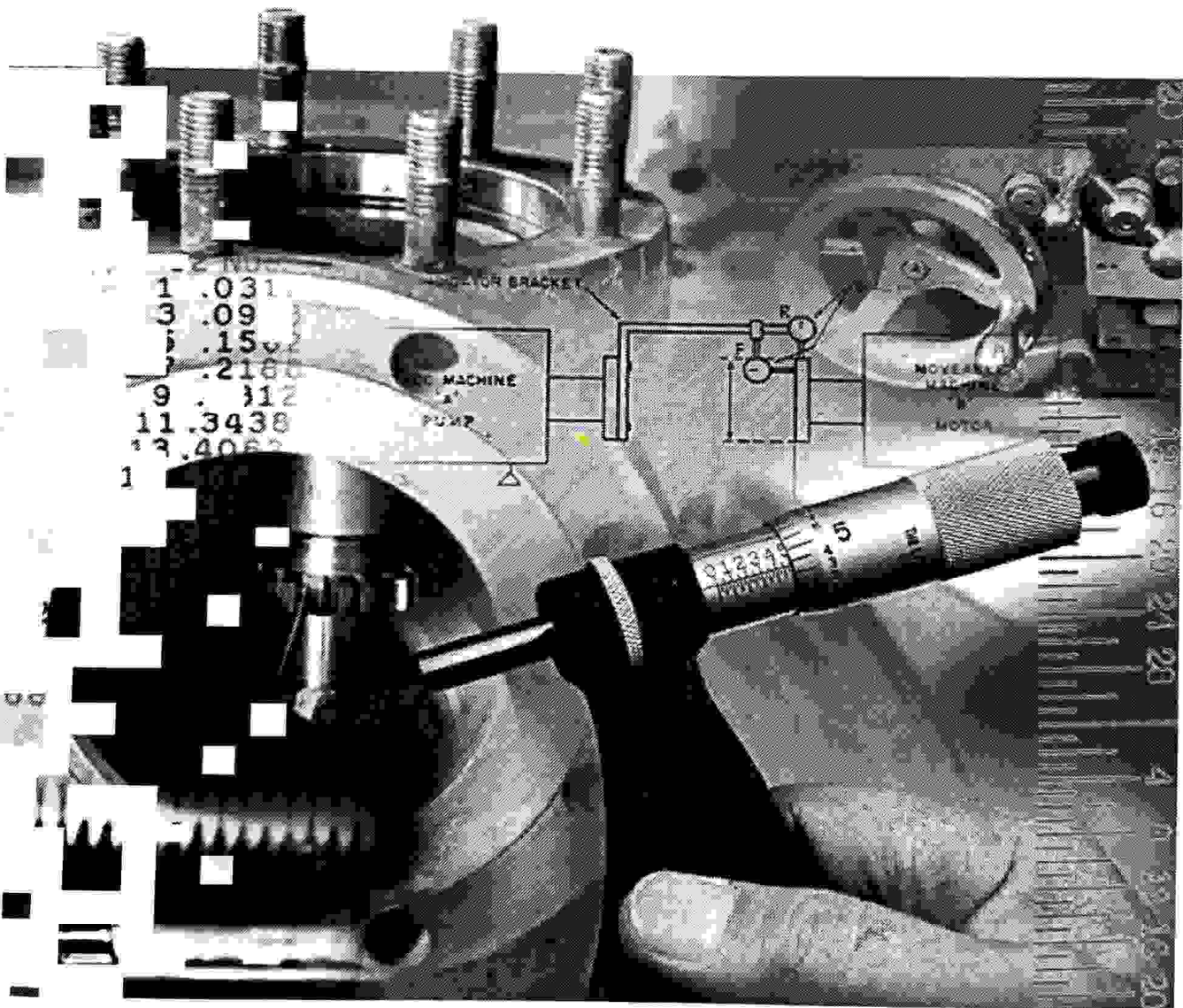


Maintenance Machinist



Module 13.4

Overhaul a Right-Angle Gearbox

***Saudi Aramco Training
January 2001***

Unit 13: Maintaining Transmission Systems

Module 13.4

Overhaul a Right-Angle Gearbox

TRAINEE HANDBOOK

<i>Information Sheets</i>	<i>1</i>
<i>Exercise A</i>	<i>22</i>
<i>Exercise B</i>	<i>32</i>
<i>Task Aid</i>	<i>35</i>

Enabling Objectives

13.4.1

Unaided, the trainee will correctly identify gears and state their operating principles.

13.4.2

Unaided, the trainee will correctly identify and state the functions of the major parts of a right-angle gearbox.

Terminal Objective

Given assembly drawings, a manufacturer's manual, and a selection of tools, materials, and equipment, the trainee will overhaul a right-angle gearbox to manufacturer's specifications or Saudi Aramco MSSD procedure W. S. 1558.

INTRODUCTION

Earlier in your training you learned about coupled machines. The coupled machine that provides power is the "drive" machine, or driver. The machine that receives the power is the "driven" machine.

The combined system of a driver and a driven machine with a gearbox between them is known as a power train. Figure 1 shows the arrangement of a simple power train.

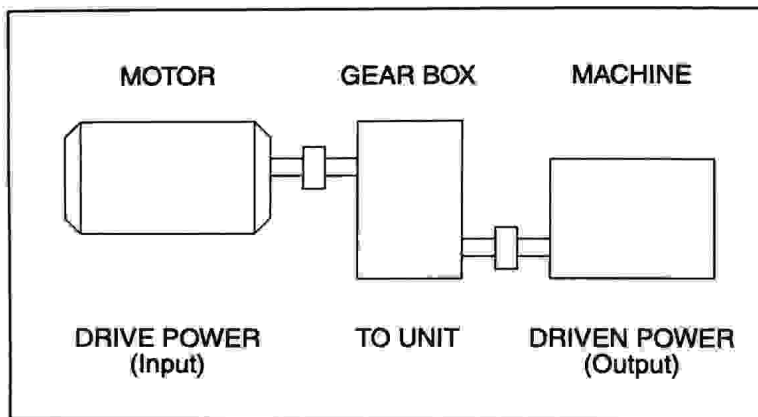


Figure 1
Simple Power Train Layout

A gearbox is an arrangement of gears inside a housing. The function of the gearbox is to transmit power from a motor to another machine—from a driver to the driven machine. A gearbox is also known as a transmission system.

Gearboxes (transmission systems) come in many sizes and types. Different applications require different power train (or power transmission) arrangements.

In this module, you will learn about the right-angle gearbox, its principles of operation, and the functions of its major parts. Later in this module, you will maintain a right-angle gearbox that is common in Saudi Aramco plants. The right-angle gearbox is commonly known in Saudi Aramco as a “fin-fan” gearbox.

The skills you learn in this unit are important. They will help you keep Saudi Aramco machinery running properly.

Identify Gears and State Their Operating Principles

In a power train, the motor (driver) generally operates at a constant speed. However, the driver's speed may be either too slow or too fast for the operating requirements of the driven machine. To match the driver with the driven and get the driven machine to operate at the required speed, you use a gearbox.

A gearbox changes (modifies) transmitted power by:

- reducing the output speed of the driver machine and increasing the torque
- increasing the output speed of the driven machine and reducing the torque
- changing the direction of shaft rotation
- changing the angle of shaft operation

Gearboxes that increase the output speeds of driven machines over the speeds of the drivers are "step-up" gearboxes. Machinists call these gearboxes "increasers."

A gearbox that reduces the output (driven) speed from the input (driver) speed is called a "reduction gearbox." These gearboxes are called "reducers."