



FCSD

Technical Training

INTERACTIVE STUDY GUIDE

2005 MUSTANG NEW MODEL TECHNICIAN TRAINING



FCS-14002-DL



Ford Customer Service Division
Technical Training



23-SEP-04

COURSE CODE: 30N30F0

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the personal safety of the individual doing the work. This manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools and parts for servicing vehicles, as well as in the skill of the individual doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from instructions provided in this manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. NOTES give you added information that will help you to complete a particular procedure. CAUTIONS are given to prevent you from making an error that could damage the vehicle. WARNINGS remind you to be especially careful in those areas where carelessness can cause personal injury. The following list contains some general WARNINGS that you should follow when you work on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Be sure that the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. If you have an automatic transmission, set it in PARK unless instructed otherwise for a specific service operation. If you have a manual transmission it should be in RE-VERSE (engine OFF) or NEUTRAL (engine ON) unless instructed otherwise for a specific service operation.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep yourself and your clothing away from moving parts when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
- Do not smoke while working on the vehicle.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on a vehicle. Tie long hair securely behind your head.
- Keep hands and other objects clear of the radiator fan blades. Electric cooling fans can start to operate at any time by an increase in underhood temperatures, even though the ignition is in the OFF position. Therefore, care should be taken to ensure that the electric cooling fan is completely disconnected when working under the hood.

The recommendations and suggestions contained in this manual are made to assist the dealer in improving his dealership parts and/or service department operations. These recommendations and suggestions do not supersede or override the provisions of the Warranty and Policy Manual, and in any cases where there may be a conflict, the provisions of the Warranty and Policy Manual shall govern.

The descriptions, testing procedures, and specifications in this handbook were in effect at the time the handbook was approved for printing. Ford Motor Company reserves the right to discontinue models at any time, or change specifications, design, or testing procedures without notice and without incurring obligation. Any reference to brand names in this manual is intended merely as an example of the types of tools, lubricants, materials, etc. recommended for use. Equivalents, if available, may be used. The right is reserved to make changes at any time without notice.

WARNING: MANY BRAKE LININGS CONTAIN ASBESTOS FIBERS. WHEN WORKING ON BRAKE COMPONENTS, AVOID BREATHING THE DUST. BREATHING THE ASBESTOS DUST CAN CAUSE ASBESTOSIS AND CANCER.

Breathing asbestos dust is harmful to your health.

Dust and dirt present on car wheel brake and clutch assemblies may contain asbestos fibers that are hazardous to your health when made airborne by cleaning with compressed air or by dry brushing.

Wheel brake assemblies and clutch facings should be cleaned using a vacuum cleaner recommended for use with asbestos fibers. Dust and dirt should be disposed of in a manner that prevents dust exposure, such as sealed bags. The bag must be labeled per OSHA instructions and the trash hauler notified as to the contents of the bag.

If a vacuum bag suitable for asbestos is not available, cleaning should be done wet. If dust generation is still possible, technicians should wear government approved toxic dust purifying respirators.

OSHA requires areas where asbestos dust generation is possible to be isolated and posted with warning signs. Only technicians concerned with performing brake or clutch service should be present in the area.



CUSTOMER EXPECTATIONS

Customer Expectations: Service

1. Make it convenient to have my vehicle serviced at your dealership.
2. The Service Advisor should demonstrate a genuine concern for my service needs.
3. Fix it right the first time.
4. Complete servicing my vehicle in a timely and professional manner.
5. Provide me with a clear and thorough explanation of the service performed.
6. Call me within a reasonable amount of time after my service visit to ensure that I'm completely satisfied.
7. Be responsive to questions or concerns I bring to your attention.

Expectation 3

“Fix It Right The First Time, on Time.”

Both service advisors and technicians are important players when it comes to Expectation #3.

Why

Customers tell us “Fixing It Right The First Time, on Time” is one of the reasons they would decide to return to a dealer to buy a vehicle and get their vehicles serviced.

Technician Training

It is our goal to help the technician acquire all of the skills and knowledge necessary to “Fix It Right The First Time, on Time.” We refer to this as “competency.”

Technician's Role

Acquire the skills and knowledge for competency in your specialty via:

STST

- Self Study
- FordStar Broadcasts
- Ford Multimedia Training (FMT)
- Instructor Led

New Model

- Self Study
- FordStar Broadcasts
- Instructor Led

The Benefits

The successful implementation of expectations means:

- Satisfied customers
- Repeat vehicle sales
- Repeat service sales
- Recognition that Ford and Lincoln/Mercury technicians are “the Best in the Business”

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NOTES



FCSD

Technical Training

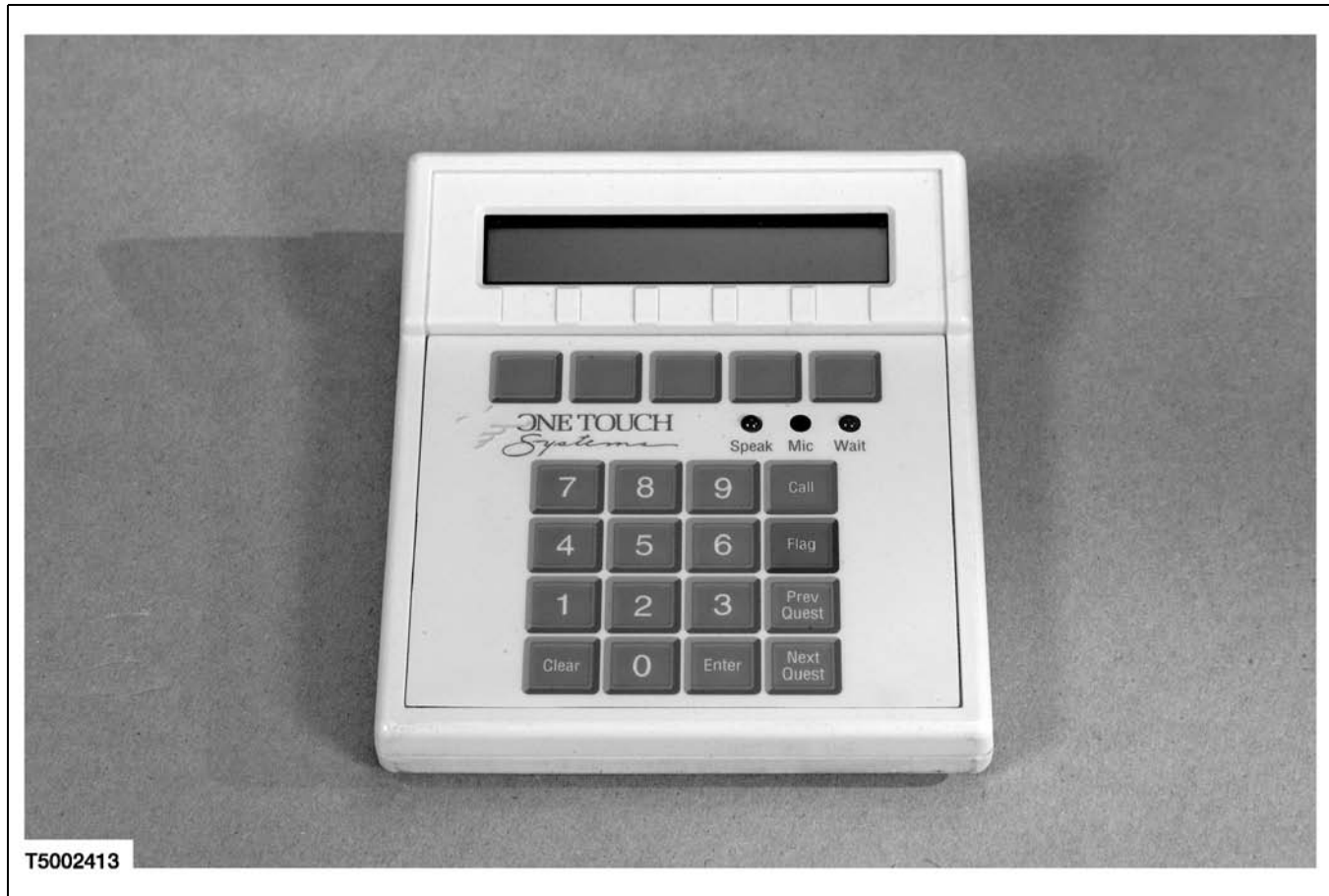
The distance learning course you are about to take is intended to give you new knowledge and information about diagnosing and servicing Ford vehicles. We hope you apply this knowledge and information to “Fix It Right The First Time” as part of our effort to satisfy our customers, the owners of Ford Vehicles.

Ground Rules for Successful Completion

This course is “**score based**”. Successful completion of this course requires a passing score of 80% or greater. Achievement of 80% or greater will result in a “PASS” in your STARS training history. A score of less than 80% results in a “FAIL” in your STARS training history. If you logon and participate in the class, but choose NOT to answer any of the questions, you will receive an “AUDIT” in your training history. You may return to complete the test in a future class session, if desired.

INTRODUCTION

LOGGING ON



Your response keypad transmits data and voice between you and the host via telephone lines and satellite. It is your ‘lifeline’, connecting you to the instructor as well as to other participants. Using the keypad, you can become involved fully in the seminar, asking questions and contributing relevant comments. To log on at the beginning of the broadcast session:

1. Enter your I.D. number (in response to the keypad prompt). If you press an incorrect key, press CLEAR and re-enter the numbers.
2. Press ENTER.
3. The system validates your I.D. number by displaying your name on the keypad. If your name does not appear on the keypad, re-enter your I.D. number.
4. If you cannot successfully log on, contact the FORDSTAR Help Desk:
 - a. USA dealers call 1-800-790-HELP (4357).
 - b. Canadian dealers call 1-800-467-8925

KEYPAD OPERATION

CALL Key

- Press the CALL key if you have a question or comment. This places you in the call queue. The system indicates your name and location to the instructor.
- It takes approximately 60 seconds for the instructor to respond. If you change your mind about asking the question, simply press the CALL key again. As long as the instructor has not accepted your call, this takes you out of the call queue.

WAIT and SPEAK Lights

- The red WAIT light illuminates when your call is received and placed in the call queue.
- When the instructor calls on you, the green SPEAK light illuminates and your microphone is activated.
- The microphone is the gray dot between the SPEAK and WAIT lights. Speak in a normal tone of voice from a normal sitting position. The instructor will hear you, as will the other students.

FLAG Key

- Use the FLAG key when requested by the instructor. The FLAG key is usually used to alert the instructor that you have completed a test or exercise.

INTRODUCTION

PURPOSE

The purpose of this FORDSTAR course is to provide Ford service technicians with the knowledge needed to understand the new systems, new components and unique service procedures for the 2005 Mustang.

AGENDA

The information in this course is arranged in the following order:

- Lesson 1: Overview
- Lesson 2: Chassis
- Lesson 3: Powertrain
- Lesson 4: Electrical
- Lesson 5: Body and Miscellaneous

OBJECTIVES

- Identify new interior and exterior features on the 2005 Mustang V-6 and Mustang GT.
- Identify the powertrains available in the 2005 Mustang V-6 and Mustang GT.
- Identify maintenance checkpoints and lift points.

LESSON 1: OVERVIEW

Introduction



Mustang GT and Mustang V-6

The all-new 2005 Mustang V-6 and Mustang GT easily combine advanced Ford technology with a dramatic styling package. The powerful engines allude to the muscle car era, while high-technology features, such as the smart junction box, definitely position the Mustang V-6 and Mustang GT in the present.

The 2005 Mustang V-6 comes equipped with the 4.0L SOHC V-6. The 2005 Mustang GT comes equipped with the 4.6L SOHC V-8. Both engines meet federal Ultra Low-Emission Vehicle II (ULEV II) standards.

The 2005 Mustang V-6 and the Mustang GT chassis is new from the ground up. Its starting point is an all-new, muscle-car platform with exceptional body stiffness and a high strength-to-weight ratio. This ultra-rigid structure allowed Mustang V-6 and Mustang GT engineers to tune spring, dampening and bushing rates to a close tolerance for exceptional handling.

Powertrain



4.0L SOHC V-6 Engine

The 4.0-liter, single overhead cam V-6 engine offers improved NVH, higher power output and a more compact package than the 3.8-liter pushrod V-6 used in the 2004 Mustang. The new V-6 incorporates many of the advanced technologies used on the V-8. In addition, the 200 horsepower and 235 pound-feet of torque enables the V-6 engine to deliver higher performance at a lower price.

LESSON 1: OVERVIEW



4.6L Engine

The Mustang GT features a new 300-horsepower, all-aluminum 4.6L engine with three valves per cylinder. The aluminum construction makes this engine 75 pounds lighter than comparable cast-iron V-8 designs. One key to producing so much horsepower from this relatively small displacement is the new single-overhead-cam, three-valve cylinder head design with variable cam timing. The new head boosts the compression ratio much higher than what was previously possible on regular 87 octane gasoline.

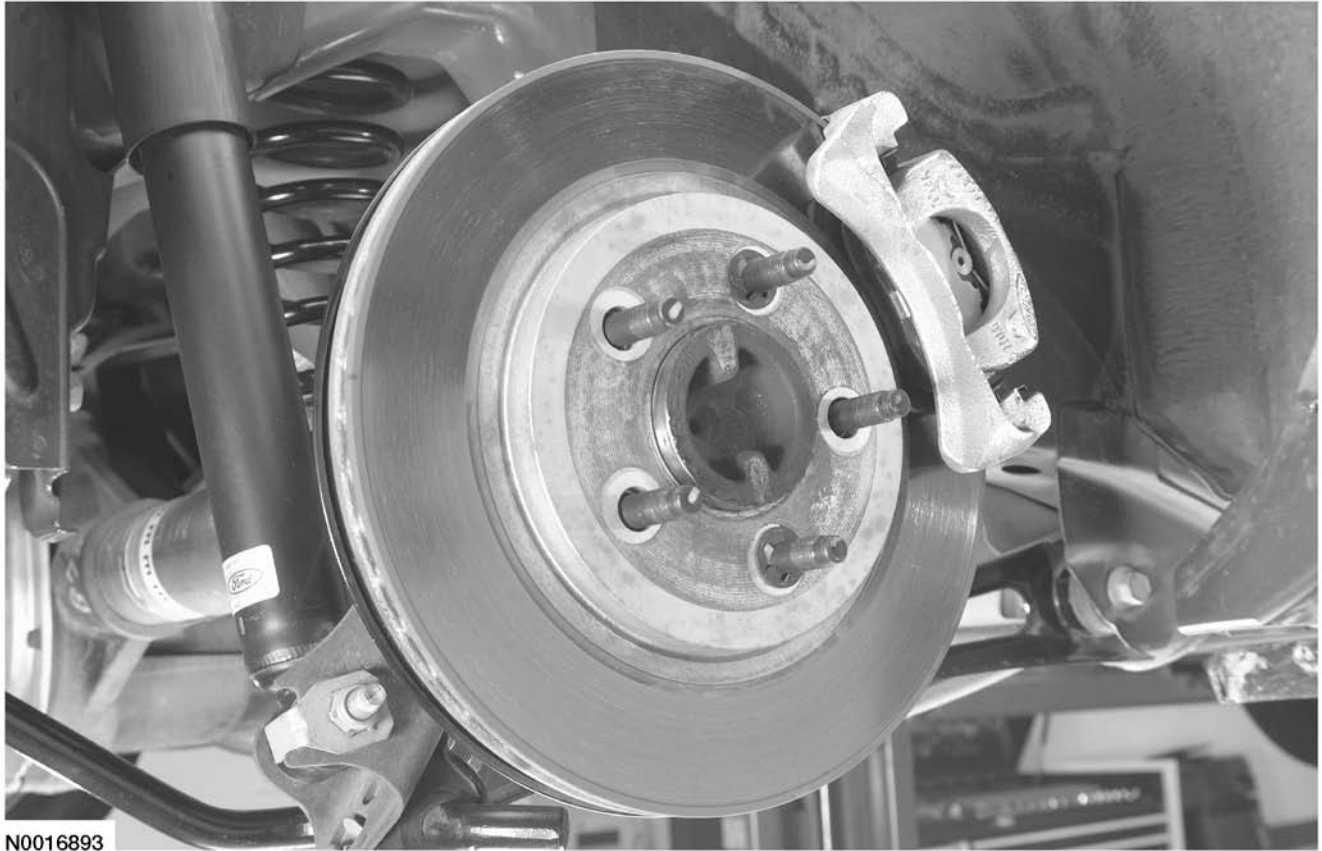
- The three-valve heads are smaller and weigh less than the previous two-valve heads.
- They also offer a more direct, “ported” style path to the valves, for better air flow at peak engine speeds.
- Magnesium cam covers help suppress valve train noise and reduce weight.
- Removing weight from the top of the engine helps improve handling by lowering the center of gravity and roll-center axis.



Five-Speed Manual Transmission

A five-speed manual transmission is standard on both the Mustang V-6 and Mustang GT versions. The Mustang V-6 uses the Tremec T5 and the Mustang GT uses the TR3650 manual transmission. Both five-speed manual transmissions have been improved for shift quality, off-the-line jump and fuel economy. Also used in the Mustang V-6 and the Mustang GT is the 5R55S automatic five-speed transmission.

LESSON 1: OVERVIEW



Rear Brake Rotor

The 2005 Mustang V-6 and Mustang GT use four-wheel disc brakes on all applications. Both models also have larger brake rotors and a four-channel anti-lock braking system, which is standard on the Mustang GT and optional on the Mustang V-6 model. This brake system uses electronic brake force distribution.

The Mustang GT optional traction control is tuned differently than that of other Ford vehicles. On dry pavement, it allows more rear wheel slip under acceleration, enhancing the performance feel of rear-wheel drive. If the system detects slippery conditions associated with snow, ice or wet roads, it acts more aggressively to help the driver maintain stability. When traction control is not desired, the driver can deactivate the system by pushing a button located on the instrument panel center stack, just to the right of the gauges. Another push turns the system back on. When traction control is manually turned off, it resets automatically each time the vehicle is started.

Interior Features

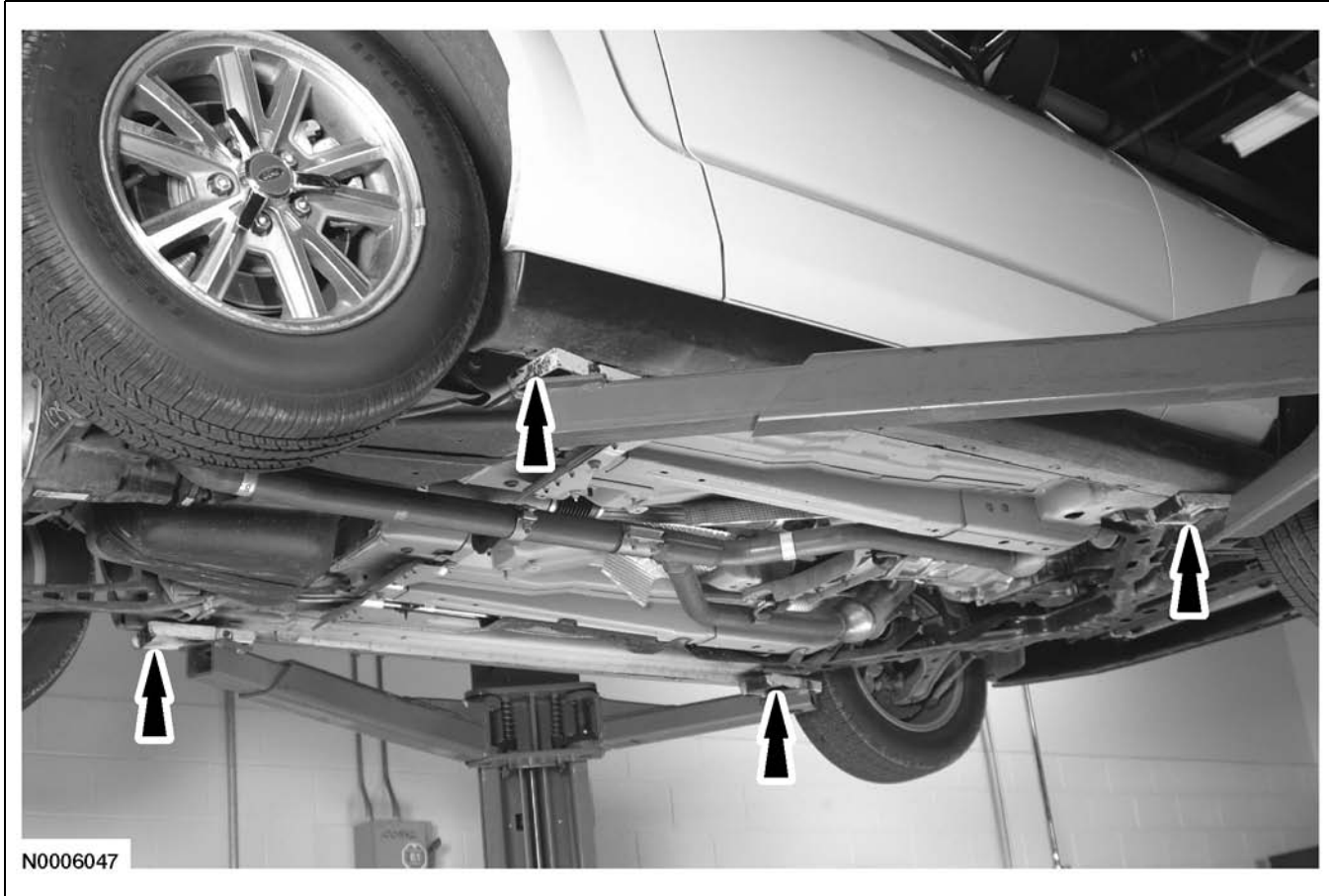


Instrument Panel

In the cabin, distinct design themes draw clearly from Mustang tradition, but using modern materials and features. This includes an available industry-first, color-configurable instrument panel. Mustang V-6 and Mustang GT owners can mix and match lights at the touch of a button to create different color backgrounds. This unique feature is available with the optional message center. In addition to the distinct cabin design themes, the radios, amplifiers and speakers are also all new.

