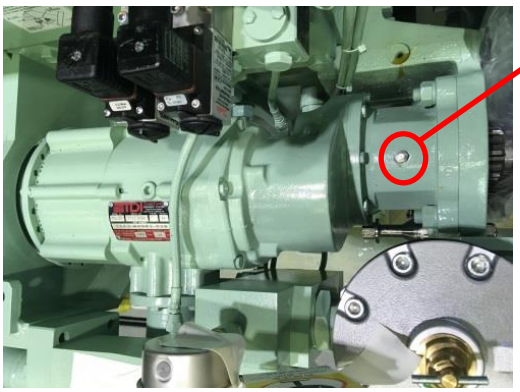
YE SERVICE NEWS

Subject	Ring gear and air motor damage due to air vent sticking of air motor		Issue No: YEN-CP-22870-3 Issued: 2019/02/05
Engine model	6,8EY26(L)(W)	Applicable engine use	Marine propulsion/ auxiliary engine
		Applicable engine No.	-

Due to sticking of the air vent in the T112V air motor manufactured by TDI, a major accident occurred resulting in damage to the ring gear and air motor.
The cause of the air vent sticking was found to be intrusion of paint onto the air vent piston's sliding surfaces during re-painting of the vessel. This paint inhibited the movement of the piston.

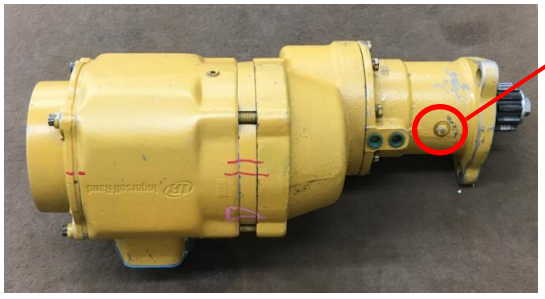
When re-painting, do not apply paint to the air vent as shown circled in red in the photo below.

This edition of YE Service News was issued in order to provide guidance and precautions for the painting of the air vent.



T112V air motor manufactured by TDI

Painting of the air vent in which failure occurred



ST950 air motor manufactured by IR

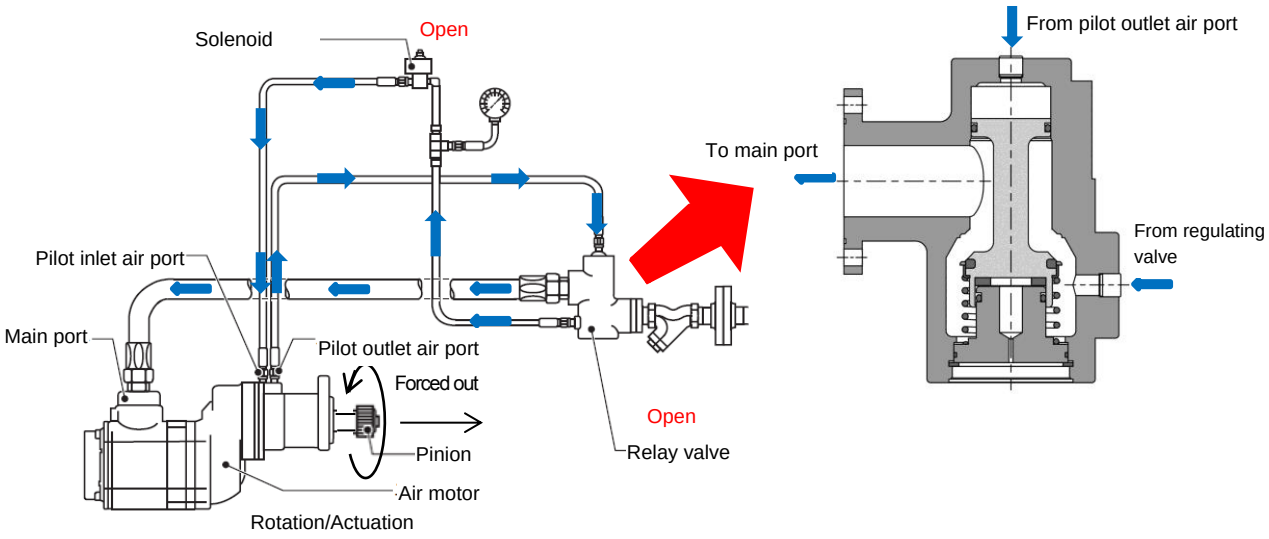
An air vent is also provided on the ST950 air motor manufactured by IR. The same painting precautions must be taken with this air motor.

