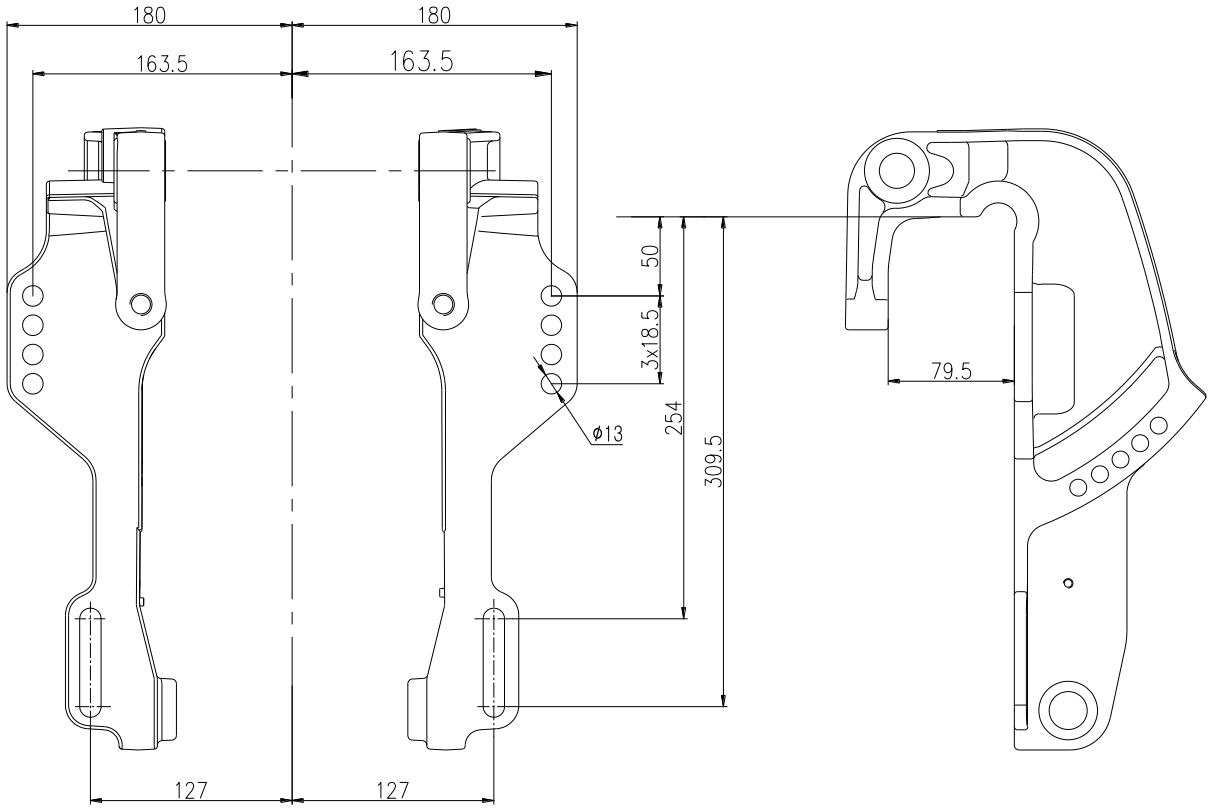
Mounting dimensions of clamp bracket



Basic maintenance

Maintenance Interval Chart

Project	Content	Initial maintenance		General maintenance interval	
		10 hours (1 month)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)
Anode	Check/replace		○	○	
Anode (internal)	Check/replace				○
Cooling water channel	Clean		○	○	
Spark plug	Clean/adjust/replace	○			○
Grease filling point	Add grease			○	
Fuel filter	Check/replace	○	○	○	
Fuel system	Check	○	○	○	
Fuel tank	Check/clean				○
Idle speed	Check/adjust	○		○	
Engine oil	Replace	○		○	
Oil filter	Replace				○
Valve clearance (OHC)	Check/adjust	○		○	
Ignition timing	Check	○		○	
Thermostat	Check				○
Gear oil	Replace	○		○	
Water pump	Check				○
Propeller and cotter pin	Check/replace		○	○	
Timing belt	Check/replace			○	○
Throttle cable	Check/adjust				○
Shift lever/shift cable	Check/adjust				○

Note:

Flush the outboard motor with fresh water immediately after running in salt water, sewage or muddy water.

If leaded gasoline is used frequently, check the valve and related parts every 100 hours.

Warning:

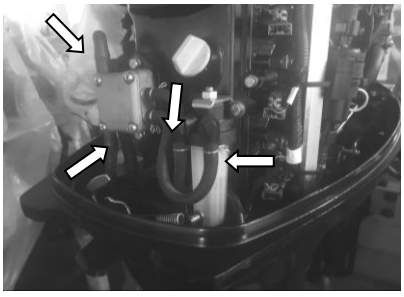
The timing belt needs to be replaced every 1000 hours (5 years); Avoid engine damage or injury accident caused by sudden fracture of timing belt due to aging.

Fuel system

1. Check the fuel tank, fuel pump and fuel pipe.

   Check the fuel tank, fuel pump and fuel pipe for leakage or damage, and replace them if necessary.

   Check the fuel filter core on the fuel tank for dirt, and clean or replace it if necessary.



2. Check the fuel connector.
   Check the fuel connector for cracks, leakage or damage. Replace it if necessary.

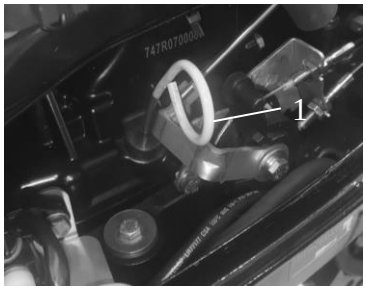
3. Check the fuel filter.
   Check whether the fuel filter is cracked or damaged, and check whether there is dirt in the fuel filter.
   If yes, replace the fuel filter.

Note:
Wipe off the spilled fuel.

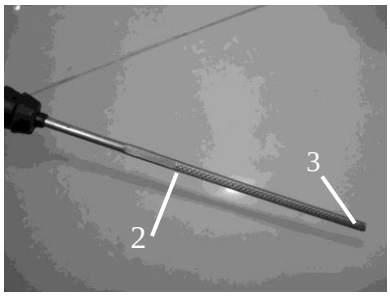
Engine

Engine oil level

1. Remove the oil dipstick and check whether the oil level is between the upper and lower marks of the oil dipstick;



1. Oil dipstick



2. High mark 3. Low mark

2. If the oil level is above the high mark, discharge the engine oil; If the oil level is below the low mark, add engine oil.

Note:

Run and then turn off the engine, and let it stand for several minutes; Check the oil level with the oil dipstick again.

If the oil level is not within the specified range, add/discharge the oil to the specified value.

Change engine oil

1. Remove the oil cap, oil drain bolt and bolt gasket; Discharge the oil.

2. Install new bolt gasket and install oil drain bolt.

3. Add engine oil through the oil port.
   Engine oil level: 1.7 L (oil filter not changed)

1.9 L (oil filter changed)
Oil type: API: SE, SF, SG, SH, SJ or SAE: 10W30, 10W40

4. Install oil cap.

5. Check the oil level.

Valve clearance

1. Unplug the engine stop safety line from the emergency stop switch assembly and remove the spark plug cap from the spark plug.

2. Remove the fuel pump and cylinder head cover.

3. Check the timing belt for slack, aging, or damage. Replace it if necessary.

4. Turn the flywheel clockwise. Align the mark “1" on the driven pulley with the mark "▼" on the cylinder head.

Check the clearance between intake and exhaust valves of Cylinder 1. Correct it if necessary.

5. Turn the flywheel 120° clockwise. Align the mark "△" on the driven pulley with the mark "▼" on the cylinder head.

Check the clearance between intake and exhaust valves of Cylinder 2. Correct it if necessary.

6. Turn the flywheel 120° clockwise. Align the mark "△" on the driven pulley with the mark "▼" on the cylinder head.

Check the clearance between intake and exhaust valves of Cylinder 3. Correct it if necessary.

Note:

It is strictly forbidden to turn the flywheel counterclockwise so as to avoid damage to the valve system.

Note:

Two places are marked with "△", which are symmetrically arranged on both sides of the mark "1" and have an 120° included angle with the mark "1".

Adjust the valve clearance when the engine is cold.

Valve clearance (Cold-state)	Intake valve	0.15~0.25mm
	Exhaust valve	0.25~0.35mm

7. Loosen the lock nut and rotate the adjusting screw until the specified valve clearance is reached.

Note:

Turn clockwise the adjusting screw to reduce valve clearance.

Turn counterclockwise the adjusting screw to increase valve clearance.

8. Reinstall the removed parts.

Spark plug

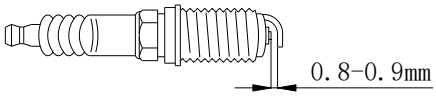
1. Remove the spark plug cap and then remove the spark plug.

2. Remove carbon deposits from the spark plug electrodes.

3. Check whether the electrodes are corroded, whether there are deposits and whether the gaskets are damaged. If necessary, change the spark plug.

Spark plug model: DPR7EA-9

4. Check whether the electrode gap meets the specified value; If necessary, replace the spark plug.



5. Install the spark plug and tighten it with the spark plug wrench according to the specified torque.
   Specified torque: 18 Nm

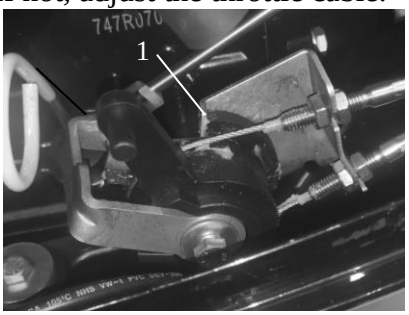
Control system

Throttle push-pull cable

1. Put the throttle grip in the closed position; Please put the shift lever to the neutral position for the front operating model.

2. Check whether the throttle actuator driving pulley is in contact with the check plate on the controller cable holder.

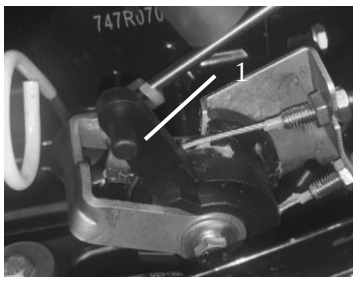
If not, adjust the throttle cable.

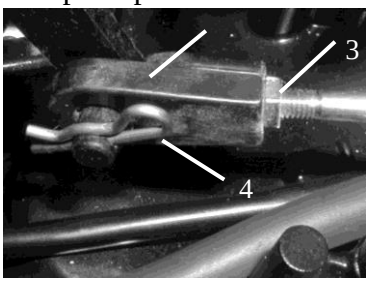


1. Check plate.

3. Loosen the throttle cable adjusting nut and adjust the throttle cable position; After adjustment, tighten the throttle cable adjusting nut

The throttle control is realized by connecting the front operating model with the fixed column on the throttle actuator through the push-pull cable





1. Fixed column; 2. Push-pull cable joint; 3. Lock nut; Step 4. Clip clutch

The adjustment method is as follows:

1. Remove the clip clutch, remove the push-pull cable joint, and loosen the lock nut of the push-pull cable joint.

2. Adjust the screw-in depth of the joint so that the joint hole is aligned with the fixed column of the throttle actuator driving pulley.

Note:

The push-pull cable joint must be screwed in more than 8 mm.

3. Sleeve the adjusted push-pull cable joint into the fixed column, install the clip clutch and tighten the lock nut.

Shift operation

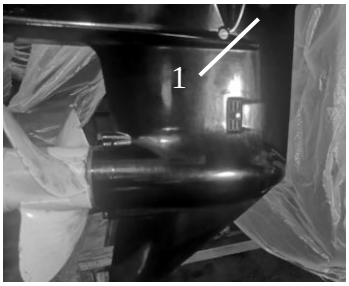
When shifting from neutral to forward or backward, check the smoothness of shift operation. Adjust the columnar nut if necessary.

Underwater unit

Gear oil

Check the amount of gear oil:

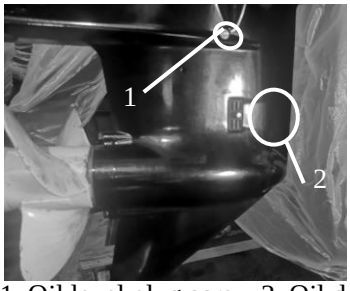
Remove the oil level plug screw, if there is gear oil overflow, the oil amount is correct; If there is no overflow of oil, add gear oil.



1. Oil level plug screw

Replace gear oil

1. Position the outboard motor vertically.
2. Place a container with sufficient capacity under the outboard motor.
3. Remove the oil drain screw, and then remove the oil level plug screw; Drain gear oil.



1. Oil level plug screw 2. Oil drain screw

4. Use the pressure filling device to inject gear oil into the oil drain screw hole.
5. When gear oil overflows from the oil level plug hole, install the oil level plug screw.
6. Install the oil drain screw; Wipe off the spilled gear oil.

Note:

Check the discharged gear oil. If the gear oil is emulsified, check the seal and replace the oil seal if necessary; If the gear oil contains metal debris, check the gears and bearings.

Note:

A new drain plug gasket must be replaced every time.

Air tightness inspection of underwater unit

Connect the leak detection device to the oil level plug hole to detect the air tightness of the underwater unit. If the pressure drops (the pressure is 1kg/cm^3), check the oil seal and other components.

General maintenance

Anode

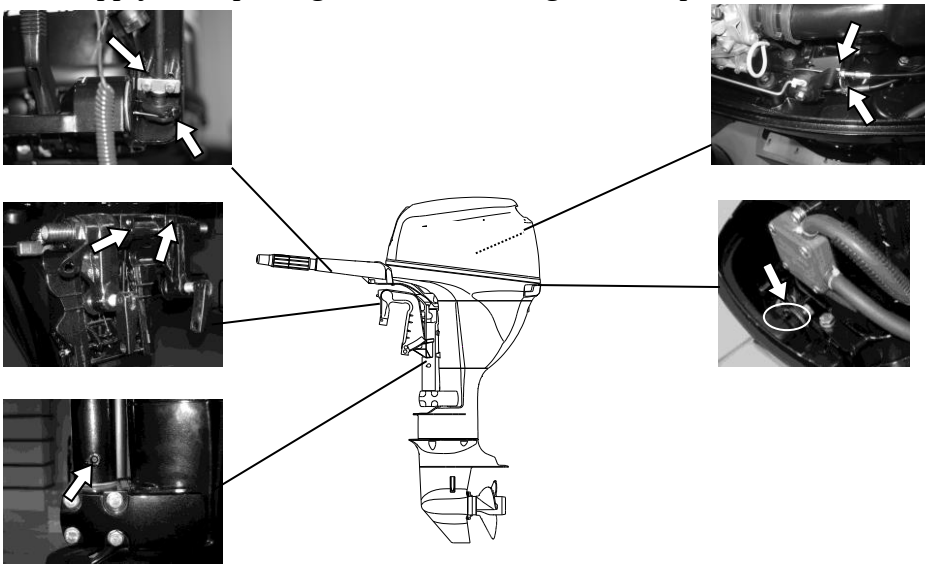
Check the anode of underwater unit; Remove oil stains and scale; If damage or corrosion exceeds 1/2, replace the anode.

Note:

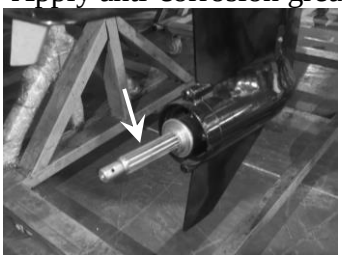
Do not oil or paint the anode to avoid anode failure.

Lubricating point

1. Fill or apply waterproof grease with an oil gun at the position shown.

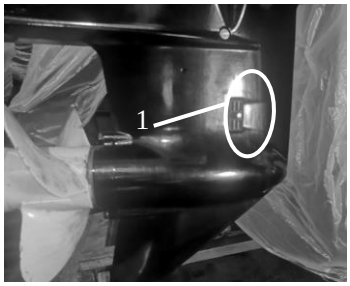


2. Apply anti-corrosion grease to the propeller shaft.



Cooling water channel

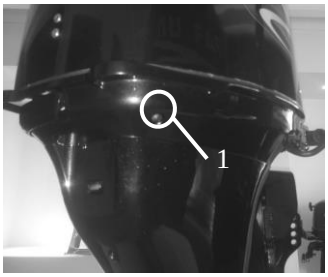
1. Check whether the inlet of cooling water channel is blocked. Clean it if necessary.



1. Inlet of cooling water channel

2. Place the outboard motor in water, ensure that the water level is above the anti-swirl baffle, and start the engine.

3. Check whether there is water flowing out of the cooling water observation hole. If there is no water flow or the water flow is interrupted, check the cooling water channel in the outboard motor.



1. Cooling water observation hole

Thermostat

1. Remove thermostat cover and then remove thermostat.

2. Hang the thermostat in a container containing water.

3. Heat the container.

4. Check the opening of thermostat valve at the specified water temperature; If it does not meet the specifications, replace it.

Water temperature	Valve opening height
Below 60℃	Do not open
Above 70℃	Greater than 3mm

5. Install thermostat and thermostat cover, and tighten the bolts to the specified value.

Propeller

Check propeller blades and internal splines for rupture, damage or wear. Replace them if necessary.

Electrical system

Precautions

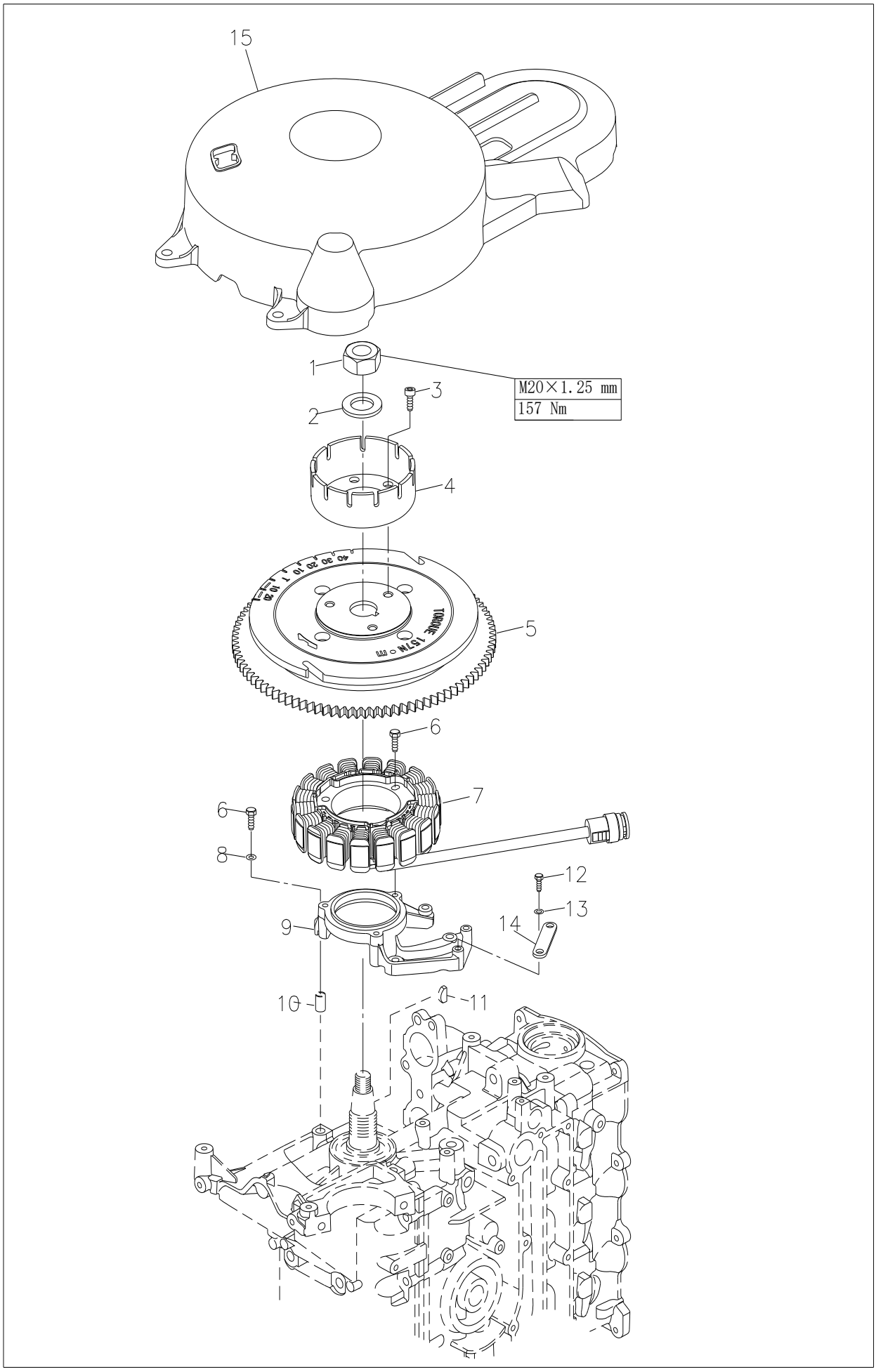
When monitoring and repairing the ignition system, be careful not to put your hands, clothes, hair or accessories close to the running flywheel.

Check the ignition coil on the insulated workbench to prevent electric leakage and electric shock.

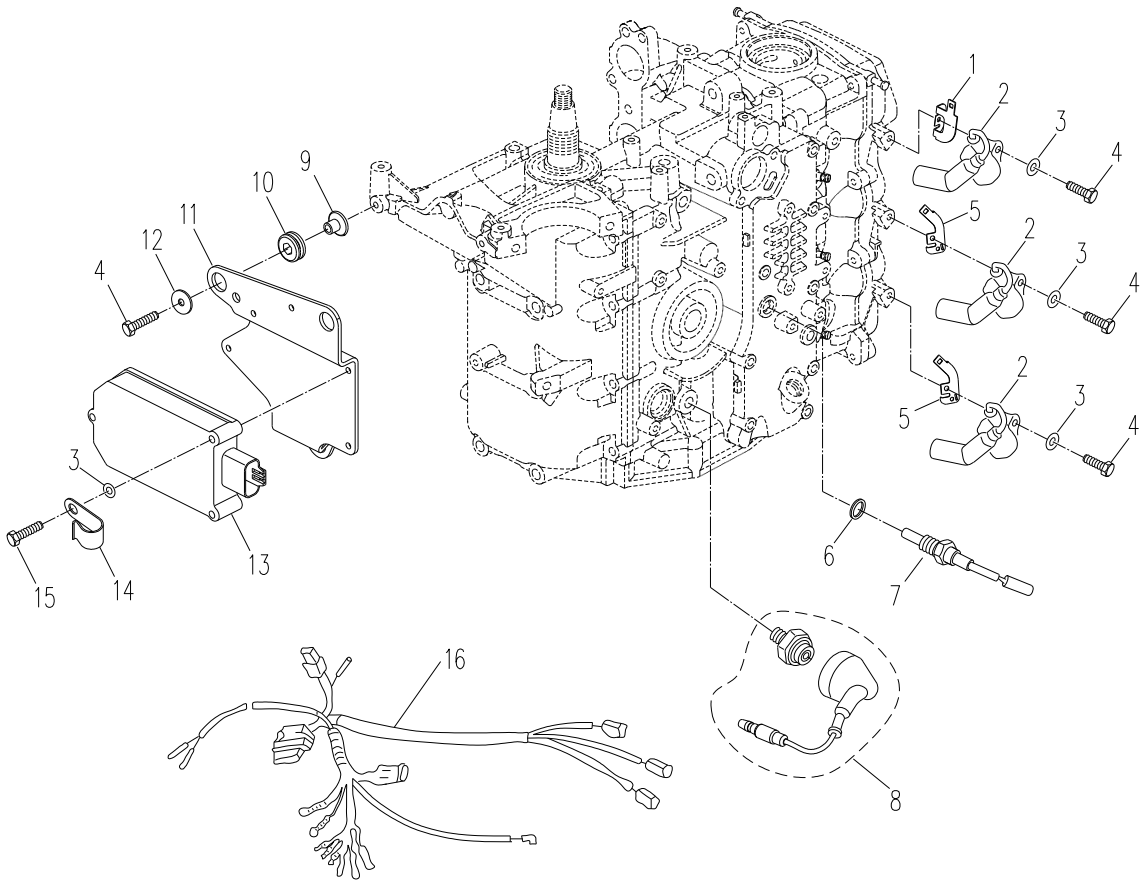
When the engine is running, do not touch the ignition coil or spark plug so as to avoid electric shock. Make sure that the wires are kept away from the running flywheel to avoid cutting off the wires or wearing the insulation of the wires.

When replacing fasteners (nuts, bolts), please use the parts provided by the manufacturer or of the same material and strength, and tighten according to the specified torque.

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-05000026	飞轮螺母	FLYWHEEL NUT	1					
2	F25-05000025	飞轮螺母垫圈	WASHER, FLYWHEEL NUT	1					
3	GB/T70.1-M8x12	内六角螺钉 M8x12	BOLT M8x12	3					
4	F40-05000010	起动轴套	PULLEY, STARTER	1					
5	F40-05000700EI	飞轮	FLYWHEEL	1					
6	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	7					
7	F40-05000600EI	磁电机线圈组件	MAGNETO COIL ASSY	1					
8	GB/T97.1-6	平垫圈 6	WASHER 6	4					
9	F40-05000034	线圈支架	BRACKET, COIL	1					
10	F8-00000005	空心定位销 ⌀8x10	DOWEL PIN ⌀8x10	2					
11	F25-05000024	飞轮半圆键	WOODRUFF KEY, FLYWHEEL	1					
12	GB/T5783-M5x16	六角螺栓 M5x16	BOLT M5x16	2					
13	GB/T97.1-5	平垫圈 5	WASHER 5	2					
14	T85-05040004	触发线圈压板 B	PLATE B, PULSER COIL	1					
15	F60-05000041A	飞轮罩	COVER, FLY WHEEL	1					



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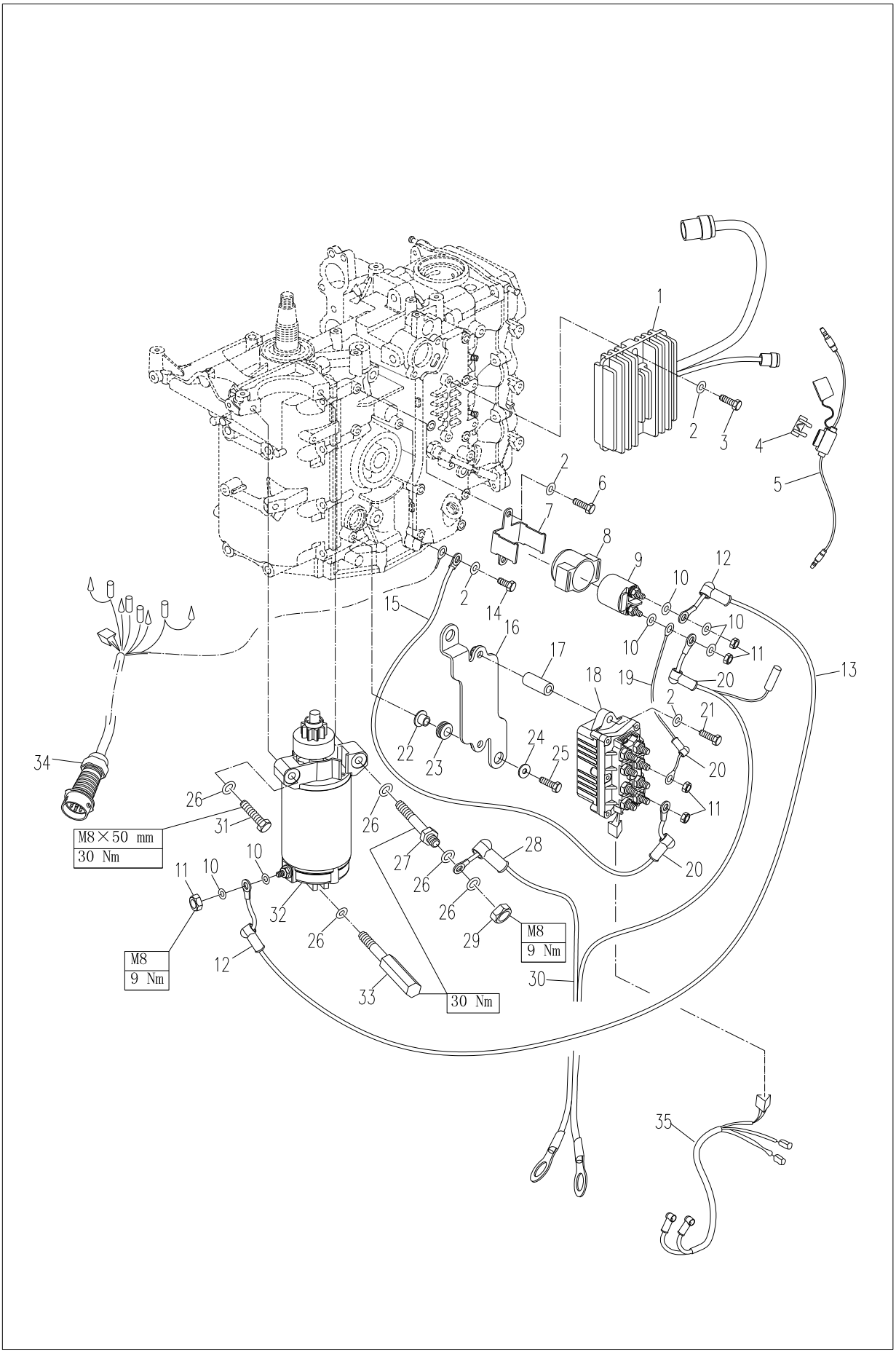
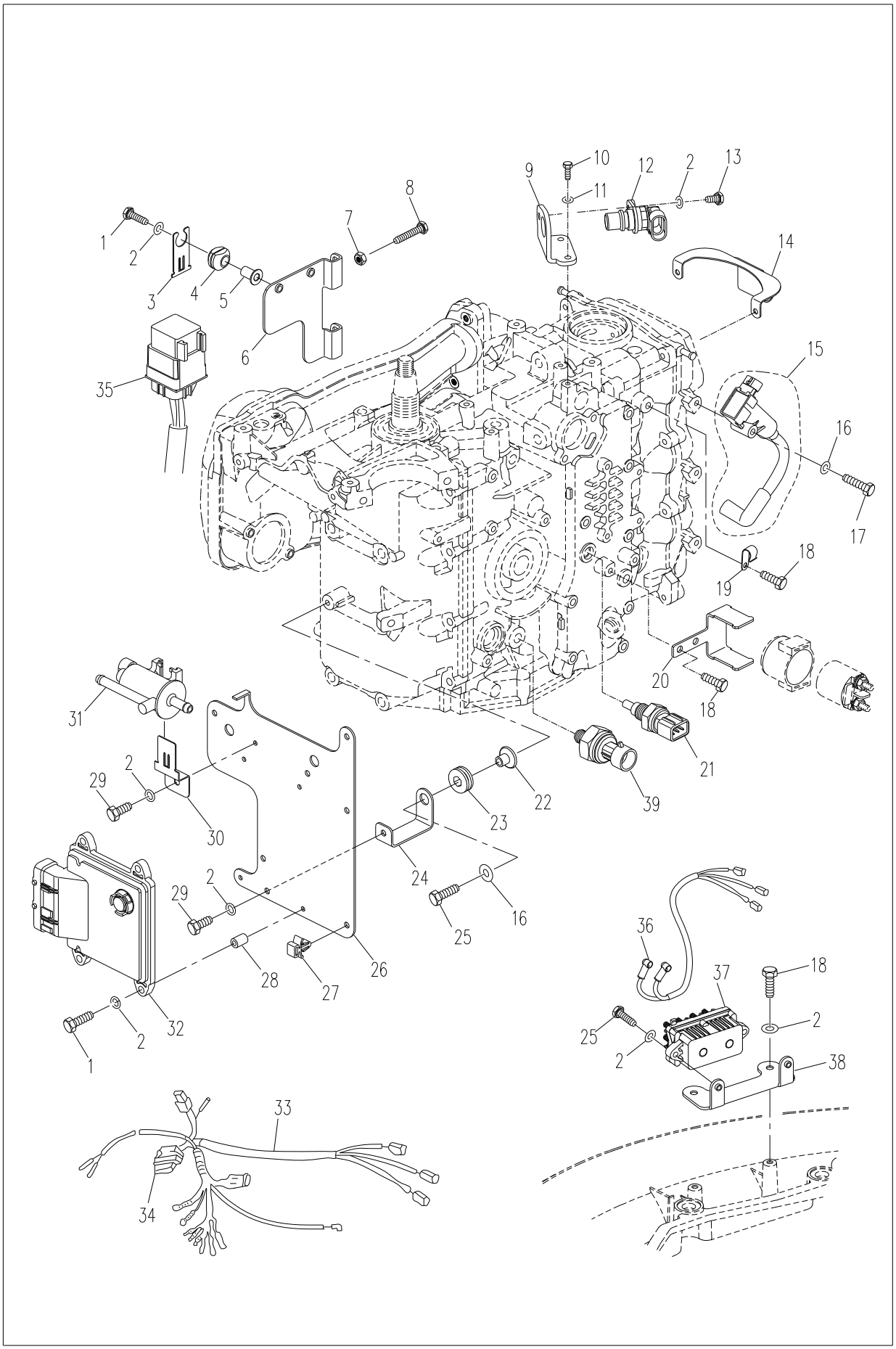
1	F40-05000029	高压包固定架 A	IGNITION COLL BRACKET A	1					
2	F40-05000200	高压包组件	IGNITION COLL ASS'Y	3					
3	GB/T97.1-6	平垫圈 6	WASHER 6	6					
4	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
5	F40-05000030	高压包固定架 B	IGNITION COLL BRACKET B	2					
6	GB/T3452.1- ⌀8x ⌀1.9	O 形圈 ⌀8x ⌀1.9	O-RING ⌀8x ⌀1.9	1					
7	F40-05000400	温控器组件	THERMOSTAT ASSY	1					
8	F15-07010100	机油压力传感器组件	OIL PRESSURE SENSOR	1					
9	F25-05090005	点火模块减震圈衬管	BUSH, IGNITION	3					
10	F25-05090004	点火模块减震圈	BUSH, DAMPING	3					
11	F40-05000009	模块固定板	BRACKET, IGNITION UNIT	1					
12	GB/T96-6	大垫圈 6	BIG WASHER 6	3					
13	F40-05000100	点火模块	C.D.I UNIT ASSY	1					
14	T36-04000023	线卡	LINE CLAMP	2					
15	GB/T5783-M6x40	六角螺栓 M6x40	BOLT M6x40	3					
16	F40-05000101	点火控制线束	C.D.I LINE ASSY	1					