LESSON 1: OVERVIEW

Lifting and Jacking



Jack and Lift Points

The 2005 Mustang V-6 and Mustang GT suspension or body can be damaged if improperly raised on a hoist. Be sure to check for possible interference between the underbody and the upright flanges of the hoist rails. If there is any interference, modify the hoist flanges or build up the approach ramps as necessary to provide clearance. Adapters may be necessary to clear vehicle components to lift the vehicle safely.

- To jack the front end, lift at the pinch welds, located at the front opening of the rocker panels.
- To jack the rear end, lift at the pinch welds, located at the rear opening of the rocker panels.



WARNING: NEVER RUN THE ENGINE WITH ONE WHEEL OFF THE GROUND, SUCH AS WHEN CHANGING A TIRE. THE WHEEL STILL ON THE GROUND COULD CAUSE THE VEHICLE TO MOVE.



CAUTION: The jack provided with the vehicle is intended to be used in an emergency for changing a deflated tire. To avoid damage to the vehicle, never use the jack to lift the vehicle for any other purpose. Refer to the owner guide when using the jack supplied with the vehicle.



CAUTION: Under no circumstances should the vehicle ever be lifted by the suspension arm brackets, rear stabilizer or differential housing or convertible cross brace. Severe damage to the vehicle could result.



CAUTION: Do not attempt to use jack pressure on either the front bumper or the rear bumper of any vehicle. Damage to the bumper covers will occur.



CAUTION: To prevent possible damage to the underbody, do not drive the vehicle onto the lift without first checking for possible interference.



CAUTION: Do not position lift pads under the No. 3 crossmember.

LESSON 1: OVERVIEW

4.0L Maintenance Check Points



4.0L Maintenance Check Points

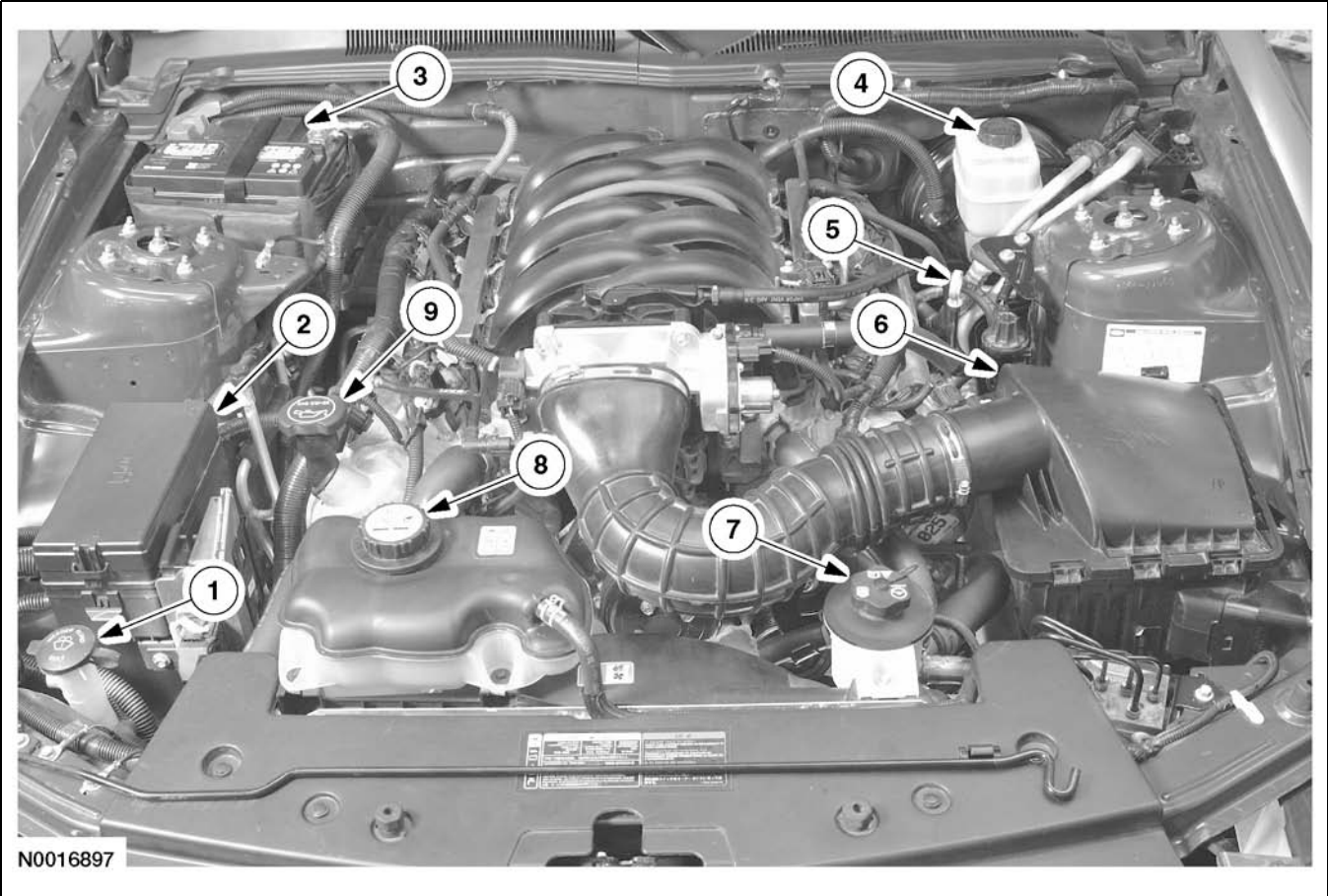
Item	Description
1	Windshield washer reservoir
2	Fuses
3	Battery
4	Brake fluid reservoir
5	Engine oil level indicator

Item	Description
6	Air filter assembly
7	Engine oil fill cap
8	Power steering fluid reservoir
9	Engine coolant reservoir

It is important to check fluid levels at the recommended maintenance intervals. Always use Ford-specified fluids and lubricants.

NOTE: The 5R55S transmission does not have a dipstick.

4.6L Maintenance Check Points



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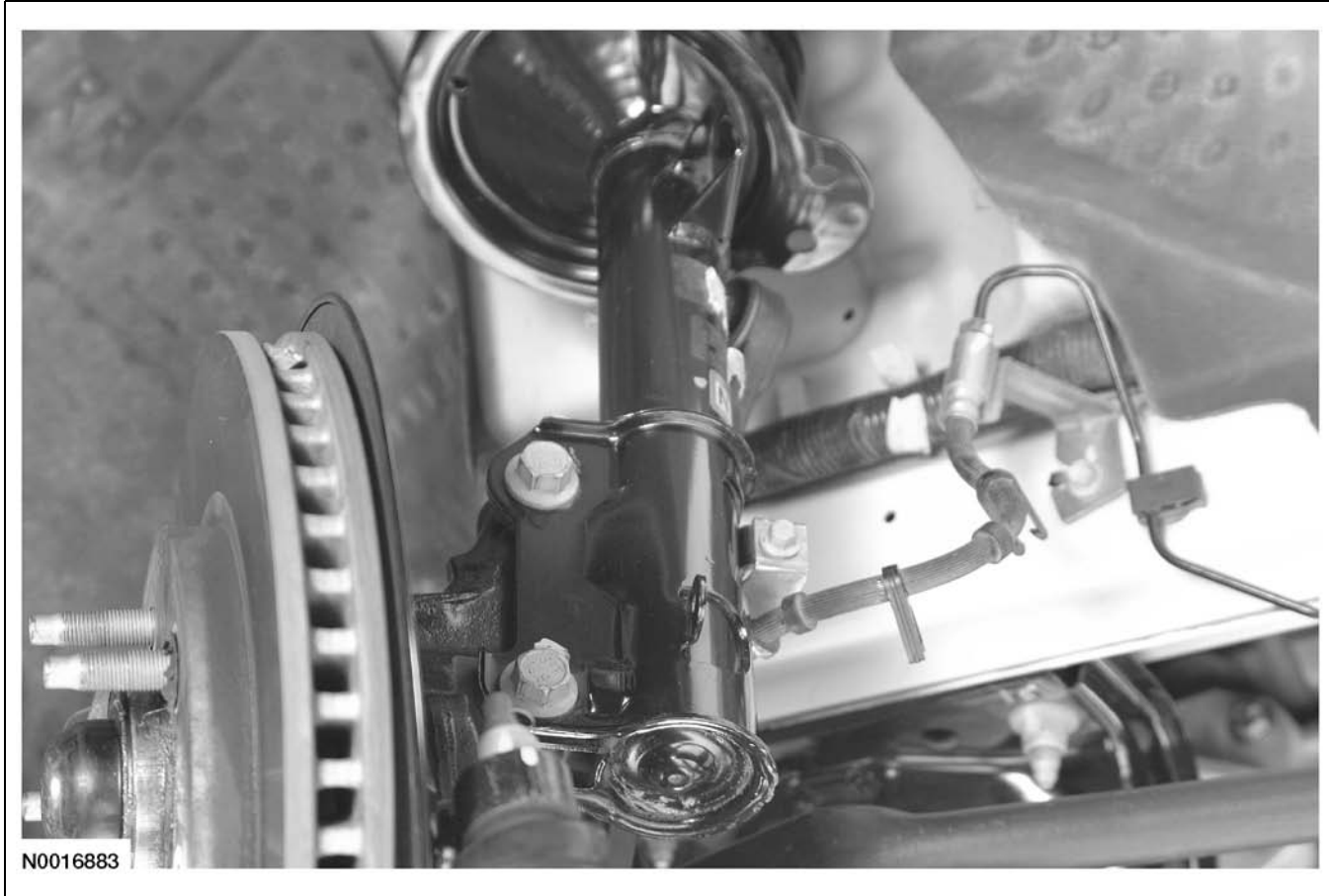
NOTES

OBJECTIVES

- Identify changes to the suspension system.
- Describe unique steering system components and service procedures.
- Describe the unique anti-lock brake and traction control system on the 2005 Mustang V-6 and Mustang GT.

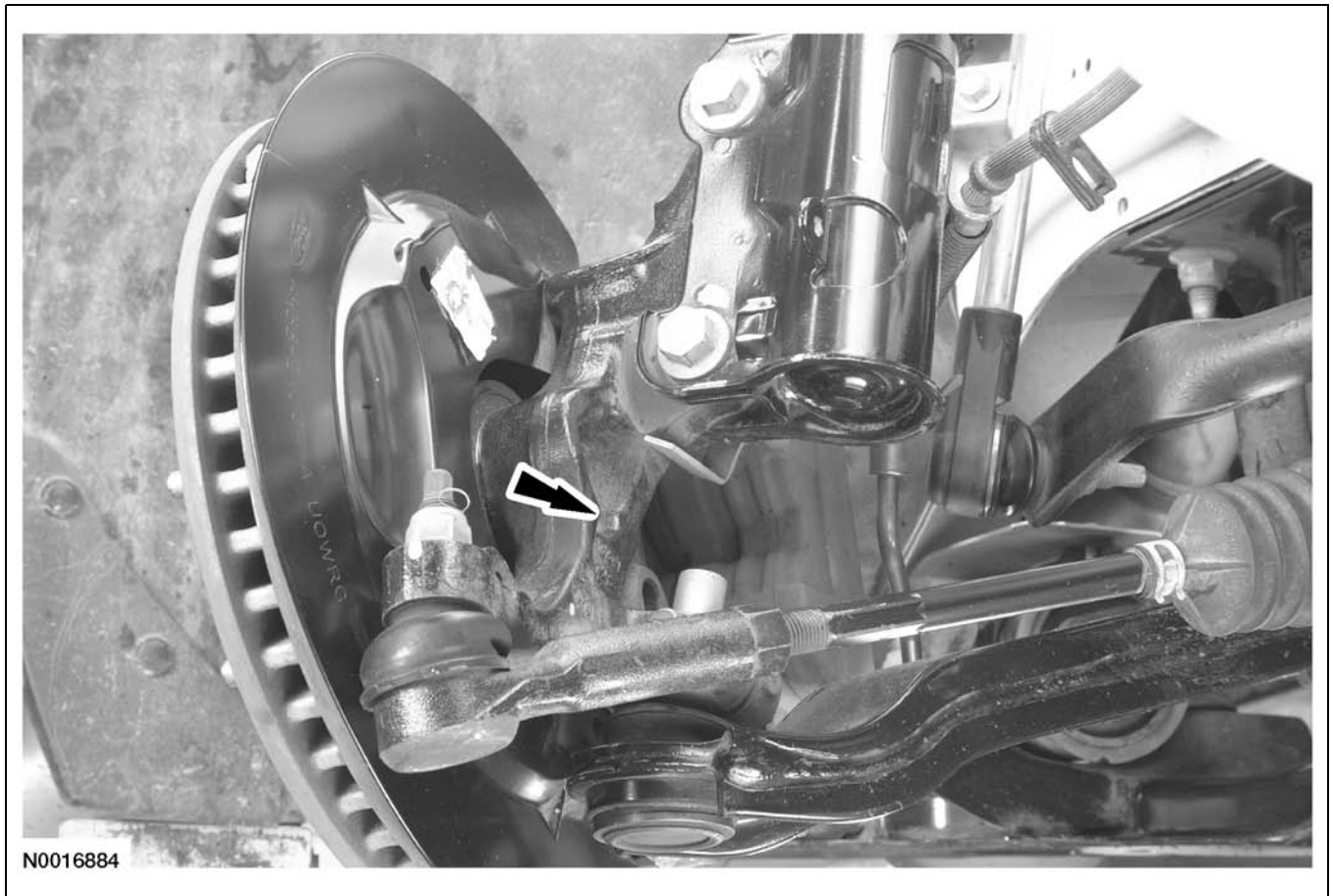
LESSON 2: CHASSIS

Suspension System



Front Strut

The front suspension is a MacPherson strut design with unique load rates for the Mustang V-6 and the Mustang GT. Camber and toe are adjustable on the front suspension systems. To adjust front camber, move the top of the strut and spring assembly. If camber adjustment is necessary to resolve a vehicle alignment issue, then slotting the strut at the lower mounting plate and installing cam bolts is an acceptable method. This procedure should not be routinely performed with all alignments but only after all other possibilities have been exhausted.



Front Knuckle

The MacPherson strut uses a clevis-style strut bracket attachment. Other interesting suspension changes are:

- Front knuckles unique from past Mustangs.
- A tubular front stabilizer bar
- Unique H-beam front lower control arm
- Lower spring seat isolator has been removed from the front strut

LESSON 2: CHASSIS



Rear Suspension

The rear suspension upper control arm includes a body bracket integrated in the control arm assembly. This bracket includes two body bracket bolts. The rear seat must be removed to access one of the body bracket bolts.

- Unique to the Mustang V-6 and Mustang GT is the panhard rod assembly that attaches to the left-hand side of the axle and to the right-hand side of the body.
- All panhard rod, shock and control arm bushings must be torqued at curb ride height to prevent bushing wind-up under a load.

Rear Drive Axle



Rear Drive Axle

The solid rear axle (SRA) assembly includes a tone ring which is replaced as an assembly with the axle shaft for ABS axles. ABS is optional on non-GT models. ABS and Traction-Lok™ are standard on GT models.

- Mustang V-6 axle ratios and axles are:
 - Conventional rear axle: Ford 7.5 inch ring gear with a 3.31 gear ratio for automatic and for manual transmissions
- Mustang GT axle ratios and axles are:
 - Traction-Lok™ (limited slip) rear axle: Ford 8.8 inch ring gear with a 3.31 gear ratio for the automatic transmission
 - Traction-Lok™ (limited slip) rear axle: Ford 8.8 inch ring gear with a 3.55 gear ratio for the manual transmission

LESSON 2: CHASSIS

Brake System



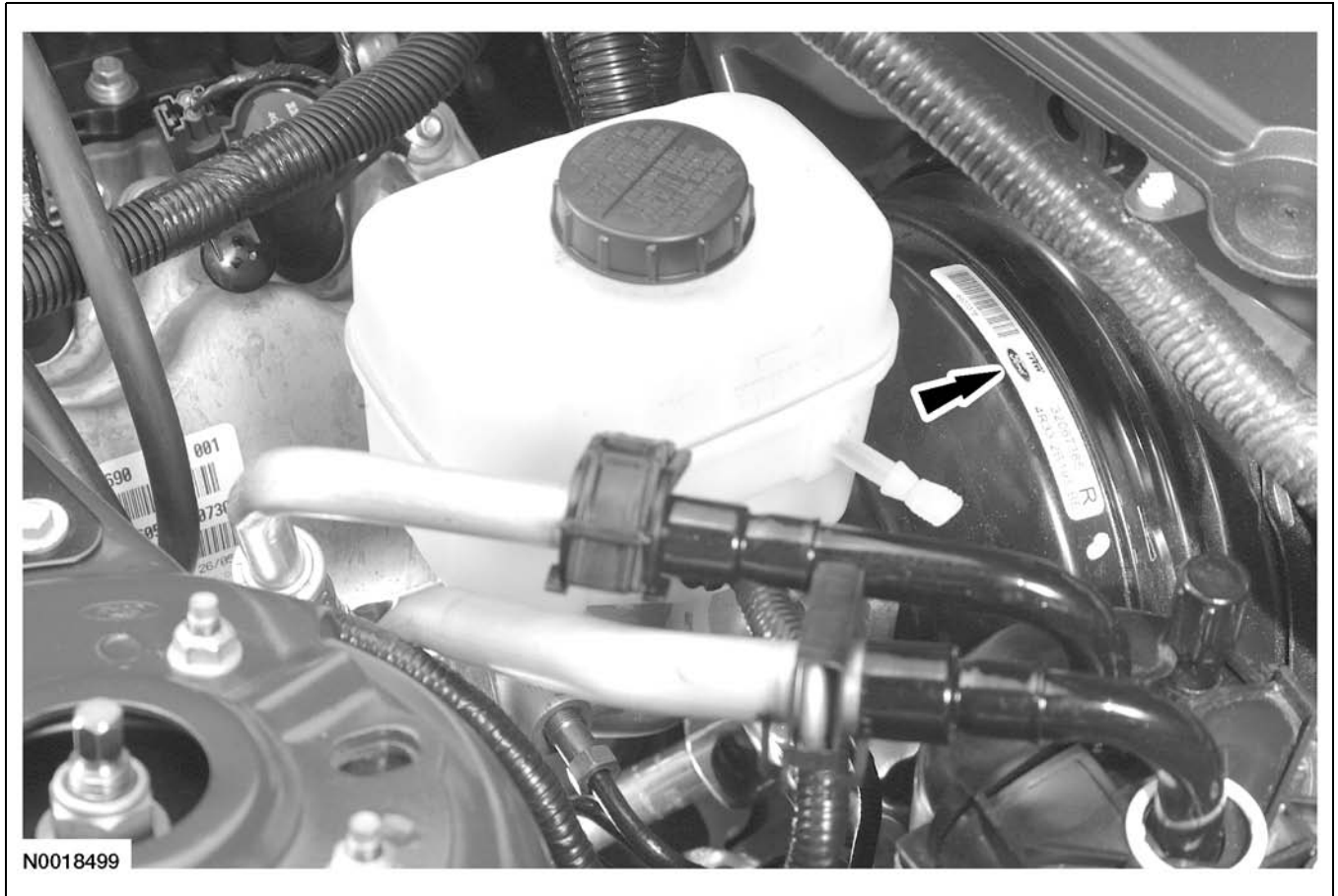
ABS Module

A four-wheel anti-lock brake system or anti-lock brake system with traction control (4WABS) is optional on all models. The four-wheel anti-lock brake system (4WABS) consists of the following components:

- Anti-lock brake control module
- Front and rear anti-lock brake sensors and indicators
- Hydraulic control unit
- Yellow anti-lock brake system (ABS) warning indicator
- Four channel brake system

The rear disc brakes utilize a single-piston brake caliper. The front disc brakes use a dual-piston brake caliper. The brake hydraulic system is split front-to-rear.

Brake Booster

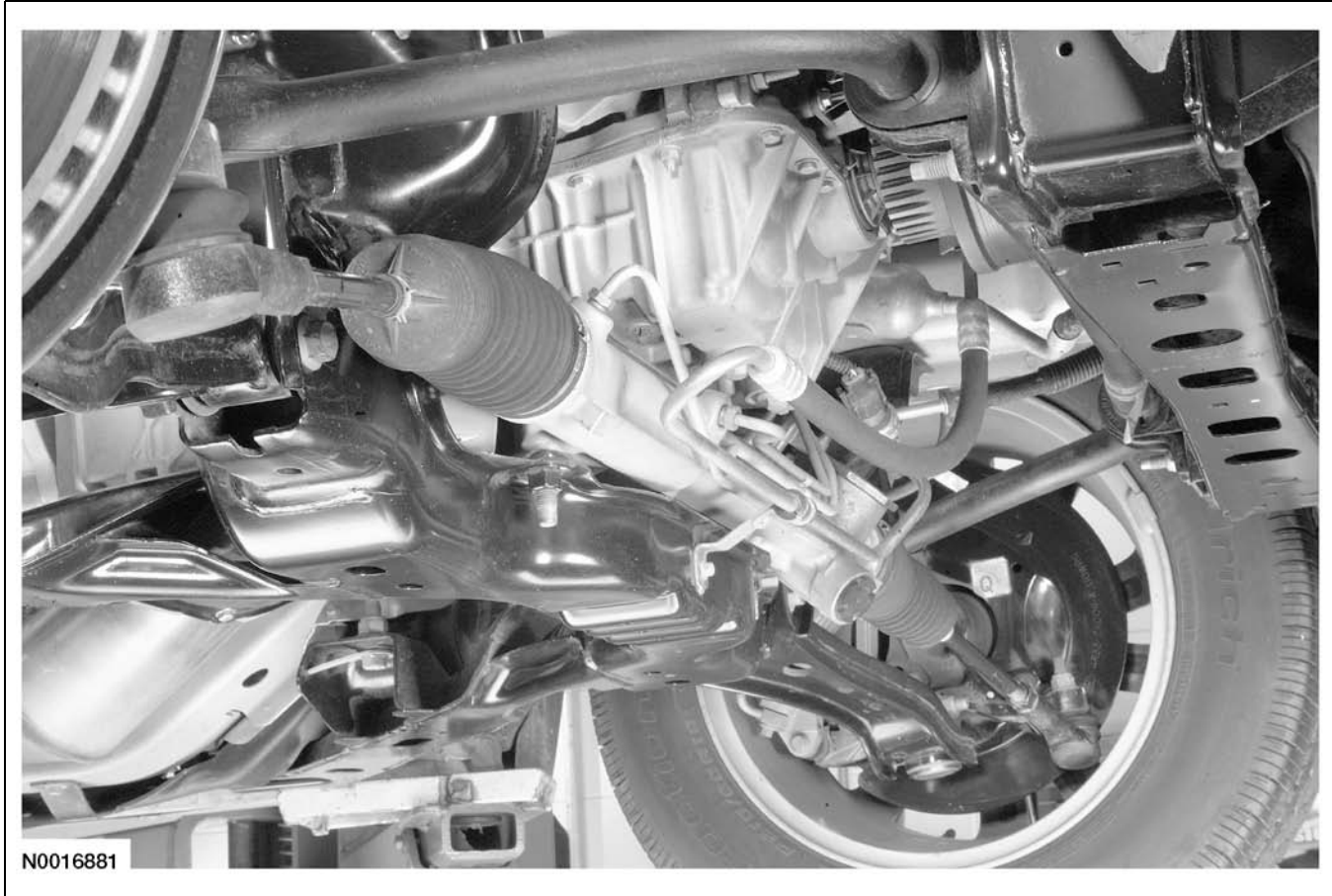


Vacuum Brake Booster

Hydroboost is not used on the 2005 Mustang. A vacuum assist brake booster is used on both the Mustang V-6 and the Mustang GT.

