Development of The Next Generation TBM Equipped with Conventional Tunneling Mode

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KAJIMA and Komatsu co-developed the world's first hybrid excavator which can convert TBM mode into conventional tunneling mode according to the geological change. This excavator performs high-speed drilling in TBM mode for hard rock excavation and this can convert to conventional tunneling mode for weak ground excavation. Weak ground can be excavated by the operation of the bucket equipped inside the machine and tunnel supports can be installed immediately afterwards.

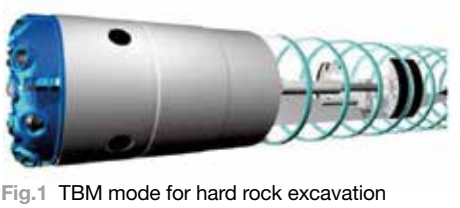

Fig.1 TBM mode for hard rock excavation

Fig.2 Conventional tunneling mode for soft ground excavation

Rapid drilling manipulating TBM mode is for hard rocks.
Like the conventional TBM, tunnel supports can be installed behind the excavator.
Appearance of weak layer can be detected by forward geological exploration.

After reaching the defective ground grasped by forward geological exploration.
The machine is retracted up to 3.0 m and secure the drilling space forward.
Then the cutter head is opend and switched to conventional tunnelling mode.

The bucket inside the machine excavates the ground.
Debris are carried out to the rear by a belt conveyor.

Steel support, shotcrete and rock bolts are installed after excavation.
Auxiliary method for a mountain tunnelling can be installed in accordance with geology.