M8×50 mm
30 Nm
M8
9 Nm
M8
9 Nm
30 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000500EI	整流器组件	RECTIFIER ASSY	1					
2	GB/T97.1-6	平垫圈 6	WASHER 6	9					
3	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	2					
4	F15-07150001W	保险丝 20A	FUSE WIRE (20A)	1					
5	F25-05090100W	熔断器组件	FUSE ASSY	1					
6	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	2					
7	F15-07150302W	继电器固定板	BRACKET, RELAY	1					
8	F15-07150301W	继电器护套	JACKET, RELAY	1					
9	F15-07150300W	启动电机继电器	RELAY, MOTOR	1					
10	GB/T97.1-6	铜垫圈 6	WASHER 6(COPPER)	6					
11	GB/T6170-M6	六角铜螺母 M6	NUT M6(COPPER)	5					
12	F25-05170201W	电源连接线护套 A	JACKET A	2					
13	T85-05000022	电机连接线	CONNECTION LINE, MOTOR	1					
14	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	2					
15	F40-05030005	起翘继电器接地线	RELAY LINE	1					
16	F40-05000046	继电器固定板组件	RELAY BRACKET	1					
17	F25-05000037	固定板垫管	BRACKET BUSH	2					
18	T85-05030200	继电器组件	RELAY	1					
19	T85-05030002	继电器连接线 (红)	RELAY LINE(RED)	1					
20	F25-05170202W	电源连接线护套 B	JACKET, CONNECT LINE	5					
21	GB/T5783-M6x35	六角螺栓 M6x35	BOLT M6x35	2					
22	F20-05000903W	整流器衬管	BUSH	2					
23	F20-05000902W	衬套减震圈	DAMPER, BUSH	2					
24	GB/T96-6	大垫圈 6	WASHER 6	2					
25	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	2					
26	GB/T97.1-8	平垫圈 8	WASHER 8	5					
27	F25-05170001W	电机固定螺栓 M8	FIXATION BOLT , MOTOR	1					
28	F25-05170101W	电机连接线护套	JACKET	1					
29	GB/T6170- M8	六角螺母 M8	NUT M8	1					
30	T85-05000023	电源连接线	CONNECTION LINE, POWER	1					
31	GB/T5783-M8x50	六角螺栓 M8x50	BOLT M8x50	1					
32	F40-05000800	启动电机	STARTING MOTOR	1					
33	F25-05170002W	柱状螺栓 M8	COLUMNAR BOLT M8	1					
34	F40-03000500EI	点火线索组件	C.D.I CABLE ASSY	1					
35	F40-05001200BW	起翘控制线束	CONNECTION LINE, TILT	1					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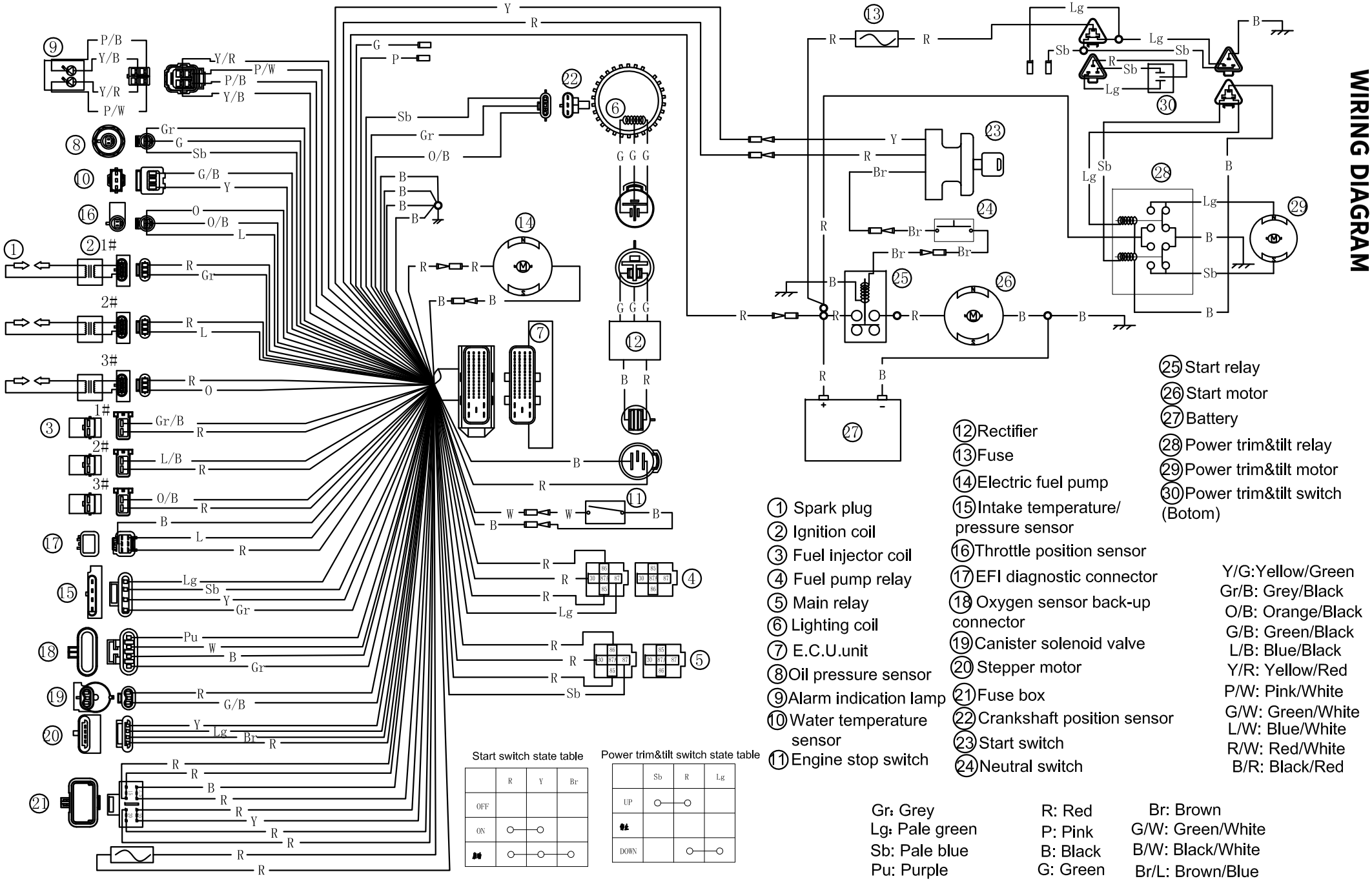
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
2	GB/T97.1-6	平垫圈 6	WASHER 6	13					
3	F40-05091401EI	主继电器固定支架	BRACKET, MAIN RELAY	2					
4	F40-05091402EI	主继电器减震圈	DAMPER, MAIN RELAY	2					
5	F4-04120003	点火器垫管	TUBE, IGNITER	2					
6	F40-05000060EI	主继电器固定板	FIXED PLATE, MAIN RELAY	1					
7	GB/T6170-M6	六角螺母 M6	NUT M6	2					
8	GB/T5783-M6x35	六角螺栓 M6x35	BOLT M6x35	2					
9	F40-05000063EI	传感器固定板	PLATE, SENSOR	1					
10	GB/T5783-M5x16	六角螺栓 M5x16	BOLT M5x16	2					
11	GB/T97.1-5	平垫圈 5	WASHER 5	2					
12	F40-05091600EI	曲轴位置传感器	SENSOR, CRANKSHAFT POSITION	1					
13	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	1					
14	F40-05000059EI	线卡 C	CLAMP C	1					
15	F40-05090200EI	高压包组件	IGNITION COIL ASSY	3					
16	F8-05000021	大垫片	WASHER	3					
17	GB/T5783-M6x40	六角螺栓 M6x40	BOLT M6x40	3					
18	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	5					
19	F40-05000003	线卡	CLAMP	1					
20	F40-05000055EI	起动继电器固定架	BRACKET, RELAY	1					
21	F40-05090700EI	水温传感器	SENSOR, WATER TEMPERATURE	1					
22	F15-07000021	进气消音器垫管	BUSHING, INTAKE SILENCER	1					
23	F8-05000007	减震圈	DAMPER	3					
24	F40-05000009-2EI	固定板支架	BRACKET, FIXED PLATE	1					
25	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	5					
26	F40-05000009-1EI	模块固定板	FIXED PLATE, ECU	1					
27	F40-05000065EI	线卡 D	CLAMP D	4					
28	F8-05000006	垫管	BUSHING	4					
29	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	2					
30	F40-05000049EI	碳罐电磁阀固定板	FIXED PLATE, MAGNETIC VALVE	1					
31	F40-05091500EI	碳罐电磁阀	MAGNETIC VALVE, CARBON POT	1					
32	F40-05090100EI	ECU 模块	ECU	1					
33	F40-05001000EI	点火控制线束	C.D.I LINE ASSY	1					
34	F40-05001000-1EI	保险丝(40A)	FUSE WIRE (40A)	1					
	F40-05001000-2EI	保险丝(20A)	FUSE WIRE (20A)	1					
	F40-05001000-3EI	保险丝(15A)	FUSE WIRE (15A)	1					
	F40-05001000-4EI	保险丝(7.5A)	FUSE WIRE (7.5A)	1					
35	F40-05091400EI	主继电器	MAIN RELAY	2					
36	F40-05001200EI	起翘控制线束	CONNECTION LINE, TILT	1					
37	T85-05030200	继电器组件	RELAY ASSY	1					
38	F40-03000013EI	起翘继电器固定架	FIXED BRACKET, TILT RELAY	1					
39	F40-05000042EI	机油压力传感器	OIL PRESSURE SENSOR	1					

WIRING DIAGRAM



① Spark plug
② Ignition coil
③ Fuel injector coil
④ Fuel pump relay
⑤ Main relay
⑥ Lighting coil
⑦ E.C.U.unit
⑧ Oil pressure sensor
⑨ Alarm indication lamp
⑩ Water temperature sensor
⑪ Engine stop switch
⑫ Rectifier
⑬ Fuse
⑭ Electric fuel pump
⑮ Intake temperature/ pressure sensor
⑯ Throttle position sensor
⑰ EFI diagnostic connector
⑱ Oxygen sensor back-up connector
⑲ Canister solenoid valve
⑳ Stepper motor
㉑ Fuse box
㉒ Crankshaft position sensor
㉓ Start switch
㉔ Neutral switch
㉕ Start relay
㉖ Start motor
㉗ Battery
㉘ Power trim&tilt relay
㉙ Power trim&tilt motor
㉚ Power trim&tilt switch (Botom)

Start switch state table

	R	Y	Br
OFF			
ON	○	○	
	○	○	○

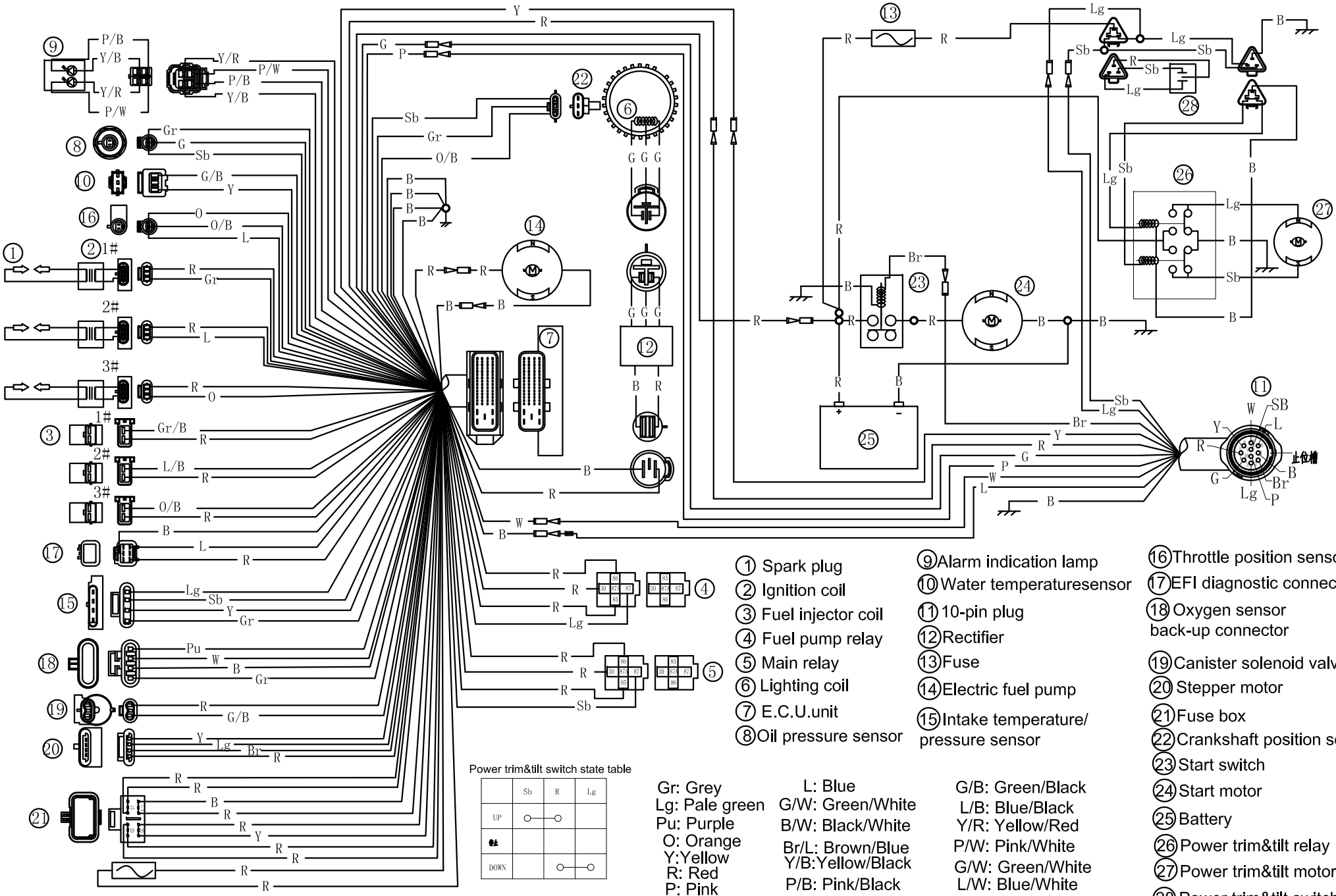
Power trim&tilt switch state table

	Sb	R	Lg
UP	○	○	
DOWN		○	○

Y/G:Yellow/Green
Gr/B: Grey/Black
O/B: Orange/Black
G/B: Green/Black
L/B: Blue/Black
Y/R: Yellow/Red
P/W: Pink/White
G/W: Green/White
L/W: Blue/White
R/W: Red/White
B/R: Black/Red

Gr: Grey
Lg: Pale green
Sb: Pale blue
Pu: Purple
O: Orange
Y:Yellow
R: Red
P: Pink
B: Black
G: Green
W: White
L: Blue
Br: Brown
G/W: Green/White
B/W: Black/White
Br/L: Brown/Blue
Y/B:Yellow/Black
P/B: Pink/Black

F40BW-EFI



Power trim&tilt switch state table

	Sb	R	Lg
UP	○	○	
触			
DOWN		○	○

① Spark plug
② Ignition coil
③ Fuel injector coil
④ Fuel pump relay
⑤ Main relay
⑥ Lighting coil
⑦ E.C.U.unit
⑧ Oil pressure sensor
⑨ Alarm indication lamp
⑩ Water temperaturesensor
⑪ 10-pin plug
⑫ Rectifier
⑬ Fuse
⑭ Electric fuel pump
⑮ Intake temperature/ pressure sensor
⑯ Throttle position sensor
⑰ EFI diagnostic connector
⑱ Oxygen sensor back-up connector
⑲ Canister solenoid valve
⑳ Stepper motor
㉑ Fuse box
㉒ Crankshaft position sensor
㉓ Start switch
㉔ Start motor
㉕ Battery
㉖ Power trim&tilt relay
㉗ Power trim&tilt motor
㉘ Power trim&tilt switch (Bottom)

Gr: Grey
Lg: Pale green
Pu: Purple
O: Orange
Y:Yellow
R: Red
P: Pink
B: Black
G: Green
W: White
L: Blue
G/W: Green/White
B/W: Black/White
Br/L: Brown/Blue
Y/B:Yellow/Black
P/B: Pink/Black
Y/G:Yellow/Green
Gr/B: Grey/Black
O/B: Orange/Black
G/B: Green/Black
L/B: Blue/Black
Y/R: Yellow/Red
P/W: Pink/White
G/W: Green/White
L/W: Blue/White
R/W: Red/White
B/R: Black/Red

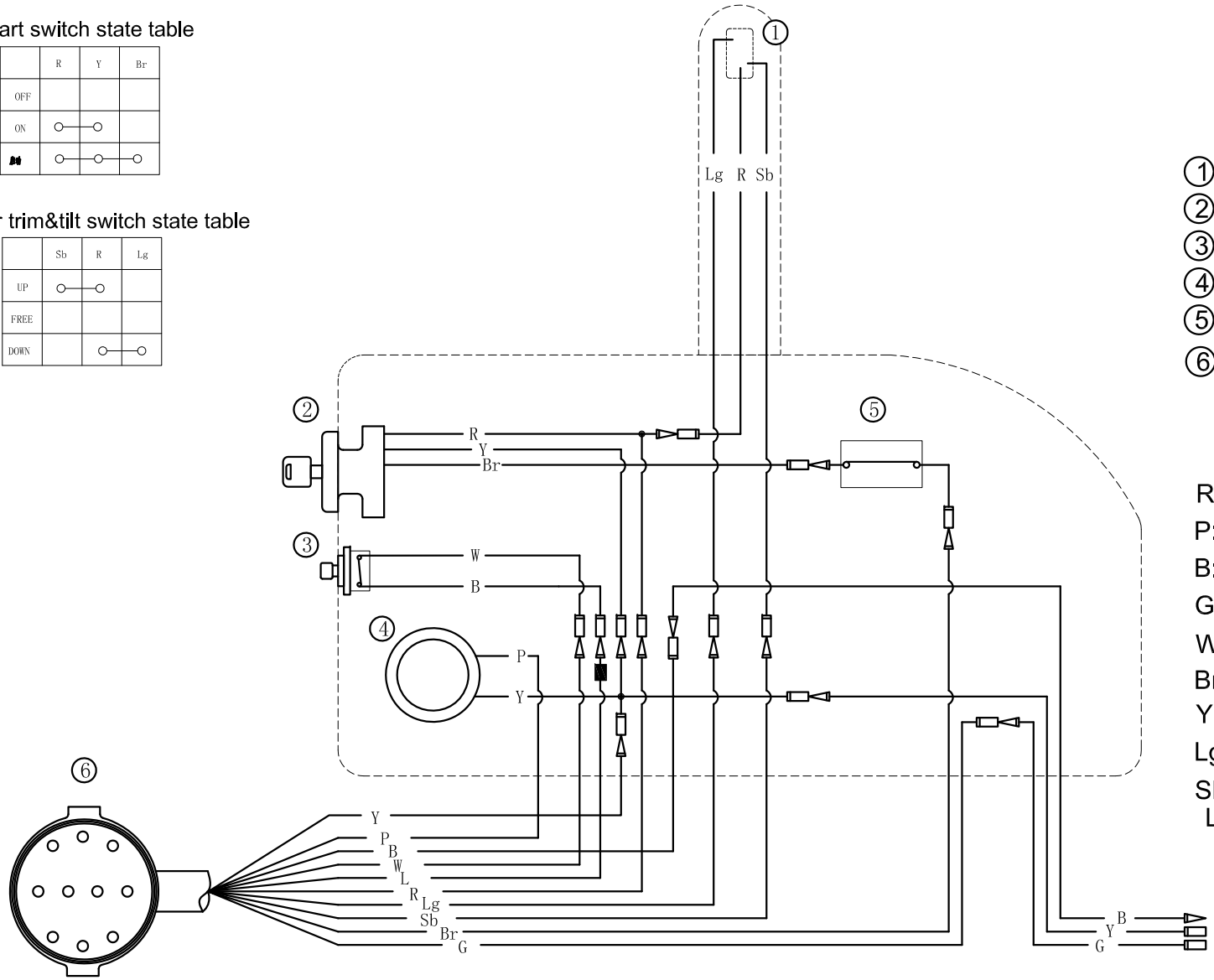
F40FW-EFI

Start switch state table

	R	Y	Br
OFF			
ON	○—○		
	○—○	○—○	

Power trim&tilt switch state table

	Sb	R	Lg
UP	○—○		
FREE			
DOWN		○—○	

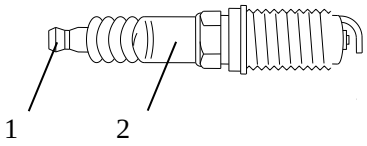


① Power trim&tilt switch
② Main switch
③ Engine stop switch
④ Buzzer
⑤ Neutral switch
⑥ 10-pin plug

R: Red
P: Pink
B: Black
G: Green
W: White
Br: Brown
Y: Yellow
Lg: Light green
Sb: Pale blue
L : Blue

Spark plug ignition

1. Remove the spark plug cap from the spark plug.



1. Spark plug cap; 2. Spark plug

2. Connect the ignition detector to the spark plug cap.

3. Start the engine and observe the spark through the discharge window of the detector.
   ⚠ **Warning:**
   Do not touch any connection part of the detector lead.
   Keep away from combustible gases or liquids to avoid accidents caused by sparks.

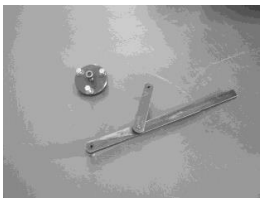
Spark plug cap

1. Unscrew the spark plug cap. Check the spark plug cap for damage. Replace it if necessary.

2. Install the spark plug cap.

Flywheel maintenance

1. Remove the flywheel nut using the flywheel gripper; Remove the flywheel using the flywheel puller.



2. Check whether the flywheel is damaged and whether the permanent magnet is firm. Replace it if necessary.

Check engine startup switch

Check the conductivity of the engine startup switch. If it is not conductive, replace it.
Note:
See wiring diagram for startup switch status,

Check engine stop switch

Check the conductivity of the engine stop switch. If it is not conductive, replace it.
Remove the locking plate: Conducting
Install locking plate: Non-conducting
Press the button: Conducting

Detection of starting relay

1. Connect the brown lead to the positive electrode of the battery.

2. Connect the black lead to the negative electrode of the battery.

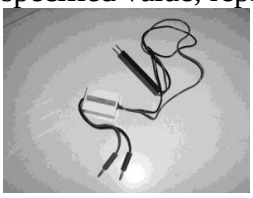
3. Check the conductivity between relay terminals. If it is not conductive, replace the relay.

4. Disconnect the lead connection with the battery and check the conductivity between the relay terminals. If it is conductive, replace the relay.

Detection of magneto coil

Measure the peak voltage of magneto coil (between green wires).

Use digital multimeter and peak voltage adapter to measure the peak output voltage of the coil. If it is lower than the specified value, replace the magneto coil.



Peak voltage of magneto coil	1500 r/min (no-load)	47.2 V
	3500 r/min (no-load)	106 V

Detection of rectifier regulator

Measure the peak voltage (DC) of the rectifier regulator.

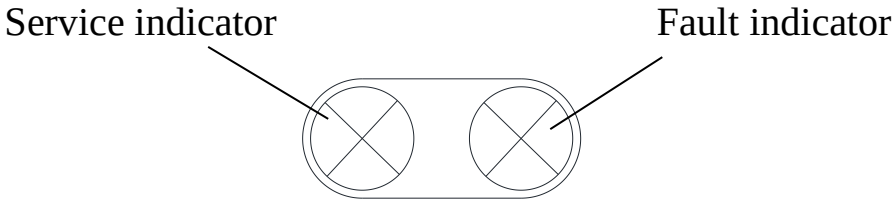
Open the rectifier output (red wire and black wire) and use a digital multimeter to measure the voltage between the red wire and black wire at the rectifier regulator output.

If it is lower than the specified value, check the peak output voltage of magneto coil. If the peak output voltage of magneto coil is higher than the specified value, replace the rectifier regulator.

Peak voltage of rectifier regulator	1500 r/min (no-load)	41.9 V
	3500 r/min (no-load)	99.8 V

Use fault diagnosis tester

When the engine is running, if the fault indicator on the bottom cover is always on/buzzer is always on, it indicates that there is a fault in the engine. At this time, connect the fault diagnosis tester with the corresponding detection port on the engine, and display the running parameters and fault codes of the engine on the mobile phone through the APP. Then check the fault code table to determine the engine fault and replace the faulty electrical components.