LESSON 2: CHASSIS

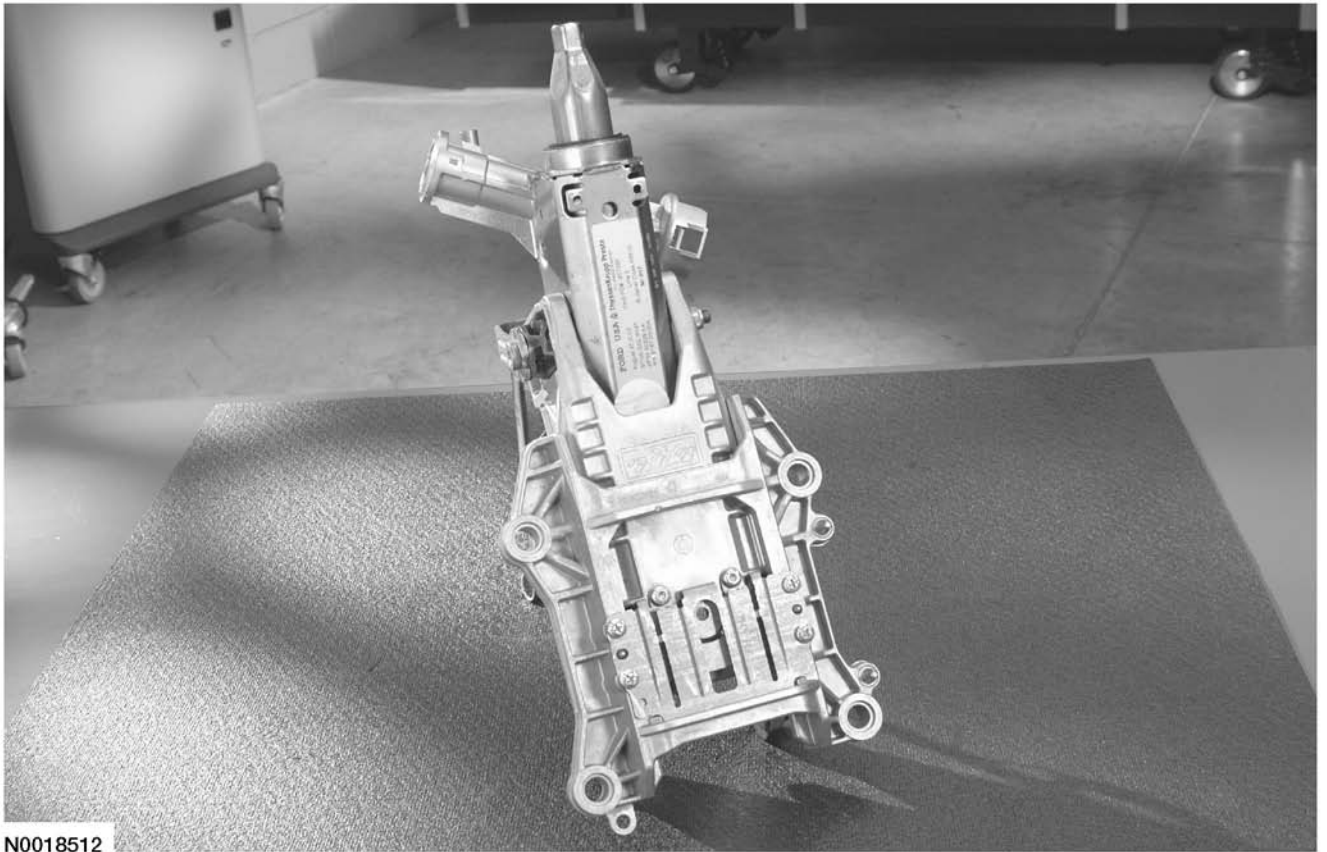
Steering



Steering Gear

The 2005 Mustang V-6 and Mustang GT feature a new rack-and-pinion steering gear similar to the Lincoln LS and the Thunderbird, but without variable assist power steering (VAPS). The steering gear isolators have also been eliminated because they are now incorporated into the front crossmember.

Steering Column

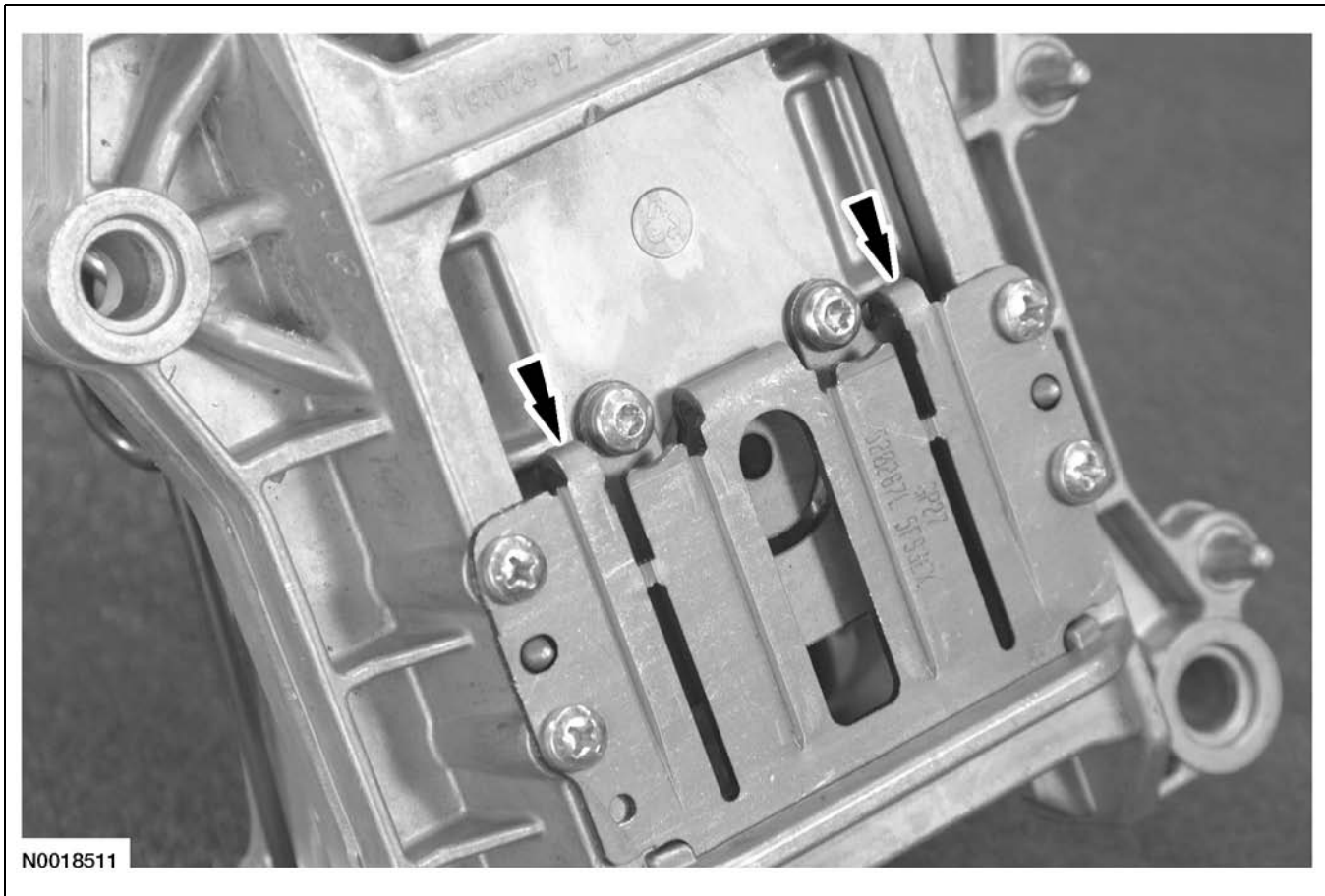


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Steering Column and Intermediate Shaft

The steering column and intermediate shaft are all new on the 2005 Mustang V-6 and Mustang GT. The body of the steering column is made of aluminum die castings. The lower attachment bracket of the steering column bends during collapse. A clip and washer are attached to the shear modules to reduce the steering column shake and to assist in installation.

LESSON 2: CHASSIS



Energy Absorption Sheets

The energy absorption sheets are made of 2 mm (0.07 in) thick bent steel sheet. If a crash occurs and the driver impacts the airbag steering wheel, this sheet provides controlled resistance load throughout the column stroke path.

**Steering Column Visual Indicator**

To determine if the steering column has collapsed, look at the steering column visual indicator. If the notch is plainly visible, the column has not collapsed. If the notch is not visible, replace the steering column.

NOTES

OBJECTIVES

- Identify available engines and transmissions.
- Describe the 4.0L engine modifications.
- Describe new service procedures for the 4.6L engine.
- Describe the 4.6L three-valve head.
- Describe the 5R55S automatic transmission changes.
- Identify the clutch differences between the V-6 and the V-8.
- Identify changes to the Tremec T5OD and TR3650 manual transmissions.
- Identify the one- and two-piece driveshaft applications.

LESSON 3: POWERTRAIN

Engine

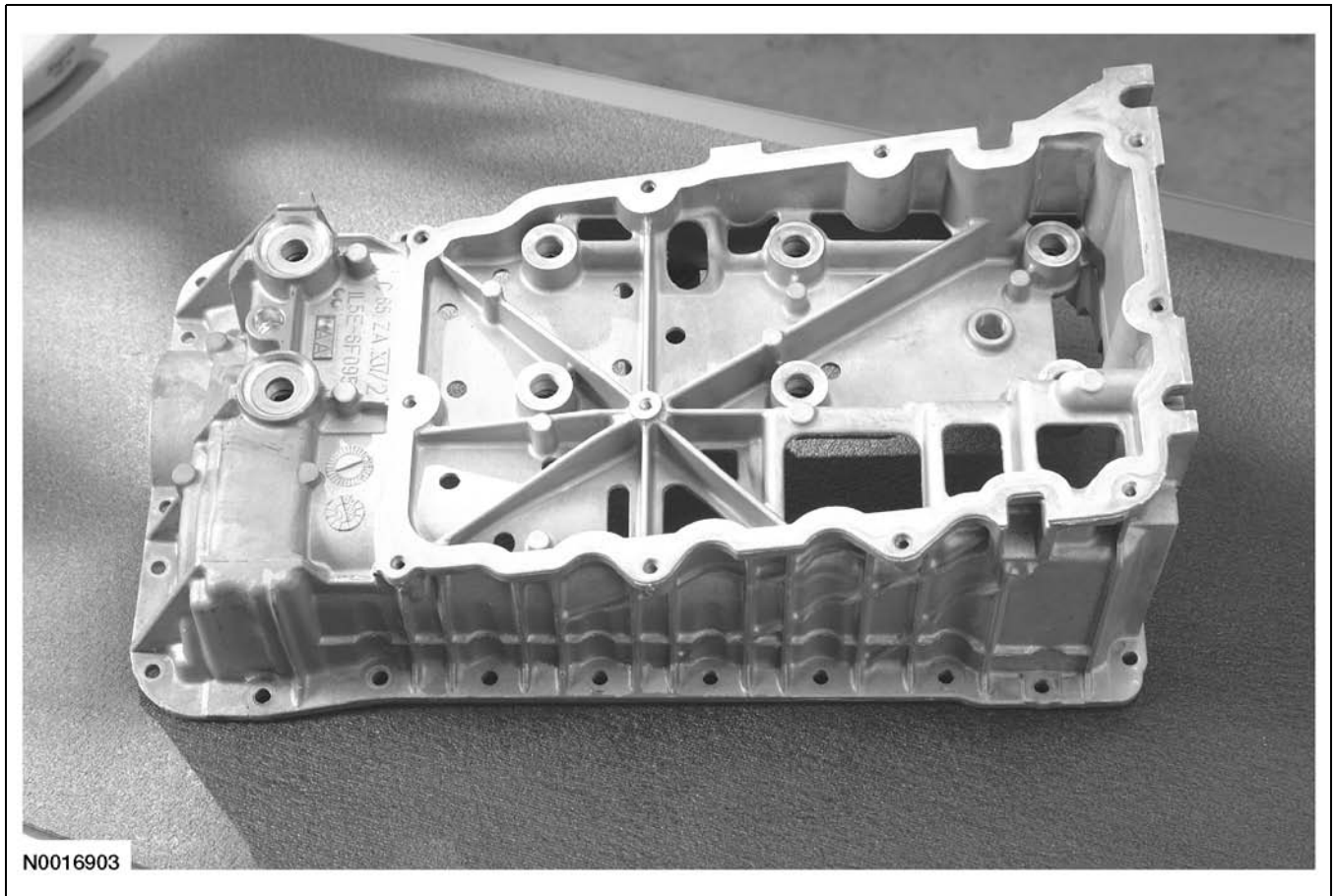


4.0L Engine

The 4.0L engine is the power plant used in the 2005 Mustang V-6. It is similar to the 4.0L engine used in the Ranger and base Explorer with the following exceptions:

- Balance shaft used in 4.0L with manual transmission to reduce NVH
- New composite upper intake manifold assembly
- New oil level indicator, oil filter and oil filter adapter
- New cast iron exhaust manifolds

The block can be serviced with a long or short block. The balance shaft assembly does not come with the short block. The current service procedure is to use the old balance shaft assembly if a short block is ordered.



4.0L Oil Baffles

Oil baffles attached to the main bearing caps reduce aeration for proper oil feed to the crankshaft during the kind of sustained lateral maneuvers encountered in performance driving. Without this arrangement, the oil in the crankcase can “slosh” to one side and become aerated during sustained driving around an oval-track type of environment.

LESSON 3: POWERTRAIN

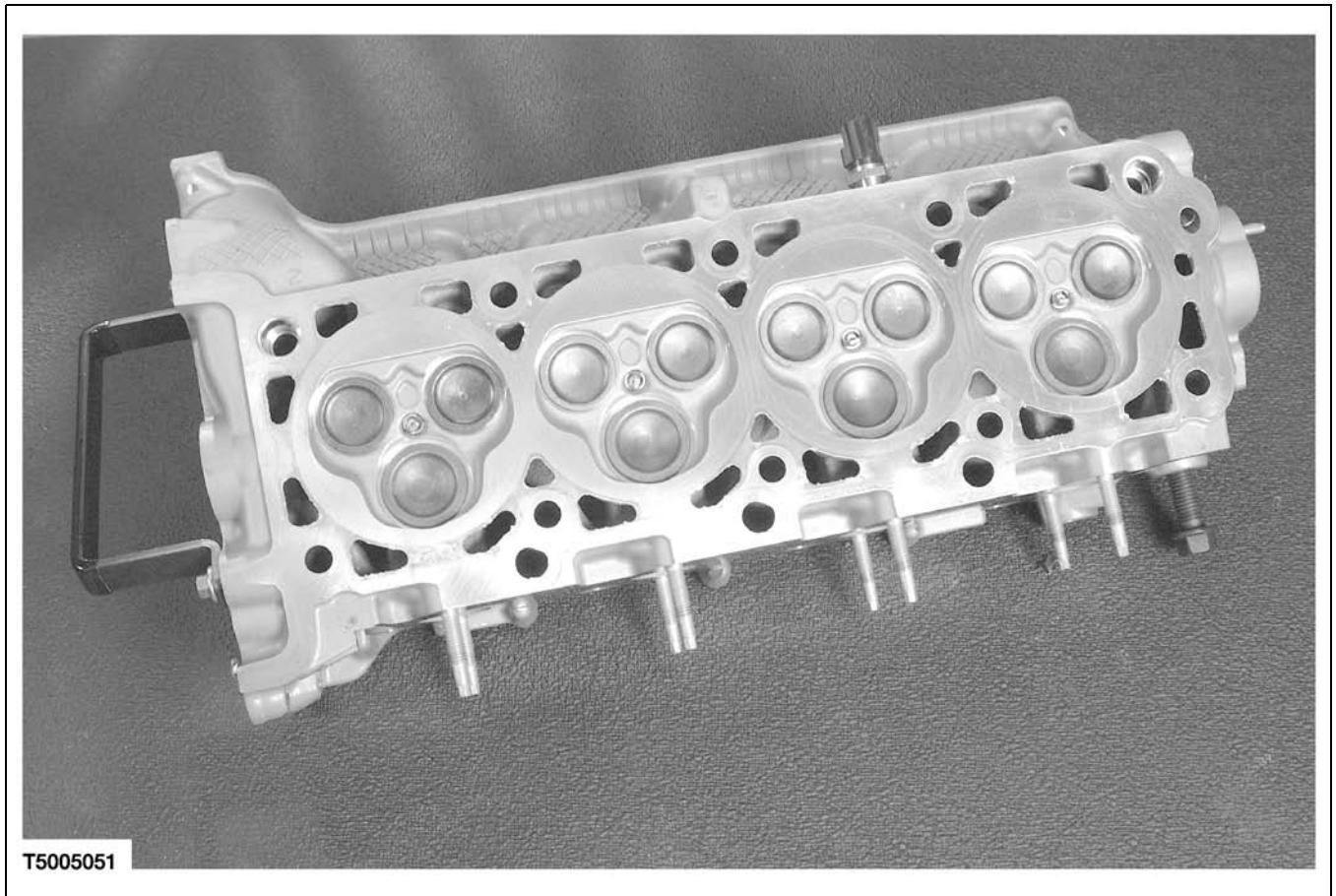
4.6L Engine



4.6L 3-Valve Engine

The 2005 Mustang GT is the first vehicle to use the 4.6L three-valve single overhead cam aluminum block engine. This block uses cast iron liners. The three-valve head has fewer moving parts than the 4.6L 4-valve head, but with all of the benefits. Fewer moving parts means less friction in the engine and fewer parts to wear. Some of the benefits of the three-valve head design are:

- Improved breathing
- Increased power output over the 2V design
- Ultra-low emission vehicle (ULEV II)



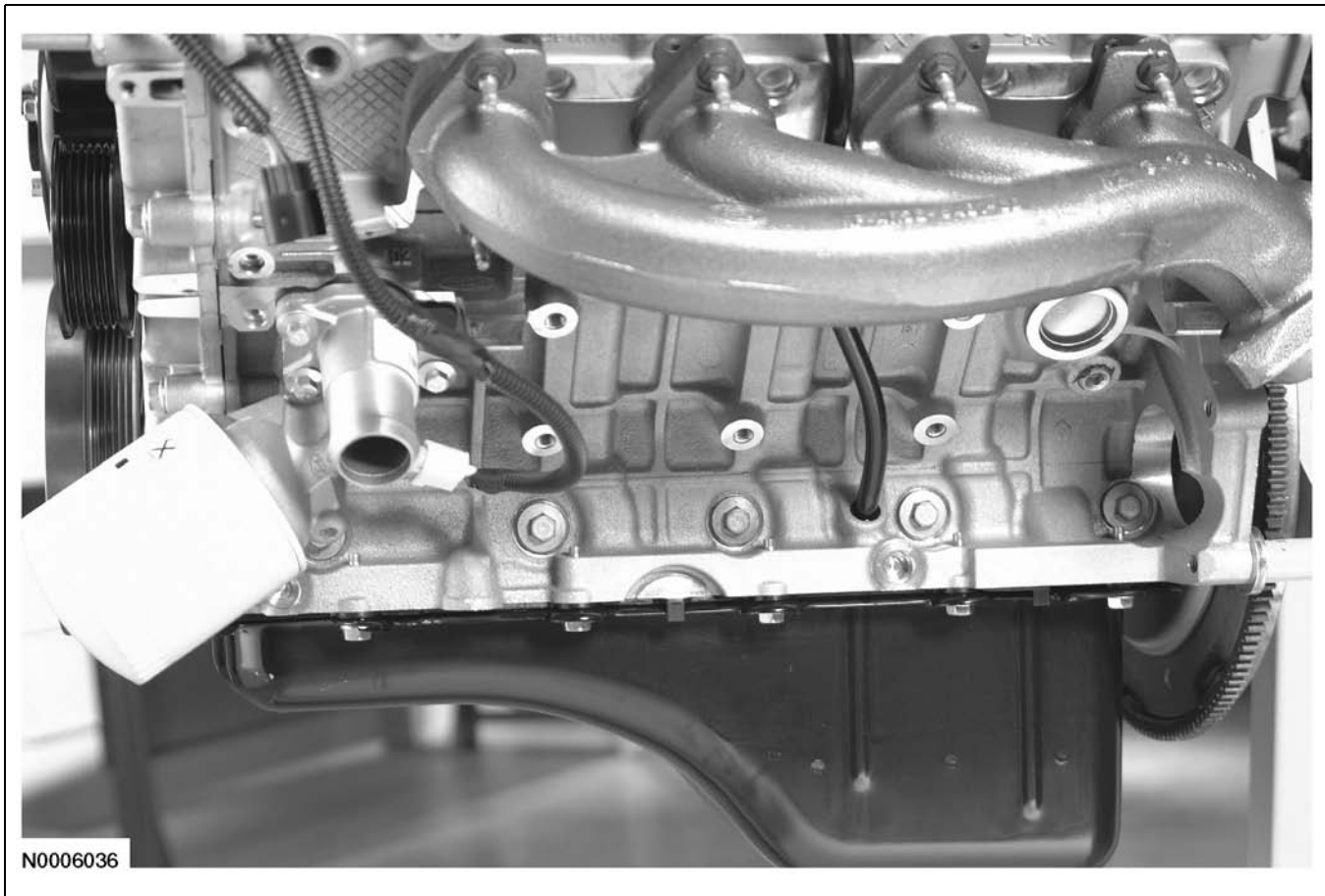
4.6L Cylinder Head

Ford modular engine architecture allows the Mustang GT to use the same aluminum heads as the new 5.4L, three-valve Triton V-8 used on the 2004 F-150, and the 2005 Expedition and Navigator. The heads from the two engines even share the same part number. The 4.6L Mustang GT engine is serviced similar to the 5.4L used in the F-150.