YANMAR ENGINEERING CO.,LTD
Market Service Division

Approved	Reviewed	Created

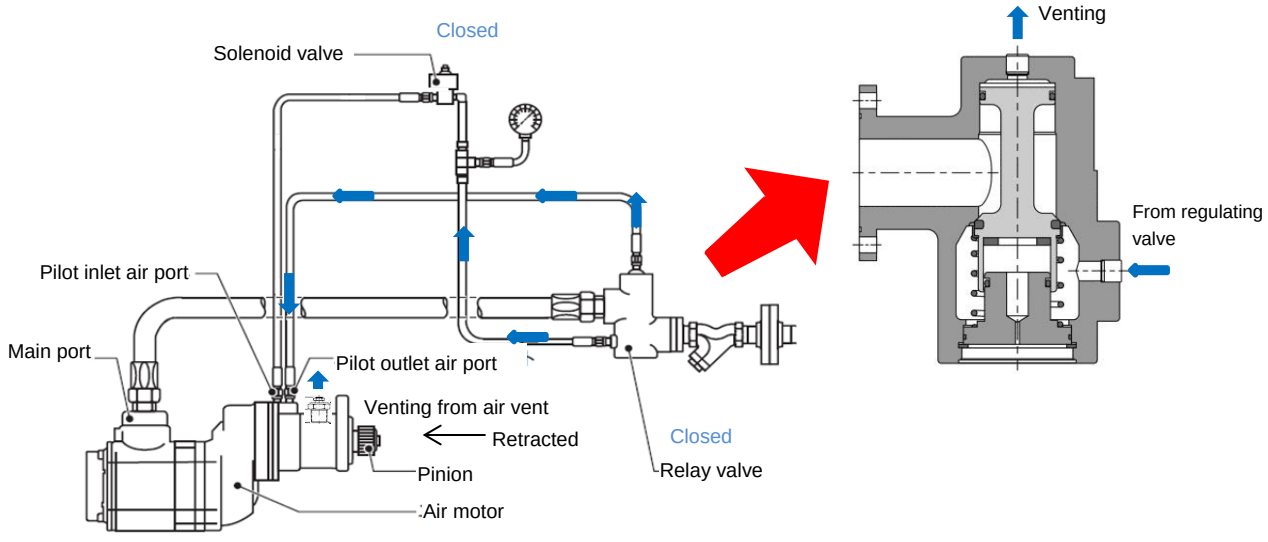
1. Explanation of air vent function

(1) Operation of each part/flow of air whilst ring gear is being driven by the air motor



The solenoid valve opens, and air enters the air motor's pinion drive shaft housing from the pilot inlet air port.
This air forces the pinion gear out, causing it to engage with the ring gear. Once fully engaged with the ring gear, air flows into the main port and the turbine rotates. Then, the pinion gear begins to turn the engine.

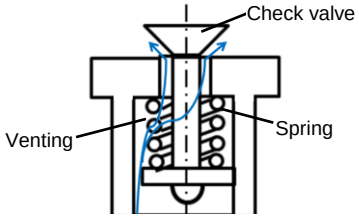
(2) Operation of each part/flow of air whilst pinion gear is being retracted



Once reaching a predetermined rpm ($125\mathrm{min}^{-1}$), the solenoid valve closes, and the pinion gear is retracted.
At this time, due to the retraction of the pinion gear, a passage is opened for the pressurized air from the pilot outlet to be vented via the air vent. As the air is being vented, the relay valve closes, the flow of starting air to the main port is stopped, and the driving force of the pinion gear ceases. The driving force of the pinion gear ceases during retraction (while semi-engaged), and this acts to prevent damage to the pinion gear and ring gear.

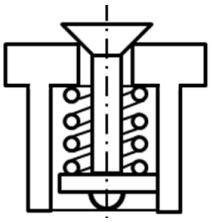
(3) Structure/Role of the air vent

While venting



The valve opens when the pressure inside the air passage reaches 1.7 kPa to 6.7 kPa

While check valve is closed



Prevents debris from entering into the air passage

2. Mechanism by which pinion gear damage occurs

Coating of the air vent piston with paint causes sticking. If air from the pilot air outlet cannot be vented, the relay valve will remain open, and starting air will continue to flow to the main port. As such, the pinion gear continues to be driven even when semi-engaged during retraction, resulting in damage to the pinion gear and ring gear.

End