# 1967 FORD

# *Thunderbird*

# SHOP MANUAL

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# 1967

# THUNDERBIRD

# SHOP MANUAL

Ford SERVICE PUBLICATIONS

FIRST PRINTING–FEBRUARY, 1967


## GROUP INDEX



SPECIFICATIONS AND SPECIAL SERVICE TOOLS AT END OF EACH GROUP

# FOREWORD

*This shop manual provides the Service Technician with information for the proper servicing of the 1967 Thunderbird.*

*The maintenance schedule and procedures for maintenance operations are published in the 1967 Passenger Car Maintenance and Lubrication Manual.*

*The information in this manual is grouped according to the type of work being performed, such as diagnosis and testing, frequently performed adjustments and repairs, in-vehicle adjustments, overhaul, etc. Specifications and recommended special tools are included.*

*Refer to the opposite page for important vehicle identification data.*

*The descriptions and specifications in this manual were in effect at the time this manual was approved for printing. The Ford Motor Company reserves the right to discontinue models at any time, or change specifications or design, without notice and without incurring obligation.*

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# Vehicle Identification

GROUP 1

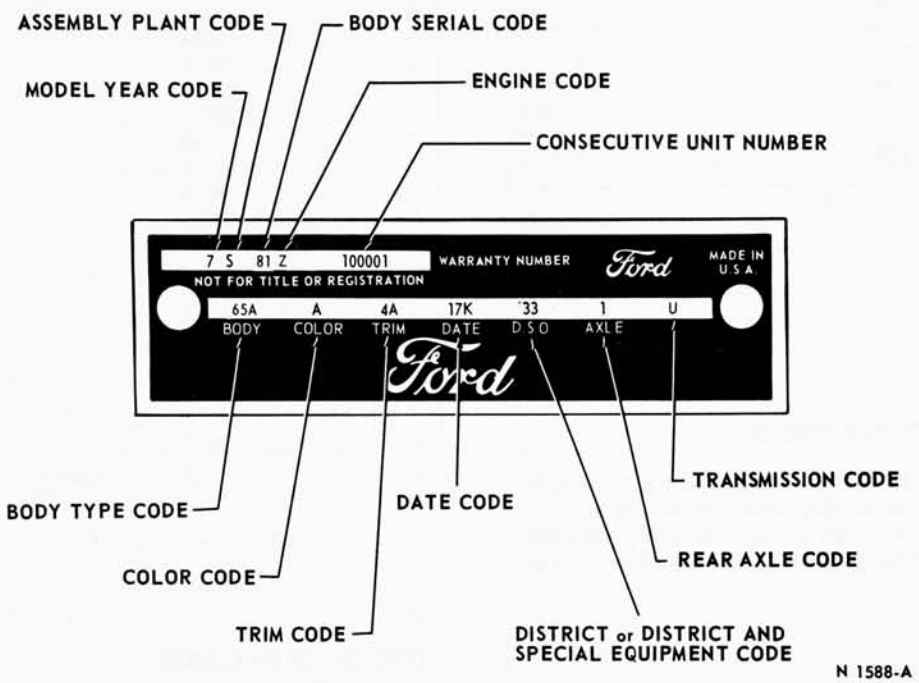



*FIG. 1*—Typical Warranty Plate— Thunderbird

## VEHICLE WARRANTY NUMBER

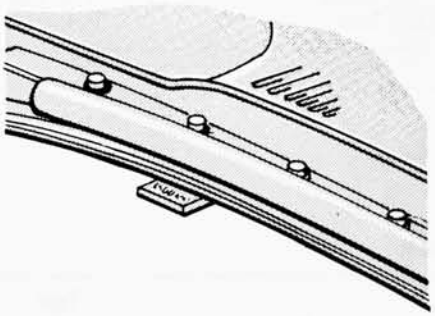
The vehicle warranty number is the first line of numbers and letters appearing on the Warranty Plate (Fig. 1). The first number indicates the model year. The letter following the model year number indicates the manufacturing assembly plant. The next two numbers designate the Body Serial Code followed by a letter expressing the Engine Code. The group of six digits remaining on the first line indicate the Consecutive Unit Number.

## VEHICLE DATA

The vehicle data appears on the second or lower line on the Warranty Plate. The first two numbers and a letter identify the Body Style. A letter or a number appears next indicating the Exterior Paint Color followed by a number-letter combination designating the Interior Trim. To the right of this code appears the Date Code indicating the date the car was manufactured. A two-digit number next designates the district in which the car was ordered and may appear in conjunction with a Domestic Special Order or Foreign Special Order number when applicable. The final two spaces indicate the Rear Axle Ratio (numbers for regular axles, letters for locking-types) and the Transmission type.

## OFFICIAL VEHICLE IDENTIFICATION NUMBER

The official Vehicle Identification Number for title and registration purposes is stamped on the cowl top panel tab right hand side of center in the engine compartment (Fig. 2).