Fault code table

Fault type	**Fault item**	**Code**
Intake pressure fault	Short circuit to ground or open circuit of intake pressure sensor line	107
	Short circuit to high level of intake pressure sensor line	108
Intake temperature fault	Short circuit to high level of intake temperature sensor line	112
	Short circuit to ground or open circuit of intake temperature sensor line	113
Water temperature fault	Short circuit to ground of coolant temperature sensor line	117
	Short circuit to high level of coolant	118

	temperature sensor	
Throttle fault	Short circuit to ground of throttle position sensor	122
	Short circuit to high level of throttle position sensor	123
Oxygen sensor fault	Short circuit to ground of oxygen sensor	131
	Short circuit to high level of oxygen sensor	132

Continued:

Fault type	**Fault item**	**Code**
Oxygen sensor heating fault	Oxygen heater fault	135
Fuel injector fault	Cylinder 1 nozzle line fault	201
	Cylinder 2 nozzle line fault	202
	Cylinder 3 nozzle line fault	203
	Cylinder 4 nozzle line fault	204
Fuel pump fault	Oil pump relay fault	230
Crankshaft position sensor fault	Signal interference of crankshaft position sensor line	336
	No signal of crankshaft position sensor line	337
Ignition coil fault	1. Cylinder ignition coil fault	351
	2. Cylinder ignition coil fault	352
	3. Cylinder ignition coil fault	353
Idle fault	Excessive idle speed fault	507
	Low idle speed fault	506
System voltage fault	Low system voltage	562
	High system voltage	563
Fault indicator	Fault indicator fault	650
Oil pressure fault	Short circuit to ground of oil pressure sensor line	523
	Short circuit to high level of oil pressure sensor	522
Carbon canister solenoid valve fault	Short circuit to ground of carbon canister solenoid valve	443
Main relay fault	Main relay fault	685

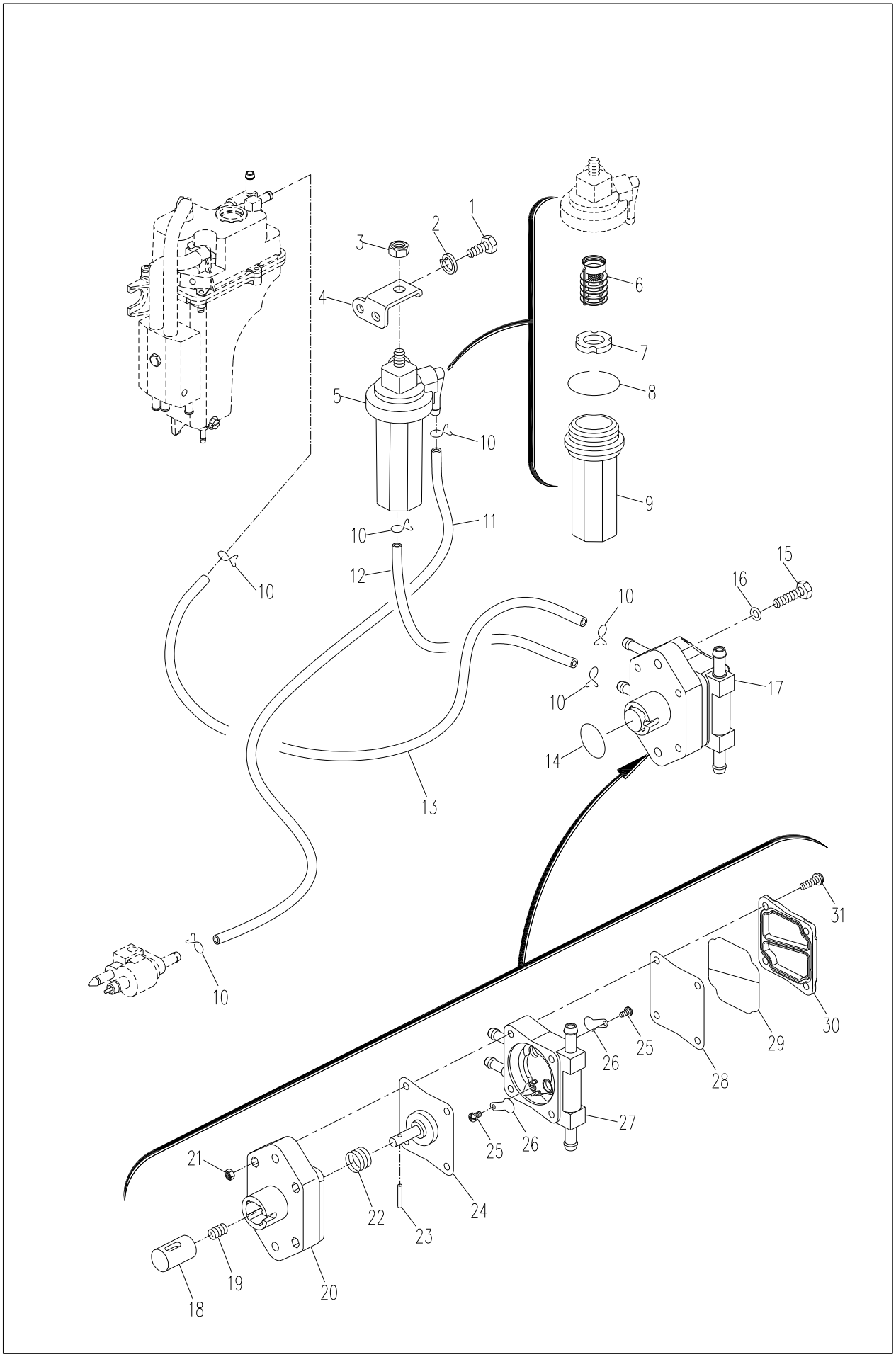
Fuel system

Precautions

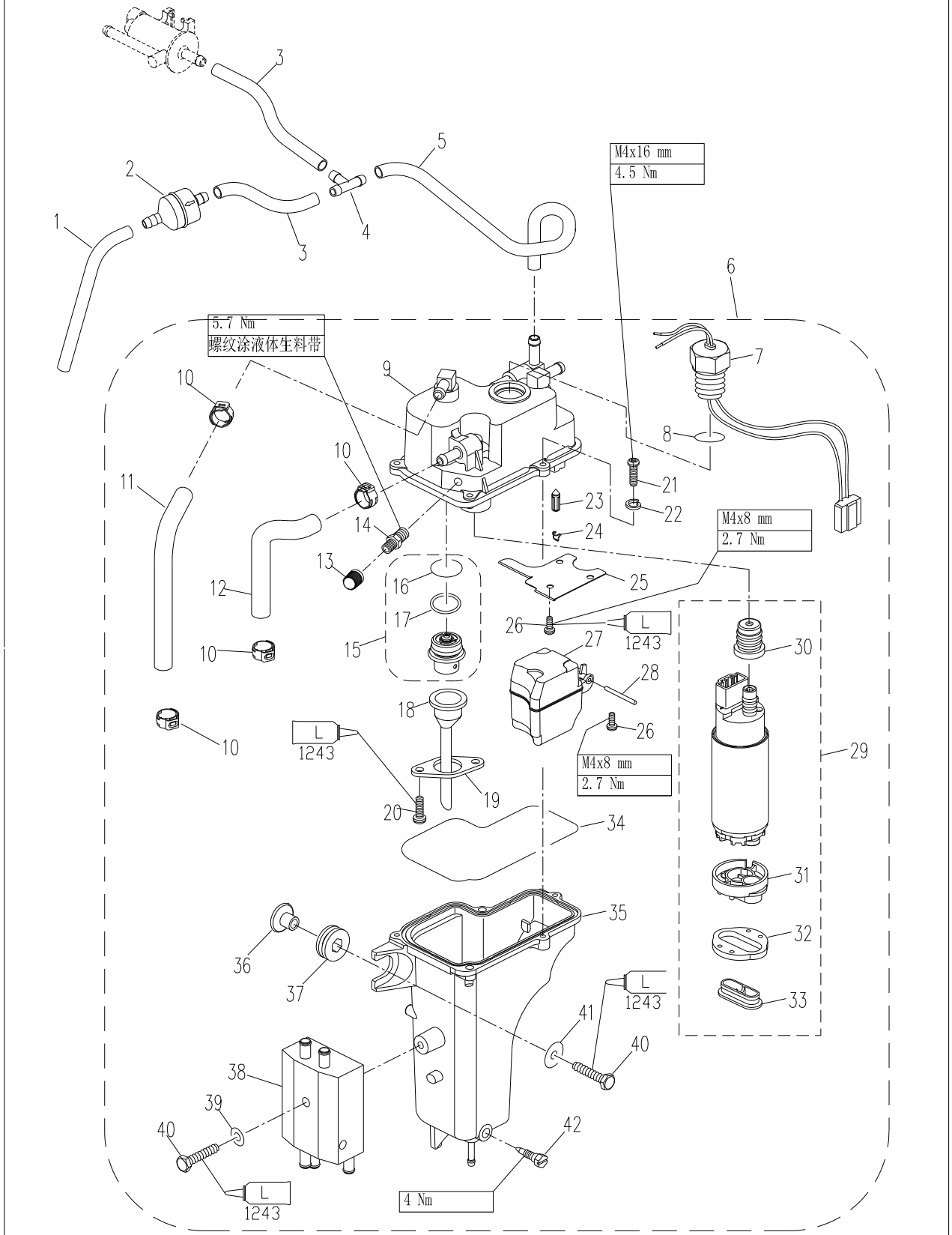
Fuel oil is a highly flammable and volatile liquid, and fuel oil leakage can cause fire and explosion.

Do not attempt to start the engine until the fuel system components are connected or installed. After completing all maintenance steps, apply pressure to the fuel system for a short time to check for leakage.

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x14	六角螺栓 M6x14	BOLT M6x14	1					
2	GB/T93-6	弹性垫圈 6	SPRING-WASHER 6	1					
3	GB/T6170-M8	六角螺母 M8	NUT M8	1					
4	F40-05000036	滤油杯支架	BRACKET ,FILTER CUP	1					
5	T85-05000300	滤油杯组件	FILTER CUP ASSY	1					
6	F15-07080001	滤网架	ELEMENT,FILTER	1					
7	T85-05000302	浮子	FLOATER	1					
8	GB/T3452.1- ⌀32.5x1.8	滤油杯密封圈 ⌀32.5 x1.8	SEAL,FILTER CUP	1					
9	T85-05000301	滤杯	CUP,FILTER	1					
10	F4-04000030	油管夹簧 B	SPRING ,FUEL PIPE "B"	6					
11	F40-03000005EI	燃油管 A ⌀5x⌀10x 720 （EPA）	FUEL P IPE A⌀5x⌀10x 720 （EPA）	1					
12	F40-05000021EI	燃油定型管 (EPA)	FUEL P IPE (EPA)	1					
13	F40-05000019	燃油管 B ⌀5x⌀10x400	FUEL P IPE B ⌀5x⌀10x400	1					
14	GB/T3452.1-25x3.0	O 形圈 25x3.0	O-RING 25x3.0	1					
15	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	2					
16	GB/T97.1-6	平垫圈 6	WASHER 6	2					
17	F40-05050000	燃油泵组件	FUEL PUMP ASSY	1					
18	F25-05130004	柱塞	PLUNGER	1					
19	F25-05130003	柱塞弹簧	SPRING ,PLUNGER	1					
20	F25-05130001	燃油泵座	SEAT,FUEL PUMP	1					
21	GB/T6170-M5	六角螺母 M5	NUT M5	4					
22	F25-05130002	隔膜弹簧	SPRING,DIAPHRAGM	1					
23	F25-05130008	滚针 ф4x16.5	ROLLER NEEDLE ф4x16.5	1					
24	F25-05130100	隔膜轴组件	DIAPHRAGM SHAFT ASSY	1					
25	F4-04090011	阀片螺钉 M3x6	SCREW M3x6	2					
26	F4-04090005	单向阀片	UNILATERAL PLATE	2					
27	F40-05050200	燃油泵壳组件	FUEL PUMP SHELL ASSY	1					
28	F25-05130005	上隔膜	UPPER DIAPHRAGM	1					
29	F25-05130006	燃油泵盖密封圈	SEAL ,FUEL PUMP	1					
30	F25-05130007	燃油泵盖	COVER, FUEL PUMP	1					
31	GB/T818-M5x40	十字槽盘头螺钉 M5x40	SCREW, PAN HEAD M5x40	4					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4.5 Nm
5.7 Nm
螺纹涂液体生料带
M4x8 mm
2.7 Nm
M4x8 mm
2.7 Nm
L
1243
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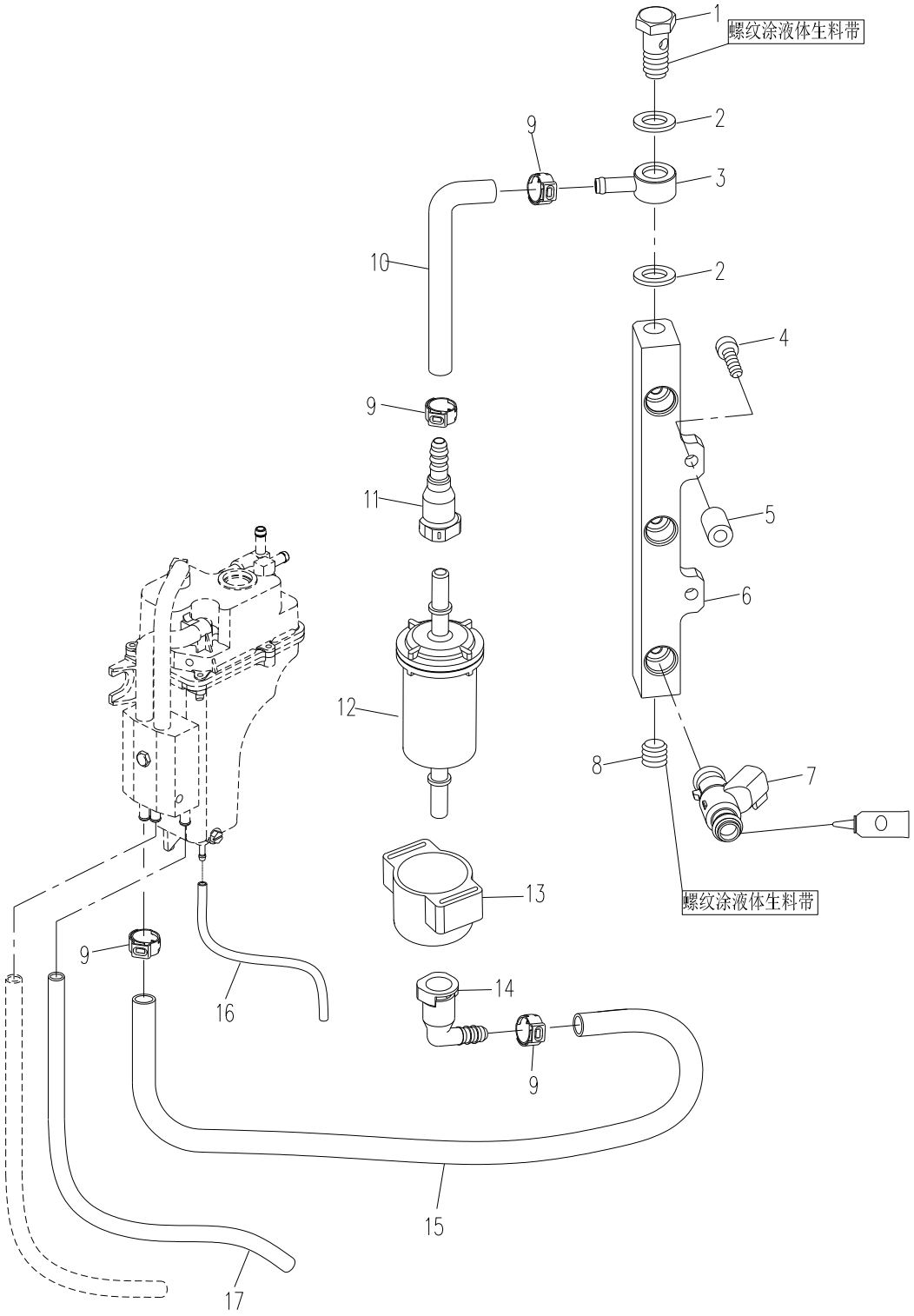
4 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000069EI	回气管 C ⌀5x⌀10x100	AIR PIPE C	1					
2	T5-04000200	单向阀	CHECK VALVE	1					
3	F40-05000070EI	回气管 D ⌀5x⌀10x150	AIR PIPE D	2					
4	F15-05000011	三通	THREE WAY	1					
5	F40-05000051EI	回气管 B	AIR PIPE B	1					
6	F40-05100000EI	电动燃油泵组件	OIL PUMP ASSY	1					
7	F40-05010400EI	油泵接头组件	JOINT ASSY, OIL PUMP	1					
8	GB/T3452.1-15.8x3.1	O 型圈 15.8x3.1	O-RING 15.8x3.1	1					
9	F40-05100100EI	电动燃油泵本体组件	BODY ASSY, OIL PUMP	1					
10	S7133- ⌀13.3	单耳无极卡箍	SINGLE LUG CLAMP	4					
11	F40-05100010EI	油泵定型管 A	SHAPED TUBE A, OIL PUMP	1					
12	F40-05100004EI	油泵定型管 B	SHAPED TUBE B, OIL PUMP	1					
13	F40-05100202EI	检测阀盖帽	CAP, DETECTION VALVE	1					
14	F40-05100201EI	油泵检测阀	DETECTION VALVE, OIL PUMP	1					
15	F40-05100600EI	压力调节阀	PRESSURE REGULATOR VALVE	1					
16	F40-05100601EI	压力调节阀 O 形圈	O-RING, PRESSURE REGULATOR VALVE	1					
17	F40-05100600-1EI	压力调节阀尼龙垫圈	WASHER, PRESSURE REGULATOR VALVE	2					
18	F40-05100602EI	泄油导管	CONDUIT TUBE	1					
19	F40-05100603EI	压力阀压板	PALTE, PRESSURE REGULATOR VALVE	1					
20	GB/T818-M5x12	十字槽盘头螺钉 M5x12	SCREW M5x12	2					
21	GB/T818-M4x16	十字槽盘头螺钉 M4x16	SCREW M4x16	5					
22	GB/T93-4	弹性垫圈 4	SPRING WASHER 4	5					
23	F40-05100301EI	针阀	NEEDLE VALVE	1					
24	F40-05100302EI	针阀卡簧	CLAMP SPRING, NEEDLE VALVE	1					
25	F40-05100003EI	挡板	BAFFLE PLATE	1					
26	GB/T818-M4x8	十字槽盘头螺钉 M4x8	SCREW M4x8	4					
27	F40-05100001EI	浮子	FLOATER	1					
28	F40-05100002EI	浮子销	PIN, FLOATER	1					
29	F40-05100500EI	油泵组件	OIL PUMP ASSY	1					
30	F40-05100501EI	油泵口胶套	RUBBER SLEEVE, OIL PUMP	1					
31	F40-05100504EI	油泵垫块	PADDING BLOCK, OIL PUMP	1					
32	F40-05100503EI	油泵橡胶垫	RUBBER PAD, OIL PUMP	1					
33	F40-05100502EI	油泵滤网	FILTER NET, OIL PUMP	1					
34	F40-05100704EI	油杯密封圈	SEAL, OIL CAP	1					
35	F40-05100701EI	电动燃油泵油杯组件	OIL CAP, ELECTRIC PUMP	1					
36	F25-05090005	点火模块减震圈衬管	BUSHING, DAMPER	3					
37	F25-05090004	点火模块减震圈	DAMPER	3					
38	F40-05100800EI	燃油冷却器	COOLER, FUEL	1					
39	GB/T97.1-6	平垫圈 6	WASHER 6	1					
40	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	4					
41	GB/T96-6	大垫圈 6	BIG WASHER 6	3					
42	F40-05100703EI	油杯放油螺钉	DRAIN BOLT, OIL CUP	1					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螺纹涂液体生料带
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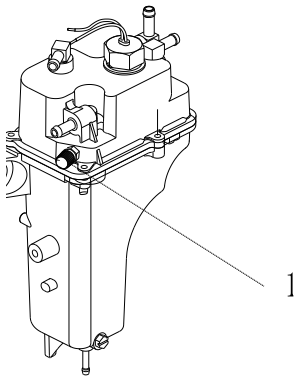
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称中文	DESCRIPTION 零件名称英文	QTY 数量					REMARKS 备注
1	F40-05000046EI	转接头螺钉	BOLT, ADAPTER	1					
2	GB/T982-12	组合密封垫圈12	COMPOUND SEAL WASHER 12	2					
3	F40-05000045EI	共轨转接头	ADAPTER, COMMON RAIL	1					
4	GB/T70.1-M6x35	内六角螺钉M6x35	INNER HEXAGON BOLT M6x35	2					
5	F40-05000044EI	共轨垫管	BUSHING, COMMON RAIL	2					
6	F40-05091200EI	燃油共轨	COMMON RAIL, FUEL OIL	1					
7	F40-05090300EI	燃油喷射器	FUEL INJECTOR	3					
8	F15-07010004	堵塞1/8	PLUG SCREW 1/8	1					
9	S7133-13.3	单耳无极卡箍 13.3	SINGLE LUG CLAMP	4					
10	F40-05000071EI	燃油定形管B	SHAPED TUBE B, FUEL OIL	1					
11	F40-05000040EI	燃油过滤器接头A	JOINT A, FUEL FILTER	1					
12	F40-05091100EI	高压燃油过滤器	FUEL FILTER	1					
13	F25-07150301W	继电器护套	RELAY JACKET	1					
14	F40-05000041EI	燃油过滤器接头B	JOINT B, FUEL FILTER	1					
15	F40-05000019EI	燃油管B ⌀5x⌀10x710	FUEL PIPE A ⌀5x⌀10x710	1					
16	F40-05100511EI	油泵放油管	OIL PIPE, OIL PUMP	1					
17	F40-05000052EI	水管 G ⌀6x⌀11x550	WATER PIPE G ⌀6x⌀11x550	1					

Release the fuel pressure in the fuel line

Before the maintenance and inspection of the fuel system, please release the fuel pressure in the fuel line; Avoid accidents caused by high-pressure fuel injection during maintenance.

1. Connect the pressure gauge with the pressure relief pipe to the oil pump detection valve of the electric fuel pump;



1. Oil pump detection valve

2. Insert the pressure relief pipe into a suitable container;

Note:

Do not release the pressure directly, The fuel will be discharged while pressure is released, Fuel spraying may cause accidents and violate local emission regulations.

3. Press the pressure relief button to release the pressure until the pressure in the electric fuel pump is balanced with the outside world.

Removal and inspection of fuel joint

1. Remove the bolts securing the fuel joint.

2. Remove the fuel joint.

3. Check the fuel joint for cracks or damage.

4. Connect a vacuum manometer to the fuel joint outlet.

5. Check whether the negative pressure can be maintained for more than 10 seconds under the specified pressure. Replace it if necessary.
   Specified pressure: 50kPa

Removal and inspection of fuel pump

1. Remove the bolts securing the fuel pump.

2. Remove the fuel pump.

3. Connect a vacuum manometer to the fuel pump inlet.

4. Plug the outlet of the oil pump with your fingers and apply the specified positive pressure. Check for air leakage.
   Specified pressure: 50kPa

5. Apply a specified negative pressure. Check for air leakage.
   Specified pressure: 30kPa

6. Connect a vacuum manometer to the fuel pump outlet.

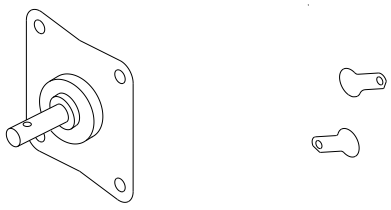
7. Plug the inlet of the oil pump with your fingers and apply a specified negative pressure. Check for air leakage.
   If necessary, disassemble the oil pump and check it.
   Specified pressure: 50kPa

8. Remove the 4 bolts and separate the fuel pump cover and from the fuel pump seat.

9. Remove the valve plate screw from the fuel pump body and remove the valve plate.

10. Press down the plunger and diaphragm and rotate the fuel pump seat to align the notch with the groove on the plunger. Remove the roller pin.

11. Check whether there are cracks in the diaphragm, whether the rivet is loose, and whether the valve plate is damaged. Replace it if necessary.



12. According to steps 8-10, assemble the oil pump in reverse sequence.

Filter inspection

Check whether the filter screen is blocked or there are sundries in it, and check whether the filter bowl is damaged or leaked.

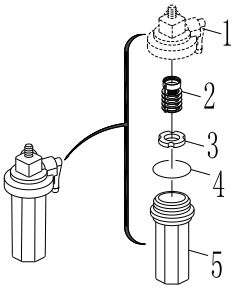
If necessary, clean it with gasoline or replace it.

Note:

Before reassembling the filter bowl, apply lubricating oil to the O-ring.

1．Oil filter lid

2．Filter screen



3．Float
4．O-ring
5．Oil filter cup

Disassembly and inspection of electric fuel pump

Disassembly of electric fuel pump

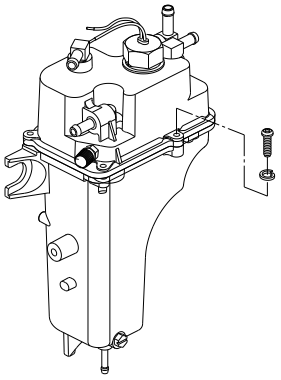
1. Loosen the oil drain screw of the oil cup and drain the fuel in the oil cup into a suitable container.

2. Remove the fuel pipe and cooling water line and disconnect the wiring harness.

3. Remove the mounting screws of the electric fuel pump and remove the electric fuel pump from the engine.

4. Disconnect the pipeline connection between the fuel cooler and the electric fuel pump and remove the fuel cooler.

5. Remove 5 cross recessed pan head screws (M4×16) and the electric fuel pump body assembly.



6. Pull off the oil pump assembly and disconnect the oil pump joint assembly;

7. Check and clean the oil pump filter screen on the oil pump assembly;

8. Check the rubber sleeve at the oil pump outlet, and replace it if it is aged, damaged or cracked;

9. Loosen the screw for fixing the float pin and remove the float;

10. Remove the baffle; (if necessary)

11. Check and clean the oil cup assembly of electric fuel pump;

12. Loosen the fixing screw of the pressure valve pressure plate and remove the pressure regulating valve;

13. Check the O-ring of pressure regulating valve; Replace it if necessary;

14. After inspection, clean the parts and install the electric fuel pump in reverse order of disassembly;

Note: Use a new oil cup sealing ring; The screws should be tightened according to the specified torque!

Inspection of fuel pipe and fuel filter

1. Check whether the fuel pipe is damaged; If so, replace it;

2. Check whether the high-pressure fuel filter is cracked and whether the fuel flows smoothly; Replace it if necessary.

Check the fuel common rail

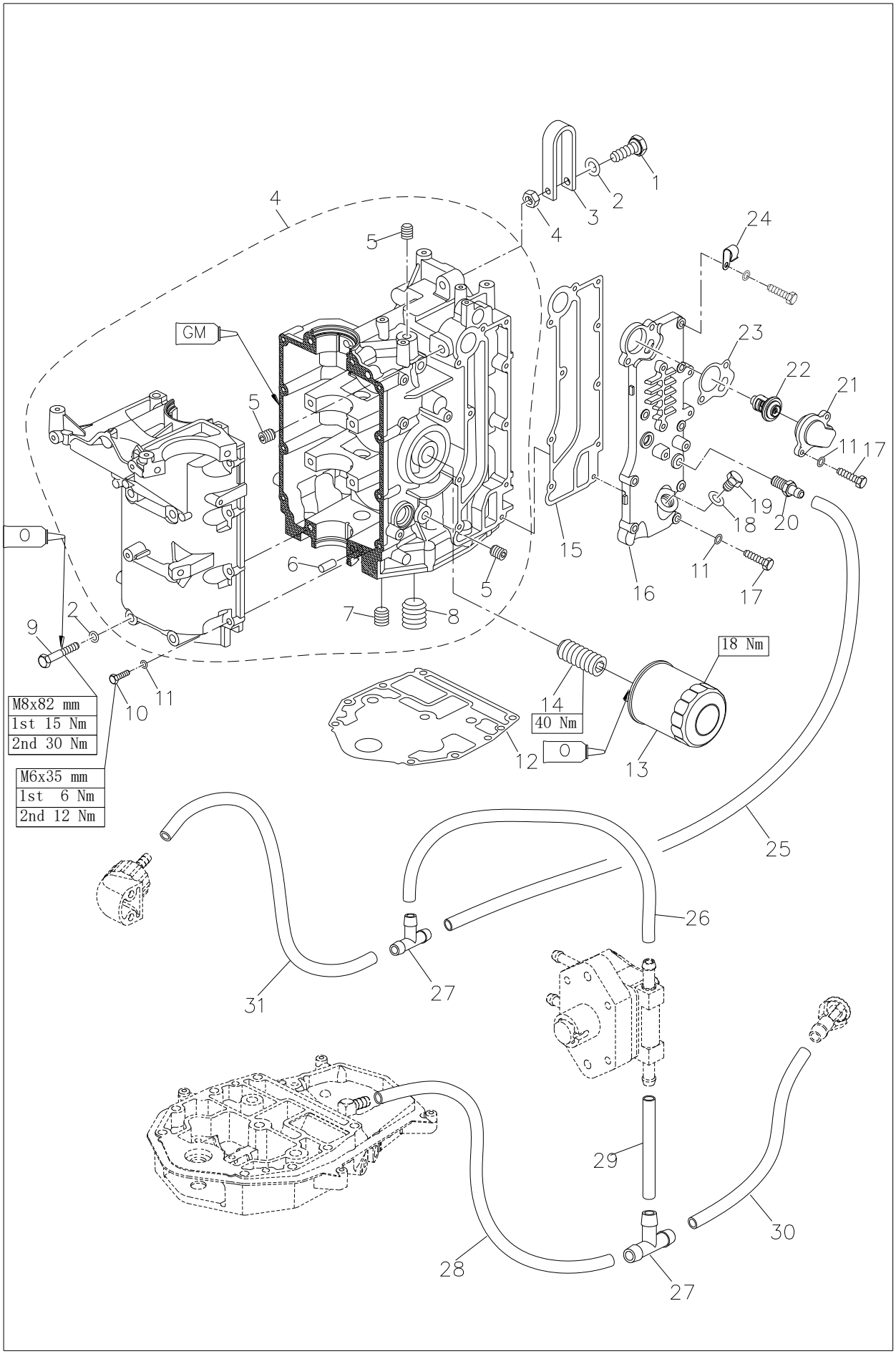
Check the fuel common rail for leakage or cracking, and replace it if necessary.

Engine

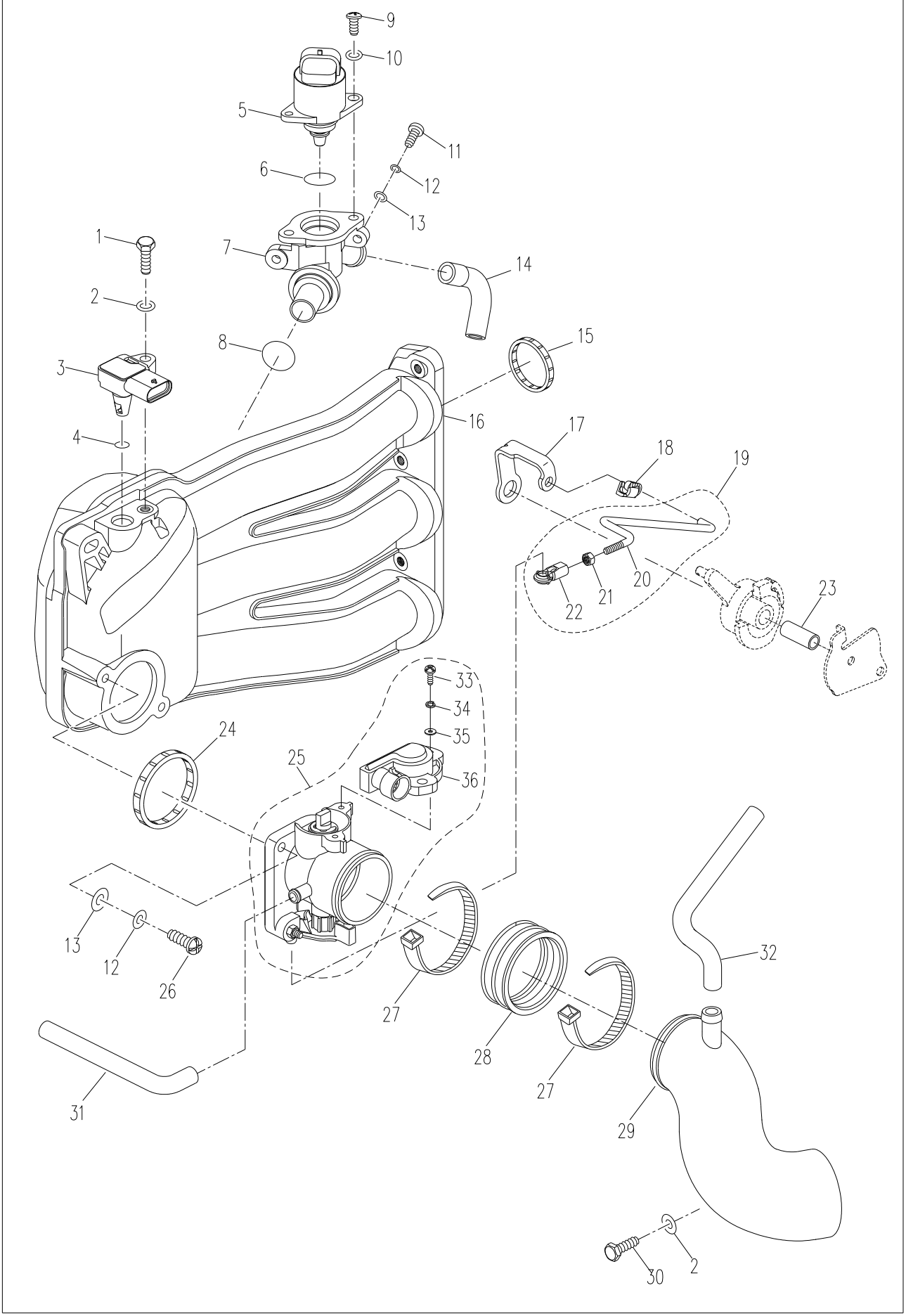
Precautions

In order to avoid accidental start during engine maintenance, please take adequate protective measures to disconnect the ignition system. For example, remove the engine stop safety line from the emergency stop switch assembly, remove the spark plug cap from the spark plug, etc.