- This head uses a unique spark-plug
 - SKT-4419 is the part number for the spark plug socket
 - It is a 9/16 inch size

NOTE: The SKT-4419 can be ordered from Rotunda for \$9.95, plus the minimum shipping order.

LESSON 3: POWERTRAIN



4.6L Aluminum Block

The Mustang GT 4.6L engine also uses a new composite upper intake manifold assembly and an aluminum block. Service procedures are similar to the 4.6L two-valve engine.

VCT Operation



VCT

The theory of operation for the 4.6L VCT is the same as the 2004 Ford F-150 with the 5.4L.

- The major differences are:
 - The 4.6L VCT system controls both intake and exhaust valve timing because the 3-valve setup uses one cam for both intake and exhaust valves.
- The VCT can vary cam timing within a range of 60 degrees of crankshaft rotation.
 - Defaults to full advance.
 - Requires engine oil at preset temperature before VCT will function.

LESSON 3: POWERTRAIN

The basics of VCT operation are:

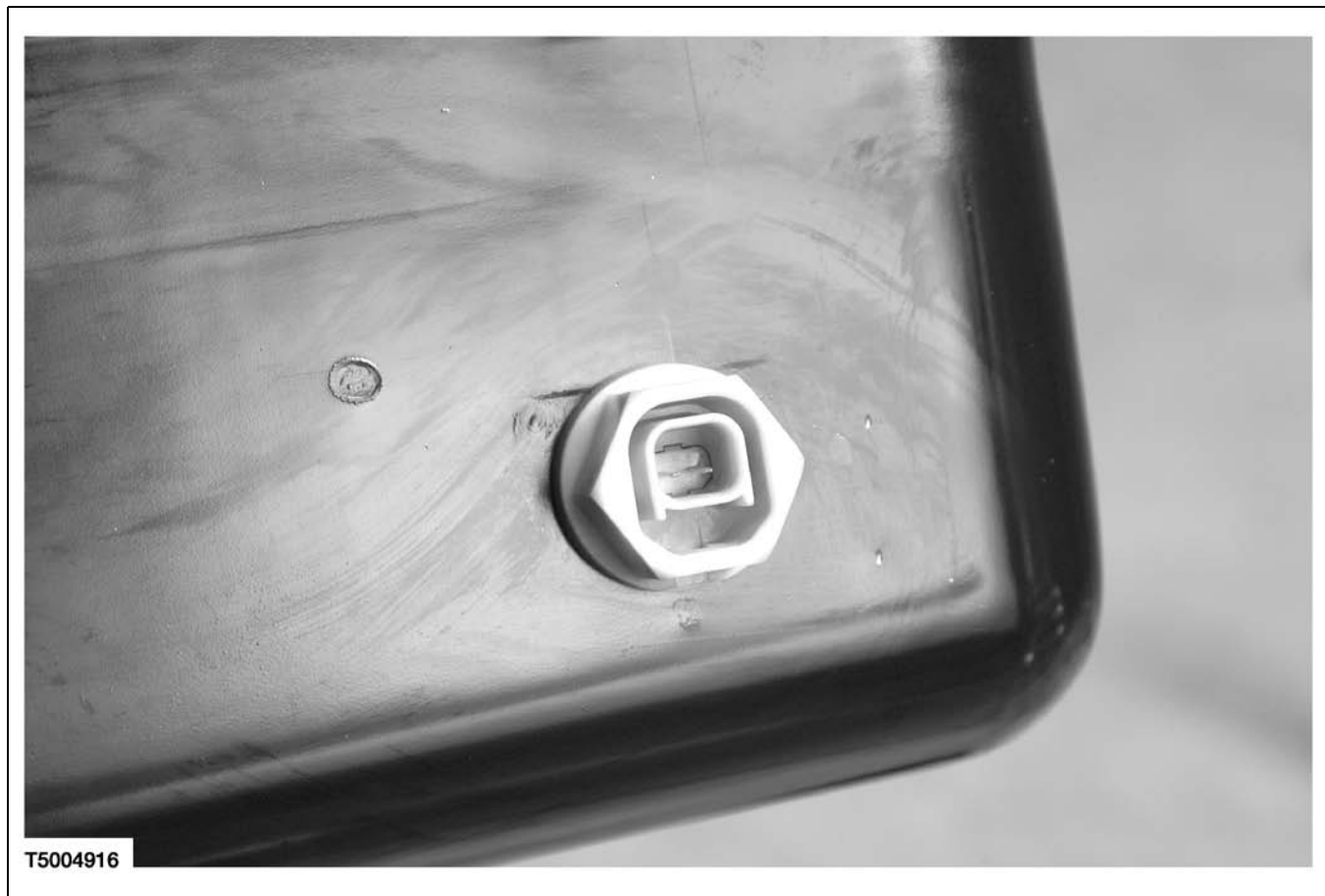
- A hydraulic timing mechanism (VCT phaser) rotates the camshafts in relation to their drive sprockets.
 - Provides performance that is precisely tailored to the engine speed and load.
 - VCT is electronically controlled (PCM duty cycled) and hydraulically operated.
- The VCT solenoid moves a spool valve to control the flow of oil through the VCT system.
 - Oil flows from the head into the VCT valve body.
 - Oil flows through the advance or retard passages as directed by the spool valve.
- Oil flows through the VCT valve body:
 - To the chain tensioner.
 - Through a metered orifice back into the head.
- Major sensor inputs:
 - CMP
 - Oil temperature sensor



4.6L 3-Valve Camshaft Position Sensor

The VCT system requires a cam position sensor for each camshaft.

- The PCM can then monitor the actual camshaft position relative to the requested position.

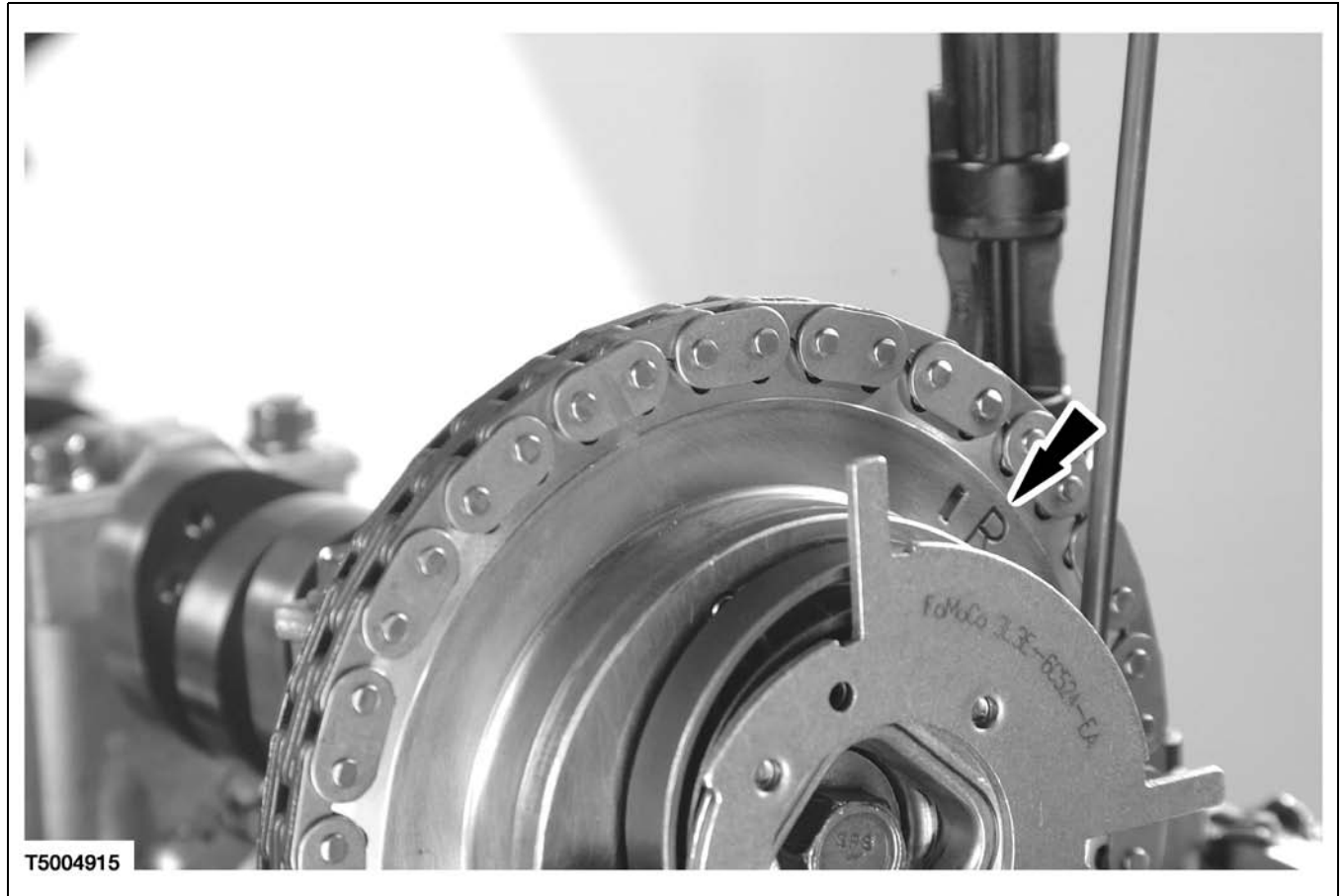


Oil Temperature Sensor

The VCT system uses a replaceable oil temperature sensor, located on the oil pan.

- Engine oil temperature has a direct effect on VCT operation.
 - Cold engine oil has high viscosity and slower flow characteristics.
 - The VCT system is disabled at oil temperatures below -7°C (18°F).
 - The PCM uses time-since-start, engine oil temperature and engine rpm to calculate VCT solenoid operation.
 - Time-since-start ranges from 60 seconds when cold to 10 seconds when hot.
- Engine oil recommended drain intervals must be followed to ensure integrity of VCT system.

Phaser Components



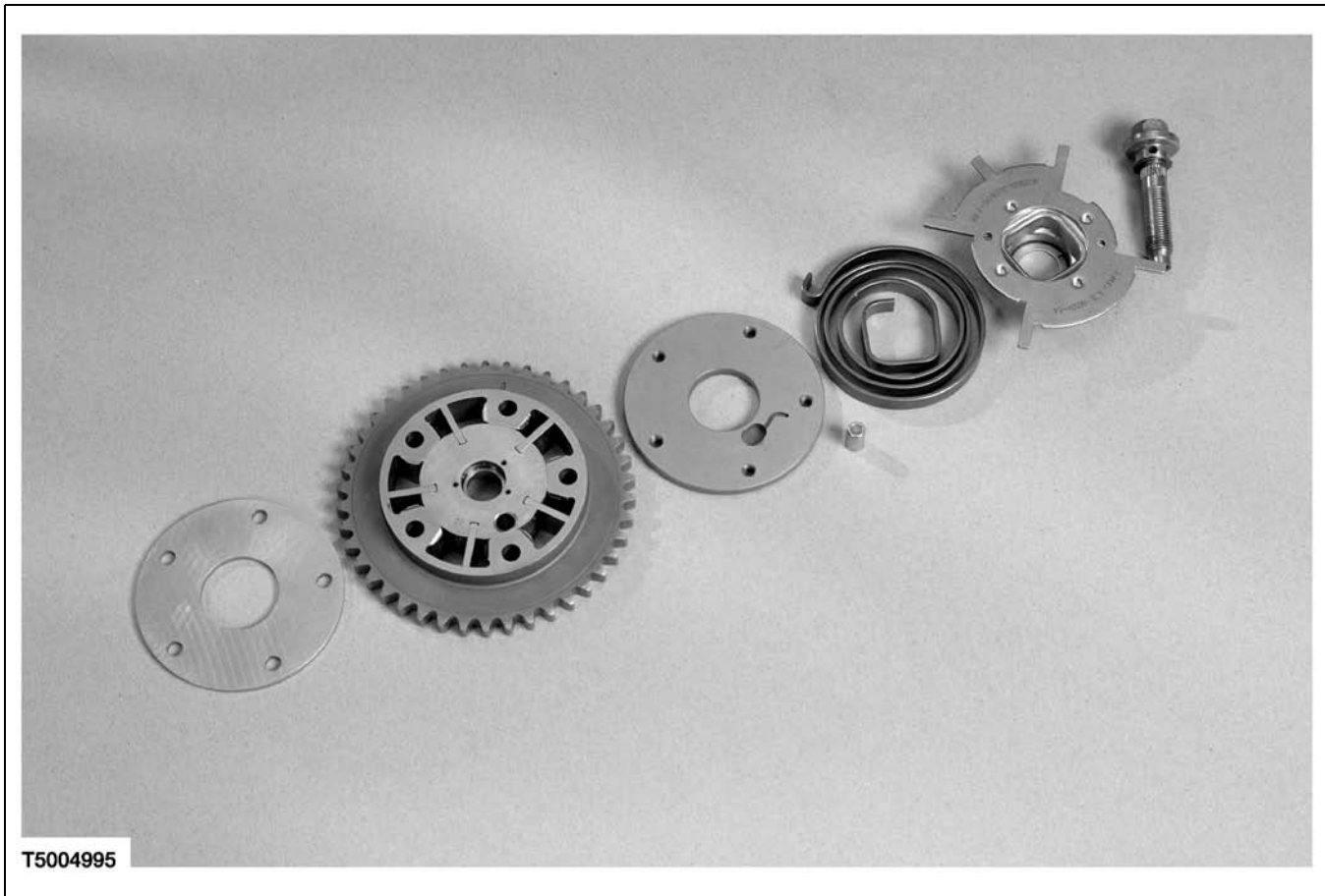
VCT Phaser

The VCT components include:

- Right and left camshaft phaser sprockets
- Right and left camshaft phaser sprocket assembly bolts and washers
- VCT valve bodies (housing)
- VCT solenoids
- Right and left camshafts

NOTE: The phaser, the phaser sprocket, the vanes and the return spring are serviced as an assembly.

NOTE: The “R” on the right phaser was discontinued with the 2005 model and up.



VCT Phaser Disassembled

The VCT phaser varies camshaft timing in response to oil pressure exerted on either side of the vanes.

⚠ CAUTION: Only use hand tools to remove the camshaft phaser sprocket assembly or damage may occur to the camshaft or camshaft phaser unit.

- The phaser contains several components, **but is serviced only as an assembly**. The components are:

- Rotor
- Spring
- Vanes
- Sprocket
- Locking collar and pin

⚠ CAUTION: Always install a new bolt and washer whenever the VCT phasers are loosened.

⚠ CAUTION: Handle the cam and phaser carefully. Damage will occur if dropped or mishandled.



VCT Solenoid Removal

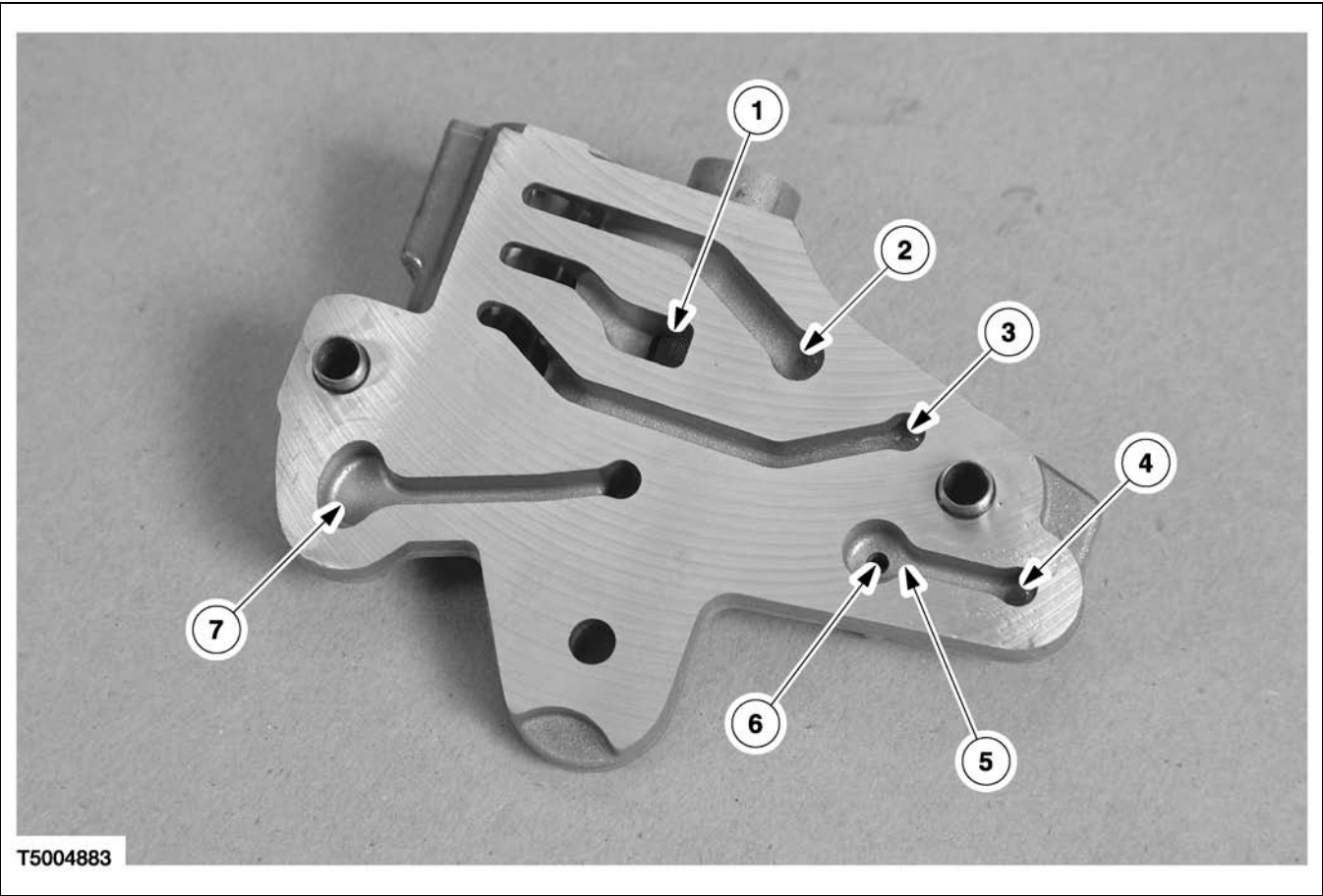
The VCT solenoid is serviced separately from the VCT valve body. No special tools are needed to remove the solenoid.

1. Disconnect the solenoid electrical connection.
2. Remove the valve cover grommet.
3. Remove the hold-down bolt.
4. Remove the solenoid.

⚠ CAUTION: Do not drop the solenoid screw into the front cover. If the screw drops into the front cover, the front cover must be removed to retrieve the screw. Do not use power tools to remove the screw.

⚠ CAUTION: Use care to prevent contamination from falling in the valve body spool bore. Thoroughly clean around cam cover and solenoid seal before removing seal and solenoid.

LESSON 3: POWERTRAIN



VCT Valve Body Oil Passages

Item	Description
1	Solenoid filter
2	Oil passage to advance side of VCT
3	Oil passage to retard side of VCT
4	Oil passage to chain tensioner

Item	Description
5	Oil passage back into head
6	Oil metering orifice
7	Oil passage from head

The valve body and solenoid work together to route oil to the vanes in the camshaft phaser to operate the VCT system.

NOTE: The solenoid filter is not removable or serviceable and is located in the valve body. The filter is designed to be self-cleaning and should not require any service. Oil drain interval recommendations are still important.



Locking Pin

The locking pin locks the camshaft in a fully advanced position when the engine is off.

- The pin locks the phaser to the camshaft during startup.
- After startup, oil pressure at the VCT assembly will unlock this pin, allowing VCT operation to resume.
 - VCT does not control valve timing until the oil temperature reaches 32°F (0°C).
 - Makes it easier to start engine.
 - Reduces noise on startup.