N 1526-A

*FIG. 2*—Thunderbird Identification Number Location

## MODEL YEAR CODE

The number 7 designates 1967

## ASSEMBLY PLANT CODES

| Code Letter | | Code Letter | |
|---|---|---|---|
| A | Atlanta | L | Michigan Truck |
| B | Oakville (Canada) | N | Norfolk |
| C | Ontario Truck | P | Twin Cities |
| D | Dallas | R | San Jose |
| E | Mahwah | S | Pilot Plant |
| F | Dearborn | T | Metuchen |
| G | Chicago | U | Louisville |
| H | Lorain | W | Wayne |
| J | Los Angeles | Y | Wixom |
| K | Kansas City | Z | St. Louis |

## BODY SERIAL AND STYLE CODES

The two-digit numeral which follows the assembly plant code identifies the body series. This two-digit number is used in conjunction with the Body Style Code, in the Vehicle Date, which consists of a two-digit number with a letter suffix. The following chart lists the Body Serial Codes, Body Style Codes and the model.

### THUNDERBIRD

| Body Serial Code | Body Style Code | Body Type | |
|---|---|---|---|
| 81 | 65A | 2-Door Hardtop | Painted Roof |
| 82 | 65B | 2-Door Hardtop | Vinyl Roof-Landau |
| 84 | 57B | 4-Door Sedan | Vinyl Roof |

## ENGINE CODES

| Code | Type |
|---|---|
| Z | 8 Cyl. 390 Cu. In. (4V) |
| Q | 8 Cyl. 428 Cu. In. (4V) |
| 8 | 8 Cyl. 428 Cu. In. (4V) ① |

① Low Compression

## CONSECUTIVE UNIT NUMBER

Each model year, each assembly plant begins production with number 100001 and continues on for each unit built.

## EXTERIOR PAINT COLOR CODES

| Code | M-30-J M-32-J | |
|---|---|---|
| A | 1724-A | Black |
| B | 1734-A | Lt. Aqua |
| C | 1900-A | Dk. Gray Met. |
| E | 2045-A | Med. Beige Met. |
| F | 1226-A | Lt. Blue |
| H | 2067-A | Diamond Green |
| K | 1903-A | Dk. Blue Met. |
| M | 1619-A | White |
| N | 921-A | Platinum |
| P | 2065-A | Pewter Met. |
| Q | 1624-A | Med. Blue Met. |
| R | 1879-A | Dk. Green Met. |
| T | 2008-A | Red |
| U | 1070-A | Med. Turquoise Met. |
| V | 2066-A | Bronze Met. |
| X | 1632-A | Maroon Met. |
| Z | 1915-A | Med. Gold Met. |
| 2 | 1633-A | Yellow |
| 4 | 1901-A | Med. Gray Met. |
| 6 | 1631-A | Lt. Beige |

## INTERIOR TRIM CODES

| Code | Trim Schemes |
|---|---|
| 2A | Black Vinyl |
| 2B | Blue Vinyl |
| 2D | Red Vinyl |
| 2F | Saddle Vinyl |
| 2G | Ivy Gold Vinyl |
| 2K | Aqua Vinyl |
| 2U | Parchment Vinyl W/Black |
| 4A | Black Vinyl ① |
| 4B | Blue Vinyl ① |
| 4D | Red Vinyl ① |
| 4G | Ivy Gold Vinyl ① |
| 4K | Aqua Vinyl ① |
| 4L | Lt. Silver Cloth and Lt. Silver Vinyl |
| 4U | Parchment Vinyl W/Black ① |
| 5A | Black Cloth and Black Vinyl |
| 5U | Parchment Cloth and Parchment Vinyl |
| 8A | Black Vinyl ① |
| 8B | Blue Vinyl ① |
| 8D | Red Vinyl ① |
| 8G | Ivy Gold Vinyl ① |
| 8K | Aqua Vinyl ① |
| 8L | Lt. Silver Cloth and Lt. Silver Vinyl |
| 8U | Parchment Vinyl ① |
| HA | Black Leather |
| LA | Black Leather |

① Combined with cloth

## DATE CODES

A number signifying the date precedes the month code letter. A second-year code letter will be used if the model exceeds 12 months.

| Month | Code First Year | Code Second Year |
|---|---|---|
| January | A | N |
| February | B | P |
| March | C | Q |
| April | D | R |
| May | E | S |
| June | F | T |
| July | G | U |
| August | H | V |
| September | J | W |
| October | K | X |
| November | L | Y |
| December | M | Z |

## REAR AXLE RATIO CODES

A number designates a conventional axle, while a letter designates a locking differential.

| Code | Ratio | Code | Ratio |
|---|---|---|---|
| 1 | 3.00:1 | A | 3.00:1 |
| 6 | 2.80:1 | – | – |

## TRANSMISSION CODE

| Code | Type |
|---|---|
| U | Automatic (C6) |

## DISTRICT CODES (DSO)

Units built on a Domestic Special Order, Foreign Special Order, or other special orders will have the complete order number in this space. Also to appear in this space is the two-digit code number of the District which ordered the unit. If the unit is a regular production unit, only the District code number will appear.

