Amendment on 27 June 2024
Resolved by Technical Committee on 30 January 2024

Shop Trials for Reciprocating Internal Combustion Engines

Object of Amendment

Rules for the Survey and Construction of Steel Ships Part D
Rules for the Survey and Construction of Inland Waterway Ships
Guidance for the Survey and Construction of Inland Waterway Ships

Reason for Amendment

Requirements related to reciprocating internal combustion engine shop trial programmes specified in Part D of Rules for the Survey and Construction of Steel Ships were established in 1989 with reference being given to relevant provisions in IACS Unified Requirement (UR) M51. These requirements have been amended as needed on some occasions since that time.

In response to requests and feedback regarding these requirements that it has received from members of relevant industries in recent years, the Society reviewed the relevant requirements to see whether they needed to be amended to reflect current common practice and the latest technical knowledge. As a result, the Society decided to relax requirements specifying a duration of 30 minutes for engine load tests because UR M51 has been applied up until now without any major problems even though it does not specify a specific test duration for 25 % to 90 % power runs. In addition, the Society also decided that the open-up inspections after the load test can be safely omitted on the condition that no abnormalities are found by visual inspections of visible parts and in other measurements. This was also because there is no specific requirement for parts to be opened-up specified in UR M51 and the number of reports of damage detected by open-up inspections is currently few.

Accordingly, relevant requirements related to reciprocating internal combustion engine shop trial programmes are amended based on the above-mentioned review.

Outline of Amendment

The main details of this amendment are as follows:
(1) Relaxes relevant requirements related to the duration of load tests.
(2) Specifies requirements related to the omission of open-up inspections after load tests.

Effective Date and application

This amendment applies to surveys of engines for which the application is submitted to the Society on or after 27 June 2024.

ID: DD23-28

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part D MACHINERY INSTALLATIONS</td><td>RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part D MACHINERY INSTALLATIONS</td><td></td></tr>
<tr><td>Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES</td><td>Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES</td><td></td></tr>
<tr><td>2.6 Tests</td><td>2.6 Tests</td><td></td></tr>
<tr><td>2.6.1 Shop Tests*</td><td>2.6.1 Shop Tests*</td><td></td></tr>
<tr><td>Table D2.7 Programme for Shop Trials of Engines
<table>
<tr><th colspan="2" rowspan="2">Test items</th><th colspan="3">Use of engines</th></tr>
<tr><th>Reciprocating internal combustion engines used as main propulsion machinery(1)</th><th>Reciprocating internal combustion engines driving generators (including those used as main propulsion machinery of electric propulsion ships) (2)</th><th>Reciprocating internal combustion engines driving auxiliaries (excluding auxiliary machinery for specific use etc.) (1)</th></tr>
<tr><td rowspan="2">Load test</td><td>110 % power run (3)</td><td>15 minutes or until steady conditions have been reached, which is shorter, at 1.032 n_0 ~~(n_0 is the rated engine speed)~~ or more (where n_0 is the rated engine speed)(3-1), (4-5)</td><td>15 minutes after having reached steady conditions at n_0</td><td>15 minutes after having reached steady conditions at n_0</td></tr>
<tr><td>100 % power run</td><td>60 minutes at n_0</td><td>60 minutes at n_0</td><td>30 minutes at n_0</td></tr>
</table></td><td>JIS F4304 Annex 2

IACS UR M51 3.3</td></tr>
</table>

Amended			Original		Remarks
	90 % power run (or normal continuous cruise power) (~~5~~6), (~~6~~7)	~~30~~20 *minutes* at engine speed in accordance with the nominal propeller curve	-	-	
	75 % power (~~5~~6), (~~6~~7)		~~30~~20 *minutes* at n_0	~~30~~20 *minutes* in accordance with the nominal power consumption curve (~~7~~8)	
	50 % power (~~5~~6), (~~6~~7)				
	25 % power (~~5~~6), (~~6~~7)				
Idle run (~~5~~6)		-	An adequate time at n_0	-	
Reversing manoeuvres (~~8~~9)		○	-	-	
Intermittent overload (~~9~~10)		○	-	○	
Governor test		-	○	-	
Performance of monitoring, alarm and safety devices		○	○	○	
Open-up inspection (11)		○	○	○	

Notes:

(1) After testing has been completed, the fuel delivery system is to be blocked so as to limit the engines to run at not more than 100 % power, unless intermittent overload power is approved by the Society. In the case of propulsion engines also driving power take-off generators, the fuel delivery system is to be adjusted so that overload of generator (110 % power) can be given in service and the electrical protection of downstream system components is activated before the engine stalls.