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M8x45	六角螺栓 M8x45	BOLT M8x45	1					
2	GB/T97.1-8	平垫圈 8	WASHER 8	9					
3	F40-05000011	发动机悬挂钩	POTHOOK, ENGINE	1					
4	GB/T889.1-M8	非金属嵌件六角锁紧螺母 M8	LOCK NUT M8	1					
5	F40-05010000	机体机座组件	CRANKCASE ASSY	1					
6	F15-07010004	堵塞 1/8 ″	JAM 1/8 ″	4					
7	F25-00000014	定位销 Φ8x12	DOWEL PIN Φ8x12	2					
8	F25-05010104	堵塞 1/2 ″	JAM 1/2 ″	1					
9	F25-05010103	堵塞 3/4 ″	JAM 3/4 ″	1					
10	F25-05000035	六角螺栓 M8x80	BOLT M8x80	8					
11	F15-07000030	六角螺栓 M6x35	BOLT M6x35	8					
12	GB/T97.1-6	平垫圈 6	WASHER 6	18					
13	F40-00000003	发动机密封垫	GASKET, ENGINE	1					
14	F25-05000100	机油滤清器	OIL FILTER	1					
15	F15-07010003	机滤螺柱 M20x1.5x35	STUD SCREW M20x1.5x35	1					
16	F40-05000004	排气盖板密封垫	GASKET, EXHAUST COVER	1					
17	F40-05000005EI	排气盖板	COVER, EXHAUST	1					
18	GB/T5783-M6x35	六角螺栓 M6x35	BOLT M6x35	10					
19	F40-05000038	堵塞垫片	GASKET, JAM	1					
20	F40-05000037	堵塞 M18x1.5	JAM M18x1.5	1					
21	F25-05010113	出水嘴接头	JOINT, WATER NIPPLE	1					
22	F15-07010021	节温器盖板	COVER, THERMOSTAT	1					
23	F15-07000031	节温器 (S60)	THERMOSTAT (S60)	1					
24	F15-07010022	节温器垫	GASKET, THERMOSTAT	1					
25	F40-05000003	线卡	CLAMP	1					
26	F40-05000022	水管 A ∅6x∅11x280	WATER PIPE A ∅6x∅11x280	1					
27	F60-05000047	水管 B ∅6x∅11x330	WATER PIPE B ∅6x∅11x330	1					
28	F40-03000016	三通	THREE WAY	2					
29	F40-03000004	水管 F	WATER PIPE F	1					
30	F40-03000002	水管 C ∅6x∅11x170	WATER PIPE C ∅6x∅11x170	1					
31	F40-03000003	水管 D ∅6x∅11x230	WATER PIPE D ∅6x∅11x230	1					
32	F25-03000021W	定型水管	WATER PIPE, SHAPED	1					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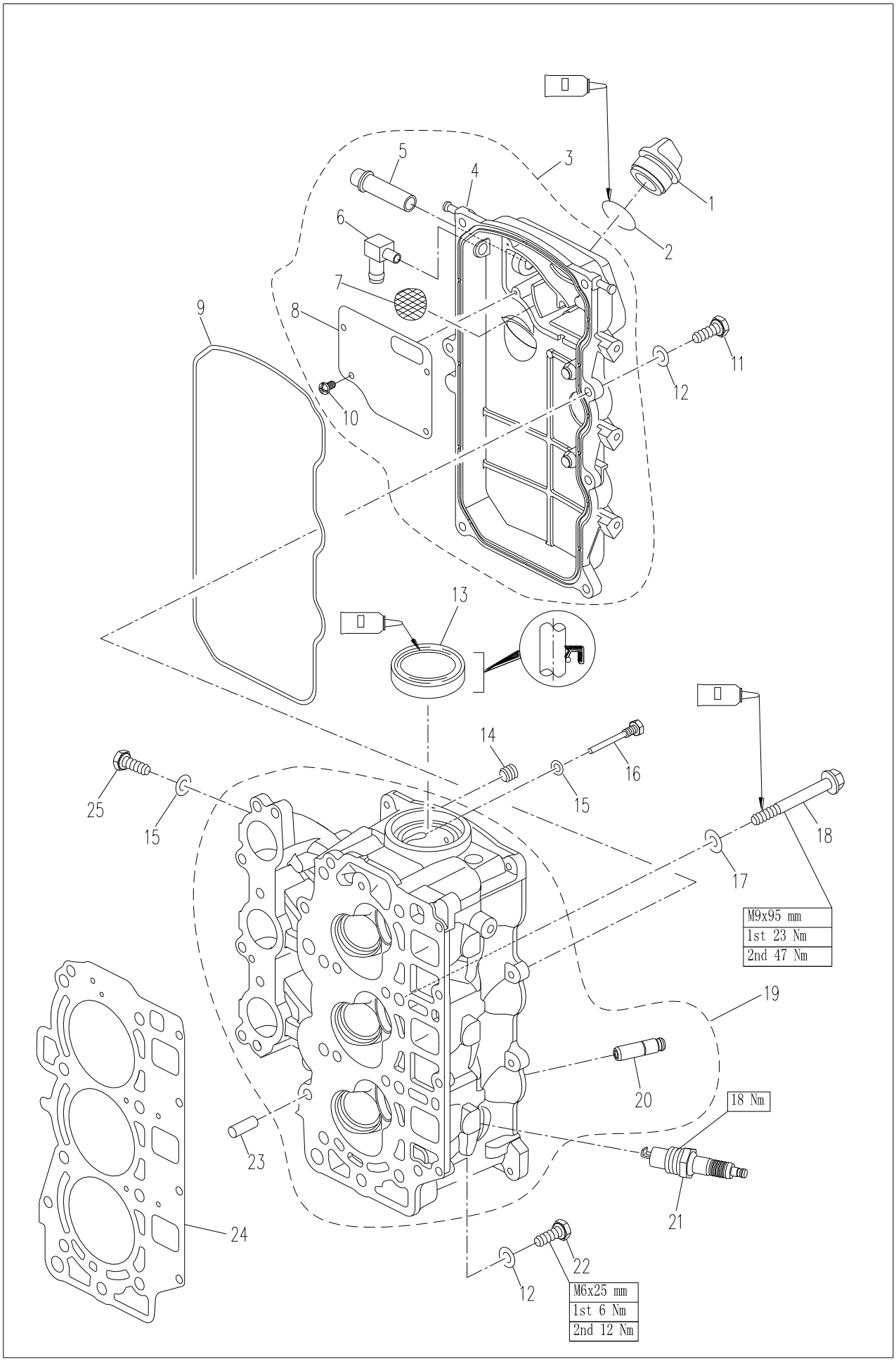
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	1					
2	GB/T97.1-6	平垫圈 6	WASHER 6	3					
3	F40-05090600EI	进气温度压力传感器	SENSOR, INTAKE TEMPERATURE	1					
4	F40-05090601EI	温度压力传感器 O 形圈	O-RING, TEMPERATURE SENSOR	1					
5	F40-05090503EI	步进电机	STEP MOTOR	1					
6	F40-05090503-1EI	步进电机 O 形圈	O-RING, STEP MOTOR	1					
7	F40-05090501EI	怠速阀体	IDLE CONTROL	1					
8	F40-05090502EI	怠速阀 O 型圈	O-RING, IDLE CONTROL	1					
9	GB/T818-M4x10	十字槽盘头螺钉 M4x10	BOLT M4x10	2					
10	GB/T97.1-4	平垫圈 4	WASHER 4	2					
11	GB/T818-M5x14	十字槽盘头螺钉 M5x14	BOLT M5x14	2					
12	GB/T93-5	弹性垫圈 5	SPRING WASHER 5	4					
13	GB/T97.1-5	平垫圈 5	WASHER 5	4					
14	F40-05000026EI	怠速阀定型管	IDLE CONTROL PIPE	1					
15	F40-05090803EI	进气消音器密封圈	SEAL, INTAKE SILENCER	3					
16	F40-05090800EI	进气消音器组件	INTAKE SILENCER ASSY	1					
17	F40-05000039EI	油门执行器摆杆	SWING ROD, THROTTLE ACTUATOR	1					
18	F15-07130314W	阻风门接头	JOIN, CHOKE	1					
19	F40-05000900EI	油门连杆组件	LINK ROD ASSY, ACCELERATOR	1					
20	F40-05000901EI	油门连杆	LINK ROD, ACCELERATOR	1					
21	GB/T6170-M5	六角螺母 M5	NUT M5	1					
22	T20-06050302	连杆接头 B	JOIN B, LINK ROD	1					
23	F40-05000016EI	油门执行器衬管	BUSHING, ACCELEROGRAPH	1					
24	F40-05090403EI	节气门密封圈	SEAL, THROTTLE VALVE	1					
25	F40-05090400EI	节气门体组件	THROTTLE VALVE ASSY	1					
26	GB/T818-M5x20	十字槽盘头螺钉 M5x20	BOLT M5x20	2					
27	HT4.0x300	尼龙扎带 4.0x300	CLAMP 4.0x300	2					
28	F40-05090408EI	节气门橡胶套	RUBBER BOOT, THROTTLE VALVE	1					
29	F40-05000064EI	节气门导管	CONDUIT, THROTTLE VALVE	1					
30	GB/T5783-M6x14	六角螺栓 M6x14	BOLT M6x14	1					
31	F40-05000050EI	回气管 A	AIR PIPE A	1					
32	F40-05000048EI	定型回气管	AIR PIPE	1					
33	GB/T818-M4x16	十字槽盘头螺钉 M4x16	SCREW M4x16	2					
34	GB/T93-4	弹性垫圈 4	SPRING WASHER 4	2					
35	GB/T96-4	平垫圈 4	WASHER 4	2					
36	F40-05090401EI	节气门位置传感器	POSITION SENSOR, THROTTLE	1					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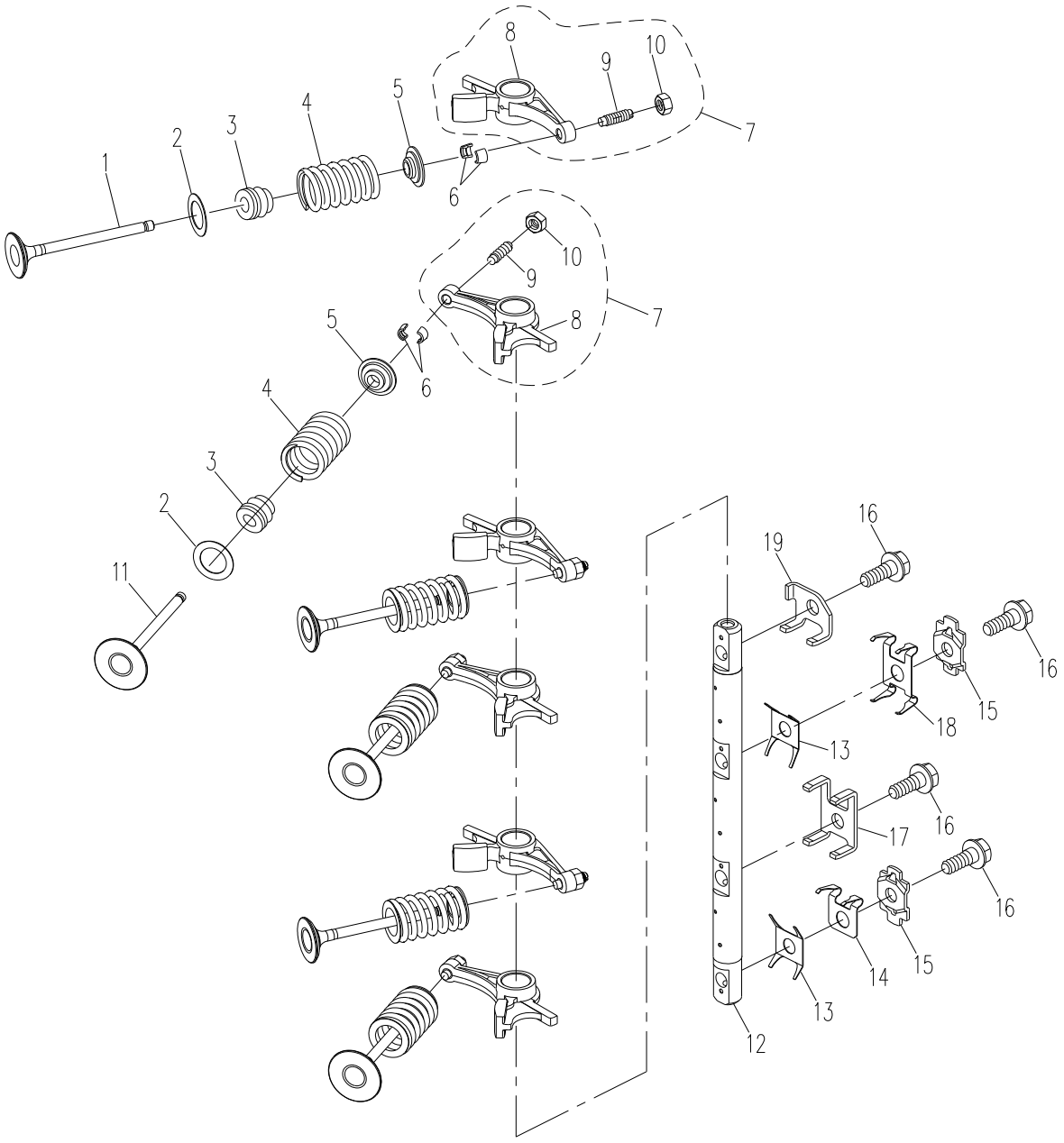
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F15-07050004	加油口盖	FILLER CAP, ENGINE OIL	1					
2	JASO F404 35 025	加油口盖 O 形圈	O-RING	1					
3	F40-05070000	气缸头罩组件	COVER ASSY, CYLINDER HEAD	1					
4	F40-05070001	气缸头罩	COVER, CYLINDER HEAD	1					
5	F40-05070002	呼吸器接头	CONNECTOR, BREATHER	1					
6	F25-02010003	回气管接头 B	CONNECTOR B, GAS PIPE	1					
7	F40-05070004	滤网	SIEVE NET	1					
8	F40-05070003	呼吸器盖板	PLATE, BREATHER	1					
9	F40-05000002	气缸头罩密封圈	SEAL, CYLINDER HEAD	1					
10	GB/T818-M4x10	十字槽盘头螺钉 M4x10	SCREW M4x10	4					
11	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	7					
12	GB/T97.1-6	平垫圈 6	WASHER 6	11					
13	F25-05050021	凸轮轴油封 37x50x7 R	OIL SEAL, CAMSHAFT	1					
14	F15-07010005	堵塞 1/4″	PLUG 1/4″	5					
15	F25-05050007	凸轮轴限位螺栓垫片	WASHER, LIMITING BOLT	4					
16	F25-05050006	凸轮轴限位螺栓	LIMITING BOLT, CAMSHAFT	1					
17	F25-05000003	平垫圈 9	WASHER 9	8					
18	F25-05000002	六角凸缘螺栓 M9x1.25	BOLT M9x1.25	8					
19	F40-05040100EI	气缸头组件	CYLINDER HEAD ASSY	1					
20	F15-07040104	气门导管	GUIDE, VALVE	6					
21	F20-05000037	火花塞 DPR7EA-9	SPARK PLUG DPR7EA-9	3					
22	F8-05000022	六角螺栓 M6x25	BOLT M6x25	4					
23	F25-00000014	定位销 ⌀8x12	DOWEL PIN ⌀8x12	2					
24	F40-05030000	气缸垫组件	GASKET ASSY, CYLINDER HEAD	1					
25	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	3					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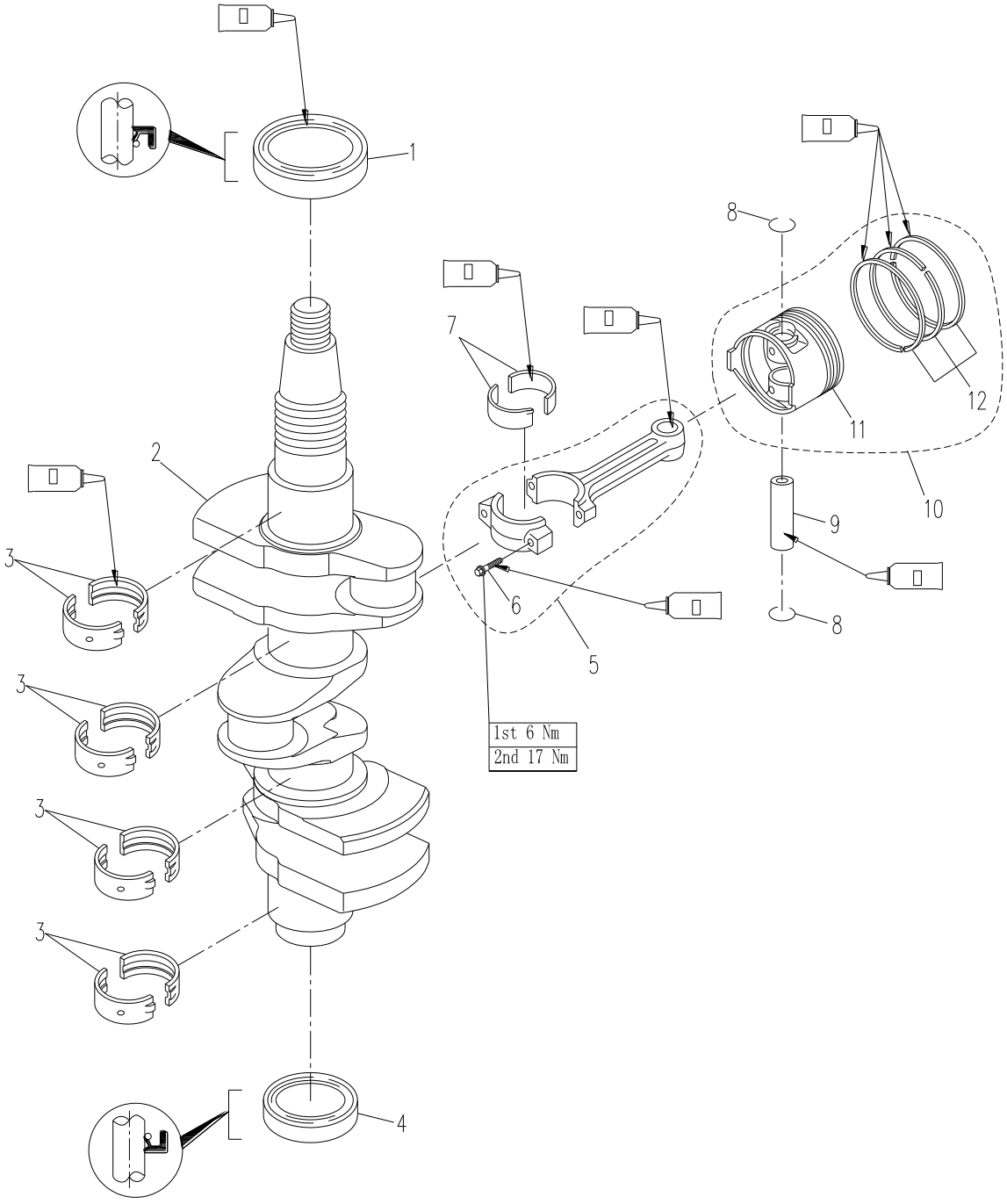
1	F25-05050002	排气门	VALVE, EXHAUST	3					
2	F25-05050003	气门弹簧垫圈	WASHER, VALVE SPRING	6					
3	PS2700.04.03	气门油封	SEAL, VALVE STEM	6					
4	F25-05050005	气门弹簧	SPRING, VALVE	6					
5	F15-07040006	气门弹簧座圈	RETAINER, VALVE SPRING	6					
6	F15-07040007	气门弹簧卡圈	COTTER, VALVE SPRING	12					
7	F25-05050300	摇臂组件	ROCKER ASSY	6					
8	F25-05050301	摇臂	ROCKER	6					
9	F15-07040303	调整螺钉	SCREW, VALVE ADJUSTING	6					
10	F15-07040304	锁紧螺母	LOCK NUT	6					
11	F25-05050001	进气门	VALVE, INTAKE	3					
12	F40-05040001	摇臂轴	SHAFT, ROCKER	1					
13	F40-05040002	弹簧板托板	SUPPORTING PLATE, SPRING PLATE	2					
14	F40-05040004	摇臂限位弹簧板　A	SPRING PLATE A, ROCKER	1					
15	F25-05050012	摇臂轴固定板　B	SPRING PLATE B, ROCKER	2					
16	F25-05050019	摇臂轴六角法兰螺栓	FLANGE BOLT, ROCKER SHAFT	4					
17	F40-05040003	摇臂轴固定板　B	FIXED PLATE B, ROCKER SHAFT	1					
18	F25-05050011	摇臂限位弹簧板	SPRING PLATE, ROCKER	1					
19	F25-05050009	摇臂轴固定板　A	FIXED PLATE A, ROCKER SHAFT	1					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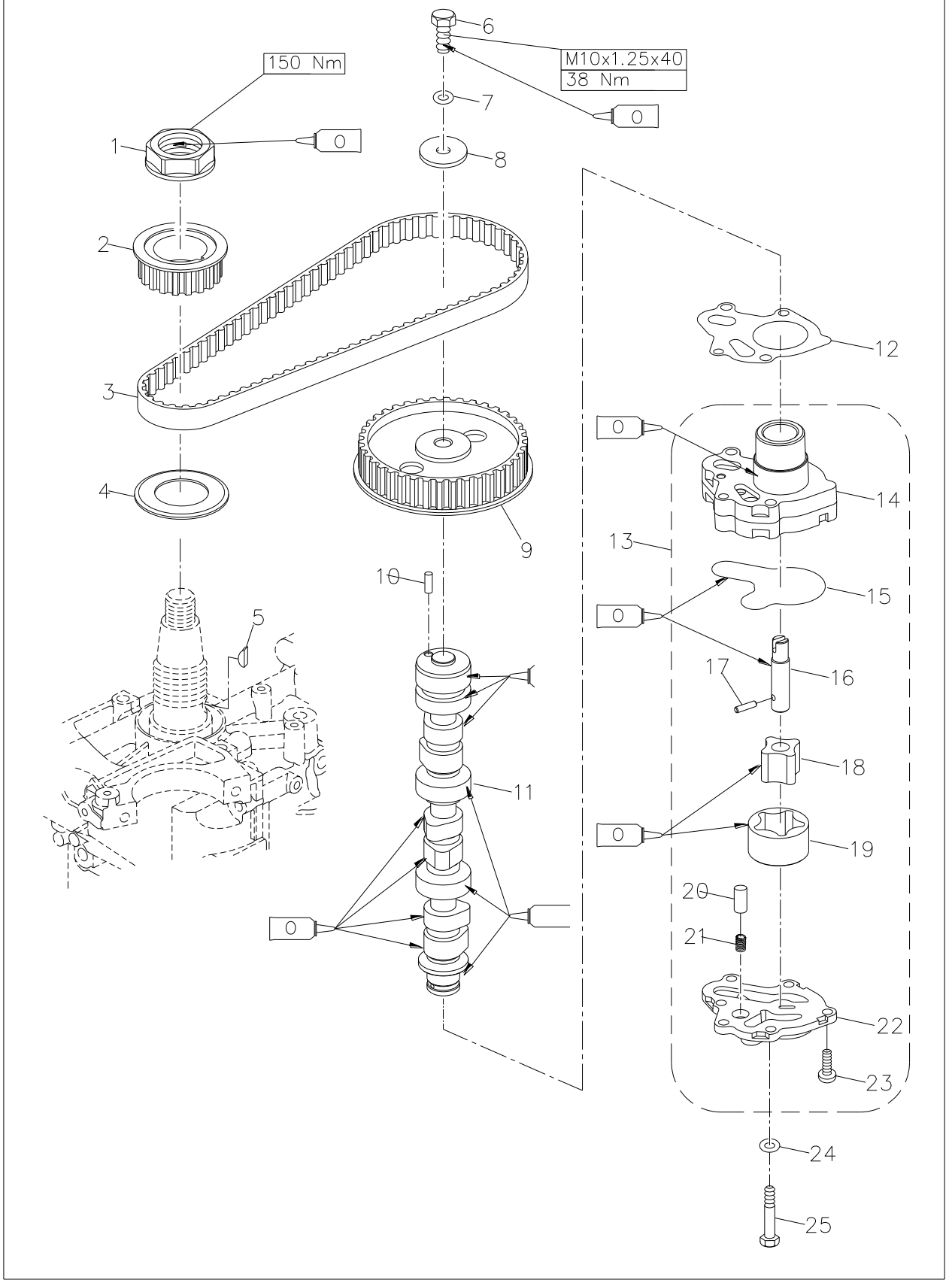
12
1st 6 Nm
2nd 17 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-05020003	曲轴油封 B ⌀43x ⌀54.8x6 R	OIL SEAL B	1					
2	F40-05000001	曲轴	CRANKSHAFT	1					
3	F25-05010302-1	曲轴轴瓦 （黑色）	BEARING SHELL, CRANKSHAFT	8					BLACK
	F25-05010302-2	曲轴轴瓦 （棕色）	BEARING SHELL, CRANKSHAFT						BROWN
4	F25-05020002	曲轴油封 A ⌀35x ⌀46.85x6 L	OIL SEAL A	1					
5	F25-05020200	连杆组件	CONNECTING ROD ASSY	3					
6	F25-05020204	连杆螺栓	BOLT, CONNECTING ROD	6					
7	F25-05020203-1	连杆轴瓦 （黑色）	BEARING SHELL, CONNECTING ROD	6					BLACK
	F25-05020203-2	连杆轴瓦 （棕色）	BEARING SHELL, CONNECTING ROD						BROWN
8	F25-05020106	活塞销挡圈	CIRCLIP, PISTON PIN	6					
9	F25-05020105	活塞销	PIN, PISTON	3					
10	F40-05020100	活塞组件	PISTON ASSY	3					
11	F40-05020101	活塞	PISTON	3					
12	F25-05020102	活塞环组件	PISTON RING ASSY	3					


150 Nm
M10x1.25x40
38 Nm
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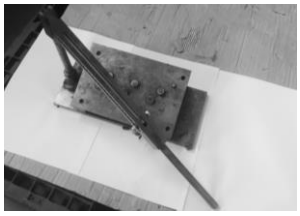
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000007	正时带轮螺母	NUT, TIMING PULLEY	1					
2	F25-05000021	正时带轮	TIMING PULLEY	1					
3	F25-05000023	正时皮带	TIMING BELT	1					
4	F40-05000008	正时带轮压板	PLATE, TIMING BELT	1					
5	F4-04000019	半圆键 4x5.3x13	WOODRUFF KEY	1					
6	GB/T5785-M10x1.25x40	六角螺栓 M10x1.25x40	BOLT M10x1.25x40	1					
7	GB/T97.1-10	平垫圈 10	WASHER 10	1					
8	F25-05050018	从动轮垫圈	WASHER, DRIVEN PULLEY	1					
9	F40-05040006	从动轮	DRIVEN PULLEY	1					
10	F25-05050016	从动轮定位销	DOWEL PIN, DRIVEN PULLEY	1					
11	F40-05040200	凸轮轴组件	CAMSHAFT ASSY	1					
12	F40-05040407	机油泵密封垫	GASKET, OIL PUMP	1					
13	F40-05040400	机油泵组件	OIL PUMP ASSY	1					
14	F40-05040401	机油泵体	BODY, OIL PUMP	1					
15	F40-05040405	机油泵密封圈	SEAL, OIL PUMP	1					
16	F40-05040404	机油泵转子轴	ROTOR SHAFT , OIL PUMP	1					
17	GB/T309-⌀4x15.8	滚针 ⌀4x15.8	NEEDLE ROLLER ⌀4x15.8	1					
18	F40-05040403	油泵内转子	INNER ROTOR , OIL PUMP	1					
19	F40-05040402	油泵外转子	OUTER ROTOR , OIL PUMP	1					
20	F15-07110003	溢流阀柱塞	PLUNGER, OIL RELIEF VALVE	1					
21	F40-05040408	溢流阀弹簧	SPRING, OIL RELIEF VALVE	1					
22	F40-05040406	机油泵盖	COVER, OIL PUMP	1					
23	GB/T823-M6x16	十字槽小盘头螺钉 M6x16	SCREW M6x16	2					
24	GB/T97.1-6	平垫圈 6	WASHER 6	4					
25	GB/T5782-M6x40	六角螺栓 M6x40	BOLT M6x40	4					

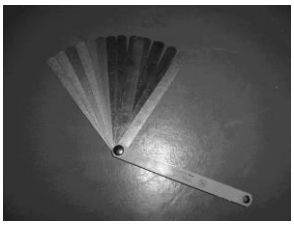
Special tool

Piston slideway

flywheel gripper and flywheel puller



Valve spring compressor kit



Clearance gauge

Oil filter spanner

Check the compression pressure

1. Start the engine, warm it up for 5 minutes, and then shut it down.

2. Remove the engine stop safety line.

3. Remove the spark plug and connect the pressure gauge to the spark plug hole.
   Note:
   Before removing the spark plug, clean the pit where the spark plug is installed with compressed air to prevent dust or other sundries from entering the cylinder.

4. Fully open the throttle, turn the crankshaft using the starter or start motor, and check the cylinder pressure when the reading on the pressure gauge is stable.
   Note:
   For the control box in use, remove the throttle linkage, open the carburetor throttle lever fully by hand, and check the pressure.

5. If the detected pressure is lower than the specified value or there is a difference between cylinders, add a small amount of oil into the cylinders and then detect it again.
   Compression pressure: 840 kPa
   Note:
   If the cylinder pressure continues to increase, check whether the piston and piston ring are damaged. Replace it if necessary.
   If cylinder pressure does not increase, check valve clearance, valve, valve seat, cylinder liner, cylinder head and cylinder head gasket. Adjust or replace them if necessary.
   The outboard motor is equipped with an automatic decompressor, so the data cannot be very accurate.

Check oil pressure

1. Start the engine, warm it up for 5 minutes, and then shut it down.

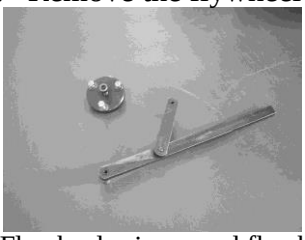
2. Remove the oil pressure switch and connect a pressure gauge.
   Note:
   Use a pressure gauge with 1/8 pitch thread adapter.

3. Test oil pressure
   Oil pressure (reference data): 230kpa (60℃, 950±50 r/min)

480kpa (62℃, 3000±50 r/min)

Remove the engine

1. Open the top cover.
2. Remove the flywheel cover.
3. Remove the throttle cable
4. Remove carburetor.
5. Remove the flywheel using a special tool.



Flywheel gripper and flywheel puller

6. Remove the semicircular key.
7. Disconnect the engine stop switching line and ground wire.
8. Remove cable connector.
9. Remove the magneto coil.
10. Disconnect the wires of the battery, starting motor, starting relay, warping relay, control box connector and other electrical components, disconnect grounding wire, disconnect water pipe.
11. Remove the high voltage ignition coil, ECU device, ignition coil and spark plug.
12. Remove the bolts connecting the engine and the water unit.
13. Lift the engine and remove the locating pin.

Pulley and timing belt

1. Turn the flywheel clockwise. Align the mark “1" on the driven pulley with the mark "▼" on the cylinder head.
   Note:
   Do not turn the flywheel counterclockwise, or it will damage the valve system.
2. Remove the timing belt from the driven pulley side.
   Note:
   Do not turn the pulley when the timing belt is not installed, otherwise the valve system will be damaged.
3. Remove the driven pulley bolt, remove the driven pulley and semicircular key.
   Note:
   Remove the driven pulley bolt with the flywheel gripper.
   Do not turn the camshaft when loosening the timing pulley.

4. Remove the timing pulley washer, timing pulley and semicircular key.

5. Check pulley and timing belt for cracks, damage or wear. Replace it if necessary.

6. Install the semicircular key and driven pulley.
   Align the mark “1" on the driven pulley with the mark "▼" on the cylinder head. Then temporarily tighten the driven pulley bolt.
   Note:
   Do not turn the pulley when the timing belt is not installed, otherwise the valve system will be damaged.

7. Install the semicircular key and timing pulley.
   Align the notch mark on the timing pulley with the mark "▼" on the engine body.

8. Install a new timing belt with the timing belt part number upright.
   Note:
   Do not twist, rotate or bend the timing belt, otherwise it will be damaged.
   Do not pour oil or lubricating oil on the timing belt.
   Do not turn the pulley counterclockwise, or it will damage the valve system.

9. Install the cover plate of the timing pulley and temporarily tighten timing pulley nut.

10. Turn the timing pulley clockwise for 2 turns to eliminate the slack of the timing belt.
    Check whether the alignment marks are aligned.

11. Tighten the bolts and nuts.
    Seating torque: Driven pulley bolt 38 Nm
    Note:
    Remove the driven pulley bolt with the flywheel gripper.
    Tighten the timing pulley nut using a special socket spanner for timing pulley nut.