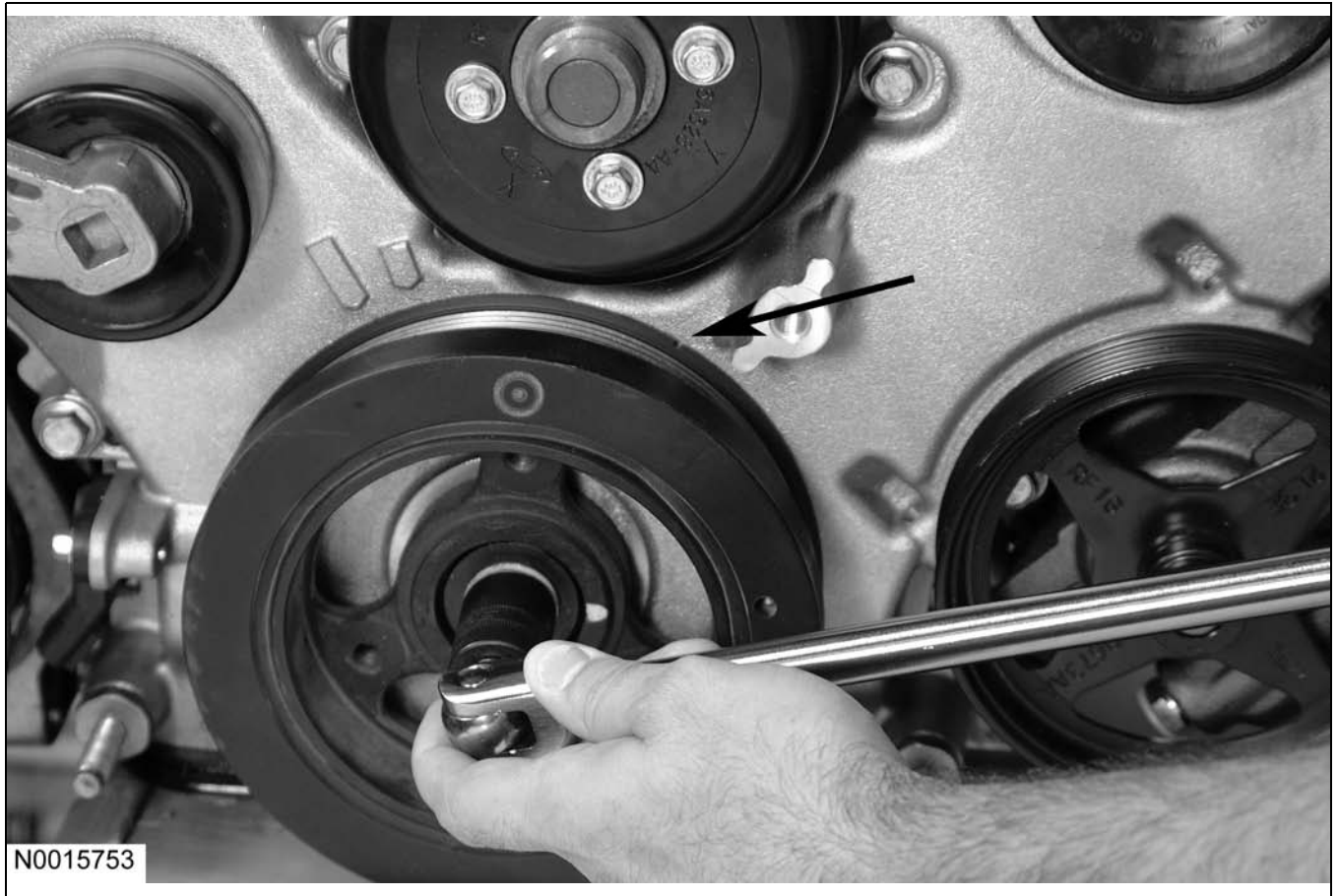
LESSON 3: POWERTRAIN

Phaser/Camshaft Removal Procedure



Remove Valve Cover

1. Remove the LH and/or RH valve covers.



Set Crankshaft Damper Notch to One O'clock Position

2a. Set the crankshaft keyway to 12 o'clock. The machined notch on the back face of the damper pulley should appear at about the one o'clock position.

NOTE: The number one piston should have just passed TDC when the crank was turned the normal rotational direction of engine operation.

LESSON 3: POWERTRAIN

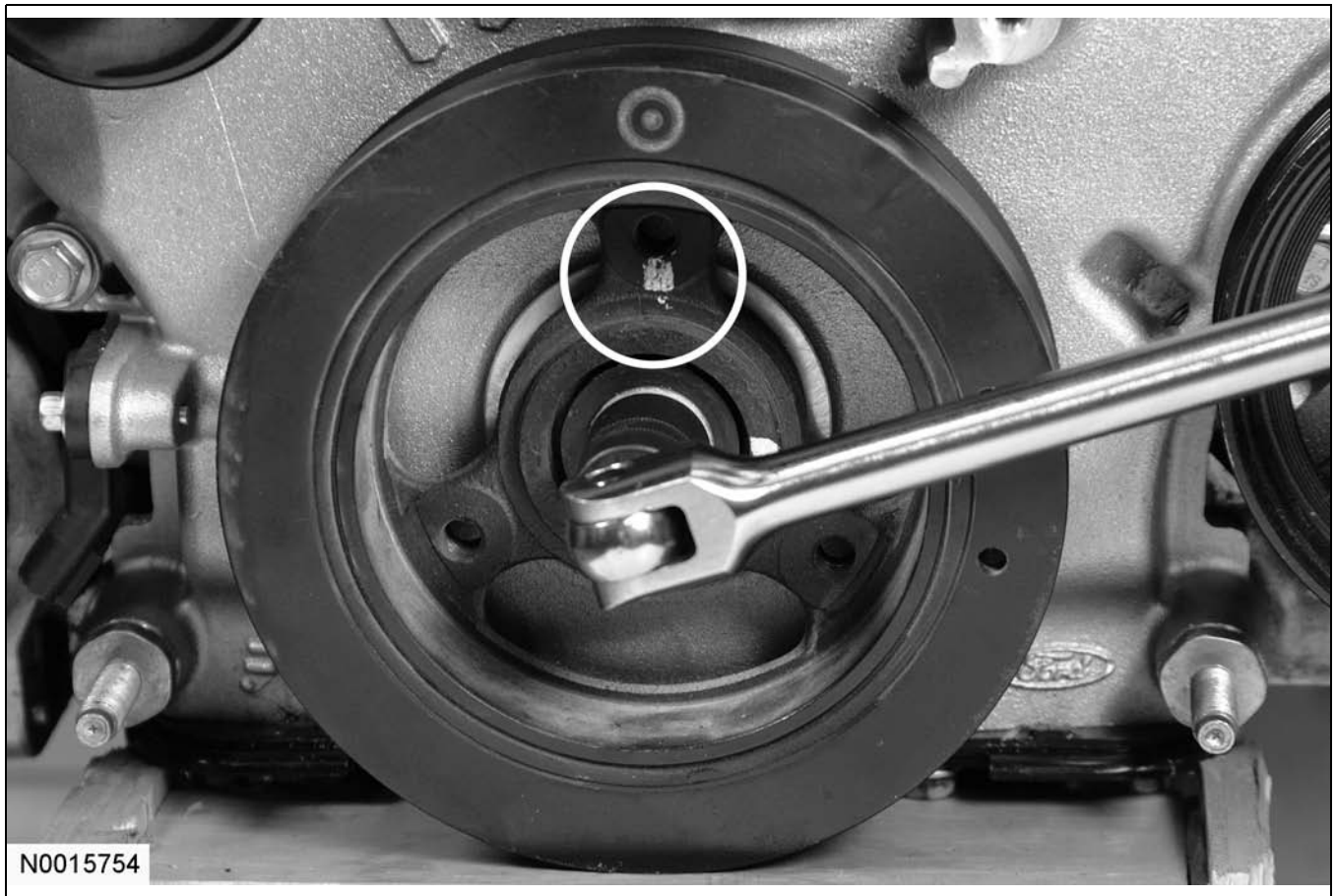


Cam Lobe Positioning

Item	Description
1	Cam lobe

Item	Description
2	Exhaust cam lobe for #1 cylinder

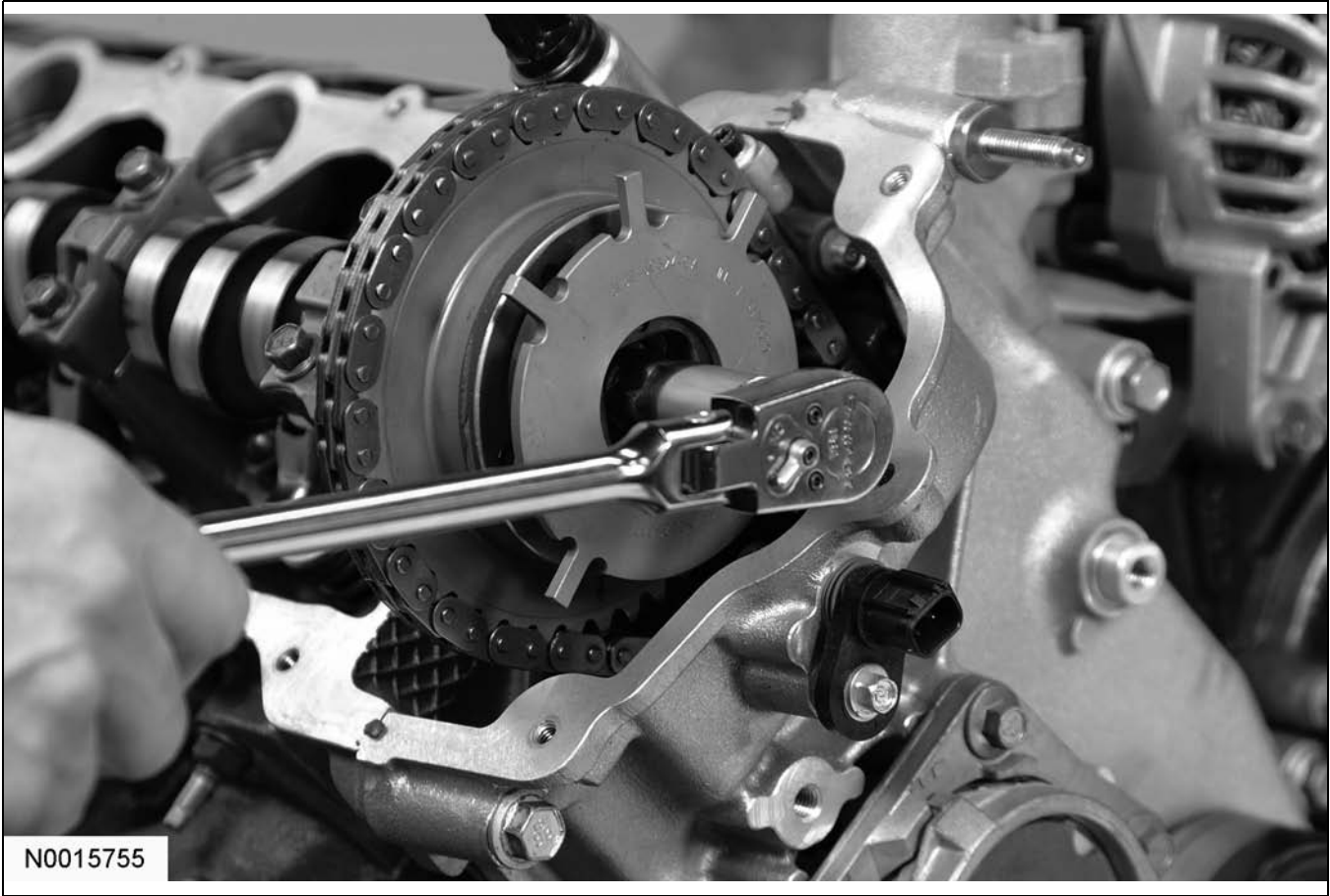
2b. The camshaft lobes must be positioned with the #1 exhaust lobe facing inward. If the lobes are not positioned this way, the crankshaft will require one full additional rotation to 12 o'clock. This positions the #1 cylinder on the exhaust stroke.



Mark Crankshaft Damper

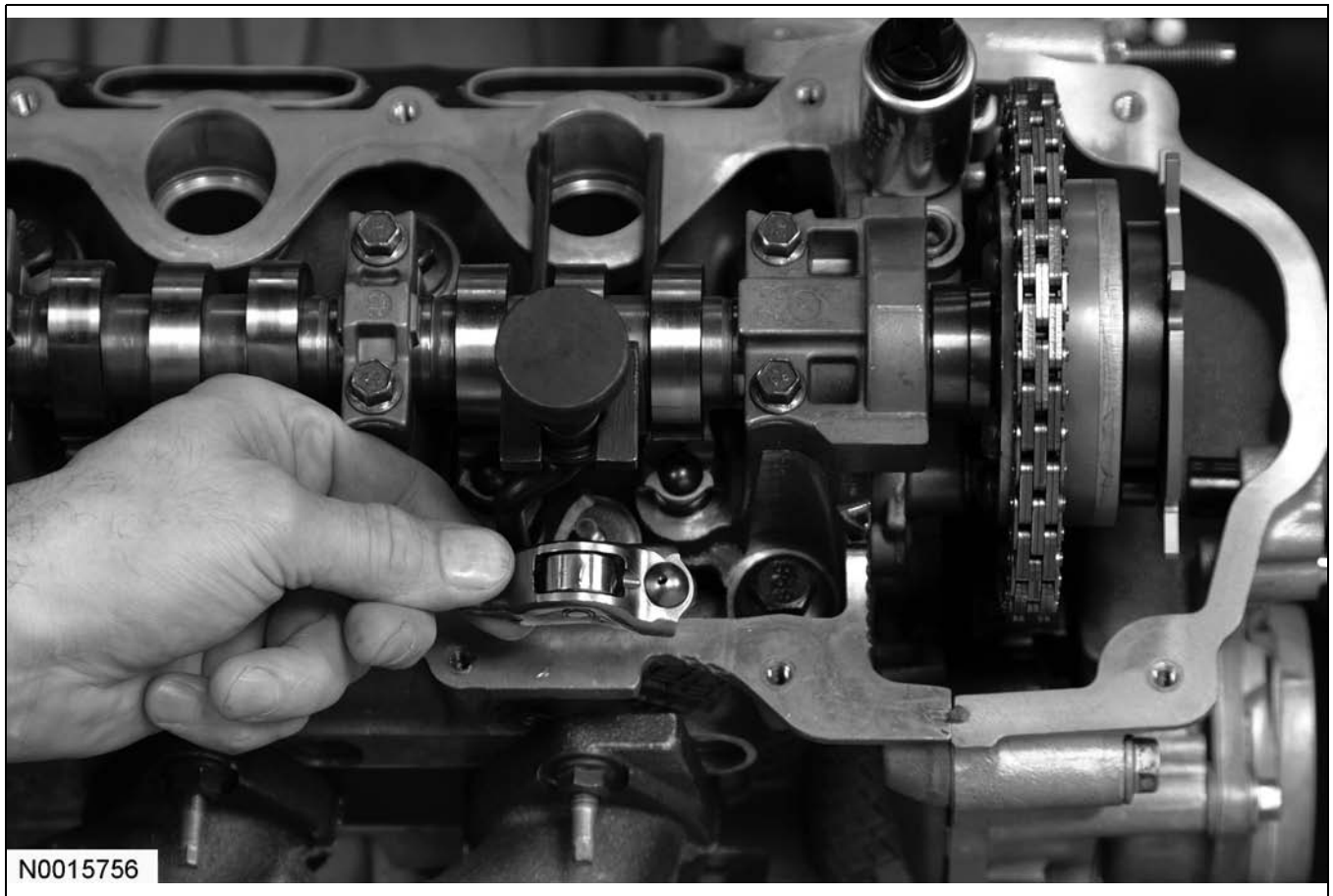
3. The damper spoke pointing upwards just to the left of the machined notch is the one with the keyway cut in it. Chalk mark that spoke for easy viewing.

LESSON 3: POWERTRAIN



Loosen One Turn

4. Loosen the camshaft phaser bolt one turn. Do not remove the bolt.



Remove Only the Indicated Followers

5. Withdraw the exhaust follower toward the exhaust valve tip. Withdraw the intake follower toward the intake valve tip. Use special tool 303-1039 Valve Spring Compressor.

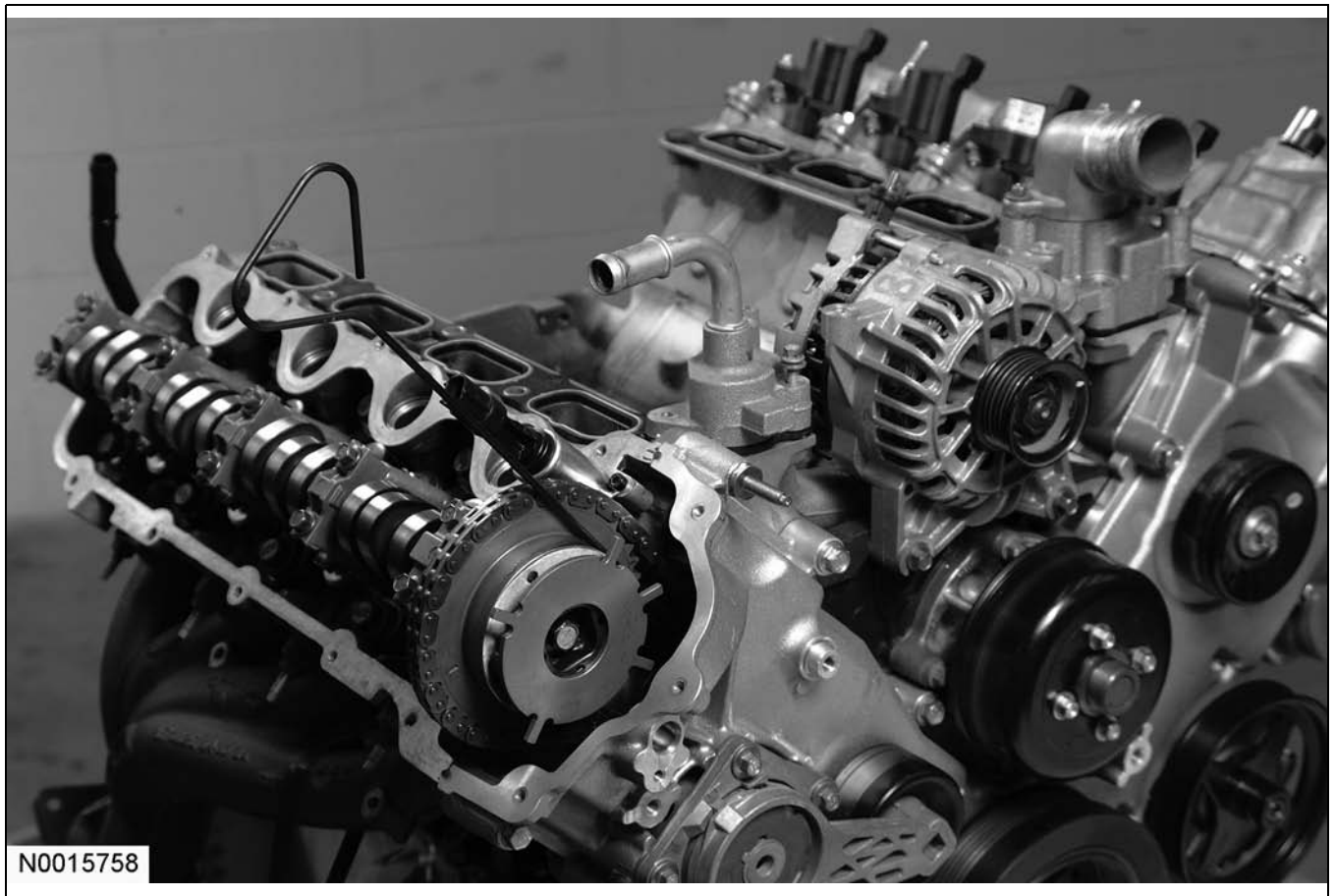
- On the right side of the engine, remove the following followers:
 - #1 cylinder - exhaust only
 - #4 cylinder - both intakes
- On the left side of the engine, remove the following followers:
 - #8 cylinder - exhaust only
 - #5 cylinder - both intakes

LESSON 3: POWERTRAIN



Set Crankshaft Damper Spoke to 6 O'clock Position

6. Rotate the damper clockwise to the 6 o'clock position. The only time the engine is turned counter-clockwise to 12 o'clock keyway position is during the reassembly procedure.



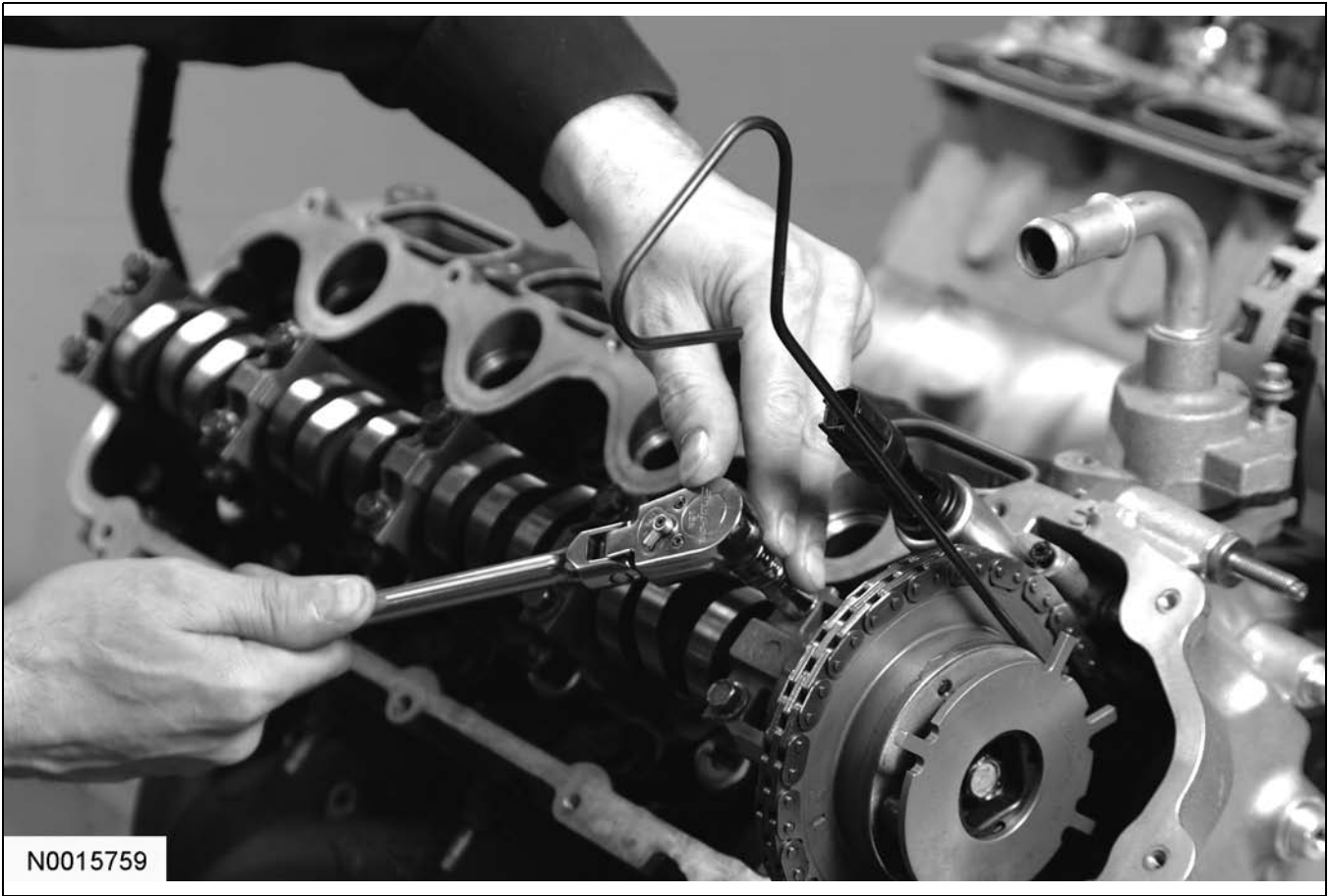
Insert Timing Chain Wedge Tool

7. Insert the timing chain wedge tool between the chain spans. Four to six clicks will hold it.

- The VCT timing chain wedge is used to hold the timing chain in place when the phaser is removed.
- The tools required for this procedure:
 - ESST 303-636 Timing Chain Wedge 303-636 Timing Chain Wedge
 - ESST 303-637 Handle 303-637 Handle

8. Mark the chain to the phaser for proper reinstallation.

LESSON 3: POWERTRAIN



Loosen #1 Camshaft Bearing Cap Bolts

9. Loosen the camshaft bearing caps, starting with the #1 cap because it contains the thrust surface groove. If the cam were to be moved in some fashion with this cap intact, the cap may be damaged or broken. Be sure to mark the caps to reinstall exactly as removed.