(2) After testing has been completed, the fuel delivery system is to be adjusted such that overload (110 % power) can be given in service after installation on board~~,~~ so that the governing characteristics (including the activation of generator protective devices) can be fulfilled at all times.

(3) For dual fuel engines, tests in the gas mode are not required in accordance with **2.6.1-3(2).**

(~~3~~4) Submission of ~~a~~ test reports for identical engines and turbocharger configurations proving their compatibility for over-loaded operation may be accepted as substitutions for the 110 % power run.

(~~4~~5) In the case of propulsion engines also driving power take-off generators, ~~the~~ tests ~~is~~are to be carried out at n_0 for 15 *minutes* after having reached a steady operating condition.

(~~5~~6) The sequence is to be selected by the engine manufacturer.

~~(6) The testing time may be shortened to 20 *minutes* for engines having cylinder bores of 400 *mm* or less when deemed~~

Amended	Original	Remarks
~~appropriate by the Society.~~ (7) A shorter time may be considered by the Society provided that the time specified in **2.6.1-2(3)** is allowed. (~~7~~8) Only for variable speed engines. (~~8~~9) The test item applies only to direct reversible engines. (~~9~~10) Only for engines for which intermittent overload is approved, and~~. The~~ tests ~~is~~are to be ~~performed~~ for the duration agreed upon with the manufacturer. (11) The scope of the open-up inspection is to be as deemed appropriate by the surveyor. The omission of the open-up inspection may be considered by the Society provided that all of the following **(a)** through **(g)** are met: (a) It is not the open-up inspection to be carried out during the approval test specified in **Chapter 8, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**. (b) No abnormality is found in the temperature measurement for each bearing of the main bearings and the crank pin bearings after the load test, and in the visual inspection of the inner surfaces of the cylinder liners from the inspection ports of the crankcase. (In the case of a 2-stroke engine, the cylinder liners, pistons, piston rings and piston rods are to be inspected from the scavenging space.) (c) No abnormality is found in the visual inspection of the lubrication oil after the load test (including the visual inspection of the filter in cases where the open-up of the strainer is reasonable). (d) Flushing of the parts through which the lubrication oil passes is carried out during the manufacturing process. (e) The manufacturer of the reciprocating internal combustion engine is approved by the Society in accordance with the **Rules for Approval of Manufacturers and Service Suppliers.** (f) There is agreement between the involved parties. (manufacturer, shipyard, prospective owner, etc.) (g) Other items deemed necessary by the Society.		
EFFECTIVE DATE AND APPLICATION **1.** The effective date of the amendments is 27 June 2024. **2.** Notwithstanding the amendments to the Rules, the current requirements apply to the surveys for which the application is submitted to the Society before the effective date. **3.** Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to the surveys for which the application is submitted to the Society before the effective date upon request by the manufacturer of the machinery.		

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS	**RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS**	
Part 7 MACHINERY INSTALLATIONS	**Part 7 MACHINERY INSTALLATIONS**	
Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES	**Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES**	
2.6 Tests	**2.6 Tests**	
2.6.1 Shop Tests*	**2.6.1 Shop Tests***	
2 For reciprocating internal combustion engines, the purpose of the shop trials is to verify design premises such as engine power, safety against fire, adherence to approved limits such as maximum pressure, and functionality as well as to establish reference values or base lines for later reference in the operational phase. The programme is to be in accordance with the following: (1) The following preparations are to be made before carrying out the engine tests: (a) All relevant equipment for the safety of attending personnel such as oil mist detection arrangements, overspeed protective devices and any other shut down functions are to be made available and are to be operational. (b) The overspeed protective device is to be set to a value which is not higher than the allowable	**2** For reciprocating internal combustion engines, shop trials are to be carried out according to the test procedure deemed appropriate by the Society.	Relocated from 2.6.1, Part 7 of the Guidance