| Code | District |
|---|---|
| 11 | Boston |
| 13 | New York |
| 15 | Newark |
| 16 | Philadelphia |
| 17 | Washington |
| 21 | Atlanta |
| 22 | Charlotte |
| 24 | Jacksonville |
| 25 | Richmond |
| 27 | Cincinnati |
| 28 | Louisville |
| 32 | Cleveland |
| 33 | Detroit |
| 34 | Indianapolis |
| 35 | Lansing |
| 37 | Buffalo |
| 38 | Pittsburgh |
| 41 | Chicago |
| 42 | Fargo |
| 43 | Milwaukee |
| 44 | Twin Cities |
| 45 | Davenport |
| 51 | Denver |
| 52 | Des Moines |
| 53 | Kansas City |
| 54 | Omaha |
| 55 | St. Louis |
| 61 | Dallas |
| 62 | Houston |
| 63 | Memphis |
| 64 | New Orleans |
| 65 | Oklahoma City |
| 71 | Los Angeles |
| 72 | San Jose |
| 73 | Salt Lake City |
| 74 | Seattle |
| 75 | Phoenix |
| 81 | Ford of Canada |
| 83 | Government |
| 84 | Home Office Reserve |
| 85 | American Red Cross |
| 89 | Transportation Services |
| 90-99 | Export |

# Brakes

GROUP 2



# PART 2-1—General Brake Service



## 1 DIAGNOSIS AND TESTING

### BRAKE SYSTEM TESTS

#### BRAKE FLUID LEVEL AND HYDRAULIC SYSTEM

Always check the fluid level in the brake master cylinder reservoirs before performing the test procedures. If the fluid level is not within 1/4 to 1/2 inch of the top of the master cylinder reservoirs, add Rotunda Brake Fluid — Extra Heavy Duty — C6AZ19542-A (ESA-M6C25-A). **The disc brake extra heavy duty brake fluid is colored for identification purposes. Do not mix low temperature brake fluids with the specified brake fluid.**

1. Turn the ignition dual master cylinder brake system switch to the ACC or ON position. If the light on the brake warning lamp remains on, the condition may be caused by a defective switch, grounded switch wires or the differential pressure valve is not centered. Centralize the differential pressure valve as outlined under Bleeding the Brake System in this section of the manual. If the warning light remains on, the condition may be caused by a defective switch, grounded switch wires or the differential pressure valve is not centered. Centralize the differential pressure valve as outlined under Bleeding the Brake System in this section of the manual. If the warning light remains on, check the switch connector and wire for a grounded condition and repair or replace the wire assembly. If the condition of the wire is good, replace the brake warning lamp switch.

2. If the brake warning lamp does not light when a pressure differential condition exists in the brake system, the warning lamp may be burned out, the warning lamp switch is inoperative or the switch to lamp wiring has an open circuit. Check the bulb and replace it, if required. Check the switch to lamp wires for an open circuit and repair or replace them, if required. If the warning lamp still does not light, replace the switch.

#### BRAKE PEDAL FREE HEIGHT AND TRAVEL MEASUREMENTS

With the engine running for full power brake operation, measure the brake pedal free height, and check the brake pedal travel with the use of the Brake Pedal Pressure Gauge, Tool WRE-500-50 as follows:

**Brake Pedal Free Height Measurement**

1. Insert a slender, sharp pointed prod through the carpet and sound deadener to the dash panel metal and measure the distance to the brake pedal (Fig. 1).

2. If the position of the pedal is not within specification, check the brake pedal linkage for missing bushings or loose attaching bolts and replace them, if required.

3. If the pedal free height is still out of specification, check the brake pedal booster or master cylinder to be sure the correct parts are installed. Replace the defective parts as necessary.

**Brake Pedal Travel Measurement**

1. Install a Brake Pedal Effort Gauge on the brake pedal pad (Fig. 2).

2. Hook a steel measuring tape to the brake pedal as shown in Fig. 1. Measure and record the distance from the brake pedal free height position to the reference point, which is at the six o'clock position on the steering wheel rim.

3. With the steel tape still hooked to the brake pedal depress the brake pedal by pressing downward on the brake pedal effort gauge. Apply a 50 pound load to the center of the pedal by observing the pressure gauge, and measure the distance from the brake pedal to the fixed reference point on the steering wheel rim parallel to the centerline of the steering column.

4. The difference between the brake pedal free height and the depressed pedal measurement under a 50 pound load should be within the specified maximum pedal travel service specification B in Fig. 1.

5. If the pedal travel is more than the specified maximum shown, in Fig. 1, dimension B, make several sharp reverse stops (equivalent to 50 pounds pedal pressure) with a forward stop before each. Move the vehicle in reverse and forward for a distance of approximately ten feet; then apply the brakes sharply and hold the brake pedal down until the vehicle is completely stopped. This will actuate the brake self-adjusters. If these stops do not bring the brake pedal travel within

specification, make several additional forward and reverse stops as outlined above.

**6.** If the second series of stops do not bring the brake pedal travel within specification, remove the brake drums and check the brake adjusters to make sure they are functioning. Check the brake linings for wear or damaged parts and non-functioning adjusters. Adjust the brake lining outside diameter to the approximate inside diameter of the brake drum with Rotunda Tool HRE-8650 (Fig. 11, Part 2-2).

**7.** If all the brake adjusters, brake drums and linings are functional and the brake travel is not within specifications, check the pedal linkage for missing bushings or loose attachments. Bleed the brakes and centralize the differential valve.