10. Remove the remaining cap bolts according to Workshop Manual procedures.

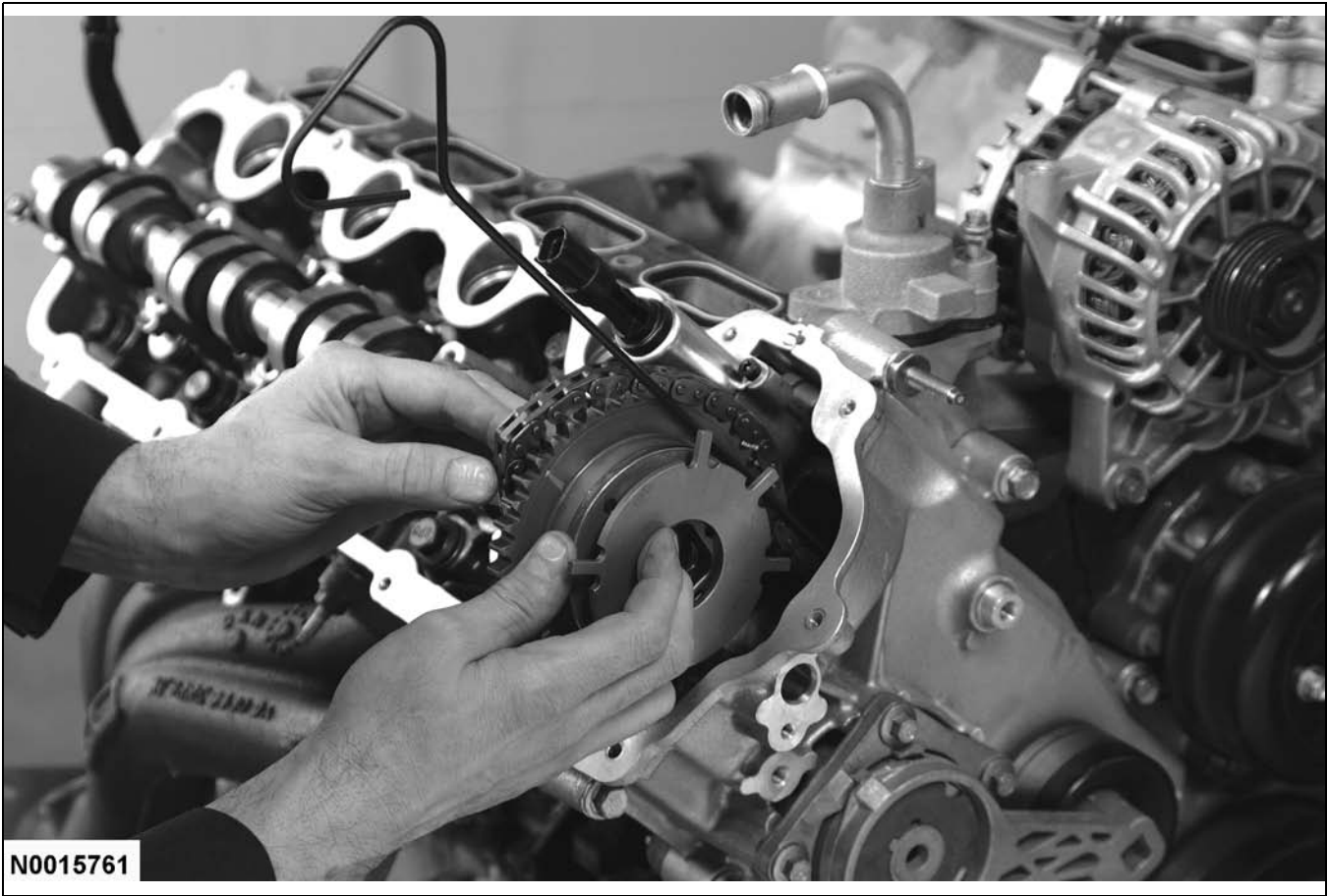


Remove the Phaser Bolt

11. The remaining followers will be loose on the lifters. Be sure to keep them in place so that the camshaft can be installed.

- a. Remove the CMP sensor.
- b. Fully withdraw the camshaft sprocket phaser bolt by hand.

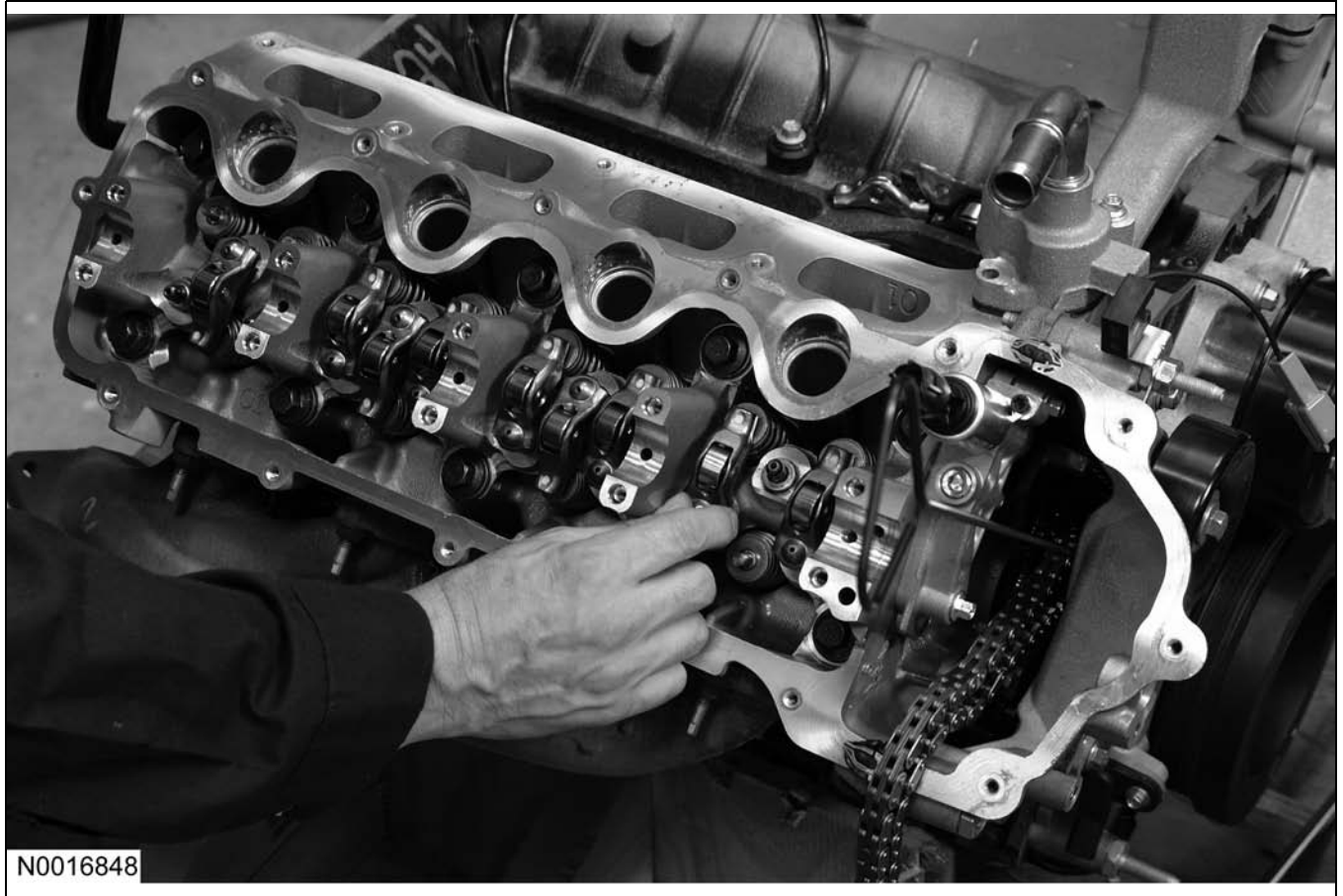
LESSON 3: POWERTRAIN



Remove the Phaser

12. Using extreme care, withdraw the phaser from the nose of the camshaft. It may be necessary to slightly tip up the cam from the rear to allow chain disengagement.

Cam and Phaser Reassembly



Seating Cam Followers

Care should be taken to ensure that the remaining followers are properly seated prior to camshaft reinstallation.



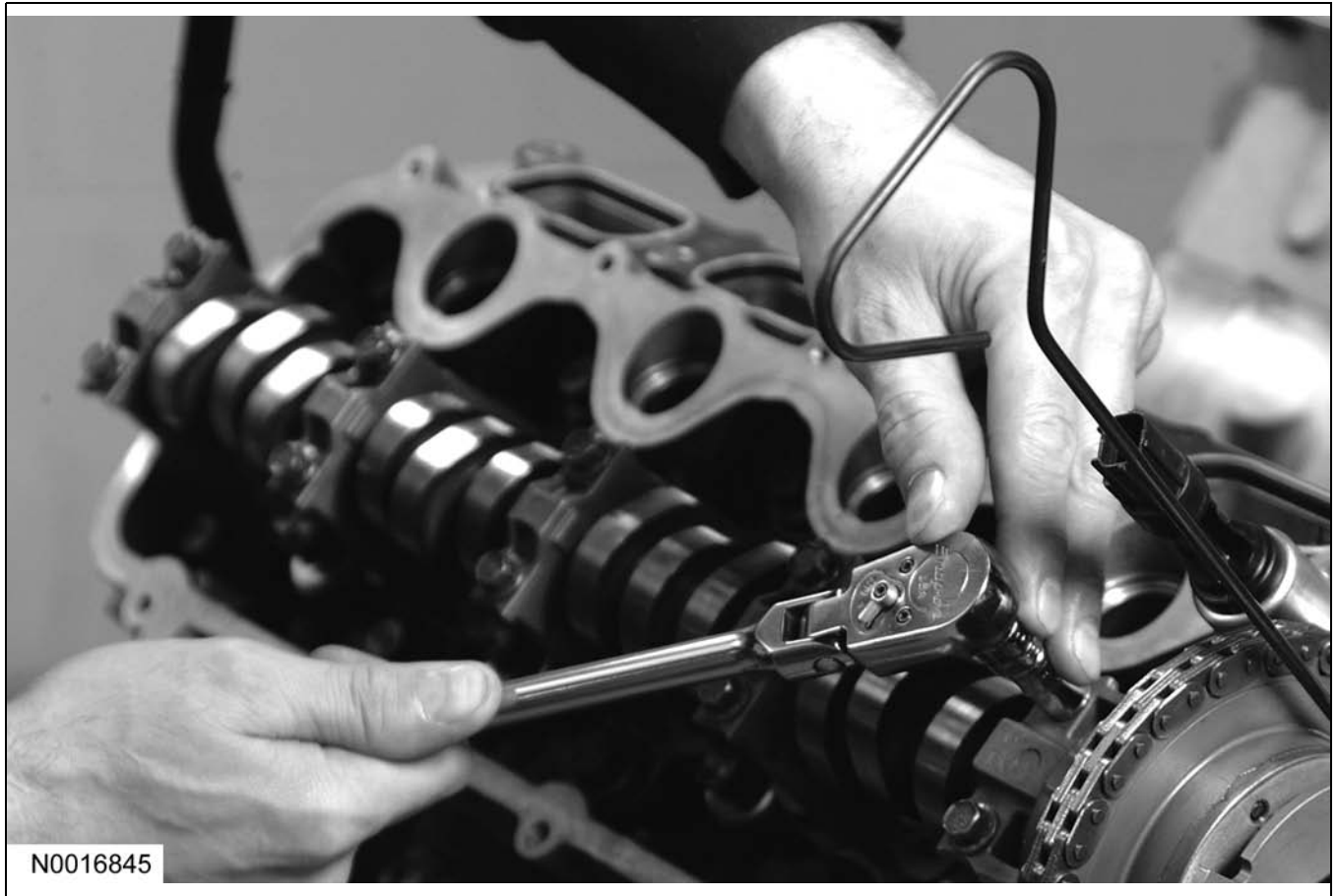
Phaser Pin and Cam Notch

Item	Description
1	Phaser Pin

Item	Description
2	Cam Notch

It is extremely important to align the phaser pin with the camshaft end notch.

- If these are not aligned during installation, the phaser and camshaft will be damaged.



Installing the Bearing Caps

Install the camshaft bearing caps in the reverse order of removal.

- The front cap should be installed last to prevent the cap from breaking.

Next, install the phaser bolt by hand. Remove the timing chain wedge. Rotate the crankshaft pulley counter-clockwise to the 12 o'clock position.

NOTE: Tighten the phaser bolt to 40 Nm (30 lb-ft), plus 90 degrees.

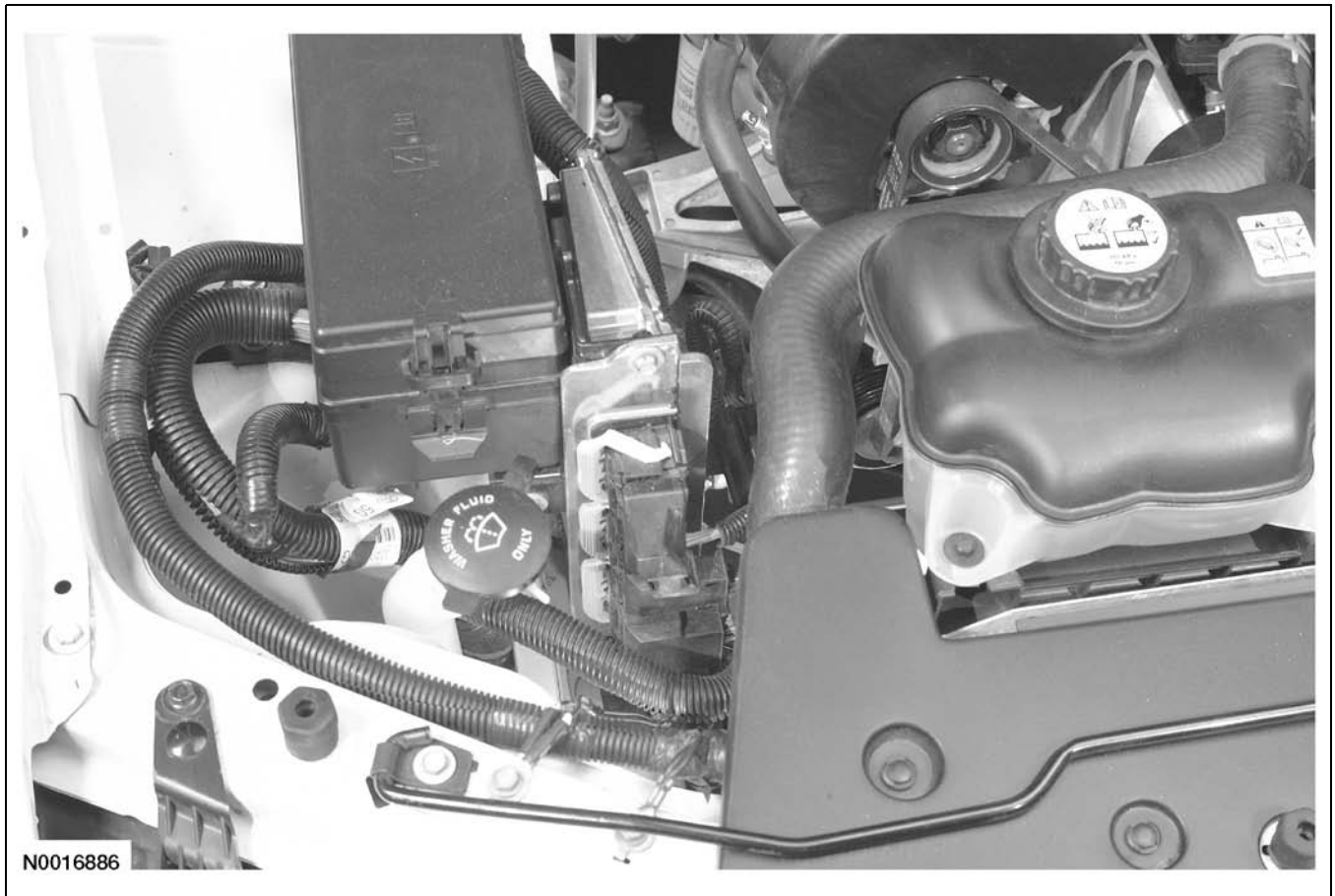
LESSON 3: POWERTRAIN

Electronic Throttle Control



Electronic Throttle Control (ETC)

The 2005 Mustang V-6 and the Mustang GT use the electronic throttle control (ETC) system on both the 4.0L and on the 4.6L. When the driver presses the accelerator, the PCM gets a signal from the accelerator position sensor. The PCM uses that information to control the throttle plate.



Powertrain Control Module (PCM)

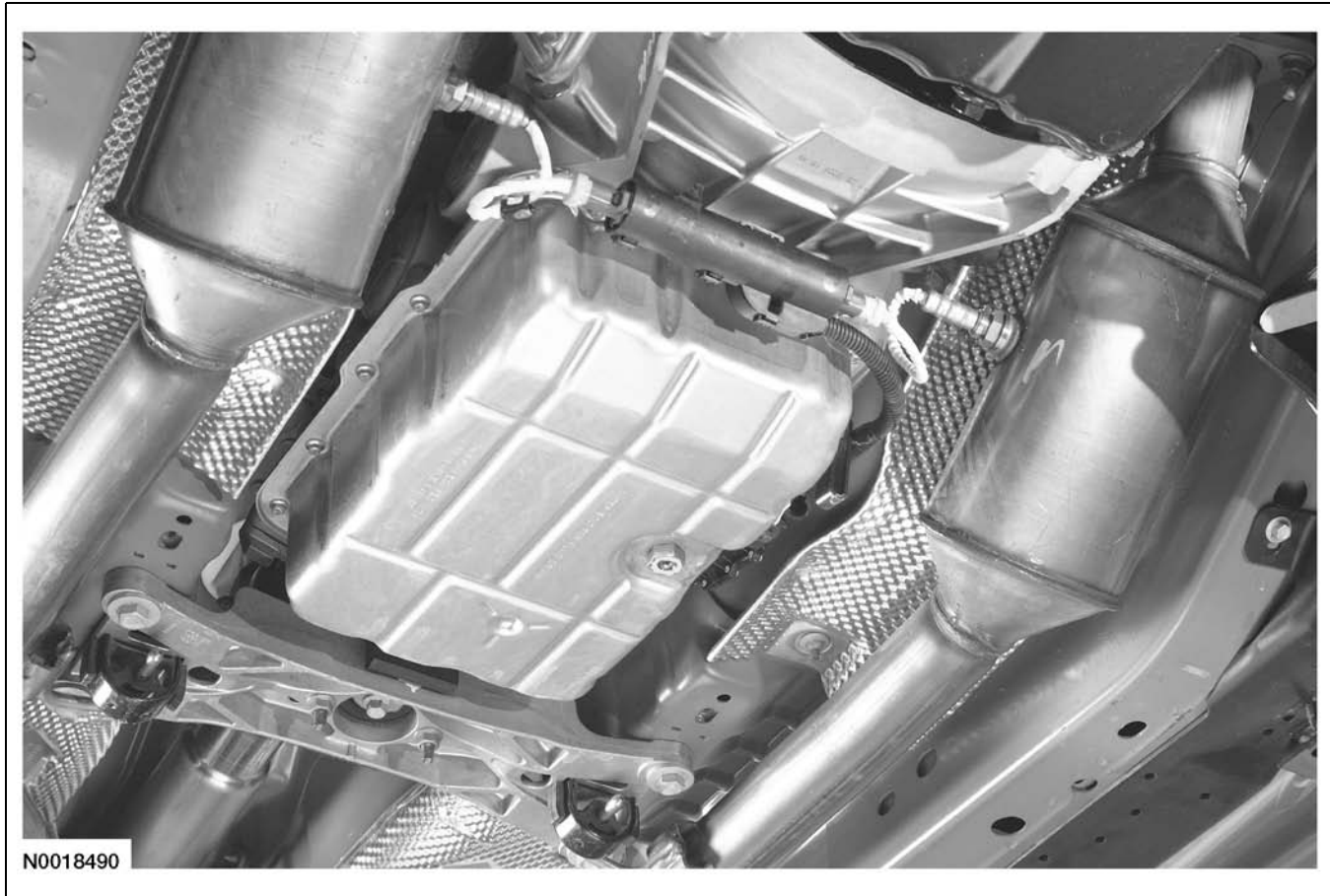
The 2005 Mustang V-6 and Mustang GT both use a 170-pin, three-pocket connector under the hood. PCMs have steadily grown from the 60-pin PCM to the 170 pin PCM now used in the Mustang V-6 and the Mustang GT.