Disassembly and inspection

Cylinder cover

Disassembly

1. Remove cylinder head cover bolts.

2. Remove the cylinder head bolts in reverse order according to the numerical symbols on the cylinder head.

3. Remove the cylinder head, and then remove the oil pump.

4. Remove the rocker shaft, spring and rocker arm assembly.
   Note:
   Before removing the rocker shaft, loosen the lock nut and adjust the screw to the relaxed state.

5. Remove the intake and exhaust valves using the valve spring compressor.

Valve and valve guide

1. Check the width of valve sealing surface; If it is not within the prescribed scope, Trim the valve seat ring.

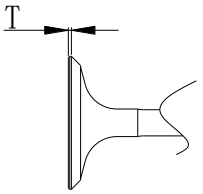
Width of sealing surface:

Intake valve	1.84～2.97 mm
Exhaust valve	1.98～3.11 mm

2. Check the valve edge thickness T; Replace the valve if it does not meet the specified value.

Valve edge thickness:

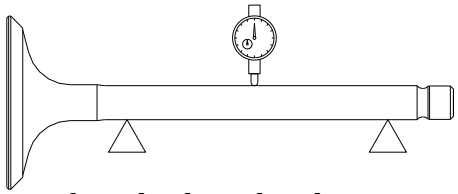
Intake valve	0.6～1.0 mm
Exhaust valve	0.7～1.1 mm



3. Check valve stem diameter. If it is not within the prescribed scope, replace the valve.
Valve stem diameter:

Intake valve	5.48～5.49 mm
Exhaust valve	5.46～5.47 mm

4. Check valve stem roundness. If it is beyond the limit, replace the valve.
Valve stem roundness limit: 0.03mm



5. Check the inner diameter of the valve guide.
Valve guide inner diameter: 5.50～5.51 mm

Note:

When replacing the valve, be sure to use new valve guide and valve oil seal.

Valve spring

1. Check the free length of valve spring; Replace it if it is less than the specified value.
Free length: 40.0 mm
Minimum free length: 38.4 mm

2. Check the inclination of the valve spring; Replace it if it is beyond the limit.
Inclination limit: 1.7 mm

Valve rocker and rocker shaft

1. Check the contact surface of valve rocker and rocker shaft for wear. Replace them if necessary.

2. Measure whether the inner diameter of valve rocker and outer diameter of rocker shaft meet the specified values. Replace it if necessary.
Inside diameter of valve rocker: 16.000～16.018 mm
Outside diameter of rocker shaft: 15.73～15.84 mm

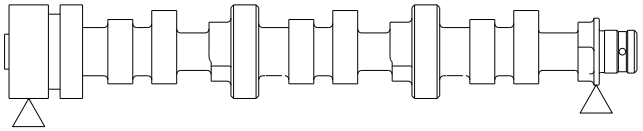
Camshaft

1. Check the cam dimensions.
Replace the camshaft if necessary.

Cam height	Intake	30.83~31.09 mm
	Exhaust	30.83~31.09 mm
Diameter of base circle		25.90~26.10 mm

2. Check camshaft roundness. Replace it if necessary.

Roundness limit: 0.03mm



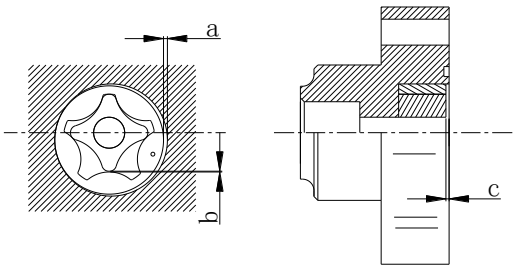
3. Check camshaft journal diameter and the inner diameter of cylinder head shaft hole. Replace it if necessary.
   Camshaft journal: 36.935~36.955mm
   Inner diameter of cylinder head shaft hole b: 37.000~37.025 mm

4. Calculate the camshaft oil clearance c (c=b-a) and replace it if it does not meet the specified value.
   Camshaft top: 0.06~0.10 mm
   Centre and rear part of camshaft: 0.05~0.09 mm
   Note:
   The camshaft and cylinder head need to be replaced together.

Check the oil pump

1. Remove the screw fixing the oil pump and remove the oil pump.

2. Open the oil pump cover and check the oil pump rotor clearance as shown. If it does not meet the specified value, replace it.



Clearance a between outer rotor and shell	0.09~0.15 mm
Clearance b between outer rotor and inner rotor	0.01~0.10 mm
Clearance c between rotor and cover	0.03~0.08 mm

Joint surface of cylinder head and engine body

1. Remove carbon deposits from combustion chamber and check for damage.

2. Check the warpage of the joint surface with a ruler and a clearance gauge. If it does not meet the specified value, replace it.
   Cylinder head buckling limit: 0.03mm

Replace valve guide

1. Knock off the valve guide in the direction of the combustion chamber.

2. Knock in the new valve guide from the top surface of the cylinder head.
   Note:
   Apply oil to the surface of the valve guide before installation.

3. Hinge the inner diameter of the guide to the specified value with a reamer.

Valve guide inner diameter: 5.50～5.518mm

Note:

Do not rotate the reamer counterclockwise when taking it out.

Check valve seat ring

1. Remove carbon deposit from the valve.

2. Coat a thin layer of dye evenly on the sealing surface of the valve seat ring.

3. Grind the valve on the valve seat with the valve grinding tool.

4. Measure the width of valve sealing surface.

Dye will stick to the valve sealing surface.

If the valve and valve seat ring fit incorrectly or the sealing surface width does not meet the specified value, trim the valve seat.

If the contact surface is uneven, replace the valve guide.

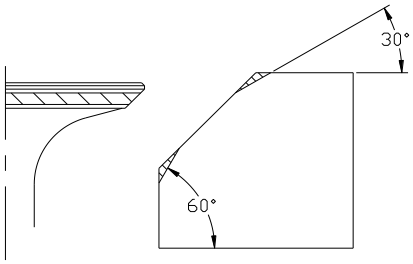
Width of intake and exhaust valve sealing surface: 0.9～1.1mm

Trim the valve seat ring

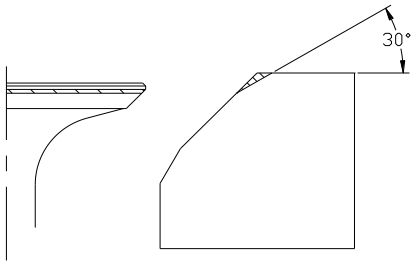
1. Trim the valve with a 45 °valve seat ring cutter and adjust the width of the sealing surface.

Turn the cutter clockwise until the surface of the seat ring is smooth.

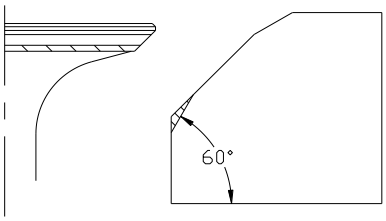
2. If the valve sealing surface is too wide and in the middle of the valve surface, trim the top edge of the seat ring with a 30 °cutter and trim the bottom edge of the seat ring with a 60 °cutter, and adjust the width of the sealing surface.



3. If the valve sealing surface is too narrow and at the top edge of the valve surface, trim the top edge of the seat ring with a 30 °cutter, and adjust the width of the sealing surface with a 45 °tool (if any).



4. If the valve sealing surface is too narrow and at the bottom edge of the valve surface, trim the bottom edge of the seat ring with a 60 °cutter, and adjust the width of the sealing surface with a 45 °cutter (if any).



5. Apply a thin layer of abrasive evenly to the valve seat ring, and grind the valve with a

valve grinding tool.

6. Remove the residual abrasive.

7. Check the width of valve sealing surface again.
Note:
Do not excessively cut the valve, and turn the cutter evenly with a downward force of 40 ~ 50N.
Do not stick the abrasive on the valve stem and valve guide.

Install the valve

1. Install a new valve oil seal and apply engine oil to the valve guide.

2. Install the valve, valve spring plate, valve spring and spring seat in sequence.

3. Compress the valve spring with the valve spring compressor and install the valve spring retainer.

4. Tap the valve spring seat with a plastic or rubber hammer to secure the retainer.

Assemble cylinder head

1. Install a new oil seal with the special tool.

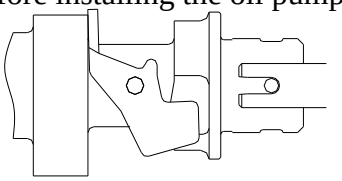
2. Fit the camshaft into cylinder head in the oil pump direction.

3. Check whether the spline position faces the cylinder joint surface. If necessary, make adjustments.

4. Install the rocker arm assembly, spring and rocker shaft.

5. Assemble the oil pump.
Note:
Make sure the mark on the outer rotor faces the oil pump cover

6. Align the oil pump drive shaft and camshaft pins and install the oil pump.
Note:
Before installing the oil pump, make sure the oil path is clear and fill the oil pump with oil.



Crankcase

Disassembly

1. Remove the oil filter using a special tool.
Note:
Place a cloth under the oil filter.

Filter spanner

2. Remove the bolts in reverse order according to the serial number on the edge of the screw hole on the exhaust cover plate.

3. Remove thermostat cover, exhaust cover, gasket and locating pin.
Check the exhaust cover for cracks, deformation or corrosion. Replace it if necessary.

4. Remove the bolts on the body in reverse order according to the serial number on the edge of the screw hole on the engine base, and remove the engine base.

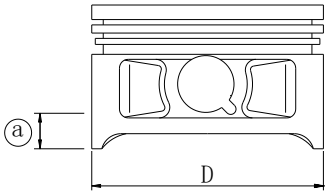
5. Remove the connecting rod bolts and connecting rod cover, remove the crankshaft, and then remove the connecting rod and piston assembly.

6. Remove piston pin clamp spring with pliers, then remove the piston pin and piston.

7. Remove the oil seal, locating pin and bearing bush.

Piston

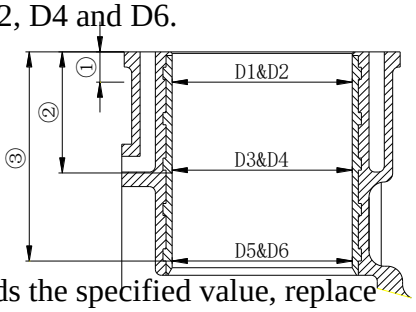
1. Measure the outside diameter of piston at the specified measuring point.
If it does not meet the specified value, replace it.
Diameter of piston: 64.930～64.945 mm
Measuring point⑨: 3 mm



2. Check the inner diameter of piston pin hole.
If it does not meet the specified value, replace it.
Inner diameter of piston pin seat: 16.002～16.008 mm

Cylinder bore

1. Measure the piston outer diameter at specified measuring points①②③.
At each measuring point, measure the diameters parallel to the crankshaft directions D1, D3 and D5 and perpendicular to the crankshaft directions D2, D4 and D6.
Height of measuring point: ①20 mm;
②60 mm;
③100 mm
Cylinder bore: 65.000～65.013 mm



2. Calculate the taper limit and roundness limit. If it exceeds the specified value, replace the crankcase.
Taper limit: 0.08 mm (D1-D5, D2-D6)
Roundness limit: 0.05 mm (D2-D1, D6-D5)

Outside diameter of piston pin

Check the outside diameter of piston pin; If it does not meet the specified value, replace it.
Outside diameter of piston pin: 15.965～15.970 mm

Piston ring

1. Check the sectional dimensions of piston ring. If it does not meet the specified value, replace it.

	Thickness	Section width
Top ring	1.17～1.19 mm	2.39～2.41 mm
Second ring	1.47～1.49 mm	2.49～2.51 mm
Oil ring	2.34～2.46 mm	2.75 mm

2. Push the piston ring into the cylinder in parallel with the piston to the specified measuring point (20mm from the joint surface).

3. Measure the clearance of piston ring end face with a clearance gauge; If it does not meet the specified value, replace it.

End face clearance (during installation): Top ring 0.15～0.30 mm

Second ring 0.30～0.50 mm

Oil ring 0.20～0.70 mm

4. Install the piston ring on the piston, and measure the clearance between the piston ring and the piston ring groove with a clearance gauge; If it does not meet the specified value, replace it.

Specified clearance: Top ring 0.02～0.06 mm

Second ring is 0.02～0.06 mm

Oil ring 0.04～0.18 mm

Inner diameter of connecting rod small end

Measure the inside diameter of the small end. If it does not meet the specified value, replace it.

Inner diameter of small end: 15.985～15.998 mm

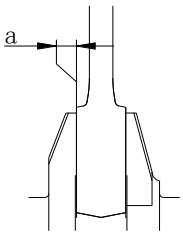
Connecting rod large end backlash

Measure the big-end backlash.

If it does not meet the specified value,

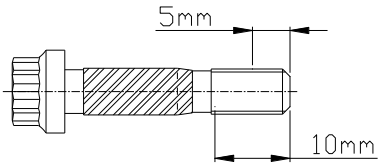
replace the connecting rod or crankshaft or both.

Large end backlash: 0.05～0.22 mm



Check connecting rod bolts

1. Check the thread diameter of the connecting rod bolt at the position shown in the figure.



2. Calculate the diameter difference of two threads; If it does not meet the specified value, replace it.

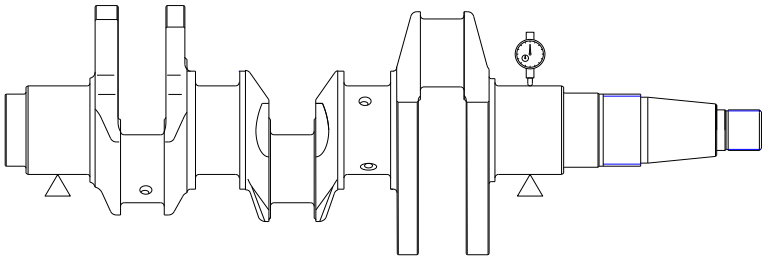
Thread diameter difference of connecting rod bolt: 0～0.1 mm

Crankshaft

1. Measure crankshaft main journal diameter, crank pin diameter and crank pin width. If they do not meet the specified value, replace the crankshaft.

Diameter of crankshaft journal	42.984~43.000 mm
Crank pin diameter	32.984~33.000 mm
Crank pin width	21.000~21.070mm

2. Check the crankshaft runout; If it exceeds the specified value, replace it.



Crankshaft runout limit: 0.04mm

Crank pin oil clearance

1. Place a plastic clearance gauge on the crank pin and make it parallel to the crankshaft.

2. Fit the connecting rod and bearing bush on the crank pin.

3. Tighten the connecting rod bolts according to the specified torque.
   Seating torque: First time 6 Nm
   Second time 17 Nm

4. Remove the connecting rod and measure the compressed width of the plastic clearance gauge; If it exceeds the specified value, replace the connecting rod bearing bush.
   Oil clearance: 0.020～0.052mm
   Note:
   Do not turn the connecting rod until the measurement is completed.

Main journal oil clearance

1. Clean the bearing bush, main journal, and the mounting surface of the engine body and engine base.

2. Install the bearing bush and crankshaft to the engine body.

3. Place a plastic clearance gauge on the main journal and parallel it to the crankshaft
   Note:
   Do not place the plastic clearance gauge on the oil hole of the main journal.

4. Install the bearing bush on the engine base and the engine base on the engine body.

5. Tighten bolts with specified torque in the order of numerical symbols on the engine base.
   Seating torque:

Frist tightening	M8	15 Nm
Second tightening		30 Nm
Frist tightening	M6	6 Nm
Second tightening		12 Nm

6. Remove the engine base and measure the compressed width of each plastic clearance gauge; If it exceeds the specified value, replace the bearing bush.
   Oil clearance: 0.012～0.044mm
   Note:
   Do not turn the crankshaft until the measurement is completed.

Body and engine base

1. Check whether the engine body and base are cracked, damaged and corroded; If yes, replace it.

2. Check the cooling water channel for grease content or blockage; If yes, clean it.

Reinstallation

Assemble piston connecting rod

Install piston, connecting rod, piston pin and piston pin clip clutch.

Note:

When installing, make sure that the mark on the connecting rod and the mark on the top of the piston are on the same side.

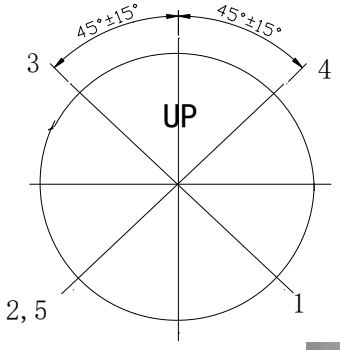
Installing the piston rings

1. Install piston rings in the order of oil ring, second ring and top ring.

   Note:

   When installing the second ring, ensure that the mark faces the top of the piston.

2. Position of piston ring notch
   Oil ring lower retaining ring 1
   Oil ring elastic ring 2
   Oil ring upper retaining ring 3
   Second ring 4
   Top ring 5



Installing piston

Install piston with piston slideway,

Make sure that the "UP" mark on the top of the piston faces the flywheel.

Note:

When installing, apply oil to the sides of the piston and piston ring.

Installing crankshaft

1.Install the bearing bush on the engine body.

Note:

Insert the raised part on the bearing bush into the groove of the corresponding part of the engine body.

2. Install the crankshaft to the engine body and install the oil seal.

   Note:

   Apply oil on the inside of the oil seal before installation.

3. Install the connecting rod cover to the connecting rod and tighten the bolts to the specified torque in two steps.

   Seating torque: First time 6 Nm
   Second time 17 Nm

   Note:

   Align the connecting rod cover with the mark on the connecting rod.

   Apply oil to connecting rod bolts before installation.

Assemble the engine

1. Coat sealant on the joint surface of the engine base, and install the locating pin and the engine base. Tighten the bolts twice in the order marked on the base.
   Seating torque:

Frist tightening	M8	15 Nm
Second tightening		30 Nm
Frist tightening	M6	6 Nm
Second tightening		12 Nm

   Note:
   Before installation, apply oil to the moving surface.
   Apply oil to the bolts before installation.

2. Install oil filter with special tools and tighten it at specified torque.
   Seating torque: 18 Nm
   Note:
   Before installation, inject oil into the oil channel.

3. Install exhaust cover plate, thermostat and thermostat cover plate.
   Tighten them according to the specified torque twice in the order marked on the exhaust cover plate.
   Seating torque: First time 6 Nm
   The first 12 Nm

6. Install the locating pin, cylinder gasket and cylinder head assembly.

7. Check the keyway position of semicircular key on the camshaft

8. Tighten the cylinder head bolts to the specified value in 2 steps in the order marked on the cylinder head.
   Specified torque:

Frist tightening	M9	23 Nm
Second tightening		46 Nm
Frist tightening	M6	6 Nm
Second tightening		12 Nm

   Note:
   It is strictly forbidden to use old cylinder head gaskets.

9. Install the timing pulley, driven pulley, timing belt and breather pipe.
   Note:
   When installing the timing belt. Ensure that the markings on the driven pulley are aligned with the "▼" mark on the cylinder head; Ensure that the mark on the timing pulley is aligned with the mark "▼" on the body.

10. Adjust valve clearance.

11. Install the cylinder head cover and tighten the bolts in the order marked on the cylinder head cover.

12. Install electrical system components in reverse order according to the removal sequence

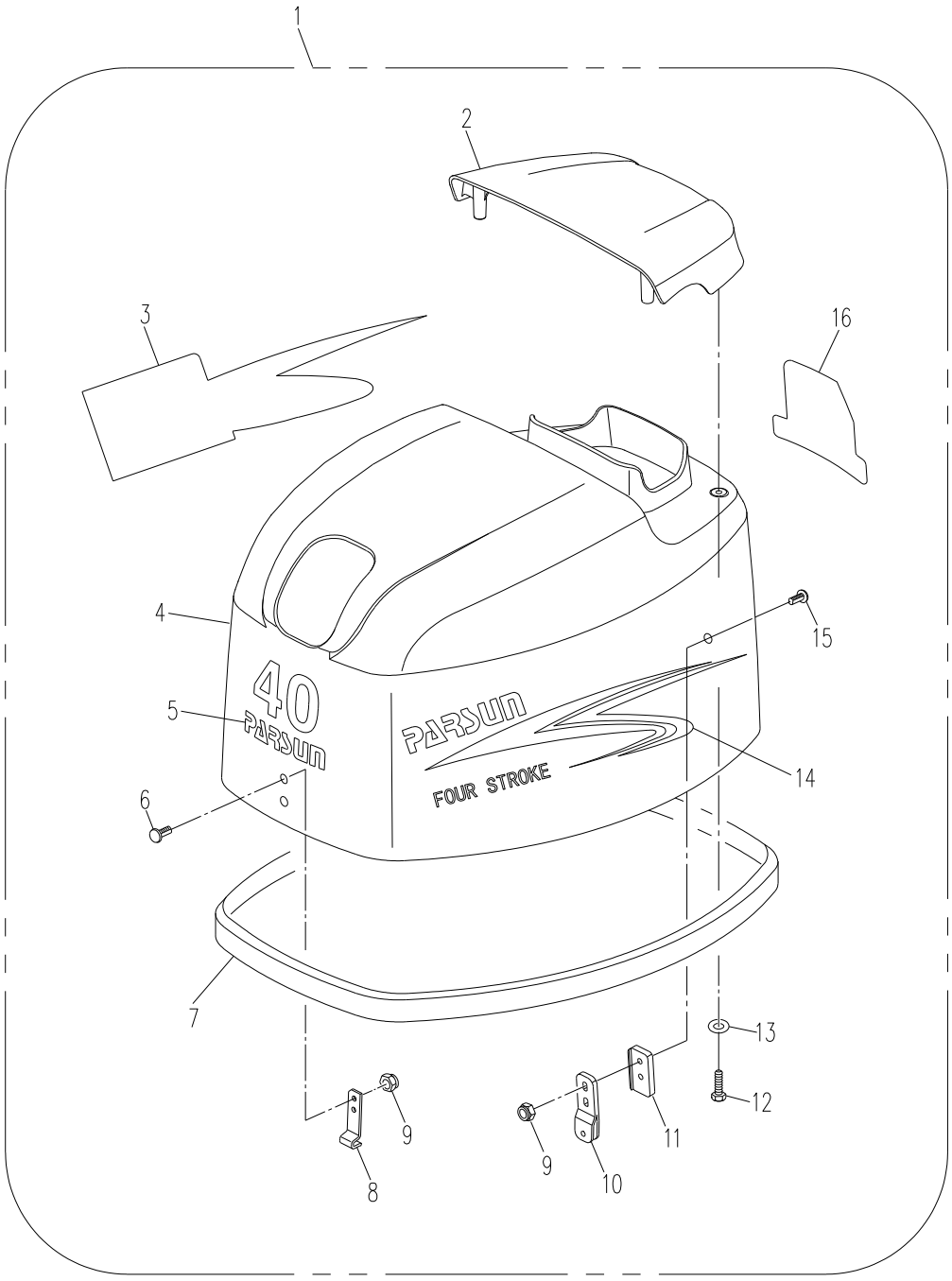
13. Connect the wires of the electrical system.

14. Install fuel system.

About water

Top cover

Disassembly schematic diagram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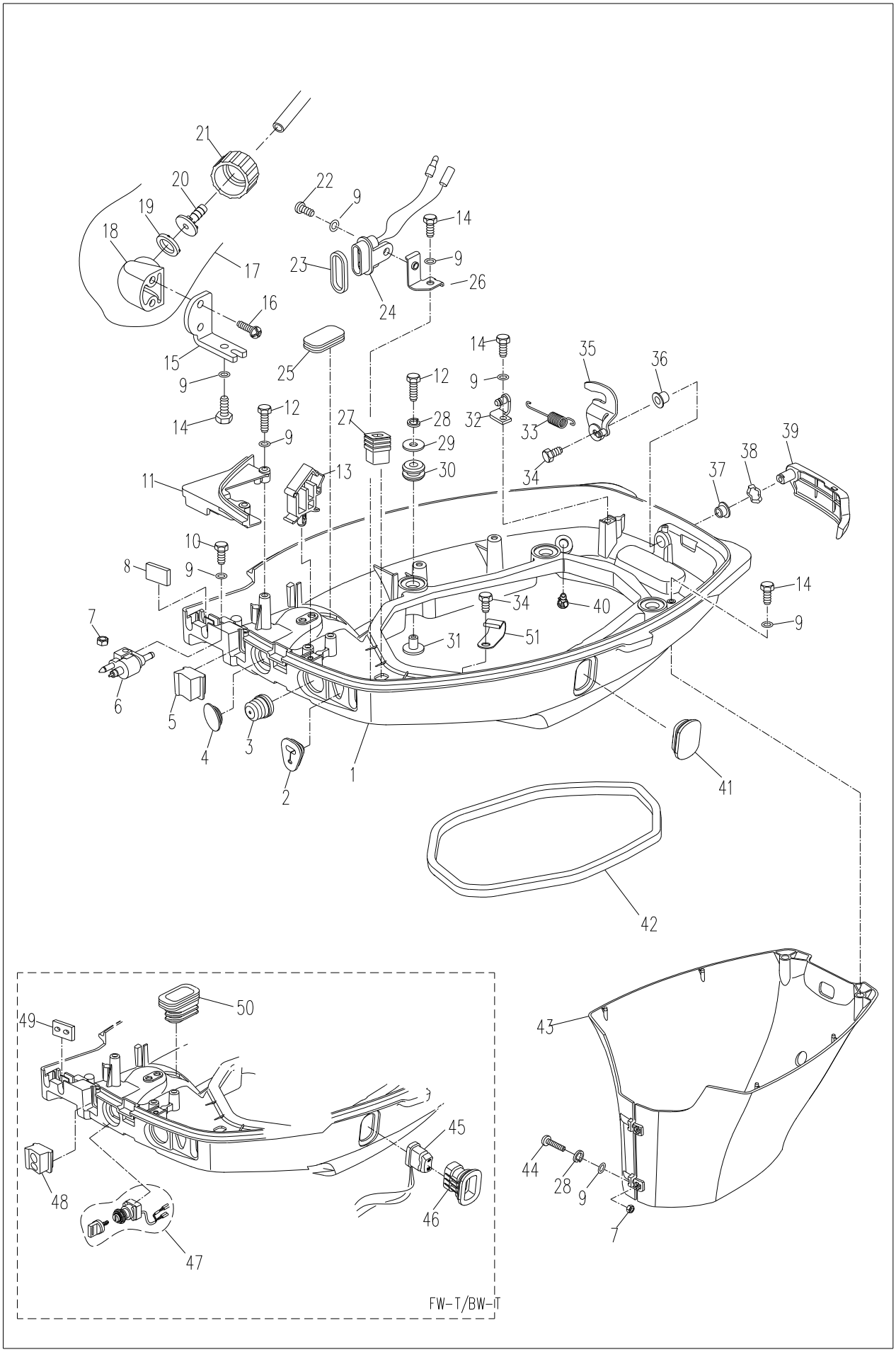
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-06000000A	顶罩组件	TOP COWLING ASSY	1					
2	F40-06000003	顶罩盖	COVER,TOP COWLING	1					
3	F40-08000002	顶罩 标贴（右）	MARK (RIGHT),TOP COWLING	1					
4	F40-06000001	顶罩	TOP COWLING	1					
5	F40-08000004	顶罩标贴 （前）	MARK (FRONT),TOP COWLING	1					
6	F25-06000006	扁头螺栓 B	FLAT BOLT B	2					
7	F40-06000002	顶罩 密封橡胶条	RUBBER SEAL,TOP COWLING	1					
8	F25-06000004	前挂钩	POTHOOK(FRONT)	1					
9	GB/T6184-M6	I 型全金属嵌件六角锁紧螺母 M6	LOCKNUT M6	4					
10	F25-06000100	后挂钩组件	POTHOOK ASSY(BACK)	1					
11	F25-06000005	后挂钩垫块	CUSHION,BACK POTHOOK	1					
12	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	4					
13	GB/T97.1-6	平垫圈 6	WASHER 6	4					
14	F40-08000001	顶罩标贴 （左）	MARK (LEFT),TOP COWLING	1					
15	F40-06000007	扁头螺栓 A	FLAT BOLT A	2					
16	F40-08000003	顶罩标贴 （后）	MARK (BACK),TOP COWLING	1					

Disassembly and inspection

1. Remove the sealing rubber strips.
2. Remove the top cover screws.
3. Remove the top cover.
4. Remove the locking hook and the hook.
5. Check the top cover for cracks or damage. Replace it if necessary.
6. Check the sealing rubber strip for cracks or damage. Replace it if necessary.
7. Check the top cover muffler cover for cracks or damage. Replace it if necessary.
8. Check the locking hook and the hook for cracks, deformation or damage. Replace it if necessary.