### POWER BRAKE FUNCTIONAL TEST

**1.** With the transmission in neutral, stop the engine and apply the parking brake. Depress the brake pedal several times to exhaust all vacuum in the system.

**2.** With the engine shut off, exhaust all vacuum in the system. Depress the brake pedal and hold it in the applied position. If the pedal gradually falls away under this pressure, the hydraulic system is leaking. Check all tubing, hoses calipers, wheel cylinders and connections for leaks.

**3.** With the engine shut off and all vacuum in the system exhausted, depress the pedal and hold it in the applied position. Start the engine. If the vacuum system is operating, the pedal will tend to fall away under foot pressure and less pressure will be required to hold the pedal in the applied position. If no action is felt, the vacuum booster system is not functioning.

If the brake pedal movement feels spongy, bleed the hydraulic system to remove air from the system. Refer to Hydraulic System Bleeding, Section 2. Also, check for leaks or insufficent fluid.

### LOCKED WHEEL BRAKE

Should one of the wheel brakes be locked and the vehicle must be moved, open the bleeder screw long enough to let out a few drops of brake fluid. **This bleeding operation will release the brakes but will not correct the cause of trouble.**

### VACUUM TESTS—VACUUM RELEASE PARKING BRAKES

Visually check the operation of the brake linkage as the park brake pedal is depressed. Then, check the operation of the brake linkage when the manual release lever is activated. These checks should indicate whether the manual parking brake control linkage is operating properly or requires repair or adjustment due to inability of the parking brake to hold against moderate vehicle movement. Perform tests of the parking brake system and controls after making certain the linkage and manual controls operate properly.

