



The IND-27, 9.5m with 9 hp diesel water-cooled engine

4. IND-27 : PLYWOOD CANOE,

9.5 m WITH 9 hp DIESELENGINE

4.1 Fishing trials

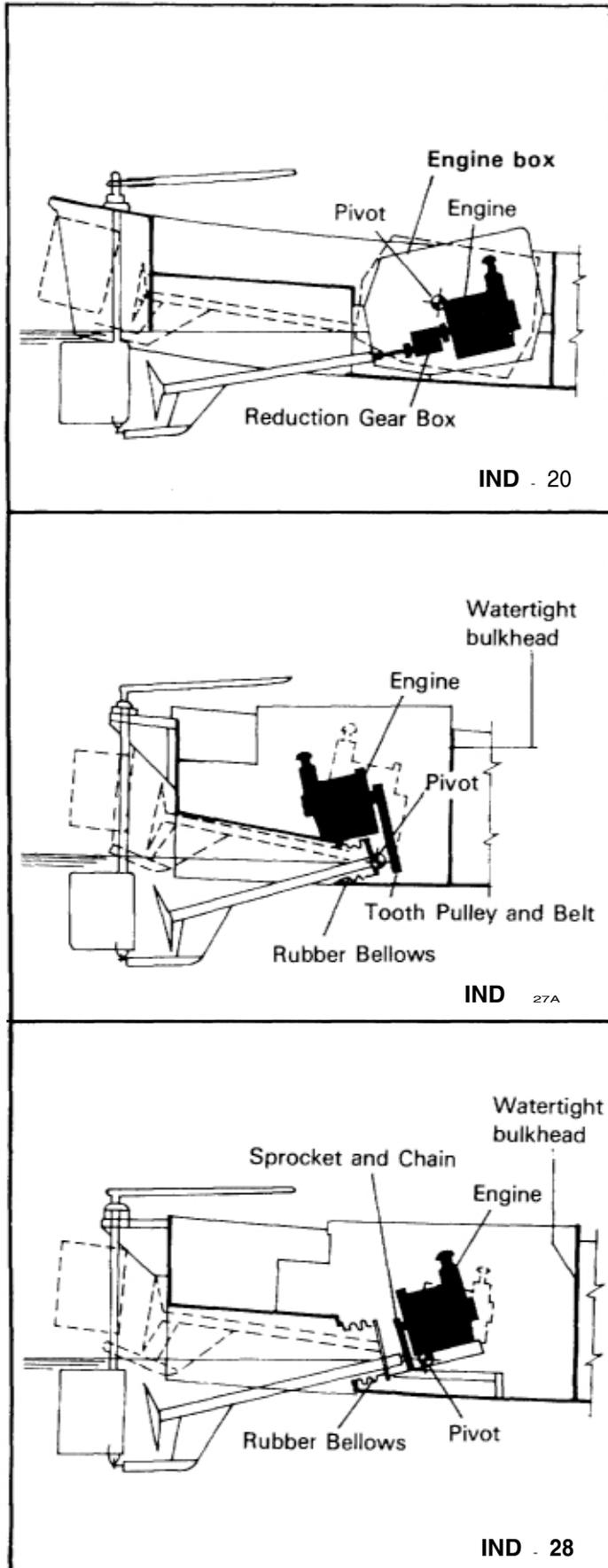
The IND-27 (Figure 5, see facing page) was designed to carry out large mesh driftnet fishing 20-25 nautical miles from the shore. Constructed of plywood, instead of FRP, and not decked, the investment in it was less than in the IND-20

Fishing trials started with the IND-27 in June 1989, but due to continuous problems with the reverse/reduction gearbox, the trials had to be discontinued. In view of the poor catches by IND-20 in the offshore fishery, it was decided not to pursue similar trials but to modify and use the IND-27 to test a new liftable propulsion system.

4.2 Engine and speed performance

The diesel engine in IND-27 was the same 9 hp watercooled VST engine used in the IND-20. The installation was, however, different, the propeller and rudder not being liftable, and fitted inside a tunnel for protection when beachlanding. With this fixed installation, a reverse/reduction gearbox was required when setting and hauling the fishing gear. (The liftable propeller system permits a neutral without a gearbox; this is possible because, in the lifted position, the propeller is run in air and does not move the boat. Some degree of control when setting and hauling nets is also possible by operating the propeller in a semi-submerged position.)

Fig. 6. Installation of diesel engines



The reverse/reduction gearbox fitted to the IND-27 engine gave repeated problems and, even though close contact was kept with the manufacturer to find a satisfactory solution, it was finally concluded that the available reverse/reduction gearbox of this engine was not dependable enough for a fishing boat. There were also problems with the clearing of nets that got entangled with the propeller inside the tunnel.

The engine installation of IND-27 was, therefore, changed in June 1990 to a liftable propeller system (IND-27A) similar to the IND-20, but rubber bellows were used instead of a watertight box to permit the pivoting of the engine and the propeller (Figure 6). This proved not only cheaper to install but it also provided more room to work on the engine.

The question of safety of the rubber bellows system was raised in connection with the possibility of the rubber bellows fracturing and resulting in flooding of the engine compartment. This is an unlikely scenario, nevertheless the consequences were tested by loosening the hose clamps on the bellows on the IND-27A. It was found that water entering the engine compartment would rise to 30cm above the bottom planking and then stop when equilibrium with the sea level was established.

The watertight bulkhead in front of the engine is an important feature. Adverse stern trim of the boat can be prevented by shifting the crew and fishing gear forward. Since the engine is well above the water level, it can be operated at a reduced speed to reach the shore safely.

The modified IND-27 (IND-27A), shortened by 0.5 m to 8.5 m, made a speed of 6.9 knots in calm water with a load of 500 kg (eight men).