Amended	Original	Remarks
overspeed value. This set point is to be verified by the surveyor. (c) The engines are to be run as prescribed by the engine manufacturer. (d) All fluids used for testing purposes (fuel oils, lubrication oils, cooling water, etc., including all fluids used temporarily or repeatedly for testing purposes only) are to be suitable for their intended purposes (i.e., they are to be clean, preheated if necessary and cause no harm to engine parts). (2) For all stages of testing, the following **(a)** to **(c)** ambient conditions are to be recorded and the pertaining operation values (normally the following **(d)** to **(k)** items) for each load point are to be measured and recorded by the engine manufacturer. All results are to be compiled in an acceptance protocol to be issued by the manufacturer. Calibration records for the instrumentation are to be presented to the attending surveyor. In addition, crankshaft deflection is to be checked and recorded in the results in cases where such a check is required by the manufacturer during the operating life of the engine. (a) Ambient air temperature (b) Ambient air pressure (c) Atmospheric humidity (d) Power (e) Speed (f) Fuel index (or equivalent reading) (g) Maximum combustion pressures (only when the cylinder heads installed are designed for such measurement)		

Amended	Original	Remarks
(h) Exhaust gas temperature at the turbine inlet and from each cylinder (i) Charge air temperature (j) Charge air pressure (k) Turbocharger speed (3) All measurements conducted at the various load points are to be carried out under steady operating conditions. However, provision is to be made for time needed by the surveyor to carry out visual inspections for all load points. The readings for 100 % power (rated power at rated speed) are to be taken twice at an interval of at least 30 *minutes*. (4) In cases where a no-load operation is conducted for adjusting engine conditions, the fuel delivery system, manoeuvring system and safety devices are to be properly adjusted by the manufacturer before the operation. (5) The programme shown in **Table 7.2.9** is to be used for the shop trials of reciprocating internal combustion engines. In this case, refer to the *JIS* specified below or those considered equivalent thereto for more details on each respective testing procedure. However, additional tests may be requested by the Society depending on the engine application, service experience, or other relevant reasons. In addition, alternatives to the detailed tests may be agreed between the manufacturer and the Society when the overall scope of tests is found to be equivalent. (a) In the case of reciprocating internal combustion engines used as main propulsion machinery (including those used as main propulsion machinery for electric propulsion ships);		

Amended	Original	Remarks
JIS F 4304 "Shipbuilding - Internal combustion engines for propelling use-shop test code" (b) In the case of reciprocating internal combustion engines driving other generators or essential auxiliary machinery; *JIS F* 4306 "Shipbuilding - Water cooled four-cycle generator diesel engines" (6) The following **(a)** to **(c)** are to be inspected. However, a part of or all of these inspections may be postponed until shipboard testing when agreed to by the Society. (a) Jacketing of high-pressure fuel oil lines, including the system used for the detection of leakage (b) Screening of pipe connections in piping containing flammable liquids (c) Temperature of hot surface insulation Random temperature readings are to be compared with corresponding readings obtained during the type test. This is to be done while running at the rated power of engine. If the insulation is modified subsequently to the type test, the Society may request temperature measurements as required by the type test. In the case of reciprocating internal combustion engine with an application for approval of use dated before 1 July 2016 which is an engine type that does not have the results of temperature measurements required by the type test, temperature measurements are to be performed by a procedure deemed appropriate by the Society. (7) Category *C* turbochargers installed on reciprocating		

Amended	Original	Remarks
internal combustion engines used as main propulsion machinery are to be checked for surge margins in accordance with the following. However, if successfully tested earlier on an identical configuration of the engine and turbocharger (including the same nozzle rings), submission of this test report may be accepted instead. (a) For 4-stroke engines, the operations given in the following **i)** and **ii)** are to be performed without any indication of surging. i) While at maximum continuous rating (maximum continuous power and speed), speed is to be reduced with the constant torque (fuel index) down to 90 % power. ii) While at 50 % power and 80 % speed, speed is to be reduced to 72 % while keeping constant torque (fuel index). (b) For 2-stroke engines, the surge margin is to be demonstrated by at least one of the following **i)** to **iii)**: i) The engine working characteristics established at shop tests of the engine is to be plotted into the compressor chart of the turbocharger (established in a test rig). There is to be at least a 10 % surge margin in the full load range, i.e., working flow is to be 10 % above the theoretical mass flow at the surge limit where there are no pressure fluctuations. ii) A sudden fuel cut-off to at least one cylinder at the following **1)** and **2)** loads is not to result in continuous surging and the		