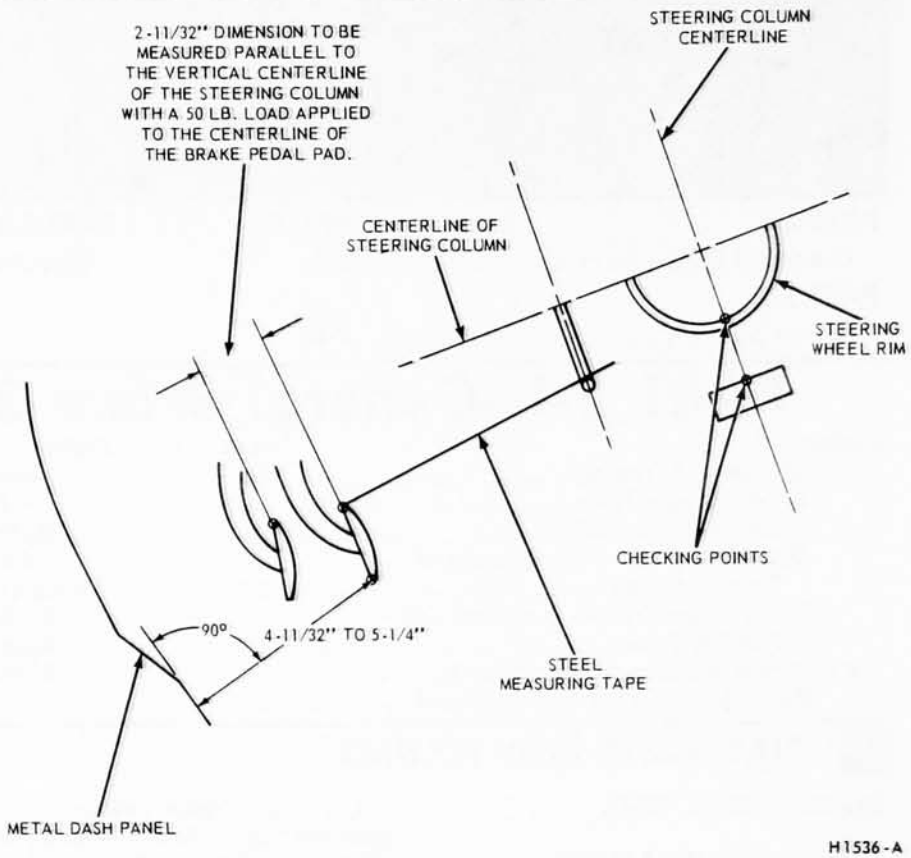



*FIG. 1*—Brake Pedal Height and Travel Measurements

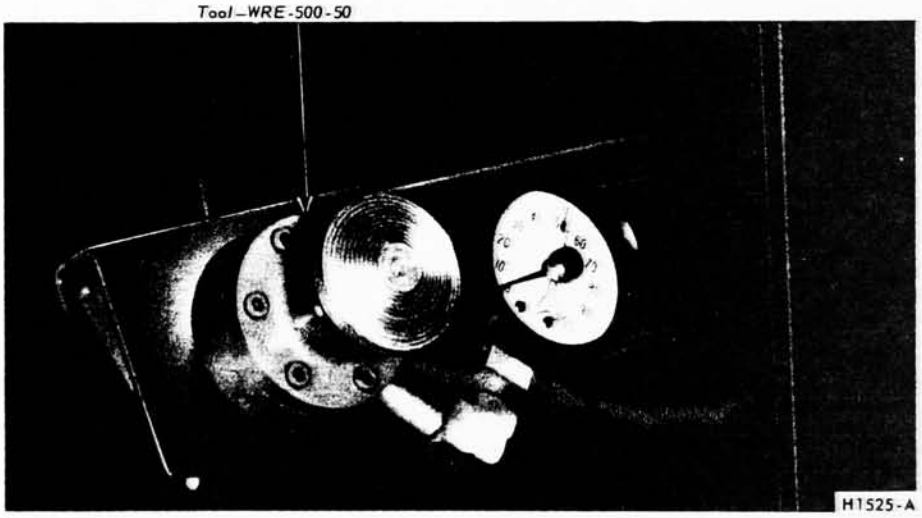



*FIG. 2*—Brake Pedal Pressure Gauge Installed

Diagnosis of vacuum release systems is basically similar to electrical diagnosis. That is, the vacuum system must be complete from the source to the vacuum components. Any leaks, like a bad connection, will make the system inoperative. If a leak develops in one of the vacuum systems, one or all of the vacuum components may become inoperative. This would be dependent on the location of the vacuum leak. If the leak is in the vacuum supply, all systems will become inoperative. If the leak is in the component side of the vacuum control for the specific system, all other systems will operate when the leaking system is off.

When testing a parking brake vacuum release system, a minimum of 10 inches of vacuum (Hg.) should be available at all points where vacuum is applied. This can be checked with a Rotunda Fuel Pump Tester Gauge (ARE 345) and two Distributor Tester hose adapters(Marked Q)connected to-

| POSSIBLE CAUSES OF TROUBLE | TROUBLE SYMPTOMS: Excessive Pedal Travel | Brake Roughness or Chatter (Pedal Pumping) | Excessive Pedal Effort | Pull | Rattle | Brakes Heat Up During Driving and Fail to Release | Leaky Wheel Cylinder | Grabbing or Uneven Braking Action | No Braking Effect When Pedal is Depressed | Brakes for the Respective System Do Not Apply | Pedal Gradually Moves Toward Floor or Dash Panel | Warning Lamp Stays Lit | Warning Lamp Does Not Light |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shoe and Lining Knock-back after Violent Cornering or Rough Road Travel | X | | | | | | | | | | | | |
| Shoe and Lining Assembly not Properly Seated or Positioned | X | | | | X | | | | X | | | | |
| Leak or Insufficient Fluid in System or Caliper | X | | X | | | | | | X | | X | | |
| Loose Wheel Bearing Adjustment | X | | | X | | | | | | | | | |
| Damaged or Worn Caliper Piston Seal | X | | | | | | X | | X | | | | |
| Improper Master Cylinder Push Rod Adjustment | X | | | | | | | | | | | | |
| Excessive Rotor Runout or Out-of-Parallel | | X | | | | | | | | | | | |
| Incorrect Tire Pressure | | | | X | | | | X | | | | | |
| Frozen or Seized Pistons | | | X | X | | X | | X | | | | | |
| Brake Fluid, Oil or Grease on Linings | | X | X | X | | | | X | | | | | |
| Shoe and Lining Worn Below Specifications | | | X | | | | | | | | | | |
| Proportioning Valve Malfunction | | | X | | | | | X | | | | | |
| Booster Inoperative | | | X | | | | | | | | | | |
| Caliper Out of Alignment with Rotor | | | | X | | | | X | | | | | |
| Loose Caliper Attachment | X | X | | X | | | | X | | | | | |
| Metering Valve Seal Leaks | | | | | | | | X | | | | | |
| Excessive Clearance Between Shoe and Caliper or Between Shoe and Splash Shield | | | | | X | | | | | | | | |
| Shoe Hold Down Clips Missing or Improperly Positioned | | | | | X | | | | | | | | |
| Operator Riding Brake Pedal | | | | | | X | | | | | | | |
| Scores in the Cylinder Bore | | | | | | | X | | | | | | |
| Corrosion Build-Up in the Cylinder Bore or on the Piston Surface | | | X | X | | | X | | | | | | |
| Bleeder Screw Still Open | | | | | | | | | X | | X | | |
| Caliper Out-of-Parallel with Rotor | | | | X | | | | | | | | | |
| One Section Dual Brake System is Inoperative | | | | | | | | | | X | | X | |
| Differential Pressure Valve is Not Centered | | | | | | | | | | | | X | |
| Wiring to Warning Lamp Switch is Grounded | | | | | | | | | | | | X | |
| Warning Lamp Switch is Grounded | | | | | | | | | | | | X | |
| Warning Lamp is Burned Out | | | | | | | | | | | | | X |
| Warning Lamp Switch Has an Open Circuit | | | | | | | | | | | | | X |
| Warning Lamp Switch is Inoperative | | | | | | | | | | | | | X |
| Wiring to Warning Lamp Has Open Circuit | | | | | | | | | | | | | X |