Bottom cover

Disassembly schematic diagram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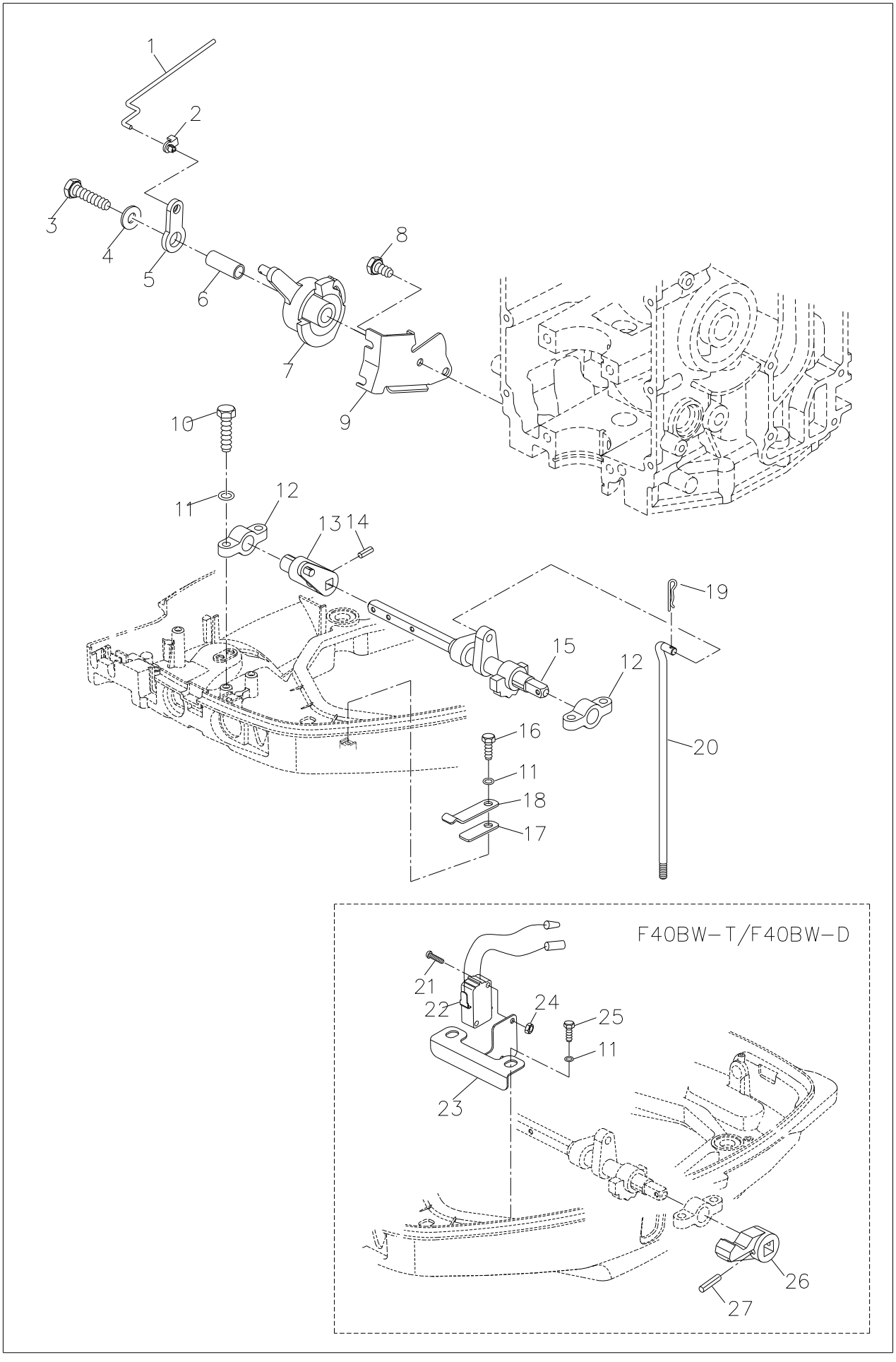
FW-T/BW-T

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-03000001EI	底罩	BOTTOM COWLING	1					
2	F15-01000015	油门钢索护套	JACKET, CABLE	1					
3	F15-05000006	波纹橡胶套	SHEATH, WAVE	1					
4	F25-03000003	圆形橡胶闷头	RUBBER PLUG, CIRCULAR	1					
5	F40-03000009	异形橡胶闷头	RUBBER PLUG, ABNORMAL	1					
6	F4-05000200	燃油管接头组件	FUEL CONNECTOR ASSY	1					
7	GB/T6170-M6	六角螺母 M6	NUT M6	3					
8	F15-05000017	方形橡胶密封条	SEAL, RUBBER	1					
9	GB/T97.1-6	平垫圈 6	WASHER 6	10					
10	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	1					
11	F40-03000006	底罩小盖板	COVER BOARD, BOTTOM COWLING	1					
12	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	4					
13	F15-05000008	方形线夹 A	CLAMP A	1					
14	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	5					
15	F25-03000023W	堵塞支架	BRACKET, JAM	1					
16	GB/T84.5-ST5.5x19	十字槽盘头自攻螺钉 ST5.5x19	SCREW ST5.5x19	2					
17	F25-03000100W	水管堵塞组件	JAM ASSY	1					
18	F25-03000101W	堵塞本体	JAM	1					
19	F25-03000102W	堵塞橡胶圈	RUBBER RING, JAM	1					
20	F25-03000103W	堵塞接头	JOINT, JAM	1					
21	F25-03000104W	堵塞螺母	NUT, JAM	1					
22	GB/T823-M6x10	十字槽小盘头螺钉 M6x10	SCREW M6x10	1					
23	F20-03000101	指示灯密封件	SEAL, PILOT LAMP	1					
24	F40-03000300EI	指示灯组件	PILOT LAMP ASSY	1					
25	F15-05000003	长方形橡胶闷头	RUBBER PLUG, QUADRATE	1					
26	F40-03000012	指示灯固定架	BRACKET, PILOT LAMP	1					
27	F15-05000033	变档连接杆护套	JACKET , LEVER	1					
28	GB/T93-6	弹簧垫圈 6	SPRING-WASHER 6	4					
29	F25-00000004	特大垫圈 6	BIG WASHER 6	4					
30	F25-03000006	减震圈	DAMPER	4					
31	F25-03000007	减震圈垫管	BUSHING, DAMPER	4					
32	F25-03000019	拉簧支架组件	BRACKET ASSY, TENSIONAL SPRING	1					
33	F15-05000026	锁紧块拉簧	SPRING, TENSION	1					
34	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	1					
35	F25-03020000	顶罩锁紧块组件	LOCKING ASSY, TOP COWLING	1					
36	F15-05000036	顶罩锁紧手柄尼龙套 B	BUSHING B	1					
37	F15-05000022	顶罩锁紧手柄尼龙套 A	BUSHING A	1					
38	F15-05000023	波形垫圈	WASHER , WAVE	1					
39	F40-03000100	顶罩锁紧手柄组件	LOCKING ASSY, TOP COWLING	1					
40	F15-05000009	塑料出水嘴	WATER NIPPLE, PLASTIC	1					
41	F40-03000011	底罩堵塞	JAM, BOTTOM CAWLING	1					

Continued:

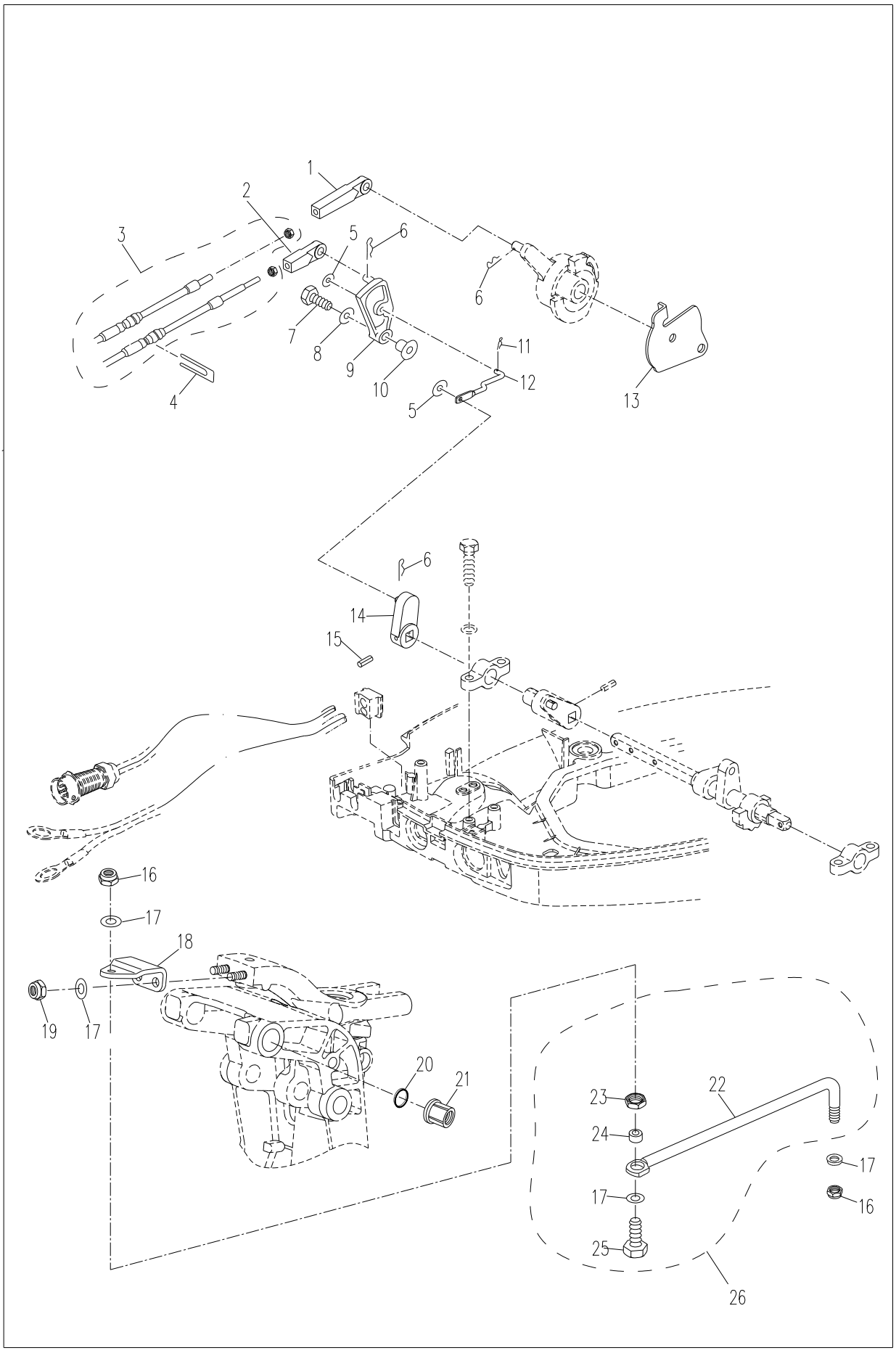
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
42	F25-03000002	底罩密封条	SEAL, BOTTOM COWLING	1					
43	F40-00000100	水上装置罩壳	SHIELD, UPPER CASING	1					
44	GB/T818-M6x25	十字槽盘头螺钉 M6x25	SCREW M6x25	2					
45	F40-03000600W	起翘开关组件	SWITCH ASSY, TILT	1					
46	F40-03000008	起翘开关护套	JACKET, TILT SWITCH	1					
47	F40-03000400EI	启动开关组件	START SWITCH	1					
48	F40-03000009BW	异形橡胶闷头	RUBBER PLUG, ABNORMAL	1					
	F40-03000009W	异形橡胶闷头	RUBBER PLUG, ABNORMAL	1					
49	F25-03000029W	长方形橡胶密封条	SEAL, RUBBER	1					
50	F40-03000014W	水管波纹护套	WAVE JACKET, WATER PIPE	1					
51	T36-04000023	线卡	CLAMP	1					

Back operation model



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000028	油门控制连杆	CONNECTING ROD, ACCELEROGRAPH	1					
2	F15-07000016	油门控制连杆接头	JIONT, CONNECTING ROD	1					
3	GB/T5782-M6x55	六角螺栓 M6x55	BOLT M6x55	1					
4	GB/T96-6	大垫圈 6	BIG WASHER 6	1					
5	F15-07000014	油门执行器从动滑轮	DRIVEN WHEEL, ACCELEROGRAPH	1					
6	F40-05000016	油门执行器衬管	BUSHING, ACCELEROGRAPH	1					
7	F40-05000033	油门执行器主动滑轮	CHAIN WHEEL, ACCELEROGRAPH	1					
8	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	1					
9	F40-05000015	控制器钢索固定架	PLATE, STEEL CABLE	1					
10	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	4					
11	GB/T97.1-6	平垫圈 6	WASHER 6	7					
12	F15-05040002	变档杆支座	BEARER, SHIFT ROD	2					
13	F40-03000010	制动器摇臂	ROCKER, DETENT	1					
14	GB/T879.4- φ3x20	标准型卷制弹性圆柱销 φ3x20	PIN φ 3x20	1					
15	F15-05040100	变档杆芯轴组件	LEVER ASSY, SHIFT ROD	1					
16	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	1					
17	F15-05000031	变档弹簧片	SPRING PIECE, SHIFT ROD	1					
18	F15-05000032	变档弹簧托片	SPRING PIECE, SHIFT ROD	1					
19	F15-00000012	夹簧 ⌀1.8	CLIP ⌀1.8	1					
20	F40-03000007L	变档连接杆（ L）	CONNECTING ROD, SHIFT GEAR(L)	1					
	F40-03000007S	变档连接杆（ S）	CONNECTING ROD, SHIFT GEAR(S)						
21	GB/T818-M3x14	十字槽盘头螺钉 M3x14	SCREW M3x14	2					F40BW-T F40BW-D
22	F15-13000800W	微动开关 (KW7-0)	JIGGLE SWITCH	1					
23	F15-05000300BW	微动开关固定板	PLATE, JIGGLE SWITCH	1					
24	GB/T6170-M3	六角螺母 M3	NUT M3	2					
25	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	2					
26	F25-03030005W	制动器摇臂 C	ROCKER C, ARRESTER	1					
27	GB/T879.2-3x20	轻型直槽弹性圆柱销 φ3×20	COLUMNIFORM PIN φ3 ×20	1					

Front operation model



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000016W	操控钢索接头 A	TIE-IN , CONTROL CABLE	1					
2	F25-07000005W	操控钢索接头 A	TIE-IN , CONTROL CABLE	1					
3	F15-11010000W	操控钢索组件	CONTROL CABLE ASSY	2					
4	F25-07000003W	开口限位板	PLATE , RINGENT	1					
5	GB/T96-5	大垫圈 5	BIG WASHER 5	2					
6	F15-00000012	夹簧 φ1.8	CLIP SPRING ⌀1.8	3					
7	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	1					
8	GB/T5287-6	特大垫圈 6	SUPPER WASHER 6	1					
9	F25-03000027W	变挡限位板	PLATE, SHIFT	1					
10	F25-03000028W	限位板衬管	BUSH, LIMITED PLATE	1					
11	F25-05160002	夹簧 φ1	CLIP SPRING ⌀1	1					
12	F25-03030004W	变挡连接杆 B	LINK ROD B, SHIFT	1					
13	F40-05000015W	控制器钢索固定架	PLATE, STEEL CABLE	1					
14	F25-03030003W	制动器摇臂 B	ROCKER B, STOPPER	1					
15	GB/T879.2-3x20	轻型直槽弹性圆柱销 φ3x20	COLUMNIFORM PIN φ3x20	1					
16	F25-07000006W	非金属嵌件六角锁紧薄螺母 3/8″	THIN LOCKNUT	2					
17	GB/T97.1-10	平垫圈 10	WASHER 10	5					
18	F25-01000007W	转向连接板	PLATE	1					
19	GB/T889.2-M10x1.25	非金属嵌件六角锁紧螺母 M10x1.25	THIN LOCKNUT M10x1.25	2					
20	JASO F404 24-016	O 形密封圈	O-RING	1					
21	F25-01010012W	塑料装饰螺母 B	NUT , PLASTIC	1					
22	F25-07000301W	转向连杆	LINK ROD , TURNING	1					
23	F25-07000304W	六角螺母 3/8″	NUT 3/8″	1					
24	F25-07000303W	螺栓垫管	TUBE , BOLT	1					
25	F25-07000302W	转向连杆螺栓	BOLT	1					
26	F25-07000300W	转向连杆组件	LINK ROD ASSY	1					

Disassembly and inspection

1. Remove rubber bulkhead, corrugated sheath and throttle cable sheath.
   Remove the ignition lead assembly.

2. Remove the bolts fixing the small cover plate of the bottom cover, remove the small cover plate of the bottom cover, and remove the square rubber sealing strip.
   Remove the retainer of the outlet and the rectangular rubber bulkhead.

3. Remove the top cover locking handle screw, and remove the top cover locking handle and top cover locking block.

4. Remove the top cover locking handle nylon sleeve A and the top cover locking handle nylon sleeve B.

5. Remove corrugated washer.

6. Disconnect the throttle control cable and remove the throttle actuator. Remove the control cable retainer. (Back operation)
   Remove the control cable connector A and remove the throttle actuator. Remove the control cable retainer. (Front operation)

7. Remove the shift lever support, shift lever assembly and brake rocker arm. Remove the gear spring plate.

8. Check the bottom cover for cracks or damage. Replace it if necessary.

9. Check the top cover locking handle and the top cover locking block for cracking or damage. Replace it if necessary.

10. Check the corrugated washer and locking handle nylon sleeve A for cracking or damage. Replace it if necessary.

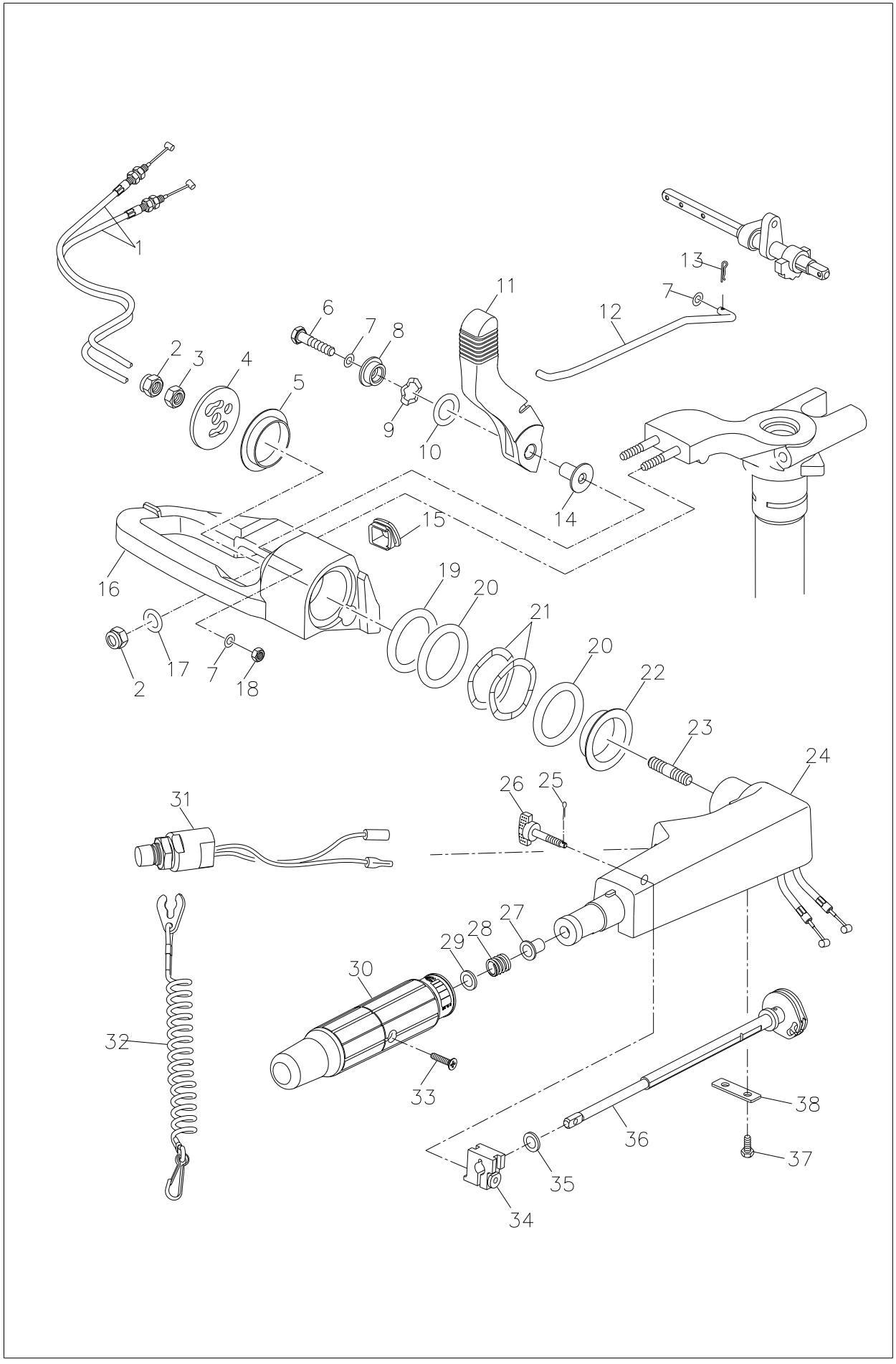
11. Check whether the throttle actuator is cracked or damaged. Replace it if necessary.

12. Check the shift lever assembly for bending deformation or damage. Replace it if necessary.

13. For back-operation and electric-start model, check whether the rocker arm of microswitch is worn; Check the conductivity of the microswitch.
    Check whether the steering linkage is bent or deformed. Replace it if necessary.

Steering handle

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-01030101	油门钢索组件	THROTTLE CABLE ASSY	1					
2	GB/T889.2-M10x1.25	细牙非金属嵌件六角锁紧螺母M10x1.25	LOCKNUT M10x1.25	3					
3	GB/T6170-M10x1.25	六角螺母 M10x1.25	NUT M10x1.25	1					
4	F15-01000013	手柄定位盖板	ORIENTATION PLATE, HANDLE	1					
5	F15-01000011	手柄衬套（低）	BUSHING, HANDLE (LOW)	1					
6	GB/T5782-M6x45	六角螺栓 M6x45	BOLT M6x45	1					
7	GB/T97.1-6	平垫圈 6	WASHER 6	3					
8	T40-00000006	手柄垫块	BLOCK, HANDLE	1					
9	T40-00000005	波形垫圈	WAVE WASHER	1					
10	T40-00000004	手柄垫圈	WASHER, HANDLE	1					
11	T40-00000002	变档手柄	HANDLE, GEAR SHIFT	1					
12	F40-00000001	变档连杆	CONNECTING ROD, GEAR SHIFT	1					
13	F15-00000012	夹簧	CLIP	1					
14	T40-00000003	凸缘垫管	FLANGE TUBE	1					
15	T40-01020001	手柄托架护套	JACKET, HANDLE BRACKET	1					
16	F25-01030001	手柄托架	BRACKET, HANDLE	1					
17	GB/T97.1-10	平垫圈 10	WASHER 10	2					
18	GB/T6170-M6	六角螺母 M6	NUT M6	1					
19	F15-01000012	衬套尼龙垫圈	NYLON WASHER, BUSHING	1					
20	F15-01000008	衬套垫圈	WASHER, BUSHING	2					
21	F15-01000009	衬套波形垫圈	WAVE WASHER, BUSHING	2					
22	F15-01000007	手柄衬套（高）	BUSHING, HANDLE (HIGH)	1					
23	F15-01030003	双头螺柱	BOLT, DOUBLE HEAD	1					
24	F15-01030001	操舵手柄	HANDLE, STEERING	1					
25	GB/T91- ⌀1.6x12	开口销 ⌀1.6x12	COTTER PIN ⌀1.6x12	1					
26	F15-01030200	阻力调整旋钮组件	BOLT, FRICTION ADJUSTING	1					
27	F4-01090006	衬套	BUSH	1					
28	F4-01090007	压缩弹簧	SPRING, COMPRESSION	1					
29	GB/T818-10	小垫圈 10	SMALL WASHER 10	1					
30	F4-01090300	操舵手柄塑胶套组件	STEERING HANDLE ASSY	1					
31	F40-01020003EI	急停开关组件	ENGINE STOP SWITCH ASSY	1					
32	F4-01090401	引擎停止安全索	STOPER , HANG ROPE ASSY	1					
33	GB/T820-M5x25	十字槽半沉头螺钉M5x25	SCREW, PAN HEAD M5x25	1					
34	F4-01090003	操舵手柄握把摩擦块	FRICTION	1					
35	F4-01090004	尼龙垫圈	NYLON WASHER	1					
36	F15-01030100	节气门杆组件	THROTTLE LEVER ASSY	1					
37	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	2					
38	F15-01030005	节气门固定板	PLATE, THROTTLE LEVER	1					

Disassembly and inspection

1. Remove handle bracket, shift handle and steering handle.

2. Remove the throttle push-pull cable assembly.

3. Remove the cotter pin and remove the resistance adjustment knob.

4. Remove the throttle grip.

5. Remove throttle retaining plate and throttle lever.

6. Remove the engine emergency stop switch.

7. Check whether the shift linkage is bent and deformed. Replace it if necessary.

8. Check the steering handle for cracks or damage. Replace it if necessary.

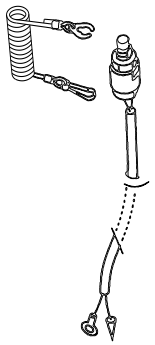
9. Check the handle anti-wear ring and wave washer for cracks or damage. Replace it if necessary.

10. Check whether the cable in the throttle push-pull cable assembly is worn or broken. Replace it if necessary.

11. Check whether the throttle lever is bent or damaged. If yes, replace it.

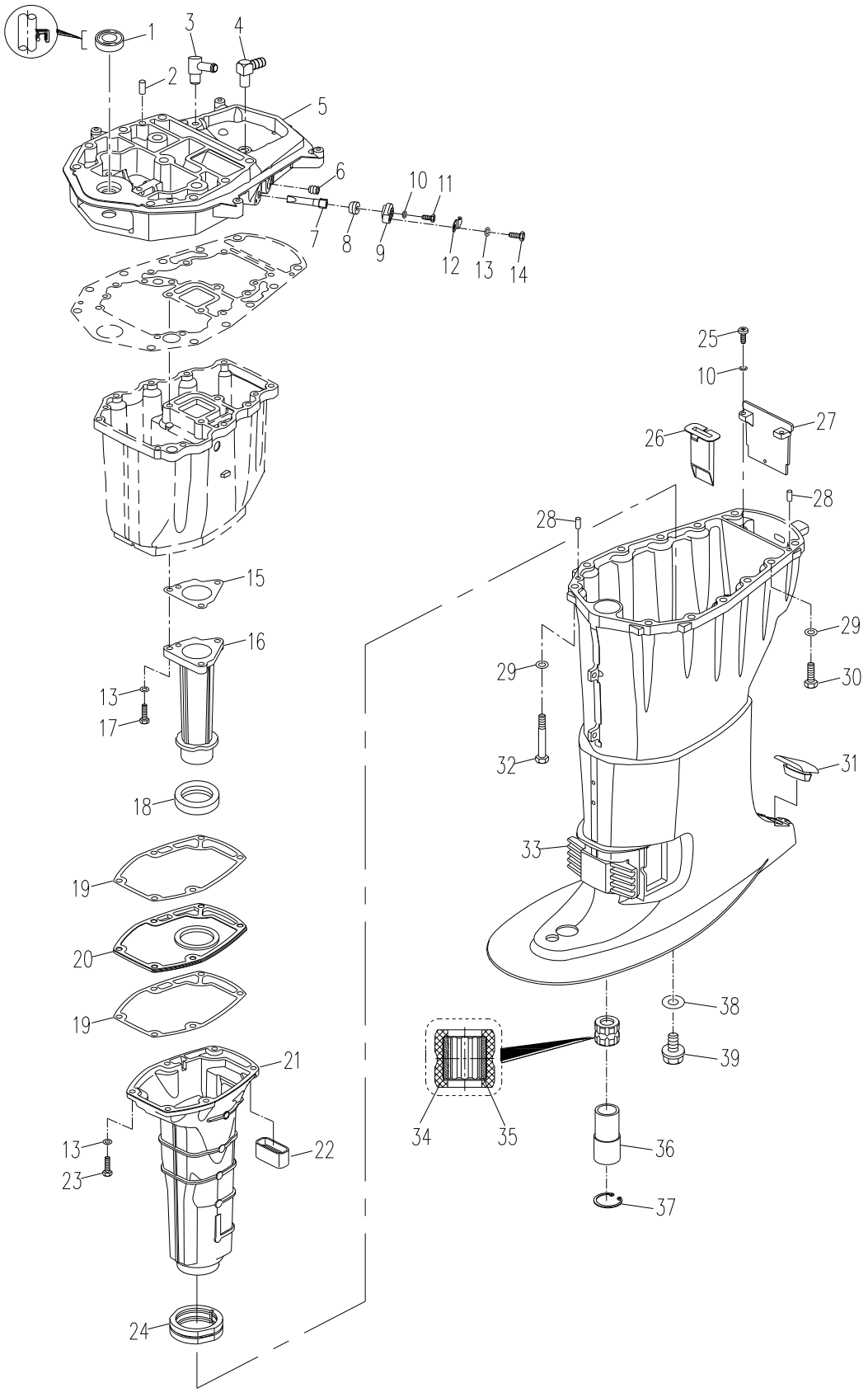
12. Check the conductivity of engine emergency stop switch ; If it does not conform to the standard, replace it.

    Remove the locking plate: Conducting
    Install locking plate: Non-conducting
    Press the switch button: Conducting