Amended	Original	Remarks
turbocharger is to be stabilised at the new loads within 20 *seconds*. For applications with more than one turbocharger, the fuel supply to the cylinders closest upstream to each turbocharger is to be cut off. 1) The maximum power permitted for one cylinder misfiring. 2) The engine load corresponding to a charge air pressure of about 0.06 *MPa*, but without auxiliary blowers running. iii) No continuous surging and the turbocharger is to be stabilised at the new load within 20 *seconds* when the power is abruptly reduced from 100 % to 50 % of the maximum continuous power. (8) For electronically controlled engines, integration tests are to be made to verify that the response of the complete mechanical, hydraulic and electronic system is as predicted. The scope of these tests is to be determined based on a risk analysis by a method deemed appropriate by the Society and agreed with the Society, prior to the tests. The tests may be carried out using other alternative methods, subject to special consideration by the Society.		
(Deleted)	**3** For reciprocating internal combustion engines with novel design features or for those with no service records, tests are to be carried out to verify their durability according to a procedure deemed appropriate by the Society.	
3 (Omitted)	**4** (Omitted)	
4 (Omitted)	**5** (Omitted)	
5 (Omitted)	**6** (Omitted)	

Amended	Original	Remarks

Table 7.2.9 Programme for Shop Trials of Engines

Test items		Use of engines		
		Reciprocating internal combustion engines used as main propulsion machinery(1)	Reciprocating internal combustion engines driving generators (including those used as main propulsion machinery of electric propulsion ships) (2)	Reciprocating internal combustion engines driving auxiliaries (excluding auxiliary machinery for specific use etc.) (1)
Load test	110 % power run (3)	15 *minutes* or until steady conditions have been reached, which is shorter, at 1.032 n_0 or more (where n_0 is the rated engine speed)(4), (5)	15 *minutes* after having reached steady conditions at n_0	15 *minutes* after having reached steady conditions at n_0
	100 % power run	60 *minutes* at n_0	60 *minutes* at n_0	30 *minutes* at n_0
	90 % power run (or normal continuous cruise power) (6), (7)	20 *minutes* at engine speed in accordance with the nominal propeller curve	-	-
	75 % power (6), (7)		20 *minutes* at n_0	20 *minutes* in accordance with the nominal power consump-tion curve (8)
	50 % power (6), (7)			
	25 % power (6), (7)			
Idle run (6)		-	An adequate time at n_0	-
Reversing manoeuvres (9)		○	-	-
Intermittent overload (10)		○	-	○
Governor test		-	○	-
Performance of monitoring, alarm and safety devices		○	○	○
Open-up inspection (11)		○	○	○

Notes:

(1) After testing has been completed, the fuel delivery system is to be blocked so as to limit the engines to run at not more than 100 % power, unless intermittent overload power is approved by the Society. In the case of propulsion engines also driving power take-off generators, the fuel delivery system is to be adjusted so that overload of generator (110 % power) can be given in service and the electrical protection of downstream system components is

JIS F4304 Annex 2

IACS UR M51 3.3

Relocated from 2.6.1, Part 7 of the Guidance and amended.

Amended	Original	Remarks

activated before the engine stalls.

(2) After testing has been completed, the fuel delivery system is to be adjusted such that overload (110 % power) can be given in service after installation on board, so that the governing characteristics (including the activation of generator protective devices) can be fulfilled at all times.

(3) For dual fuel engines, tests in the gas mode are not required in accordance with **2.6.1-3(2), Part D of the Rules for the Survey and Construction of Steel Ships**.

(4) Submission of test reports for identical engines and turbocharger configurations proving their compatibility for over-loaded operation may be accepted as substitutions for the 110 % power run.

(5) In the case of propulsion engines also driving power take-off generators, tests are to be carried out at n_0 for 15 *minutes* after having reached a steady operating condition.

(6) The sequence is to be selected by the engine manufacturer.

(7) A shorter time may be considered by the Society provided that the time specified in **2.6.1-2(3), Part D of the Rules for the Survey and Construction of Steel Ships** is allowed.

(8) Only for variable speed engines.

(9) The test item applies only to direct reversible engines.

(10) Only for engines for which intermittent overload is approved, and tests are to be for the duration agreed upon with the manufacturer.

(11) The scope of the open-up inspection is to be as deemed appropriate by the surveyor. The omission of the open-up inspection may be considered by the Society provided that all of the following **(a)** through **(g)** are met:

(a) It is not the open-up inspection to be carried out during the approval test specified in **Chapter 8, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

(b) No abnormality is found in the temperature measurement for each bearing of the main bearings and the crank pin bearings after the load test, and in the visual inspection of the inner surfaces of the cylinder liners from the inspection ports of the crankcase. (In the case of a 2-stroke engine, the cylinder liners, pistons, piston rings and piston rods are to be inspected from the scavenging space.)