*FIG. 3*—Disc Brake Trouble Symptoms and Possible Cause

| POSSIBLE CAUSES OF TROUBLE | TROUBLE SYMPTOMS: One Brake Drags | All Brakes Drag | Hard Pedal | Spongy Pedal | Car Pulls to One Side | One Wheel Locks | Brakes Chatter | Excessive Pedal Travel | Pedal Gradually Goes to Floor | Brakes Uneven | Shoe Click After Release | Noisy or Grabbing Brakes | Brakes Do Not Apply | Brakes For the Respective System Do Not Apply | Warning Lamp Stays Lit | Pedal Gradually Moves Toward Floor or Dash Panel | Warning Lamp Does Not Light |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mechanical Resistance at Pedal or Shoes | | X | X | | | | | | | | | | | | | | |
| Brake Line Restricted | X | X | X | | X | | | | | | | | | | | | |
| Leaks or Insufficient Fluid | | | | X | | | | X | X | | | | X | | | X | |
| Improper Tire Pressure | | | | | X | | | | | X | | | | | | | |
| Distorted or Improperly Adjusted Brake Shoe | X | X | X | | X | X | | X | | | | X | | | | | |
| Faulty Retracting Spring | X | | | | X | | | | | | | | | | | | |
| Drum Out of Round | X | | | | X | | X | | | | | | | | | | |
| Lining Glazed or Worn | | | X | | X | X | X | X | | | | X | X | | | | |
| Oil or Grease on Lining | | | | | X | X | X | | | X | | X | X | | | | |
| Loose Carrier Plate | X | | | | | X | X | | | | | | | | | | |
| Loose Lining | | | | | | | X | | | | | | | | | | |
| Scored Drum | | | | | | | | | | X | | X | | | | | |
| Dirt on Drum-Lining Surface | | | | | | | | | | | | X | | | | | |
| Faulty Brake Cylinder | X | | | | X | X | | | | | | X | | | | | |
| Dirty Brake Fluid | X | X | | | | | | | | X | | | X | | | | |
| Faulty Master Cylinder | | X | | | | | | X | X | | | | X | | | | |
| Air in Hydraulic System | X | | | X | | | | X | | | | | X | | | | |
| Self Adjusters Not Operating | | | | | X | | | X | | | | | | | | | |
| Insufficient Shoe-to-Carrier Plate Lubrication | X | | | | | | | | | | X | X | | | | | |
| Tire Tread Worn | | | | | | X | | | | | | | | | | | |
| Poor Lining-to-Drum Contact | | | | | | | X | | | | | | | | | | |
| Loose Front Suspension | | | | | | | X | | | | | | | | | | |
| Threads Left by Drum Turning Tool Pulls Shoe Sideways | | | | | | | | | | | X | | | | | | |
| Cracked Drum | | | | | | | | X | | | | | | | | | |
| One Section Dual Brake System is Inoperative | | | | | | | | | | | | | | X | X | | |
| Differential Pressure Valve is Not Centered | | | | | | | | | | | | | | | X | | |
| Wiring to Warning Lamp Switch is Grounded | | | | | | | | | | | | | | | X | | |
| Warning Lamp Switch is Grounded | | | | | | | | | | | | | | | X | | |
| Warning Lamp is Burned Out | | | | | | | | | | | | | | | | | X |
| Warning Lamp Switch Has an Open Circuit | | | | | | | | | | | | | | | | | X |
| Wiring to Warning Lamp Has Open Circuit | | | | | | | | | | | | | | | | | X |

*FIG. 4*—Drum Brake (and General System) Trouble Symptoms and Possible Causes

gether with a coupling. This allows the Fuel Pump Tester Gauge to be adapted to any other vacuum hose or rubber connector in the vacuum systems.

Failure to maintain 10 inches of vacuum (Hg.) during vacuum system tests could be caused by a bad hose connection, resulting in a vacuum leak. When checking for vacuum between two points, trace the hose along the entire routing to be sure it is not crossed with another hose and connected to the wrong connection.

All of the vacuum parking brake release checks are to be performed with the engine running at idle speed.

Leaks in the parking brake hoses or a disconnected or improperly connected hose can usually be found by listening for a hissing sound along the hose routings. **Under no circumstances should air pressure be applied to the vacuum system as the actuator diaphragm in the parking brake vacuum motor may be damaged.**

1. Start the engine and run it at idle speed. With the transmission shift control in neutral, depress the parking brake pedal and apply the parking brake. Move the transmission shift control to drive range and observe the parking brake pedal to see that the pedal moves upward and the parking brake releases. If the parking brake releases, the parking brake vacuum control is working properly.

2. If the parking brake does not release, start the engine. Test for vacuum at the steering column neutral switch port in the left junction block, vacuum lines and the parking brake release vacuum motor. Use the Rotunda Vacuum and Fuel Pump Tester ARE 345. This can be accomplished by removing the hose from each component and attaching it to the vacuum gauge. Connect two distributor tester vacuum hose adapters together with a coupling as a connector to attach the gauge. A minimum of ten inches of vacuum is required to actuate the parking brake vacuum motor. **Do not remove any of the vacuum hoses from the junction block unless the junction block is being replaced, as the plastic nipples are thin and very brittle and damage may result.** If a minimum reading is not present when checking each of the aforementioned components, they must be replaced.