Transmission upshifting is controlled by the powertrain control module (PCM). The PCM receives inputs from various engine or vehicle sensors and driver demands and uses them to control shift scheduling, shift feel and torque converter clutch (TCC) operation.

- The PCM has an adaptive learn strategy to electronically control the transmission, which automatically adjusts the shift feel.
 - When the battery has been disconnected or a new battery installed, certain engine and transmission operating parameters may be lost.
 - As with any volatile memory, when the engine and transmission parameters are lost, the PCM must relearn the driving habits of the vehicle operator.
 - **While the PCM is relearning the operator's driving habits, the operator may experience slightly firm shifts. This operation is considered normal and does not affect the function of the engine or transmission.**
 - Normal operation returns after the PCM relearns the driving habits of the operator.

LESSON 3: POWERTRAIN

Transmission System



5R55S Automatic Transmission.

The automatic transmission 5R55S is used in both the Mustang V-6 and Mustang GT vehicles. This transmission is similar to other applications with minor differences that include:

- Improved calibrations for shift feel and timing.
- Overdrive ratio of 0.71 to 1.
- Torque converter updated to include a new cover and internal components to reduce shudder concerns.
- New flexplate for both the V-6 and the V-8.
- Revised cooling tubes.
- The fluid for service is Mercon™ V.
- Under normal usage the transmission fluid should be changed every 240,000 km (150,000 miles). Under severe duty such as trailer towing, change the fluid every 48,000 km (30,000 miles).



Flange Tool 307-523

The 2005 Mustang uses a new rear output flange. The flange requires the use of a new special service tool. The flange tool global number is 307-523. This new tool can also be used on past model 5R55S vehicles and also on the 5R55N.

The Workshop Manual has also been revised to include three independent transmission sections. They are:

- 307-01 Automatic Transmission
- 307-02 Transmission Cooling
- 307-05 Automatic Transmission External Controls

LESSON 3: POWERTRAIN



Overdrive Switch

The transmission range selector has seven positions: P, R, N, D, 3, 2, and 1.

- The park, reverse and neutral positions operate as on all automatic transmissions.
- Drive with overdrive active is the normal position for most driving, and it provides:
 - Automatic shift 1-5 and 5-1
 - Engine braking possible in 5th gear
 - TCC may apply and release
- The drive position with overdrive canceled provides:
 - Automatic shift 1-4 and 4-1
 - Engine braking possible
 - TCC may apply and release

- The 3rd position provides:
 - Third gear start and hold
 - Engine braking possible
 - TCC may apply and release
 - Improved traction on slippery roads
- The 2nd position provides:
 - Second gear start and hold
 - Engine braking possible
 - TCC may apply and release
 - Improved traction on slippery roads
- The first position provides:
 - First gear operation only
 - Engine braking for descending steep grades
 - If this position is selected at normal road speeds, the transmission will downshift into the next lower gear and continue downshifting at appropriate points to prevent transmission and engine damage until the vehicle reaches first gear.

LESSON 3: POWERTRAIN

Transmission Fluid Fill Procedure



Transmission Fluid Fill Procedure Special Tools

The 5R55S transmission does not have a fill tube or fluid indicator. Checking the transmission fluid requires the following special tools:

- Worldwide Diagnostic System (WDS) 418-F224 or New Generation Star Plus (NGS+) Tester 418-F205 or equivalent scan tool
- Vacuum Pump Kit 416-D002 (D95L-7559-A)
- Adapter, Fluid Level and Fill Plug 307-437
- Fluid Transporter/Evacuator/Injector 307-D465
- Rubber Tip Air Nozzle 100-D009 (D93L-7000-A)

NOTE: When adding fluid, be sure to use MERCON® V automatic transmission fluid.

1. Using the scan tool (WDS), monitor the transmission fluid temperature (TFT) using PID: TFT.
2. Start the vehicle.
3. **NOTE:** Engine idle speed is approximately 650 rpm. While proceeding with this procedure, run the engine until the transmission fluid temperature is between 27°C and 49°C (80°F and 120°F). Do not use the stall test to raise the fluid temperature.



Moving Range Selector Lever

4. Move the range selector lever slowly through each gear, stopping in each position and allowing the transmission to engage.
5. Place the range selector lever in the PARK position.

LESSON 3: POWERTRAIN



Raise Vehicle on Hoist, Level

6. With the engine running, position the vehicle on a hoist and set it as close to level as possible.



Removing Fluid Level Indicating Plug

7. Hold the larger drain plug with a wrench and remove the small (center) fluid level indicating plug.
8. Install the fluid level and fill plug 307-437 into the pan.

NOTE: Prior to filling the special tool with clean transmission fluid, make sure that the canister is clean.

9. Fill the special tool with clean automatic transmission fluid.
10. Hang the special tool under the vehicle. Position it upright and close to the transmission.

LESSON 3: POWERTRAIN



Evacuator/Transporter

11. Connect the open end of the fluid hose from the Fluid Transporter/Evacuator/Injector to the Fluid Level and Fill Plug Adapter at the bottom of the transmission fluid pan.



Applying 206.85 kPa (30 psi) To Hose

12. Apply a **maximum of 206.85 kPa (30 psi)** to the open end of the vacuum/pressure hose from the canister. Fluid will immediately start flowing out of the canister into the transmission fluid pan.
13. Add one pint of transmission fluid into the fluid pan. Stop the process by releasing the air pressure and removing the air nozzle from the end of the hose.
14. Inspect the fluid level in the canister. If the fluid drains back into the canister, the transmission is full. If no fluid drains back, more fluid will need to be added. Repeat steps 12 and 13.



Applying Vacuum

15. Once the transmission is full, place a hand vacuum pump on the open end of the vacuum/pressure hose of the special tool and apply vacuum to the system. This will pull out any extra fluid trapped in the system and direct it into the canister.
16. Allow the fluid to drain. Make sure that the fluid temperature is between 27°C and 49°C (80°F and 120°F). When the fluid comes out as a thin stream or drip, the fluid is at the correct level.



Reinstalling Plug

17. Reinstall the small (center) fluid level indicating plug.
18. Check the operation of the transmission by moving the range selector lever slowly through each gear, stopping in each position and allowing the transmission to engage.

LESSON 3: POWERTRAIN

Brake Transmission Shift Interlock



Brake Transmission Shift Interlock Override

This vehicle is equipped with a brake-shift interlock feature that prevents the gearshift lever from being moved from P (Park) when the ignition is in the ON position unless the brake pedal is depressed. If you cannot move the gearshift lever out of P (Park) with ignition in the ON position and the brake pedal depressed:

1. Apply the parking brake, turn ignition key to LOCK, then remove the key.
2. Using a flat head screwdriver, remove the plastic cover.
3. Insert the ignition key and push it straight down to release the interlock.
4. Shift to N (Neutral).
5. Start the vehicle.

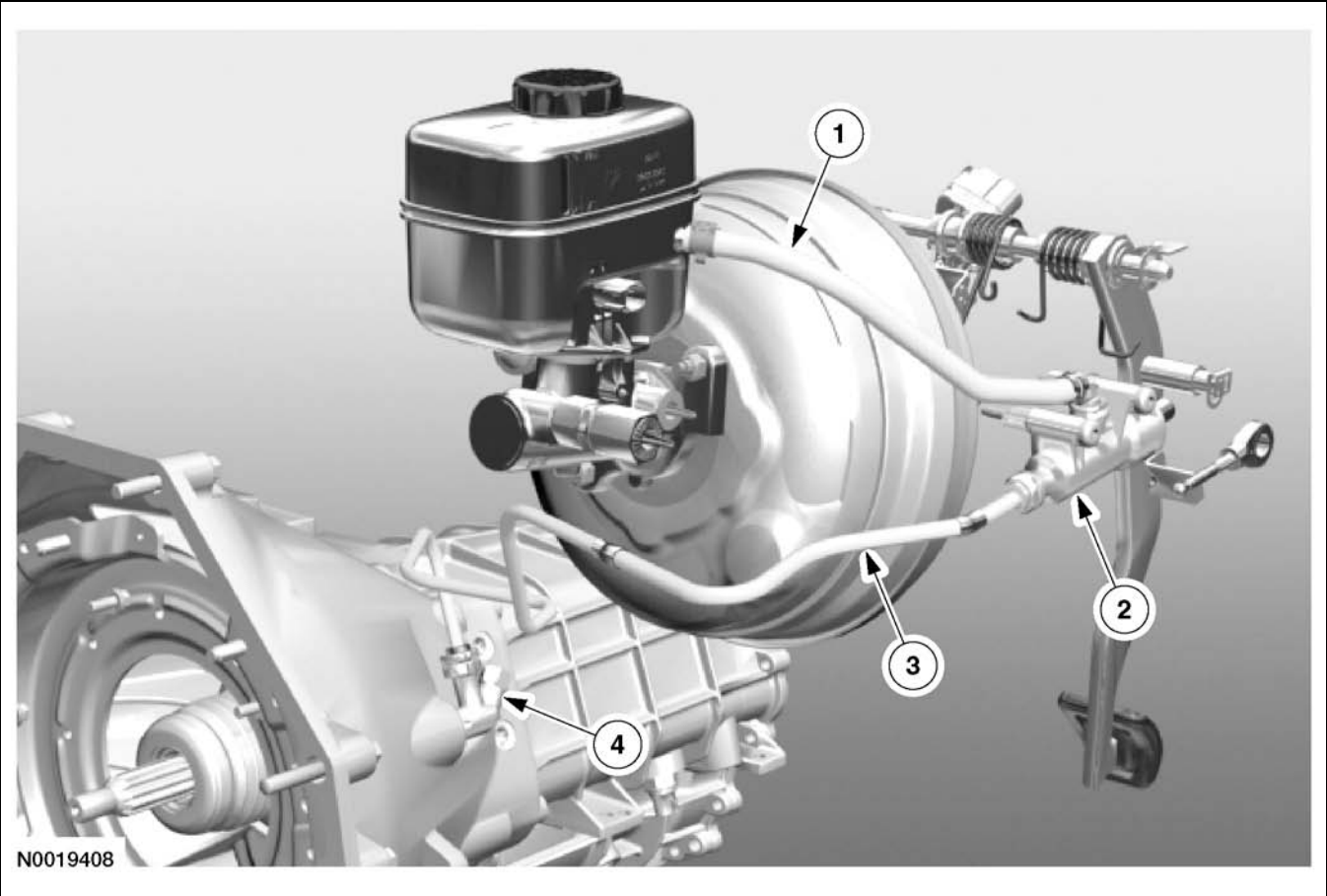
Manual Transmission**Tremec T5OD Manual Transmission Semi-Remote Shifter**

The Tremec T5OD is used in the Mustang V-6 and the TR3650 manual transmission is used in the GT. The Tremec T5OD neutral switch has been removed and the remote shifter attachment design has changed. The remote shifter is used on both the Tremec T5OD and the TR3650.

- In 2004 the shifter was a stub mounted directly to the top of the transmission. The upper lever with isolation was then attached to the stub with two screws.
- The 2005 uses a semi-remote shifter.
 - Shifter attaches to the transmission in two places and the body in one place.
 - A reaction arm is bolted through a bushing to the side of the extension housing.
 - A threaded pin attaches the shifter arm end fitting to the transmission shift rail end that protrudes from the rear of the extension housing.
 - The rear of the shifter body attaches to the sheet metal of the floorpan with a bushing and bracket to several weld studs.
 - The boot which seals the hole in the floorpan through which the shift lever protrudes is now part of the shift lever assembly.

LESSON 3: POWERTRAIN

Clutch

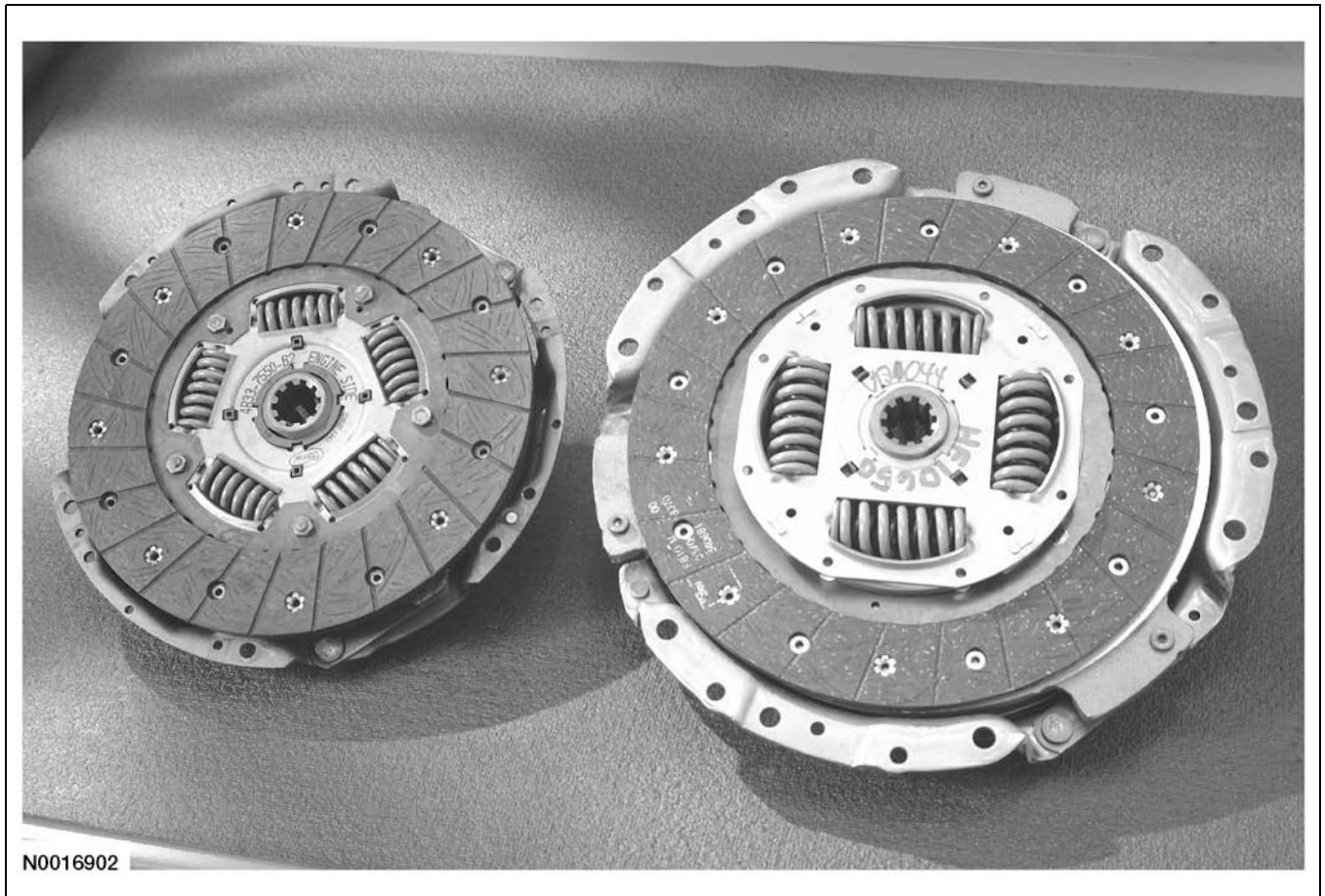


Mustang V-6 and Mustang GT Clutch Hydraulic System

Item	Description
1	Reservoir line to master cylinder
2	Master cylinder

Item	Description
3	Master cylinder to slave cylinder line
4	Slave cylinder bleeder fitting

The clutch release system for the Mustang V-6 and the Mustang GT has changed to hydraulic. The brake master cylinder reservoir supplies the fluid. The release system is designed to self-bleed. No bleeding is required, but a special air bleed procedure is available. Refer to the Workshop Manual for additional information.



Mustang V-6 and Mustang GT Clutch and Pressure Plate Assemblies

In addition to the clamp loads being slightly different for the pressure plate and cover assembly, the Mustang V-6 and the Mustang GT differ in the following ways:

- Mustang GT
 - Non-potted flywheel design
 - 280 mm (11.02 in) friction disc
 - Torque-to-yield bolts

NOTE: On the Mustang GT, the inner spring in the main damper is designed to float, so it may appear loose. This is a normal condition.

- Mustang V-6
 - Potted flywheel design
 - 254 mm (10 in) friction disc
 - Bolts are not torque-to-yield, but must be replaced every time the clutch is replaced
 - Includes a floating-damper design friction disc

LESSON 3: POWERTRAIN

A potted flywheel includes extra material along the outer edge of the flywheel so that the clutch friction disc appears to sit into the flywheel. A non-potted flywheel does not have the clutch friction plate inset into the flywheel.

Driveline System



Mustang GT Two-Piece Driveshaft

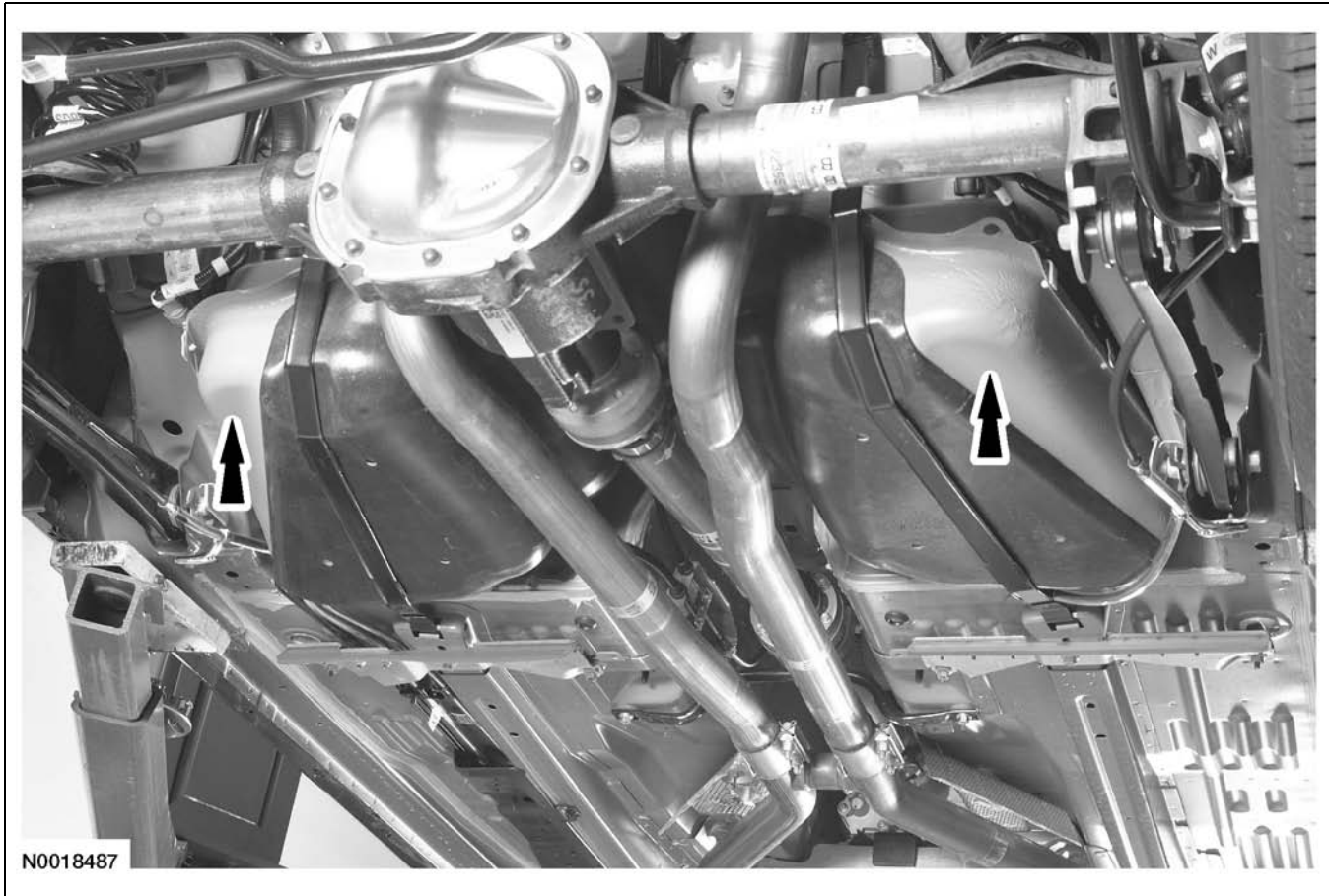
The 2005 Mustang GT uses a different driveshaft than the Mustang V-6. The Mustang V-6 uses a one-piece steel driveshaft. The Mustang GT is equipped with a two-piece driveshaft to handle higher torque loads. The two-piece driveshaft is removed from the vehicle as one piece.

- The U-joints are staked in production. The U-joints and driveshafts are replaced as an assembly.
- The purpose of using staked U-joints is to reduce the total driveshaft runout in production.

NOTE: All driveshaft assemblies are balanced. If undercoating the vehicle, protect the driveshaft to prevent overspray of any undercoating material.

LESSON 3: POWERTRAIN

Fuel Tank



Fuel Tank

The fuel tank on the 2005 Mustang is similar to the tank on the Thunderbird. This tank uses dual senders and keeps the fuel at the same level in both sides of the tank.

OBJECTIVES

- Identify the module communication networks.
- Describe the gateway function.
- Identify the smart junction box/generic electronic module.
- Describe the smart junction box/generic electronic module (SJB/GEM) functions.
- Identify the alternator overrunning clutch.
- Describe the anti-theft system.
- Identify the service procedures for the intrusion/inclination sensor module.
- Identify changes to the climate control system.