(c) No abnormality is found in the visual inspection of the lubrication oil after the load test (including the visual inspection of the filter in cases where the open-up of the strainer is reasonable).

(d) Flushing of the parts through which the lubrication oil passes is carried out during the manufacturing process.

(e) The manufacturer of the reciprocating internal combustion engine is approved by the Society in accordance with the **Rules for Approval of Manufacturers and Service Suppliers.**

(f) There is agreement between the involved parties. (manufacturer, shipyard, prospective owner, etc.)

(g) Other items deemed necessary by the Society.

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

Amended	Original	Remarks
EFFECTIVE DATE AND APPLICATION **1.** The effective date of the amendments is 27 June 2024. **2.** Notwithstanding the amendments to the Rules, the current requirements apply to the surveys for which the application is submitted to the Society before the effective date. **3.** Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to the surveys for which the application is submitted to the Society before the effective date upon request by the manufacturer of the machinery.		

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

Amended	Original	Remarks
GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS	**GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS**	
Part 7 MACHINERY INSTALLATIONS	**Part 7 MACHINERY INSTALLATIONS**	
Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES	**Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES**	
2.6 Tests	**2.6 Tests**	
2.6.1 Shop Tests	**2.6.1 Shop Tests**	
(Deleted)	**1** The purpose of the shop trials specified in **2.6.1-2, Part 7 of the Rules** is to verify design premises such as power, safety against fire, adherence to approved limits such as maximum pressure, and functionality as well as to establish reference values or base lines for later reference in the operational phase. The programme is to be in accordance with the following: (1) The preparations specified in **1.4.2-8, Part 2** are to be made before any tests are carried out. (2) For all stages of testing, the following **(a)** to **(c)** ambient conditions in are to be recorded and the pertaining operation values (normally the following **(d)** to **(k)** items) are to be measured and recorded by the engine manufacturer for each load point. All results are to be compiled in an acceptance protocol to be issued by the manufacturer. Calibration records	Relocated to 2.6.1, Part 7 of the Rules

Amended	Original	Remarks
	for the instrumentation are to be presented to the attending surveyor. In addition, crankshaft deflection is to be checked and recorded in the results in cases where such a check is required by the manufacturer during the operating life of the engine. (a) Ambient air temperature (b) Ambient air pressure (c) Atmospheric humidity (d) Power (e) Speed (f) Fuel index (or equivalent reading) (g) Maximum combustion pressures (only when the cylinder heads installed are designed for such measurement) (h) Exhaust gas temperature at the turbine inlet and from each cylinder (i) Charge air temperature (j) Charge air pressure (k) Turbocharger speed (3) All measurements conducted at the various load points are to be carried out under steady operating conditions. However, provision is to be made for time needed by the surveyor to carry out visual inspections for all load points. The readings for 100% power (rated power at rated speed) are to be taken twice at an interval of at least 30 *minutes*. (4) In cases where a no-load operation is conducted for adjusting engine conditions, the fuel delivery system, manoeuvring system and safety devices are to be properly adjusted by the manufacturer before the operation. (5) The programme shown in **Table 7.2.6.1-1** is to be	

Amended	Original	Remarks
	used for the shop trials of reciprocating internal combustion engines. In this case, refer to the *JIS* specified below or those considered equivalent thereto for more details on each respective testing procedure. However, additional tests may be requested by the Society depending on the engine application, service experience, or other relevant reasons. In addition, alternatives to the detailed tests may be agreed between the manufacturer and the Society when the overall scope of tests is found to be equivalent. (a) In the case of reciprocating internal combustion engines used as main propulsion machinery (including those used as main propulsion machinery for electrical propulsion ships); *JIS F* 4304 "Shipbuilding - Internal combustion engines for propelling use-shop test code" (b) In the case of reciprocating internal combustion engines driving other generators or essential auxiliary machinery; *JIS F* 4306 "Shipbuilding - Water cooled four-cycle generator diesel engines" (6) The following **(a)** to **(c)** are to be inspected. However, a part of or all of these inspections may be postponed until shipboard testing when agreed to by the Society. (a) Jacketing of high-pressure fuel oil lines, including the system used for the detection of leakage (b) Screening of pipe connections in piping containing flammable liquids (c) Temperature of hot surface insulation	