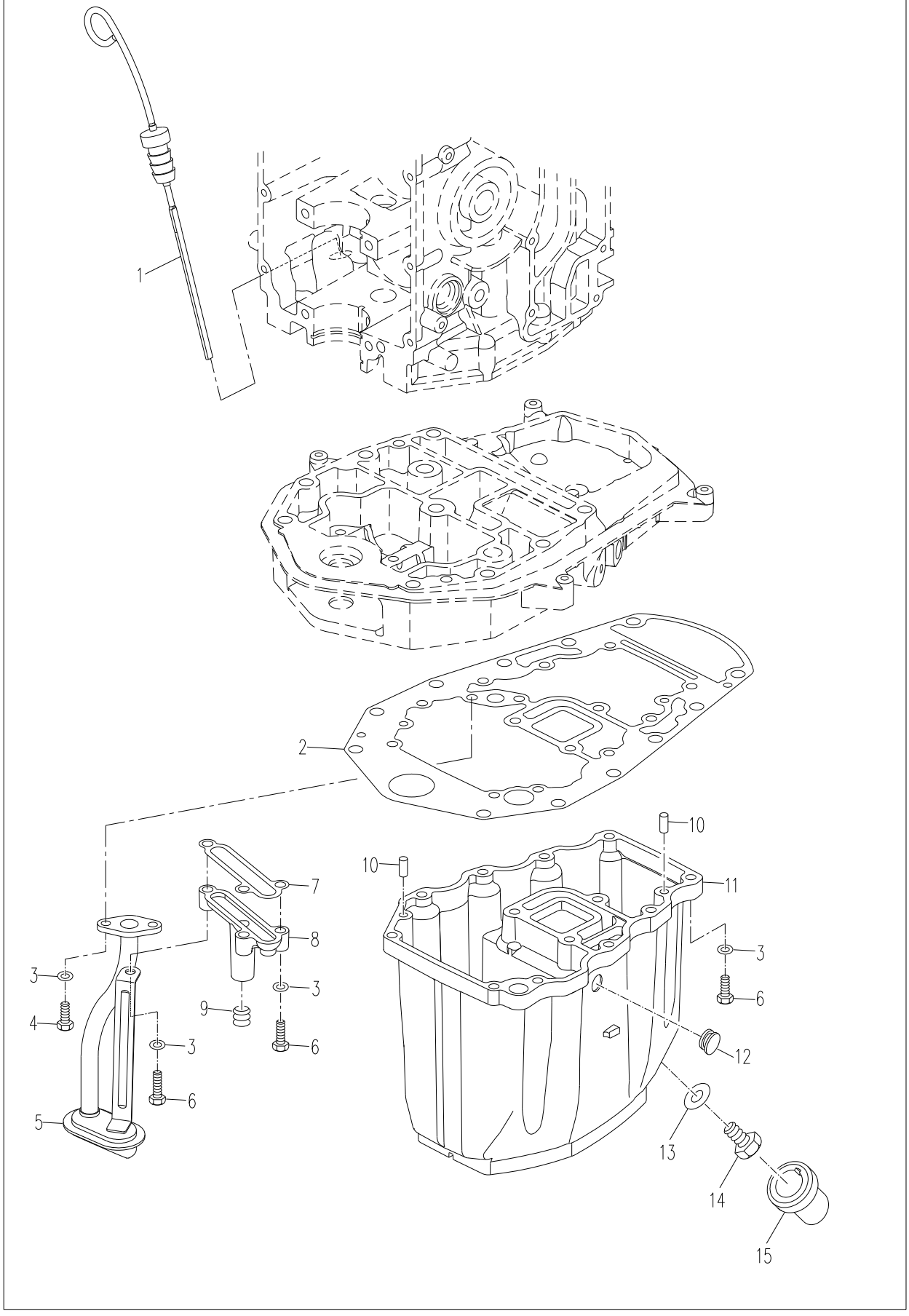


Water unit and bracket

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-02010002	排气歧管座油封 16x30x6	OIL SEAL 16x30x6	1					
2	F25-00000014	定位销 ⌀8x12	PIN ⌀8x12	2					
3	F15-04000005	水嘴	WATER NOZZLE	1					
4	F25-02010003	回气管接头 B	JOINT B,GAS PIPE	1					
5	F40-02010001	排气歧管座	SEAT,OUTLET MANIFOLD	1					
6	F15-07010005	堵塞 1/4	PLUG 1/4	1					
7	F25-02010005	阳极	ANODE	1					
8	F15-07010009	阳极密封圈	SEAL,ANODE	1					
9	F15-07010011	阳极盖板	COVER,ANODE	1					
10	GB/T97.1-5	平垫圈 5	WASHER 5	3					
11	GB/T5783-M5x12	六角螺栓 M5x12	BOLT M5x12	1					
12	F15-07010012	阳极锁止片	PLATE,ANODE	1					
13	GB/T97.1-6	平垫圈 6	WASHER 6	10					
14	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	1					
15	F25-02000011	排气导管垫	GASKET,EXHAUST PIPE	1					
16	F40-02010005	排气导管	EXHAUST PIPE	1					
17	GB/T5783-M6x50	六角螺栓 M6x50	BOLT M6x50	3					
18	F40-02010006	排气管密封圈	SEAL RING,EXHAUST PIPE	1					
19	F40-02010007	隔板密封垫	GASKET,CLAPBOARD	2					
20	F40-02010008	隔板	CLAPBOARD	1					
21	F40-02010009L	排气歧管 (L)	OUTLET MANIFOLD	1					L
	F40-02010009S	排气歧管 (S)	OUTLET MANIFOLD(S)	1					S
22	F40-02000008	排气歧管橡胶套 B	RUBBER JACKET B,OUTLET MANIFOLD	1					
23	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
24	F40-02000007	排气歧管橡胶套 A	RUBBER JACKET A,OUTLET MANIFOLD	1					
25	GB/T818-M5x16	十字槽盘头螺钉 M5x16	SCREW M5x16	2					
26	F40-02000004	塑料排气接口	EXHAUST GUIDE,PLASTIC	1					
27	F25-02000003	排气隔板	CLAPBOARD,EXHAUST	1					
28	F15-00000006	定位销 ⌀6x12	PIN ⌀6x12	2					
29	GB/T97.1-8	平垫圈 8	WASHER 8	10					
30	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	4					
31	F40-00000002	水上装置橡胶堵塞	RUBBER PLUG,UPPER CASING	1					
32	GB/T5783-M8x80	六角螺栓 M8x80	BOLT M8x80	8					
33	F40-02000001L	水上装置壳体 (L)	UPPER CASING (L)	1					L
	F40-02000001S	水上装置壳体（ S ）	UPPER CASING (S)						S
34	T40-02000004	驱动轴衬套橡胶套	RUBBER BUSHING	1					
35	T40-02000003	驱动轴衬套	BUSHING,DRIVE SHAFT	1					
36	F40-02000003	驱动轴护套	JACKET,DRIVE SHAFT	1					L
37	GB/T893.1-32	A 型孔用弹性挡圈 32	CIRCLIP 32	1					L
	GB/T893.1-30	A 型孔用弹性挡圈 30	CIRCLIP 30						S
38	F15-04000003	放油螺塞垫片	WASHER,BOLT	1					
39	F15-04000002	放油螺塞	BOLT,OIL DRAIN	1					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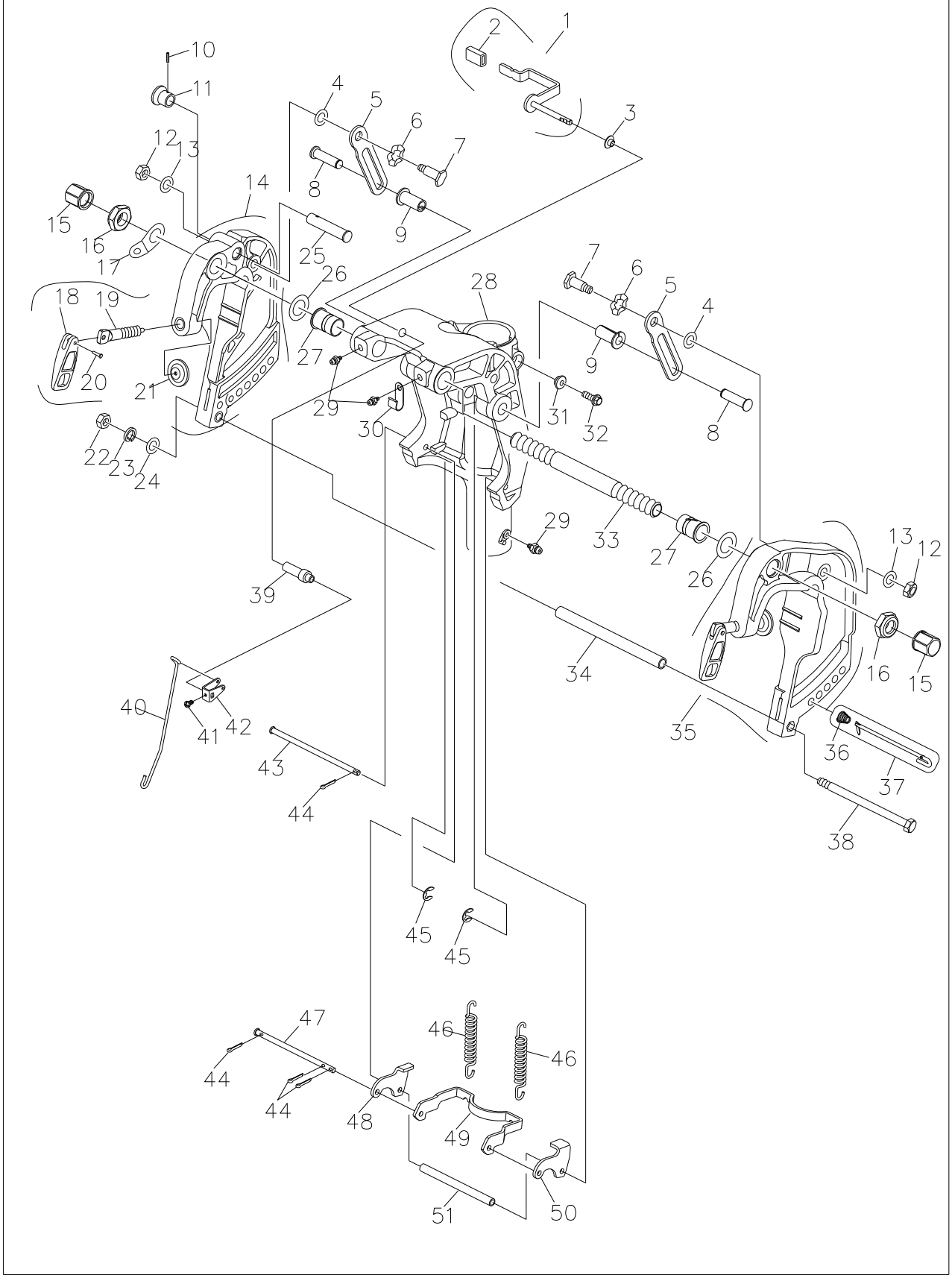
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000032	机油尺组件	OIL LEVEL ASSY	1					
2	F25-02010007	排气歧管座垫	GASKET, OUTLET MANIFOLD	1					
3	GB/T97.1-6	平垫圈 6	WASHER 6	15					
4	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	2					
5	F40-02010100	粗滤器组件	FILTER ASSY	1					
6	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	13					
7	F25-02010006	溢流阀垫片	GASKET, RELIEF VALVE	1					
8	F40-02010010	溢流阀壳体	SHELL, RELIEF VALVE	1					
9	F15-07010004	堵塞 1/8	PLUG	1					
10	F15-00000006	定位销 ⌀6x12	PIN ⌀6x12	2					
11	F40-02010002	油底壳	OIL PAN	1					
12	F40-02010003	橡胶堵塞	RUBBER JAM	1					
13	F15-04000003	放油螺塞垫片	WASHER, BOLT	1					
14	F15-04000002	放油螺塞	BOLT, OIL DRAIN	1					
15	F40-02010004	放油口胶套	JACKET, OIL DRAIN	1					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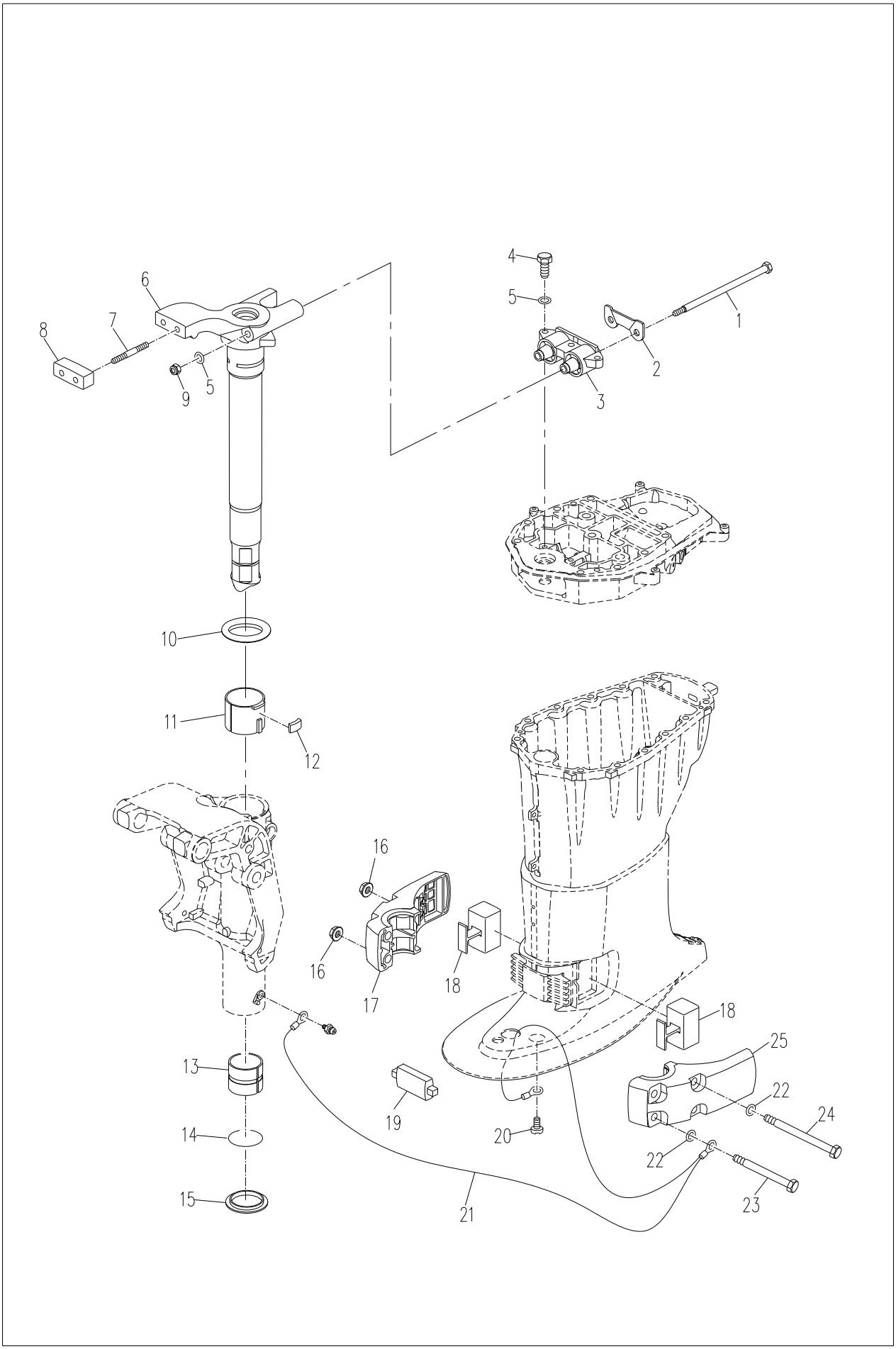
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-01010312	角度锁紧手柄组件	LOCKING HANDLE ASSY	1					
2	F15-01010305-3	手柄护套	JACKET, HANDLE	1					
3	F25-01010311	锁紧手柄衬圈	BUSHING, LOCKING HANDLE	1					
4	F25-01010009	尼龙垫圈	WASHER, NYLON	2					
5	F25-01010321	倾斜制动板	DETENT PLATE, TILT	2					
6	F25-01010008	波形垫圈	WAVE WASHER	2					
7	F25-01010007	扁六角轴位螺钉	SCREW, PROLATE HEXAGON	2					
8	F25-01010318	制动板销轴（短）	PIN, DETENT PLATE	2					
9	F25-01010319	销轴尼龙衬套（高）	NYLON BUSHING, PIN	2					
10	GB/T879.2- ⌀3x18	轻型直槽弹性圆柱销 ⌀3x18	PIN ⌀3x18	1					
11	T40-01010102	起翘限位手柄	LIMITING HANDLE, TILT	1					
12	GB/T6182-M8	Ⅱ型非金属嵌件六角锁紧螺母 M8	LOCKING NUT M8	2					
13	F25-01010010	厚垫片 8	THICK WASHER 8	2					
14	F25-01010200	右夹紧托架组件	CLAMP BRACKET ASSY (RIGHT)	1					
15	F25-01010011	塑料装饰螺母	PLASTIC NUT	2					
16	F15-01010007	托架夹紧螺母	SELF-LOCKING NUT, BRACKET	2					
17	F25-01010004	双孔固定板	PLATE , TWO HOLE	1					
18	F25-01010102	艉板夹紧手柄	CLAMP HANDLE, STERN	2					
19	F25-01010104	艉板夹紧螺杆	CLAMP SCREW, STERN	2					
20	F25-01010103	艉板夹紧手柄铆钉	RIVET, CLAMP HANDLE	2					
21	F4-01010003	艉板夹紧圆盘	CLAMP PAD	2					
22	GB/T6170-M8	六角螺母 M8	NUT M8	1					
23	GB/T93-8	弹簧垫圈 8	WASHER , SPRING 8	1					
24	GB/T97.1-8	平垫圈 8	WASHER 8	1					
25	T40-01010101A	起翘限位轴	LIMITING SHAFT, TILT	1					
26	F25-01010003	螺管垫圈	WASHER	2					
27	F25-01010002	螺管尼龙衬套	BUSH , NYLON	2					
28	F25-01010301AL	旋转支架 (L)	ROTARY BRACKET (L)	1					L
	F40-01010101AS	旋转支架 (S)	ROTARY BRACKET (S)						S
29	GB/T7940.1-M6	直通式压注油杯 M6	OIL CUP M6	3					
30	T36-04000023	线卡	LINE CLAMP	1					
31	F25-01010302	锁紧螺栓密封圈	SEAL, BOLT	1					
32	F25-01010303	六角凸缘螺栓 M8x20	FLANG BOLT M8x20	1					
33	F15-01010001	夹紧托架双头螺管	BOLT , CLAMP BRACKET	1					
34	F25-01010006	螺栓套管	TUBE, BOLT	1					
35	F25-01010100	左夹紧托架组件	CLAMP BRACKET ASSY (LEFT)	1					
36	F25-01010403	锥形弹簧	CONICAL SPRING	1					
37	F25-01010400	角度限位杆组件	LIMITING ROD ASSY	1					
38	F25-01010005	六角长螺栓 M8x255	LONG BOLT M8x255	1					
39	F25-01010309	锁紧手柄轴套	BUSHING, LOCKING HANDLE	1					
40	F25-01010315	角度锁紧支架连杆	CONNECTING ROD, BRACKET	1					
41	GB/T818-M5x6	十字槽盘头螺钉 M5x6	SCREW, PAN HEAD M5x6	1					
42	F25-01010313	角度定位件	LEVER, ANGLE ORIENTATION	1					

Continued：

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
43	F25-01010305	锁紧架长轴	LONG SHAFT, LOCKING FRAME	1					
44	GB/T91- ⌀2x12	开口销 ⌀2x12	COTTER PIN ⌀2x12	4					
45	GB/T896-9	开口档圈 9	CIRCLIP 9	2					
46	F25-01010304	角度锁紧拉簧	TENSION SPRING, LOCKING FRAME	2					
47	F25-01010307-3	外支架短轴	SHORT SHAFT , OUTER BRACKET	1					
48	F25-01010307-4	角度锁紧外支架（B）	OUTER BRACKET (B)	1					
49	F25-01010307-1	角度锁紧内支架	INNER BRACKET	1					
50	F25-01010307-2	角度锁紧外支架（A）	OUTER BRACKET (A)	1					
51	F25-01010306	长轴套管	TUBE , LONG SHAFT	1					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SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-02000016	长螺栓	LONG BOLT	2					
2	F25-02000015	减震器垫板	PLATE, ABSORBER	1					
3	F25-02030000	双孔减震器组件	SHOCK ABSORBER ASSY, DOUBLE HOLE	1					
4	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	3					
5	GB/T97.1-8	平垫圈 8	WASHER 8	5					
6	F25-01020001L	操舵托架 (L)	BRACKET, STEERING (L)	1					L
	F40-01020001S	操舵托架 (S)	BRACKET, STEERING (S)	1					S
7	F40-01020002	双头螺柱	BOLT, DOUBLE HEAD	2					BM
	F25-01020002	双头螺柱	BOLT, DOUBLE HEAD	2					FW
8	F40-01000004	操舵托架垫块	PADDING BLOCK, STEERING BRACKET	1					BM
9	GB/T889.2-M8x1.25	细牙型非金属嵌件六角锁紧螺母M8x1.25	LOCKNUT M8x1.25	2					
10	F25-01000003	旋转支架上垫圈	UPPER WASHER, ROTARY BRACKET	1					
11	F25-01000001A	旋转支架上衬套	UPPER BUSHING, ROTARY BRACKET	1					
12	F25-01000002	上衬套锁紧块组件	FRICTION PAD ASSY	1					
13	F25-01000004L	旋转支架下衬套	LOWER BUSHING, ROTARY BRACKET	1					L
	F25-01000004S	旋转支架下衬套	LOWER BUSHING, ROTARY BRACKET						S
14	F25-01000005L	下衬套 O 形圈	O－RING, LOWER BUSHING	1					L
	F25-01000005S	下衬套 O 形圈	O－RING, LOWER BUSHING						S
15	F25-01000006L	旋转支架下垫圈	LOWER WASHER, ROTARY BRACKET	1					L
	F25-01000006S	旋转支架下垫圈	LOWER WASHER, ROTARY BRACKET						S
16	F25-00000005	六角法兰面螺母 M10	NUT M10	4					
17	F25-00000016	右减震块外壳	SHELL , MOUNT DAMPER (RIGHT)	1					
18	F25-00000002	左右减震块	MOUNT DAMPER , LEFT AND RIGHT	2					
19	F25-00000003	前减震块	MOUNT DAMPER , FRONT	1					
20	GB/T818-M6x8	十字槽盘头螺钉 M6x8	SCREW M6x8	1					
21	F25-02000002	接地钢索	TIGHTWIRE , EARTHING	1					
22	GB/T97.1-10	平垫圈 10	WASHER 10	4					
23	F25-00000007	六角螺栓 M10x80	BOLT M10x80	2					
24	F25-00000006	六角螺栓 M10x120	BOLT M10x120	2					
25	F25-00000015	左减震块外壳	SHELL , MOUNT DAMPER (LEFT)	1					

Disassembly and inspection of bracket

1. Remove the left and right absorber covers, and remove the left and right absorbers and double-hole absorber fixing nuts.

2. Remove the water unit, oil pan and exhaust manifold seat as a whole from the bracket

3. Remove bracket clamping nut and clamp bracket twin-headed threads.

4. Disconnect the grounding cable and remove the clamp bracket.

5. Remove the cotter pin Φ2×12 and circlip 9, and remove the long shaft of the locking frame and the short shaft of the outer frame.

6. Remove the inner and outer frames of the support frame.

7. Pull out the steering carrier assembly and remove the ring gasket, bushing and O-ring.

8. Check the rotary bracket and clamp bracket for cracking or damage. Replace it if necessary.

9. Check the bushing and ring gasket; Replace it if damaged or cracked.

10. Check the support frame assemblies A & B for deformation or damage. Replace it if necessary.

11. Check the left and right absorber rubber for aging, cracking, or degumming. Replace it if necessary.

Disassembly and inspection of water unit

1. Drain the oil.

2. Remove the mounting bolts on the water and underwater, and remove the water unit.

3. Remove the exhaust manifold block and oil pan.

4. Remove the coarse filter assembly and coarse filter bracket from the exhaust manifold seat.

5. Remove the exhaust manifold, drain screw, rubber sleeve of the oil drain hole, exhaust manifold rubber sleeves A&B and exhaust manifold block from the oil pan.

6. Remove the double-hole absorber, exhaust partition, round rubber ring of water pipe and water pipe.

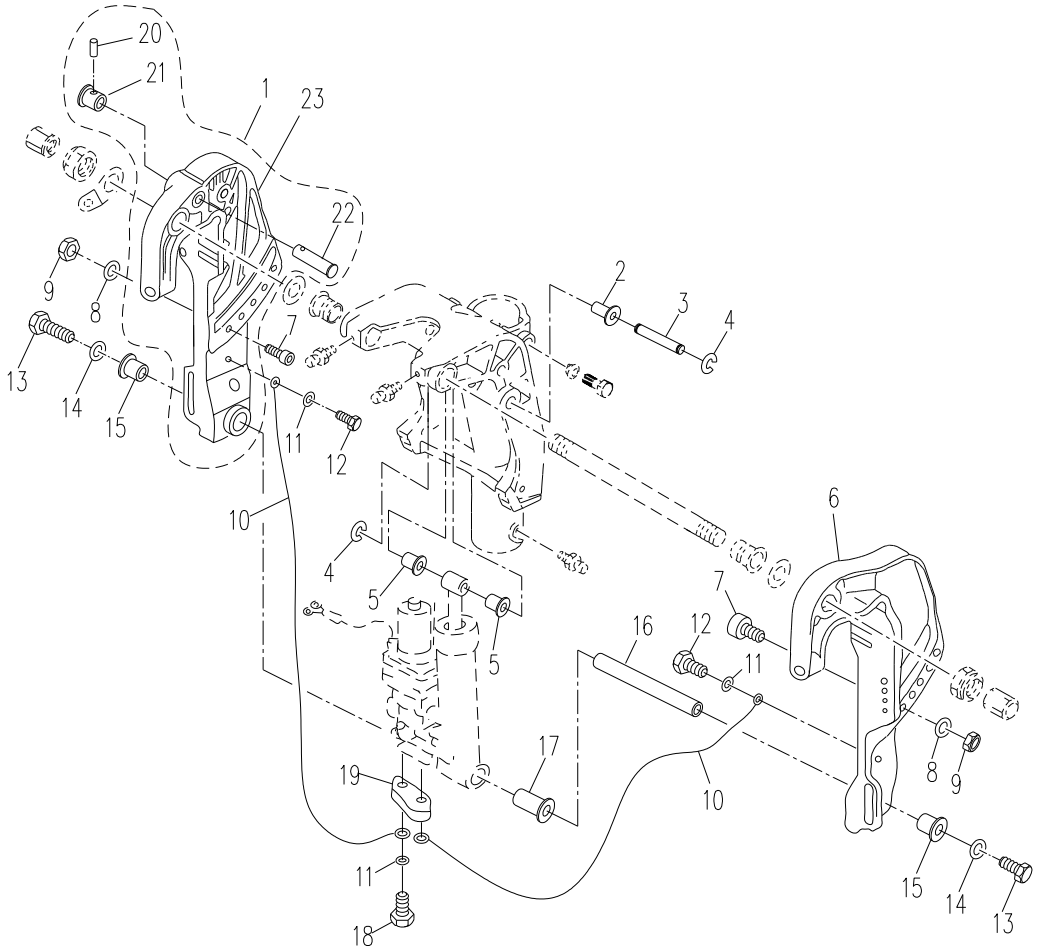
7. Check the water unit housing and oil pan for cracking or damage. Replace it if necessary.

8. Check the exhaust manifold for cracking or damage. Replace it if necessary.

9. Check the exhaust pipe sealing ring and exhaust manifold rubber sleeves A&B for aging and cracking. Replace it if necessary.

Hydraulic warping device

Disassembly schematic diagram



3	E10-01010001	液压起翘销轴	PIN	1					
4	GB/T896-9	开口档圈 9	CIRCLIP 9	2					
5	F25-01010324	销轴尼龙衬套（低）	BUSH	2					
6	T40-01010001-A	左夹紧托架	LEFT BRACKET	1					
7	GB/T70.1-M10x1.5x45	内六角圆柱头螺钉 M10x1.5x45	SCREW M10x1.5x45	2					
8	GB/T97.1-10	平垫圈 10	WASHER 10	2					
9	GB/T889.1-M10x1.5	非金属嵌件六角锁紧螺母 M10x1.5	NUT ， SELF-LOCKING M10x1.5	2					
10	E10-01010009	阳极钢索	WIRE,ANODE	2					
11	GB/T97.1-6	平垫圈 6	WASHER 6	4					
12	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	2					
13	GB/T5783-M8x16	六角螺栓 M8x16	BOLT M8x16	2					
14	E10-01010007	定位轴垫圈	WASHER， PLATE	2					
15	E10-01010005	定位衬套 A	BUSH A	2					
16	E10-01010004	液压定位轴	PIN	1					
17	E10-01010006	定位衬套 B	BUSH B	1					
18	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	2					
19	E10-01010008	起翘机构阳极	ANODE	1					
20	GB/T879.2- ∅3x18	轻型直槽弹性圆柱销 ∅3x18	PIN ∅3x18	1					
21	T40-01010102	起翘限位手柄	HANDLE	1					

Disassemble

1. Completely warp the outboard motor upward, and push it in the warping limit shaft to support the outboard motor.

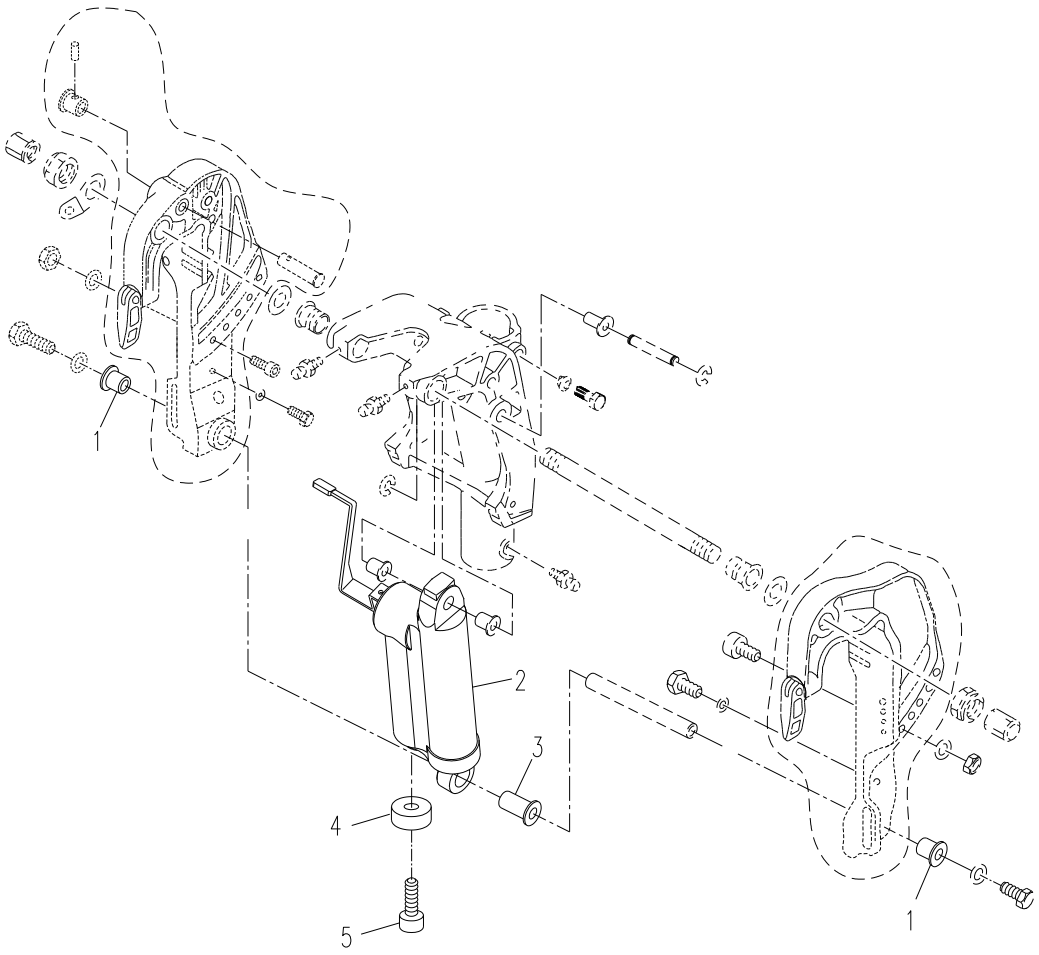
2. Remove the circlip 9, and remove the warping hinge pin.

3. Remove bolts and hydraulic positioning shaft.

4. Remove the manual cylinder assembly

Manual warping device

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-00000004D	定位轴衬套A	BUSH A	2					
2	F40-00000200D	氮气缸	TRIM & TILT ASSY	1					
3	F40-00000005D	定位轴衬套B	BUSH B	1					
4	F40-00000006D	氮气缸阳极	ANODE	1					
5	GB/T820-M6x25	十字槽半沉头螺钉 M6x25	SCREW M6x25	1					

Disassemble

1. Completely warp the outboard motor upward, and push it in the warping limit shaft to support the outboard motor.

2. Remove the circlip 9, and remove the warping hinge pin.

3. Remove bolts and hydraulic positioning shaft.

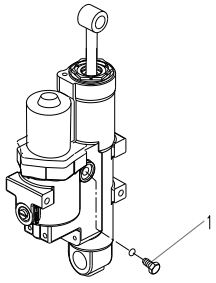
4. Remove the manual cylinder assembly

Check the oil level.

1. Position the hydraulic warping device vertically and fix it.

2. Connect the lead of the warping motor of the hydraulic warping device to the battery.

3. Extend the push rod completely, remove the oil screw, and observe the oil level.
   Note:
   The oil level should be at the edge of the oil hole,



1. Oil drain screw

4. If necessary, add oil to the edge of the oil hole.

5. Install the oil drain screw and tighten it.
   Specified torque: 6.5 Nm

Exhaust the air in the oil line of the hydraulic warping device.

After adding oil, discharge the excess air in the oil.

1. Connect the lead of the warping motor of the hydraulic warping device to the battery.

2. Extend the push rod completely.

3. Exchange the positive and negative wire connections.

4. Completely compress the push rod.

5. Repeat steps 1~4 to make the push rod move up and down 4~5 times.

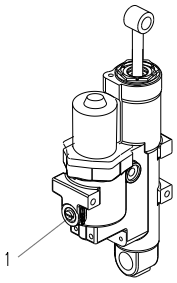
6. Extend the push rod completely, remove the oil screw, and observe the oil level.

7. If necessary, repeat the above steps until the oil level is correct.

8. Install the oil drain screw and tighten it.
   Specified torque: 6.5 Nm

If the hydraulic warping device is installed on the outboard motor and exhausting is required, please follow the following steps.