## 2 COMMON ADJUSTMENTS AND REPAIRS

### PARKING BRAKE LINKAGE ADJUSTMENT

Check the parking brake cables when the brakes are fully released. If the cables are loose, adjust them as follows:

1. Fully release the parking brake pedal by pushing down the manual release lever.
2. Raise the vehicle.
3. Depress the parking brake pedal 1 1/4 inch from its normal released position.
4. Turn the adjusting nut forward against the equalizer (Fig. 5) until a moderate drag is felt when turning the rear wheels (approximately 100 lbs of force at the outside diameter of the tire is required to turn the rear wheels).
5. Release the parking brake, and check to make sure that the brake shoes return to the fully released position.
6. Depress the parking brake pedal 1 1/2 inches. Under normal conditions, this will satisfactorily hold the vehicle.
7. Release the parking brake again, and check as in step 5.
8. Depress the pedal 1/2 inch. The brakes should not drag.
9. If the rear brakes do not fully release, check the cables for kinks or binds. Free the cables as required.

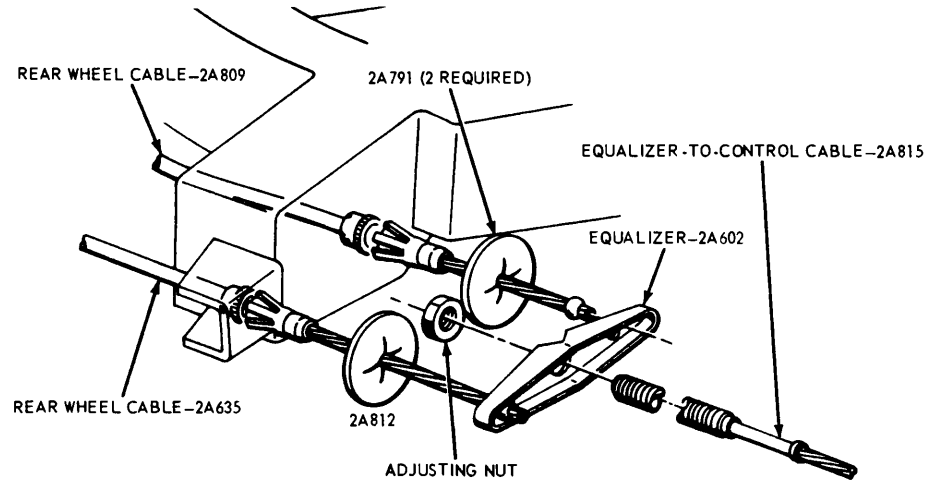



*FIG. 5—Parking Brake Adjustment*

### POWER BRAKE MASTER CYLINDER PUSH ROD ADJUSTMENT

The push rod is designed with a self-locking adjustment screw to provide the correct relationship between the booster piston and the master cylinder pistons. The adjustment screw is set to the correct height at the time of original assembly of the power unit. **Under normal service the adjustment screw does not require any further attention providing the push rod assembly remains in the original unit. The distance from the end of the adjustment screw to the mounting surface of the booster body can be checked either with a micrometer depth gauge to a dimension of 0.980, 0.995 inch, or with a height gauge as shown in Fig. 6. The details for making a height gauge are given in Fig. 7.**

To adjust the push rod, hold the serrated end of the rod with cross-milled pliers and turn the adjustment screw in to shorten, or out to lengthen.

After assembly of the master cylinder to the power section, the piston cup in the hydraulic cylinder should just clear the compensating port hole when the unit is in the fully released position. This can be checked by placing a few

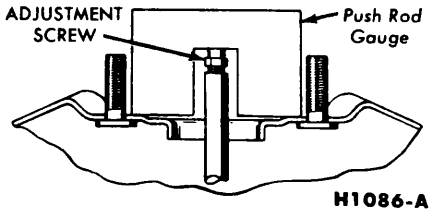



*FIG. 6—Push Rod Adjustment*

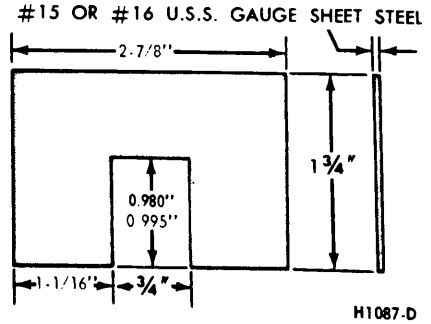



*FIG. 7—Push Rod Gauge Dimensions*

drops of brake fluid over the compensating port and applying light air pressure to the output port of the master cylinder. If air bubbles appear, the port is open. If the primary piston cup overlaps the compensating port, there will be no flow of air through the compensating port. If this condition exists, the adjustment screw should be turned into the push rod a slight amount or until the compensating port is open.

## HYDRAULIC SYSTEM BLEEDING AND CENTRALIZING OF THE DIFFERENTIAL VALVE

When any part of the hydraulic system has been disconnected for repair or replacement, air may enter the system and cause spongy pedal action. Bleed the hydraulic system after it has been properly connected, to be sure that all air is expelled.

