1. General

During normal operation, a few 'shots' of surging will often occur, e.g. at crash stop or other abrupt manoeuvrings. This sporadic surging is normally harmless, provided the turbocharger bearings are in a good service condition.

However, continuous surging must be avoided, as there is a risk of damaging the rotor, especially the compressor blading.

All cases of turbocharger surging can be divided into three main categories:

1. Restriction and fouling in the air/gas system.
2. Malfunction in the fuel system.
3. Rapid variations in engine load.

However, for convenience, the points in the "check lists" below are grouped according to specific engine systems. *See also Plate 70404.*

2. Causes

2.1 Fuel Oil System

- Low circulating or supply pump pressure.
- Air in fuel oil
- Water in fuel oil
- Low preheating temperature
- Malfunctioning of deaerating valve on top of venting tank
- Defective suction valve
- Sticking fuel pump plunger
- Sticking fuel valve spindle
- Damaged fuel valve nozzle
- Defect in overflow valve in fuel return pipe
- Faulty load distribution (this will be monitored in the ECS).

2.2 Exhaust System

- Exhaust valve not opening correctly
- Damaged or blocked protective grating before turbocharger
- Increased back pressure after T.Ch.
- Pressure pulsations after T.Ch.
- Pressure pulsations in exhaust receiver
- Damaged compensator before T.Ch.

2.3 Turbocharger

- Fouled or damaged turbine side
- Fouled or damaged compressor side
- Fouled air filter boxes
- Damaged silencer
- Bearing failure.

2.4 Scavenge Air System

- Fouled air cooler, water mist catcher, and/or ducts
- Stopped water circulation to cooler
- Coke in scavenge ports
- Too high receiver temperature.

2.5 Miscellaneous

- Rapid changes in engine load.
- Too rapid rpm change:
  a. when running on high load
  b. during manoeuvring
  c. at shut downs/slow downs
  d. when running ASTERN.
  e. due to “propeller racing” in bad weather.

3. Countermeasure

Continuous surging can be temporarily counteracted by “blowing-off” from the valve at the top of the air receiver. However, when doing this the exhaust temperatures will increase and must not be allowed to exceed the limiting values, *see Chapter 701.*