Amended	Original	Remarks
	Random temperature readings are to be compared with corresponding readings obtained during the type test. This is to be done while running at the rated power of engine. If the insulation is modified subsequently to the type test, the Society may request temperature measurements as required by the type test. In the case of an engine with an application for approval of use dated before 1 July 2016 which is an engine type that does not have the results of temperature measurements required by the type test, temperature measurements are to be performed in accordance with **8.4.2-2(10), Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**. (7) Category *C* turbochargers used on propulsion engines are to be checked for surge margins in accordance with the following. However, if successfully tested earlier on an identical configuration of the engine and turbocharger (including the same nozzle rings), submission of this test report may be accepted instead. (a) For 4-stroke engines, the operations give in the following **i)** and **ii)** are to be performed without any indication of surging. i) While at maximum continuous rating (maximum continuous power and speed), speed is to be reduced with the constant torque (fuel index) down to 90% power. ii) While at 50% power and 80% speed, speed is to be reduced to 72% while keeping	

Amended	Original	Remarks
	constant torque (fuel index). (b) For 2-stroke engines, the surge margin is to be demonstrated by at least one of the following **i)** to **iii)**: i) The engine working characteristics established at shop tests of the engine is to be plotted into the compressor chart of the turbocharger (established in a test rig). There is to be at least a 10% surge margin in the full load range, i.e., working flow is to be 10% above the theoretical mass flow at the surge limit where there are no pressure fluctuations. ii) A sudden fuel cut-off to at least one cylinder at the following **1)** and **2)** loads is not to result in continuous surging and the turbocharger is to be stabilised at the new loads within 20 seconds. For applications with more than one turbocharger, the fuel supply to the cylinders closest upstream to each turbocharger is to be cut off. 1) The maximum power permitted for one cylinder misfiring. 2) The engine load corresponding to a charge air pressure of about 0.06 *MPa*, but without auxiliary blowers running. iii) No continuous surging and the turbocharger is to be stabilised at the new load within 20 seconds when the power is abruptly reduced from 100% to 50% of the maximum continuous power.	
(Deleted)	**2** The wording “a procedure deemed appropriate by the	

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

Amended	Original	Remarks
	Society" in **2.6.1-3, Part 7 of the Rules** means the tests specified in **Chapter 8, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.	
1 The wording "a procedure deemed appropriate by the Society" in **2.6.1-2(6)(c), Part 7 of the Rules** means the tests specified in **8.5.2-2(10), Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.	(New)	
2 In cases where the manufacturer has a quality system deemed appropriate by the Society, the dynamic balancing tests specified in **2.6.1-3, Part 7 of the Rules** for category *B* turbochargers may be substituted for by manufacturer tests. In such cases, the submission or presentation of test records may be required by the Society.	**3** In cases where the manufacturer has a quality system deemed appropriate by the Society, the dynamic balancing tests specified in **2.6.1-4, Part 7 of the Rules** for category *B* turbochargers may be substituted for by manufacturer tests. In such cases, the submission or presentation of test records may be required by the Society.	
3 In cases where the manufacturer has a quality system deemed appropriate by the Society, the overspeed tests specified in **2.6.1-4, Part 7 of the Rules** for categories *B* turbochargers may be substituted for by manufacturer tests. In such cases, the submission or presentation of test records may be required by the Society.	**4** In cases where the manufacturer has a quality system deemed appropriate by the Society, the overspeed tests specified in **2.6.1-5, Part 7 of the Rules** for categories *B* turbochargers may be substituted for by manufacturer tests. In such cases, the submission or presentation of test records may be required by the Society.	
4 The wording "procedures deemed appropriate by the Society" in **2.6.1-5, Part 7 of the Rules** means the tests specified in **Chapter 11, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.	**5** The wording "procedures deemed appropriate by the Society" in **2.6.1-6, Part 7 of the Rules** means the tests specified in **Chapter 11, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.	
(Deleted)	Table 7.2.6.1-1 Programme for Shop Trials of Reciprocating Internal Combustion Engines (Omitted)	

Amended-Original Requirements Comparison Table (Shop Trials for Reciprocating Internal Combustion Engines)

Amended	Original	Remarks
EFFECTIVE DATE AND APPLICATION **1.** The effective date of the amendments is 27 June 2024. **2.** Notwithstanding the amendments to the Guidance, the current requirements apply to the surveys for which the application is submitted to the Society before the effective date. **3.** Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to the surveys for which the application is submitted to the Society before the effective date upon request by the manufacturer of the machinery.		