The hydraulic system can be bled manually or with **pressure bleeding equipment.**

**After a brake hydraulic system malfunction has been corrected and the hydraulic system has been bled, the dual-brake warning lamp will usually continue to burn when the ignition switch is turned to ON.** This is due to the pressure differential created during the bleeding operation, causing the valve to move to an off-center position (low pressure side). This depresses the warning lamp switch plunger, closing the contact points which turn on the brake warning light. **The differential valve will remain off-center and the warning lamp will remain lit until the valve is centralized.** When the valve is centralized the spring loaded switch plunger drops into the groove in the valve and the warning light switch continuity is broken at the switch contact points. To centralize the valve a pressure differential must again be created on the side opposite the brake hydraulic system that was bled last. For example: If the primary (front brake) system was bled last, the pressure differential (reduced pressure) required to centralize the valve will be created on the secondary system (rear brake) side of the differential valve.

### PRESSURE BLEEDING

Bleed the longest lines first. The bleeder tank should contain enough new Rotunda Brake Fluid to complete the bleeding operation. Use Rotunda Brake Fluid — Extra Heavy Duty — Part Number C6AZ-19542-A (ESA-M6C25-A). **The brake fluid is colored blue for identification purposes. Do not mix low temperature brake fluid with the specified disc brake fluid during the bleeding operations. Never re-use brake fluid that has been drained from the hydraulic system.** The tank should be charged with approximately 10 to 30 pounds of air pressure. **Never exceed 50 pounds pressure.**

1. Clean all dirt from the master cylinder reservoir cover.
2. Remove the master cylinder reservoir cover and rubber gasket, and fill the master cylinder reservoir with the specified brake fluid. Install the pressure bleeder adapter tool to the master cylinder, and attach the bleeder tank hose to the fitting on the adapter.

**Master cylinder pressure bleeder adapter tools can be obtained from the various manufacturers of pressure bleeding equipment.** Follow the instructions of the manufacturer when installing the adapter.

3. Loosen the bleed screw, located on the side of the master cylinder, and bleed the master cylinder until the fluid is free of air bubbles; then, tighten the bleed screw.
4. If the rear wheel cylinders and the secondary brake system is to be bled, position a 3/8 inch box wrench (Fig. 8) on the bleeder fitting on the right rear brake wheel cylinder. Attach a bleeder tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

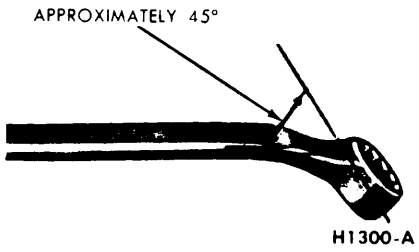



*FIG. 8*— Wrench for Bleeding Brake Hydraulic System

5. Open the valve on the bleeder tank to admit pressurized brake fluid to the master cylinder reservoir.
6. Submerge the free end of the tube in a container partially filled with clean brake fluid, and loosen the bleeder fitting.
7. When air bubbles cease to appear in the fluid at the submerged end of the bleeder tube, close the bleeder fitting and remove the tube.
8. Repeat steps 3 through 7 at the left wheel cylinder of the secondary system being bled.
9. **If the primary (front brake) system is to be bled, remove the front wheel covers, and the front wheel and tire assemblies to gain access to the bleeder fittings on the disc brake calipers.** Repeat steps 4 through 7, starting at the right front disc caliper and ending at the left front disc caliper.
10. When the bleeding operation is completed, close the bleeder tank valve and remove the tank hose from the adapter fitting.
11. Be sure that the front brake pistons are returned to their normal positions and that the shoe and lining assemblies are properly seated by depressing the brake pedal several times until normal pedal height exists. Install the front wheel and tire assemblies on the front wheels, and torque the mounting bolts to specification. Install the wheel covers.
12. Remove the Pressure Bleeder Adapter Tool. Fill the master cylinder reservoirs to within 1/4 to 1/2 inch from the top. Install the master cylinder cover and gasket. **Be sure the diaphragm type gasket is properly positioned in the master cylinder cover.**
13. Centralize the pressure differential valve as follows:

### CENTRALIZING THE PRESSURE DIFFERENTIAL VALVE

After a failure of the primary (front brake) or secondary (rear brake) system has been repaired and bled, the dual-brake warning light will usually continue to be illuminated due to the pressure differential valve remaining in the off-center position. **Front wheel balancing operations can also cause a pressure differential in the primary (front) brake system, illuminating the brake warning light.**

To centralize the pressure differential valve and turn off the warning light after a repair operation, a pressure differential or unbalance condition must be created in the **opposite** brake system from the one that was bled last.

1. Turn the ignition switch to the ACC or ON position. Loosen the differential valve assembly brake tube nut at the outlet port on the opposite side of the brake system that was wheel balanced, repaired and/or bled last. Depress the brake pedal slowly to build line pressure until the pressure differential valve is moved to a centralized position and the brake warning light goes out; then, immediately tighten the outlet port tube nut.
2. Check the fluid level in the master cylinder reservoirs and fill them to within 1/4 to 1/2 inch of the top with the specified brake fluid, if necessary.
3. Turn the ignition switch to the OFF position.
4. Before driving the vehicle, check the operation of the brakes and be sure that a firm pedal is obtained.