INTERACTIVE DISTANCE LEARNING

ANTI-LOCK BRAKE SPECIALIST:
KELSEY HAYES REAR WHEEL ANTI-LOCK BRAKING SYSTEMS (RWAL/ RABS)

LEARNING GUIDE

CARS KNOWLEDGE NETWORK

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REAR WHEEL ANTILOCK BRAKES

LEARNING OUTCOME

Upon successful completion of this segment, the participant shall be able to locate and identify rear brake antilock components, diagnose system complaints and failures. As well, demonstrate a working knowledge of the use of service manuals and test equipment to determine system faults.

OBJECTIVES

Upon successful completion the participant will be able to:

1. describe how a vehicle with rear wheel antilock brakes operates during an ABS event
2. utilize service information to locate and identify system components
3. follow diagnostic flow charts as set out by individual manufacturers
4. identify safe service practices as they pertain to rear wheel antilock brake systems
5. demonstrate a working knowledge of the application of ABS diagnostic equipment

RATIONALE (benefits of learning experience)

Service technicians with a background in rear wheel antilock brake systems, will be able to perform timely and accurate diagnostics of system abnormalities in a work environment.

ELABORATIONS

UNIT #1
1.1 Identify vehicle applications for RWAL

1.2 Describe the reasons for RWAL as opposed to 4WAL

1.3 Compare standard brake operation and RWAL operation

UNIT #2
2.1 Describe the construction and operating principles of RWAL hydraulic components, location and identity.
2.2 RWAL electrical/electronic component, location and identity.

UNIT #3
3.1 Describe RWAL system maintenance and servicing precautions.

3.2 Describe RWAL system repair or replacement procedures.

UNIT #4
4.1 Identify service and diagnostic information required

4.2 Use diagnostic flow charts as they apply to specific systems

4.3 Identify system and component testing procedures.

4.4 Identify required diagnostic tools and their use.

**PERFORMANCE INDICATORS**

1 Identified RWAL vehicle applications

2 Compared non-RWAL braking to RWAL braking

3 Identified basic hydraulic brake components and location

4 Identified RWAL system components and location

5 Described RWAL system operation

6 Explained RWAL component operation

7 Related RWAL system limitations and service precautions

8 Chosen the correct service information for the vehicle application

9 Followed flow chart diagnostics

10 Demonstrated a working knowledge utilizing test equipment required for RWAL diagnostics
LEARNING ACTIVITIES

Please take a moment to examine pages 2 and 3 of the Learning Guide, which provide an overview of the program goals. We encourage you to follow along in your Guide throughout the program, taking notes, performing calculations and other exercises as required.

RWAL Overview

Exercise 1:
List reasons for the use of the Kelsey Hayes RWAL/RABS system:
________________________
________________________
________________________
________________________

Anti-Lock Brake System Type

Exercise 2:
What type of ABS system the Kelsey Hayes RWAL/RABS system?
________________________
________________________
________________________
________________________
Base Brake Components

Exercise 3:
Fill in blanks

ABS Components

Exercise 4:
List the ABS components:

_____________________ __________________
_____________________ __________________
_____________________ __________________
_____________________ __________________

Electronic Brake Control Module

Exercise 5:
What is the main function of the electronic brake control module?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

__________________________________________________________________________
EBCM Connector Identification

Exercise 6:
Label the EBCM circuits:
(Typical General Motors EBCM)

EBCM Functional Tests

Exercise 7:
When the ignition switch is turned to the on position, the EBCM will check its _________ and _________ circuits. Perform a _________ check and cycle the ___________ and _________ valves.

EBCM

Exercise 8:
What will the EBCM do in case of a malfunction in either the base brake system or ABS system?
______________________________________________________________________________
______________________________________________________________________________
Exercise #9:
What are the various ways to test a wheel speed sensor?
__________________________
__________________________
__________________________
__________________________

Exercise #10:
When the driver of the vehicle steps on the brake pedal, the EBCM will see ____________ volts.

Exercise #11
What conditions will cause the Red Brake Warning Lamp (RBWL) to come on?
__________________________
__________________________
__________________________

Exercise #12:
What conditions will cause the Amber ABS Warning Lamp to come on?
__________________________
__________________________
__________________________

Exercise #13:
The main function of the control valve assembly is to __________ the hydraulic pressure applied to the rear brakes during _____ __________.
Exercise #14:
Label the control valve components:

Exercise #15:
The isolation valve ___________ the rear brake channel from the master cylinder during ____
____________.

Exercise #16:
The reset switch signals the EBCM that ___ _______ __________ occurred.
Exercise #17:
Complete the diagram indicating where the valves would be during a normal brake application:
Exercise #18:
Complete the diagram indicating where the valves would be during a hold mode application:
Exercise #19:
Complete the diagram indicating where the valves would be during a pressure decrease application:
Exercise #20:
Complete the diagram indicating where the valves would be during a pressure re-apply application:
Exercise #21:
Complete the diagram indicating where the valves would be during an accumulator bleed-down mode:

![Diagram of hydraulic system with labeled components: FROM MASTER CYLINDER, ISOLATION VALVE, ISOLATION SOLENOID, ACCUMULATOR, DUMP VALVE, TO WHEEL CYLINDER, DUMP SOLENOID, and RESET SWITCH.]

Exercise #22
List the different methods of testing the control valve assembly:
_____________________________
_____________________________
Exercise # 23