1. Turn the manual valve counterclockwise until it cannot turn.



1. Manual valve.

2. Tilt the outboard motor completely upward, and then lower it downward by its own gravity; Repeat 4~5 times.

3. Turn the manual valve clockwise until it cannot turn.

4. Wait for 5 minutes to stabilize the oil.

5. Press and hold the warping switch until the outboard motor is completely warped.

6. Wait for 5 minutes to stabilize the oil.

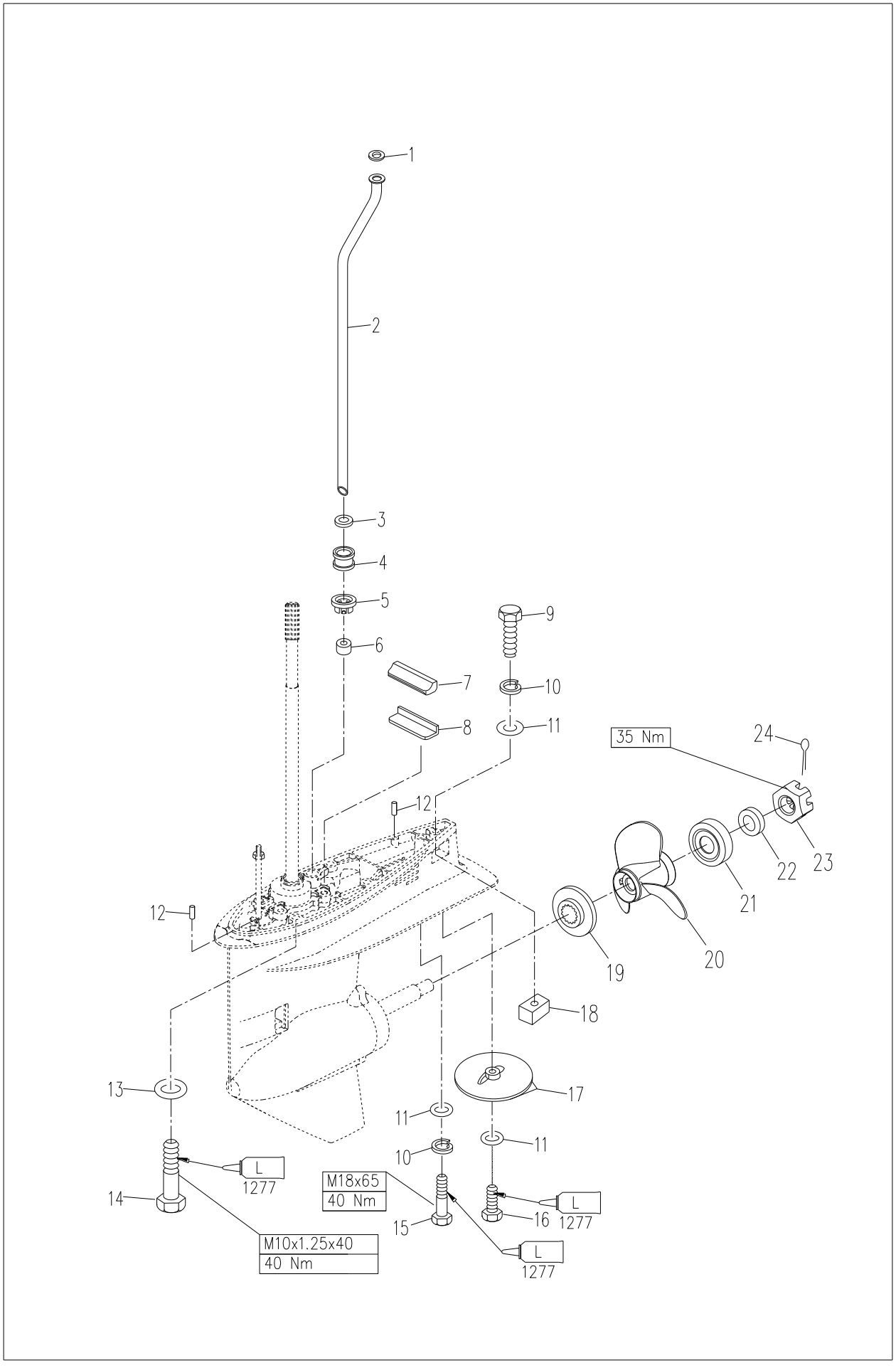
7. Remove the oil drain screw and observe the oil level.

8. If necessary, repeat the above steps until the oil level is correct.

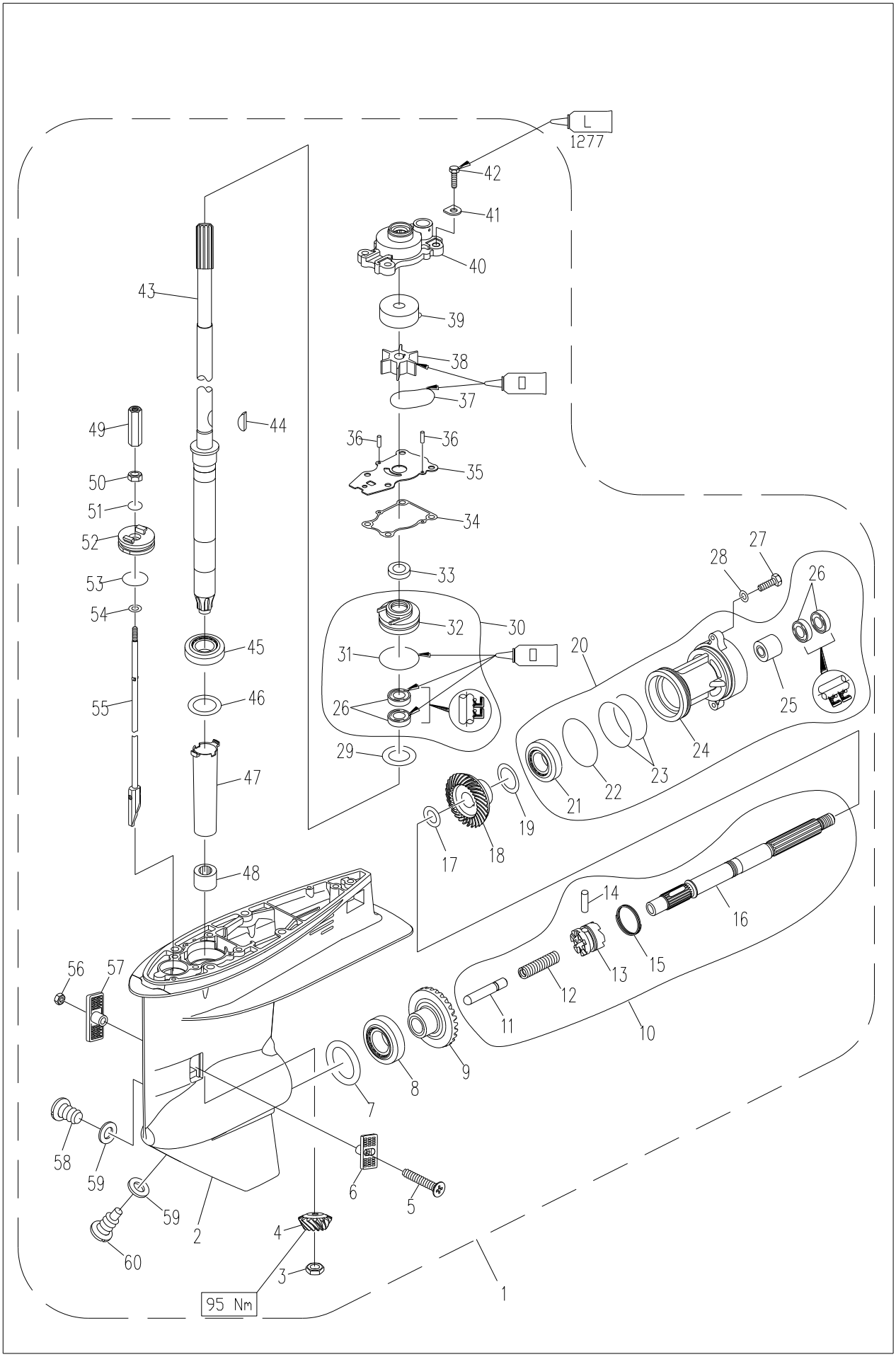
9. Install the oil drain screw and tighten it.
   Specified torque: 6.5 Nm

Underwater part

Disassembly schematic diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-02000019	尼龙垫圈	NYLON WASHER, WATER PIPE	1					
2	F40-02000005L	水管 (L)	WATER PIPE(L)	1					L
	F40-02000005S	水管 (S)	WATER PIPE(S)	1					S
3	T40-02010005	水管密封圈	SEAL, WATER PIPE	1					
4	T40-02000002	水管导向套	GUIDE BUSHING, WATER PIPE	1					
5	T40-04000204	水管尼龙导向套	NYLON BUSHING, WATER PIPE	1					
6	T40-04000203	水管下密封圈	SEAL	1					
7	T40-04000014	水封	WATER ENVELOP	1					
8	T40-04000013	水封垫板	PLATE, WATER ENVELOP	1					
9	GB/T5783-M8x35	六角螺栓 M8x35	BOLT M8x35	1					
10	GB/T93-8	弹簧垫圈 8	SPRING-WASHER 8	2					
11	GB/T97.1-8	平垫圈 8	WASHER 8	3					
12	F15-00000006	定位销 φ6x12	DOWEL PIN φ6x12	2					
13	GB/T97.1-10	平垫圈 10	WASHER 10	4					
14	T40-00000008	六角螺栓 M10x1.25x40	BOLT M10x1.25x40	4					
15	GB/T5783-M8x65	六角螺栓 M8x65	BOLT M8x65	1					
16	GB/T5783-M8x25	六角螺栓 M8x25	BOLT M8x25	1					
17	T40-00000010	航向调整片	ANODE	1					
18	T40-00000009	水下阳极 A	ANODE A, LOWER CASING	1					
19	T40-04000018	螺旋桨垫块	SPACER, PROPELLER	1					
20	T40-04070000-13	螺旋桨体组件 3-11 1/8″x13″	PROPELLER ASSY 3-11 1/8″x13″	1					
	T40-04070000-12	螺旋桨体组件 3-11 3/8″x12″	PROPELLER ASSY 3-11 3/8″x12″						
	T40-04070000-11	螺旋桨体组件 3-11 5/8″x11″	PROPELLER ASSY 3-11 5/8″x11″						
21	T40-04000019	螺旋桨衬套 A	BUSH A, PROPELLER	1					
22	T40-04000020	螺旋桨衬套 B	BUSH B, PROPELLER	1					
23	T40-04000021	开槽六角螺母	NUT	1					
24	GB/T91-3.2x25	开口销 φ3.2x25	COTTER PIN φ3.2x25	1					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SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-04000000L	水下装置组件（ L)	LOWER CASING ASSY(L)	1					L
	F40-04000000S	水下装置组件（ S)	LOWER CASING ASSY(S)						S
2	T40-04000001	水下装置壳体	LOWER CASING	1					
3	T40-04000006	小齿轮螺母 M12x1.25	NUT, PINION	1					
4	T40-04000005	小齿轮	PINION	1					
5	GB/T820-M5x30	十字槽半沉头螺钉 M5x30	SCREW M5x30	1					
6	T40-04000022	进水口 A	WATER INLET A	1					
7	T40-04000004-1	正档齿轮填隙片 (T=0.10 毫米)	SHIM(t:0.10mm)	1					
	T40-04000004-2	正档齿轮填隙片 (T=0.12 毫米)	SHIM(t:0.12mm)						
	T40-04000004-3	正档齿轮填隙片 (T=0.15 毫米)	SHIM(t:0.15mm)						
	T40-04000004-4	正档齿轮填隙片 (T=0.18 毫米)	SHIM(t:0.18mm)						
	T40-04000004-5	正档齿轮填隙片 (T=0.30 毫米)	SHIM(t:0.30mm)						
	T40-04000004-6	正档齿轮填隙片 (T=0.40 毫米)	SHIM(t:0.40mm)						
	T40-04000004-7	正档齿轮填隙片 (T=0.50 毫米)	SHIM(t:0.50mm)						
8	KOYO H1-CAP 322/32	圆锥滚子轴承 322/32	ROLLER BEARING	1					
9	T40-04020000	正档齿轮组件	FORWARD GEAR ASSY	1					
10	T40-04050000	螺旋桨轴组件	PROPELLER SHAFT ASSY	1					
11	T40-04050006	变档柱塞	PLUNGER, SHIFT	1					
12	T40-04050002A	离合器弹簧	SPRING, CLUTCH	1					
13	T40-04050003	爪型离合器	DOG CLUTCH	1					
14	T40-04050004	离合器销	PIN, CLUTCH	1					
15	T40-04050005	离合器簧环	ANNULAR SPRING, CLUTCH	1					
16	T40-04050001	螺旋桨轴	SHAFT, PROPELLER	1					
17	T40-04050007	倒档齿轮垫圈	WASHER, REVERSE GEAR	1					
18	T40-04060006	倒档齿轮	GEAR, REVERSE	1					
19	T40-04060005-1	填隙片（ T＝0.10 毫米）	SHIM （T＝0.10mm ）	1					
	T40-04060005-2	填隙片（ T＝0.12 毫米）	SHIM （T＝0.12mm ）						
	T40-04060005-3	填隙片（ T＝0.15 毫米）	SHIM （T＝0.15mm ）						
	T40-04060005-4	填隙片（ T＝0.18 毫米）	SHIM （T＝0.18mm ）						
	T40-04060005-5	填隙片（ T＝0.30 毫米）	SHIM （T＝0.30mm ）						
	T40-04060005-6	填隙片（ T＝0.40 毫米）	SHIM （T＝0.40mm ）						
	T40-04060005-7	填隙片（ T＝0.50 毫米）	SHIM （T＝0.50mm ）						
20	T40-04060000	水下装置壳体盖组件	COVER ASSY, LOWER CASING	1					
21	KOYO 6007C4	深沟球轴承 6007	BEARING 6007	1					
22	T40-04060002	水下装置壳体盖 O 型密封圈 A	O-RING A, COVER	1					
23	T40-04060003	水下装置壳体盖 O 型密封圈 B	O-RING B, COVER	2					
24	T40-04060001	水下装置壳体盖	COVER, LOWER CASING	1					
25	NTN HK 2220 JS	滚针轴承 2220	BEARING 2220	1					
26	F25-04010003	驱动轴油封 22x36x6	OIL SEAL	4					
27	GB/T5783-M8x25	六角螺栓 M8x25	BOLT M8x25	2					
28	GB/T97.1-8	平垫圈 8	WASHER 8	2					
29	T40-04000008	大垫圈	BIG WASHER	1					
30	T40-04040000	油封壳体 A 组件	CASING A ASSY, OIL SEAL	1					

Continued：

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
31	JASO F404 24-050	油封壳体 A O 型密封圈	O-RING ,CASING A	1					
32	T40-04040001	油封壳体 A	CASING A, OIL SEAL	1					
33	T40-04000009	油封盖	COVER ,OIL SEAL	1					
34	T40-04000010	水泵座密封垫	GASKET ,WATER PUMP SEAT	1					
35	T40-04000011	外挡板	OUTER PLATE	1					
36	F25-04000007	定位销 ⌀4x10	DOWEL PIN ⌀4x10	2					
37	T40-04000205	水泵壳体 O 形密封圈	O-RING	1					
38	F25-04040000	水泵叶轮组件	IMPELLER ASSY,WATER PUMP	1					
39	T40-04000202	水泵内壳	INNER SHELL,WATER PUMP	1					
40	T40-04000201	水泵壳体	WATER PUMP HOUSING	1					
41	T40-04000012	水泵壳体压板	PLATE ,WATER PUMP	4					
42	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	4					
43	F40-04010000L	驱动轴组件	DRIVE SHAFT ASSY	1					L
	F40-04010000S	驱动轴组件	DRIVE SHAFT ASSY	1					S
44	F25-04000015	半圆键	WOODRUFF KEY	1					
45	32005 JR KOYO	驱动轴圆锥滚子轴承 32005	BEARING 32005	1					
46	T40-04000003-1	驱动轴填隙片 (t:0.10 毫米)	SHIM(t:0.10mm)	1					
	T40-04000003-2	驱动轴填隙片 (t:0.12 毫米)	SHIM(t:0.12mm)						
	T40-04000003-3	驱动轴填隙片 (t:0.15 毫米)	SHIM(t:0.15mm)						
	T40-04000003-4	驱动轴填隙片 (t:0.18 毫米)	SHIM(t:0.18mm)						
	T40-04000003-5	驱动轴填隙片 (t:0.30 毫米)	SHIM(t:0.30mm)						
	T40-04000003-6	驱动轴填隙片 (t:0.40 毫米)	SHIM(t:0.40mm)						
	T40-04000003-7	驱动轴填隙片 (t:0.50 毫米)	SHIM(t:0.50mm)						
47	T40-04000002	长尼龙套管	BUSHING ,NYLON	1					
48	NSK B-1416	滚针轴承 B-1416	QUILL BEARING	1					
49	F15-05000035	柱状螺母	COLUMN NUT	1					
50	GB/T6172.1-M6	六角薄螺母 M6	NUT M6	1					
51	F15-06020004	O 型密封圈 14x4.2	O-RING 14x4.2	1					
52	T40-04000007	变档凸轮轴盖板	COVER PLATE,CAMSHAFT	1					
53	JASO F404 31-035	O 型密封圈	O-RING	1					
54	GB/T97.1-6	平垫圈 6	WASHER 6	1					
55	F40-04020000	变档凸轮组件	CAM ASSY,SHIFT ROD	1					
56	GB/T889.1-M5	非金属嵌件 六角 锁紧 螺母 M5	LOCKING NUT M5	1					
57	T40-04000023	进水口 B	WATER INLET B	1					
58	F4-03000023	注油孔螺塞	PLUG,OIL HOSE	1					
59	F4-03000024	注油孔螺塞垫	GASKET	2					
60	F25-04000031	放油螺塞	PLUG ,OIL RELEASE	1					

Disassembly and inspection

1. Remove the water pipe.

2. Remove the pump housing.

3. Remove the impeller and pump inner shell.

4. Remove the semicircular key and outer plate.
.

5. Check the pump casing and outer plate for cracks, distortions or damage. Replace it if necessary.

6. Check the pump inner shell and impeller for cracking, deformation, burning or wear. Replace it if necessary

7. Drain gear oil. Remove the cotter pin.

8. Place a piece of wood between the anti-swirl baffle and the propeller to prevent the propeller from rotating freely. Remove the slotted hexagon nut, anode and water inlet.

9. Remove the propeller and cushion block.

10. Remove the anode.

11. Remove the housing cover of the underwater unit.
Remove the reverse gear and shim, and remove the oil seal.

12. Remove the propeller shaft assembly.

13. Remove the shift plunger.

14. Remove the clutch ring, clutch pin and claw clutch. Remove the clutch spring.

15. Remove oil seal housing A.

16. Remove the pinion nut using an internal spline wrench and remove the drive shaft.

17. Remove the shift cam and forward gear.
Remove the cover plate of the shift cam and remove the shift cam. Remove the forward gear (CD/CT)

18. Remove the needle bearing from the underwater unit.

19. Remove the oil seal of oil seal housing A and remove the bearing on the forward gear.

Propeller shaft and clutch block

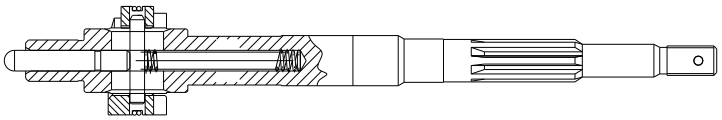
1. Check the claw clutch; If broken or damaged, replace it.

2. Check the propeller shaft; Replace it if worn or bent.

Install the claw clutch

1. Fit the clutch spring into the hole at the tail of the propeller shaft.

2. Install the claw clutch. Mark "F" or "●" towards forward gear. Fix the clutch pin.



3. Fix the clutch ring and shift plunger.

Housing cover of underwater unit

1. Check the bearing for rust and whether there is noise during rotation; If so, replace it.

2. Remove the bearing and oil seal with bearing puller.
Note:
Do not remove the bearing unless it needs to be replaced.

3. Remove the needle bearing with special tool.
Note:
When reinstalling the oil seal and needle bearing, please use new parts to replace them.

4. Clean the housing cover with a soft brush and solvent.

5. Check the housing cover; Replace it if cracked or damaged.

Install the oil seal and bearing of the housing cover

1. Install the oil seal.

2. Fit the new bearing on the reverse gear.
Note:
Use special tools to install the oil seal and bearing.
Pay attention to the installation direction and depth.
Make sure that the manufacturer's mark of the bearing faces the reverse gear.
Mounting depth:

Needle roller bearing		31.0~31.5 mm
Oil seal	Depth 1	13.0~13.5 mm
	Depth 2	6.0~6.5 mm

Underwater unit housing cover bearing installation tool

Underwater unit housing cover oil seal installation tool

Underwater unit housing cover needle bearing installation tool

3. Install reverse gear and shim.

Note:
Shim adjustment is required when installing new reverse gears and bearings.

Drive shaft

Check the drive shaft for bending or wear. Replace it if necessary.

Shift cam

Check whether the shift cam is worn or deformed. Replace it if necessary.

Gear

Check the forward gear, reverse gear and pinion for wear or damage. Replace it if necessary.

Forward gear bearing

Check whether the bearing is corroded and whether there is noise when rotating; Replace it if necessary.

Note:
Do not remove the bearing unless it needs to be replaced.
When installing a new bearing, it is required to adjust the shim.

Check the housing of the underwater unit

Check whether the housing of underwater unit is cracked or damaged, and check whether the cooling water inlet is blocked; Replace them if necessary.

Check the water pipe

Check the water pipe for corrosion or bending. Replace it if necessary.

Assemble the housing of the underwater unit

1. Use special tools to install the needle bearing.

Needle bearing installation tool kit

2. Install the new forward gear bearing. (Replace it if necessary)

Forward gear bearing jacket installation kit

3. Install the oil seal for drive shaft seat.

Drive shaft seat oil seal installation tool kit

4. Install shift cam, gasket and pump housing A. Install forward gear, drive shaft, shim

and pinion.

Note:

When installing a new drive shaft, it is required to adjust the shim.

5. Tighten the pinion nut.
   Specified torque: 95 Nm

6. Install the propeller shaft assembly.

7. Install the underwater unit housing cover.

Installation tool for housing cover assembly of underwater unit

8. Check whether the gear shift is working properly.

9. Install the water pump assembly.

10. Install the anode and water inlet.

11. Install the propeller and slotted hexagon nut, place a piece of wood between the anti-swirl baffle and the propeller,
    Tighten the nut according to the specified torque.
    Specified torque: 35 Nm

Note:

If the groove on the nut is not aligned with the cotter pin hole on the propeller shaft, tighten the nut further until they are aligned.

Install the underwater unit

1. Install the locating pin.

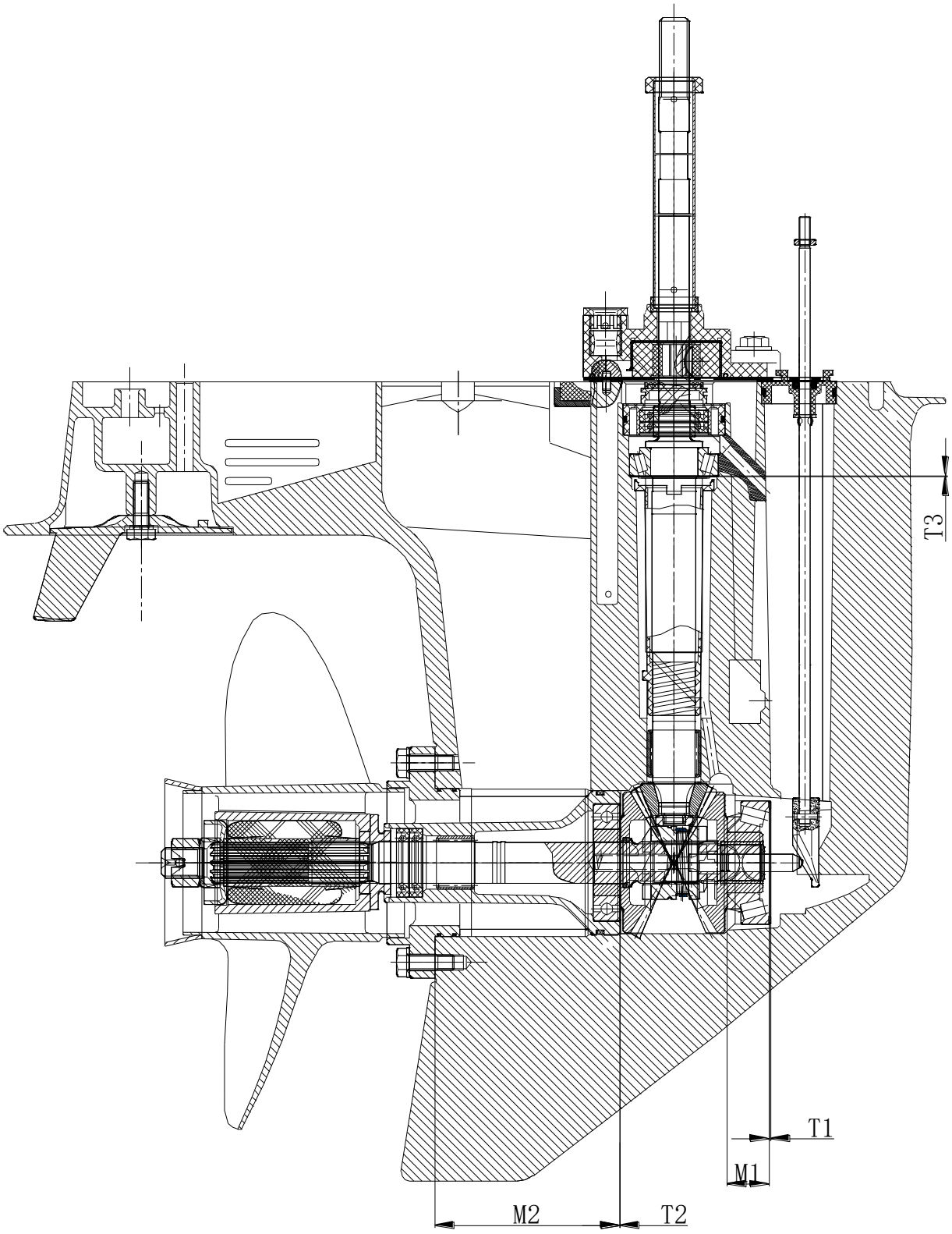
2. Place the shift cam in the forward position. Install the underwater unit to the housing of the water unit and tighten the bolts to the specified value.
   Specified torque: 40 Nm

3. Perform shift operation and check whether it is operating normally.

4. Add gear oil with pressure filling device.

Selection of shim

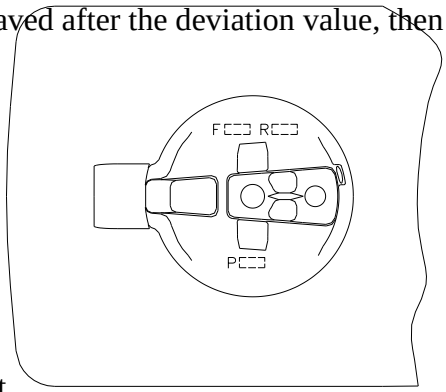
When replacing the internal parts of the underwater unit or assembling a new underwater unit, it is required to adjust the shim.



Deviation value mark

The installation surface of the anode/heading tab of the underwater unit is engraved with

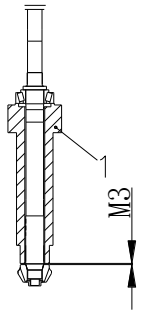
deviation value marks, which are F, R and P respectively; they represent the difference between the actual size and the theoretical size on the housing of the underwater unit. For example, the mark P is followed by +3, which means that the actual size is 0.03 mm more than the theoretical size; If no number is engraved after the deviation value, then P is regarded as 0.



Pinion shim

1. Check the P value marked on the underwater unit.

2. Attach the drive shaft to the special tool. Install the pinion and lock the pinion nut according to the specified torque.
   Specified torque: 95 Nm



1. 专用工具

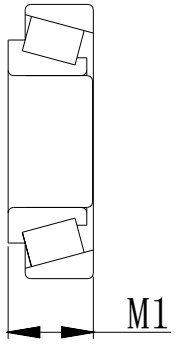
3. Measure the clearance between special tool and pinion with stopper gauge
   Calculate the thickness T3 with the formula.
   Formula: T3=M3－(P/100)

4. Shims that can be selected.
   0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm
   Note:
   The thickness of the shim can be 0~0.05 thicker than T3, and choose the closest size.

Forward gear shim

1. Check the F value marked on the underwater unit.

2. Turn the outer ring of the forward gear bearing so that the rollers fall completely into the bearing outer sleeve.



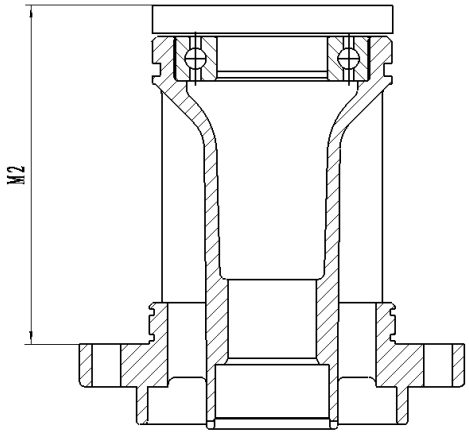
3. Measure the bearing height and calculate the thickness T1 with the formula.
   Formula: T1=22.75＋(F/100)－M1
   Note:
   When measuring the thickness, three points are measured. Take the average value.

4. Shims that can be selected.
   0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm
   Note:
   The thickness of the shim can be 0~0.05 thinner than T1, and choose the closest size.

Reverse gear shim

1. Check the R value marked on the underwater unit.

2. Measure the dimension M_2 as shown in the figure with a depth gauge:



3. Formula: T_2=108.25 +(R)/100-M_2

4. Shims that can be selected.

0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm

Note:
The thickness of the shim can be 0~0.05 thinner than T2, and choose the closest size.

Common faults and solutions

Fault type	Fault cause	Solution
Engine fails to start	There is no fuel in the fuel tank	Fill the fuel tank with clean new fuel
	Contaminated or obsolete fuel oil	

	Fuel filter blocked	Replace the fuel filter
	Fuel pump failure	Overhaul or replace it
	Vent screw of fuel tank cap not loosened	Loosen the vent screw
	The spark plug is contaminated or the model is incorrect	Check the spark plug. Clean it or replace with the correct spark plug
	Incorrect installation of spark plug cap	Check and reinstall the spark plug cap
	Ignition circuit failure	Check the wiring. Tighten the loose wire and replace the old or broken wire.
	Ignition component failure	Replace it
	The engine stop safety line is not connected to the emergency stop switch assembly.	Connect the line to the switch
	Internal parts failure of the engine	Repair it
Engine idle is abnormal or stalls	The spark plug is contaminated or the model is incorrect	Clean it or replace with the correct spark plug
	Fuel system blocked	Check the fuel line for extrusion, entanglement or blockage
	Fuel oil polluted or obsoleted	Fill the fuel tank with clean new fuel
	Fuel filter blocked	Replace the fuel filter
	Incorrect spark plug gap	Adjust the gap to the specified value
	Ignition circuit failure	Check the wiring. Tighten the loose wire and replace the old or broken wire.
	Incorrect engine oil grade	Change it to the specified oil grade
	Thermostat failure	Replace it
	Fuel pump failure	Replace it
	Vent screw of fuel tank cap not loosened	Loosen the vent screw
	The fuel joint is not connected correctly	Connect it correctly
	Pull out the choke handle and return it to its original position	
	The angle of the outboard motor is too high	Return it to its normal running position
The engine is weak.	Propeller damaged	Repair or replace the propeller
	Incorrect trim angle	Adjust the trim angle to the appropriate angle
	Incorrect installation height of outboard motor	Adjust it to the correct height
	The bottom of the ship is polluted by underwater organisms	Clean the bottom of the ship
	Gear box twined by aquatic plants or foreign matters	Remove the foreign matters and clean it

Continued:

Fault type	Fault cause	Solution
The engine is weak.	The spark plug is contaminated or the model is incorrect	Clean it or replace with the correct spark plug
	Fuel system blocked	Check the fuel line for extrusion, entanglement or blockage
	Fuel filter blocked	Replace the fuel filter
	Fuel oil polluted or obsoleted	Fill the fuel tank with clean new fuel
	Incorrect spark plug gap	Adjust the gap to the specified value
	Ignition circuit failure	Check the wiring. Tighten the loose wire and replace the old or broken wire.
	Ignition component failure	Replace it
	Incorrect engine oil grade or excessive oil	Change to the specified oil grade or add it to the proper position of the oil dipstick
	Thermostat failure	Replace it
	Fuel pump fault	Replace it
	The fuel joint is not connected correctly	Connect it correctly
	Incorrect spark plug specification	Replace it with the correct model
Excessive vibration of outboard motor	Propeller damaged	Repair or replace the propeller
	Propeller shaft damaged	Replace it
	Propeller twined by aquatic plants or foreign matters	Remove the foreign matters and clean it
	Mounting bolts of outboard motor loosened	Tighten the bolts
	Steering shaft loosened	Tighten the shaft
	Steering shaft damaged	Replace