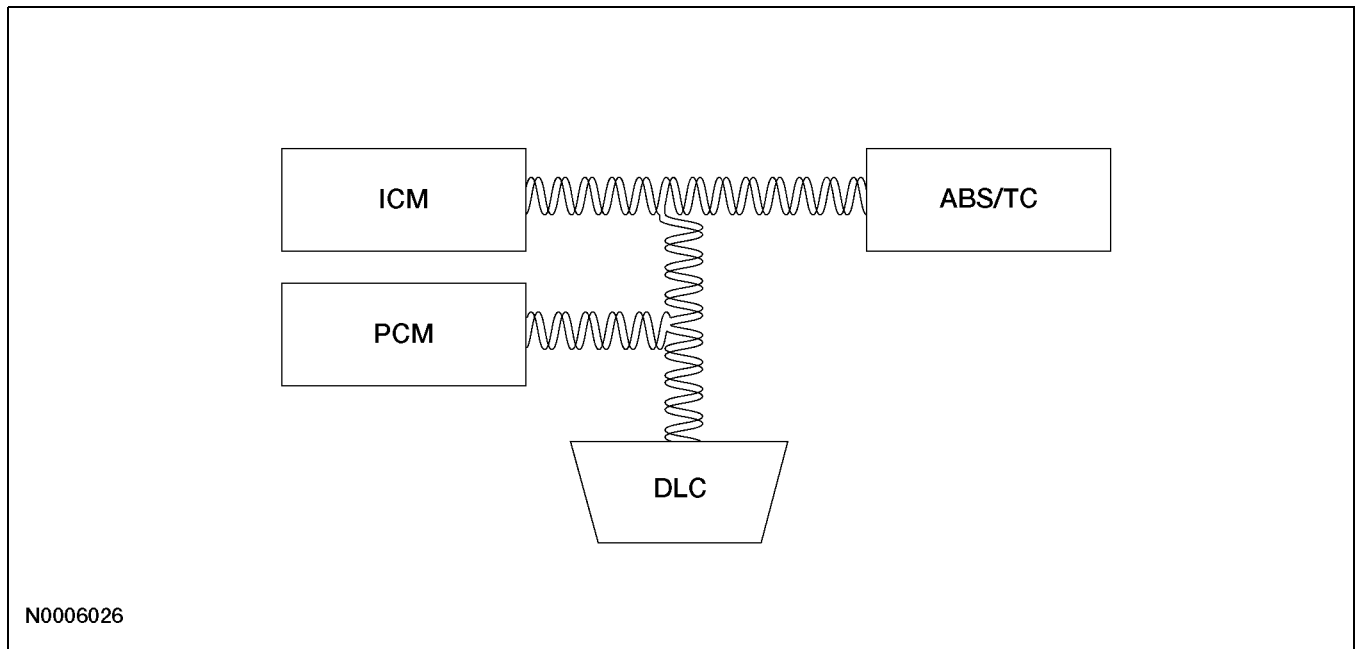
LESSON 4: ELECTRICAL

Module Communication Networks

The 2005 Mustang V-6 and Mustang GT use four module communication networks:

- High-speed controller area network (HS-CAN)
- Medium-speed controller area network (MS-CAN)
- ISO 9141
- HS-CAN subnetwork

The 2005 Mustang V-6 and Mustang GT do not use the Standard Corporate Protocol (SCP) network.

High-Speed Controller Area Network (HS-CAN)**HS-CAN**

The 2005 Mustang V-6 and Mustang GT high-speed controller area network (HS-CAN) is a two-wire system that allows inter-module communication.

- HS-CAN uses a serial communication language protocol to transfer messages (signals) between electronic modules or nodes.

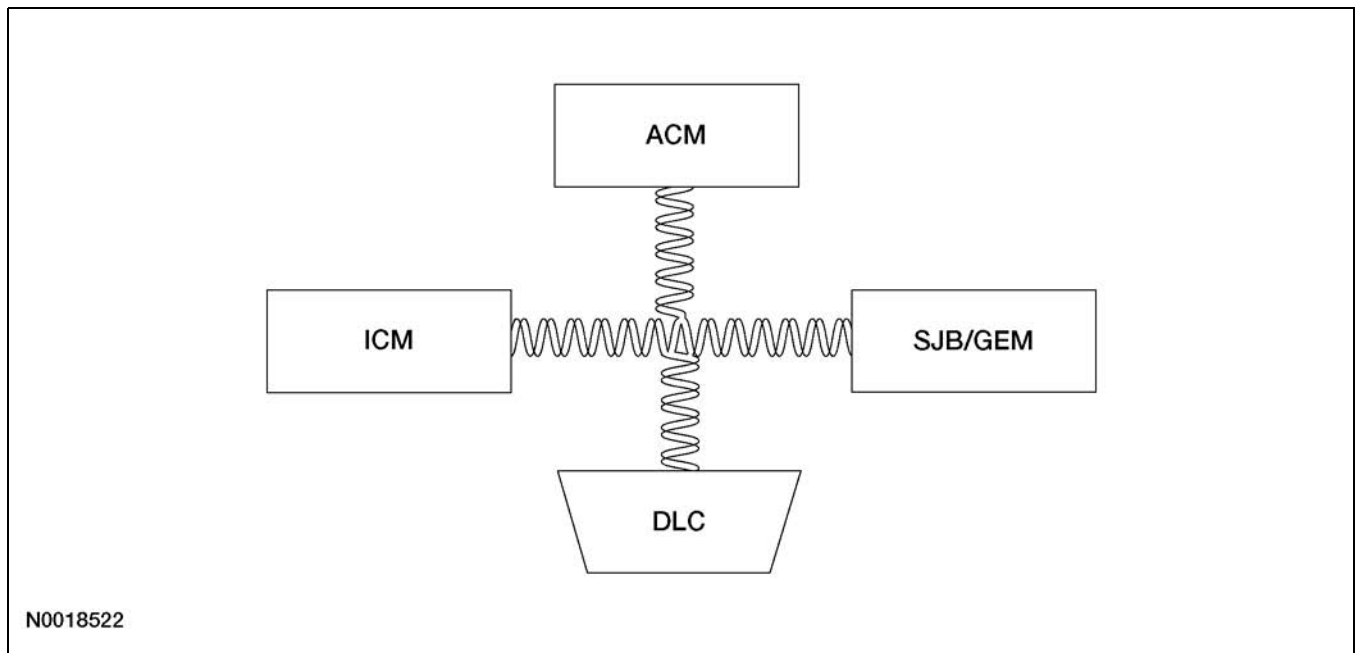
The HS-CAN is composed of two wires, CAN_H and CAN_L.

- If one wire is shorted to battery, then the HS-CAN is down and communication is not possible.
- If CAN_L is shorted to ground, then communication is still possible. But if CAN_H is shorted to ground, then communication is not possible.
- For open wires, communication is still possible on both sides of the open wire.
- If there are issues with HS-CAN, there may be missing functionality and the technician may have problems connecting with an NGS+ or a WDS.
- HS-CAN uses two terminating modules which are composed of the PCM and the IC which are located at the far opposite ends of the HS-CAN wiring. Communication is possible with the loss of one termination, but communication is not possible with the loss of two terminations.
- HS-CAN provides higher speeds of data communication than SCP or MS-CAN.
 - HS-CAN operates at 500 kilobytes per second.
 - HS-CAN operates only when the ignition is in the RUN/START position.

LESSON 4: ELECTRICAL

- Modules on the HS-CAN network are:
 - Instrument cluster module (ICM)
 - Powertrain control module (PCM)
 - Anti-lock brake/traction control system (ABS/TC) control module
- Typical signals sent on this network include:
 - Torque data
 - Engine and vehicle speed with throttle position
 - Engine configuration
 - Transmission configuration
 - Transmission gear and torque converter effects
 - Brake system information
 - PCM telltale, overdrive and fail-safe cooling
 - Cluster information
 - Wheel speeds
- HS-CAN goes down as soon as the ignition is turned to ACCESSORY or OFF, this network operates only in the RUN/START position.
- This network is diagnosed using either the NGS+ or the WDS.

Medium Speed Controller Area Network (MS-CAN)



Medium Speed Controller Area Network (MS-CAN)

The 2005 Mustang V-6 and Mustang GT medium-speed controller area network (MS-CAN) is a two-wire system that allows inter-module communication.

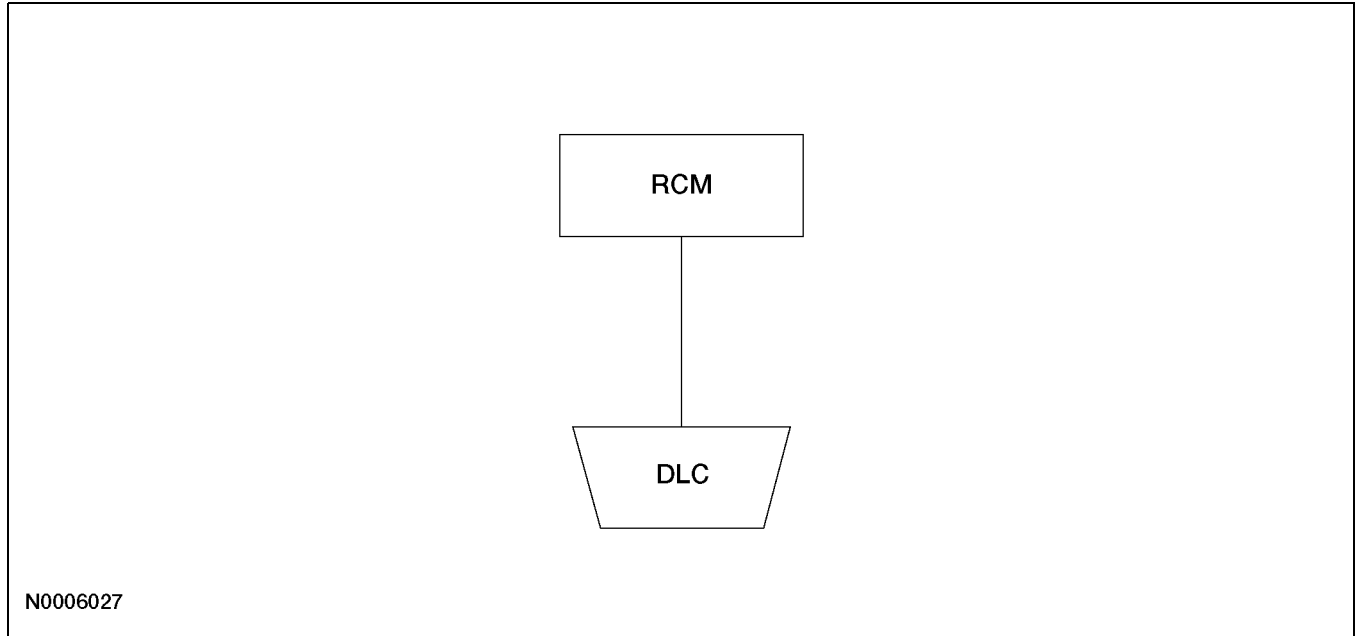
The MS-CAN is composed of two wires, CAN_H and CAN_L.

- If one wire is shorted to battery, then the MS-CAN is down and communication is not possible.
- If CAN_L is shorted to ground, then communication is still possible. But if CAN_H is shorted to ground, then communication is not possible.
- For open wires, communication is still possible on both sides of the open wire.
- If there are issues with MS-CAN, there may be missing functionality and the technician may have problems connecting with an NGS+ or a WDS.
- MS-CAN uses two terminating modules which are composed of the SJB/GEM and the IC which are located at the far opposite ends of the MS-CAN wiring. Communication is possible with the loss of one termination, but communication is not possible with the loss of two terminations.
- The ICM communicates on the MS-CAN and the HS-CAN networks. Other modules on the MS-CAN are:
 - Instrument cluster module (ICM)
 - Smart junction box/generic electronic module (SJB/GEM)
 - Audio control module (ACM)

LESSON 4: ELECTRICAL

- Typical signals sent on this network are:
 - Vehicle security status
 - Door ajar status
 - Lamp status
 - Key-in-ignition status
 - PATS key status
 - Cluster information
 - Turn signals
 - Backlighting
 - AC command
- The MS-CAN network will remain active after the ignition is turned OFF if accessory delay is active. Otherwise, the network will go to sleep as soon as the driver turns off the key and leaves the vehicle.
- The MS-CAN operates at 125 kilobytes per second.
- This network is diagnosed with the NGS+ or the WDS.

ISO 9141

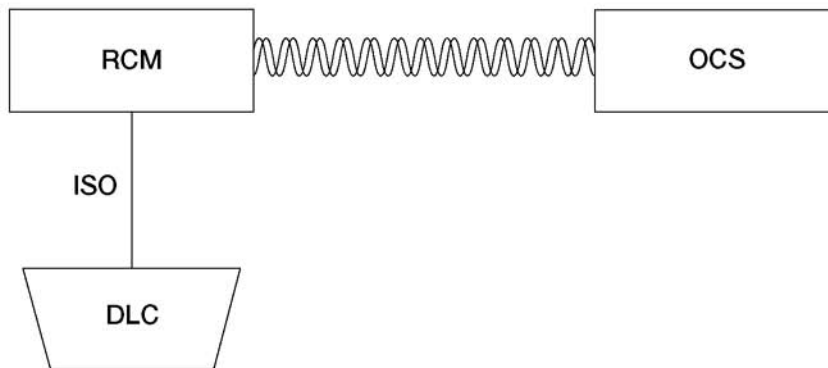


ISO 9141

The ISO 9141 network is used for diagnostic tests. It does not allow inter-module communication and does not operate if shorted to power or ground.

- The ISO 9141 network includes only one module, the restraints control module (RCM). For diagnosis and testing, use either the WDS or the NGS+.

LESSON 4: ELECTRICAL



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HS-CAN Subnetwork

The 2005 Mustang V-6 and Mustang GT use an HS-CAN subnetwork between the RCM module and the OCS system.

- Modules on the HS-CAN subnetwork are:
 - Restraints control module (RCM)
 - Occupant classification sensor (OCS) electronic control unit
- Diagnostic equipment communicates with the RCM on the ISO network.



Instrument Cluster

The hybrid instrument cluster (IC) on the 2005 Mustang V-6 and the Mustang GT include an instrument cluster module (ICM). The ICM takes messages from the high-speed (HS-CAN) and puts them onto the medium-speed (MS-CAN) and vice versa. This action is referred to as the “gateway.”

- The Mustang V-6 and the Mustang GT include an industry-first, color-configurable instrument panel available on clusters with a message center. At the touch of a button the driver can mix and match lights to create different color backgrounds.

LESSON 4: ELECTRICAL



Message Center Controls

To change the colors of the instrument panel, use the three buttons on the message center: INFO, SETUP, and RESET. The colors are accessed through the SETUP button. The vehicle must be stationary to adjust color. To change the colors:

1. Press SETUP to get to the DISPLAY COLOR menu.
2. Pressing RESET will scroll through the following selectable colors: green, purple, orange, blue, white, red, and Mycolor.
3. Select Mycolor to choose any of the different colors. This is achieved by blending the light from the red, green, and blue LEDs.
4. When in Mycolor mode, press RESET to scroll through the green, blue, red, and exit options.
5. Adjust each of the primary colors, one at a time, by pressing SETUP. Every time SETUP is pressed the colors change incrementally. Holding the SETUP button down for three seconds exits Mycolor.

Smart Junction Box/Generic Electronic Module (SJB/GEM)



Smart Junction Box/Generic Electronic Module (SJB/GEM)

The smart junction box/generic electronic module (SJB/GEM) in the 2005 Mustang V-6 and Mustang GT consists primarily of the fusebox and an electronic module. The interior body circuits all feed through the SJB/GEM. If replaced, the SJB/GEM must be reconfigured. Be sure to get the current configuration before removing the SJB/GEM.

NOTE: The WDS and the NGS+ refer to this module as the GEM, but the service manual calls it the SJB/GEM.

LESSON 4: ELECTRICAL



Ignition Key and Cylinder

The electronic locking and convenience features that are new to Mustang for the 2005 model year are as follows:

- Smart locking
 - This feature helps prevent the customer from locking their keys in the ignition when the vehicle is locked via the power door lock switch.
- Autolock
 - This feature is only available on vehicles with automatic transmissions; the doors are automatically locked when all doors are closed, the ignition is in the ON position, the brake pedal is pressed before reaching three mph, and the vehicle speed then increases above three mph.
 - A relock occurs when an Autolock has occurred prior to the brake being pressed when vehicle speed is less than three mph, any door is opened then all doors become closed, and vehicle speed increases above three mph.
 - This feature is configurable through the driver configuration method or via a diagnostic tool.

- Power door trim switch inhibit
 - This feature disables the power door lock switch 20 seconds after all doors are locked if the feature is enabled.
 - The default for this feature is disabled. This feature can be enabled through the driver configuration method or via a diagnostic tool.



Door Key

- Central lock/unlock from driver door key cylinder is available only on vehicles with active anti-theft installed.
 - This feature allows both doors to be locked or unlocked from the driver door key cylinder. To unlock the driver door, the key is inserted and turned to the unlock position. Turning the key to the unlock position again within three seconds unlocks both doors.
 - To lock all doors insert the key in the driver door and turn to the lock position.
- Global open/close of windows from driver door key cylinder is available only on vehicles with active anti-theft installed.
 - This feature allows the windows to be opened or closed using the key in the driver door key cylinder. To open all windows, insert the key, turn to the unlock position and hold. To close, turn the key to the lock position and hold.
- Global open of windows from remote transmitter is available only on vehicles with active anti-theft installed.
 - This feature allows the customer to open all windows from the remote transmitter by pressing and holding the unlock button. Pressing any other button on the remote transmitter will cause the motion to cease.

Smart Drop Feature



Smart Drop Feature

All of the 2005 Mustang V-6 and Mustang GT models include the smart drop feature. The purpose of the smart drop feature is to allow the door to be opened and closed easily while maintaining a tight seal on the door window.

- The smart drop feature works automatically. When the driver or passenger opens a door, the window drops down about one-half inch. When the door is closed, the window closes tightly.
- To recalibrate the smart drop, fully lower the window and hold the switch in the DOWN position for two seconds. Then raise the window and hold the switch in the UP position for two seconds.

NOTE: It may be necessary to recalibrate the smart drop feature after disconnecting the battery or in the event of a discharged battery.

LESSON 4: ELECTRICAL



Motion Sensor Module

- Active anti-theft
 - The SJB monitors doors, hood, and trunk and communicates with the intrusion sensing module which monitors motion inside the vehicle cabin as well as vehicle tilt. When unauthorized activity is detected, the system sounds the security and traffic sounders and flashes the turn signals.
 - All doors, the convertible top and trunk must be closed for the motion sensing system to arm. Additionally, the windows must be closed for proper motion sensing performance.
 - **To arm the security system without enabling the motion or inclination sensor, turn the key counterclockwise in the driver door key cylinder.**

NOTE: Arming via the key in the driver door key cylinder arms perimeter alarm but inhibits the motion and tilt sensing systems.

NOTE: The WDS and the NGS+ refer to this module as the GEM, but the service manual calls it the SJB/GEM.

- The US and Canadian SJB/GEM modules have the same part number.

Anti-Theft System



2005 Mustang GT and Mustang V-6

The optional active anti-theft alarm system used on the 2005 Mustang monitors the status of the doors, hood and trunk, as well as the motion inside the vehicle cabin and tilting of the vehicle. The system includes the following parts:

- Front door ajar switches (integral part of the latch assemblies)
- Underhood ajar switch
- Luggage compartment ajar switch
- Luggage compartment anti-theft alarm inhibit switch
- Driver door lock cylinder switch (SET/RESET)
- Remote keyless entry (RKE) transmitter
- Powertrain control module (PCM)
- Smart junction box
- Convertible top ajar switch
- Intrusion sensing module

LESSON 4: ELECTRICAL

- Security sounder
- Traffic horn

Intrusion Sensing System**Intrusion Sensor and Module**

The 2005 Mustang V-6 and Mustang GT intrusion sensing/inclination sensing system consists of a separate intrusion sensing module which is mounted in the overhead console and communicates with the SJB/GEM over a dedicated line. When the vehicle is armed, the system utilizes ultrasonic sensors to detect movement within the passenger compartment and an integrated inclination sensor to detect changes in vehicle attitude. When an intrusion is detected, the system sends an alarm command to the SJB which activates the turn signals, security sounder, and traffic horn.

The system is armed by pressing the lock button on the remote transmitter or pressing the power door lock switch with the accompanying door open and then all doors become closed. Locking via the key in the driver door key cylinder arms the doors, hood, and trunk while inhibiting the motion and tilt sensing systems.

- The motion detection and incline sensing work only when the vehicle is armed by using the:
 - Keyless entry transmitter.
 - Power door lock control with the door open, then closing all the open doors.
- If the vehicle is locked, the turn signal lamps flash once.
 - If locked again within three seconds, the vehicle locks again, the lamps flash again, and the horn chirps.

LESSON 4: ELECTRICAL

- If the convertible top, hood, trunk, or any of the doors or windows, are not properly closed, the turn signal lamps do not flash, but the horn will chirp twice.
- The motion sensing system will not become armed until all doors, trunk, and convertible top are closed. Additionally, for optimal motion sensing performance, all windows should be closed to prevent false alarms.
- If the system is armed and the customer commands the trunk be opened, the motion and tilt sensing systems are inhibited until the trunk becomes closed again.
- Disarm the system if any of the following is expected:
 - Motion is expected inside the vehicle
 - The vehicle is to be transported
 - The vehicle is to be lifted/hoisted
 - Motion is expected around the vehicle and the windows are left open

NOTE: Locking via the key in the driver door key cylinder arms the doors, hood, and trunk while inhibiting the motion and tilt sensing systems.

NOTE: If a driver leaves a pet in the vehicle but wishes to use the perimeter alarm system, the intrusion sensing/inclination system must be turned off.

Climate Control System



Climate Control

The climate control system is almost entirely carryover. It is a semi-center stack, single-zone system. Manual control is standard.

An important item to be aware of is that the box changed.

- There are no vacuum actuated door motors.
- The air doors are operated by electric motors.

LESSON 4: ELECTRICAL

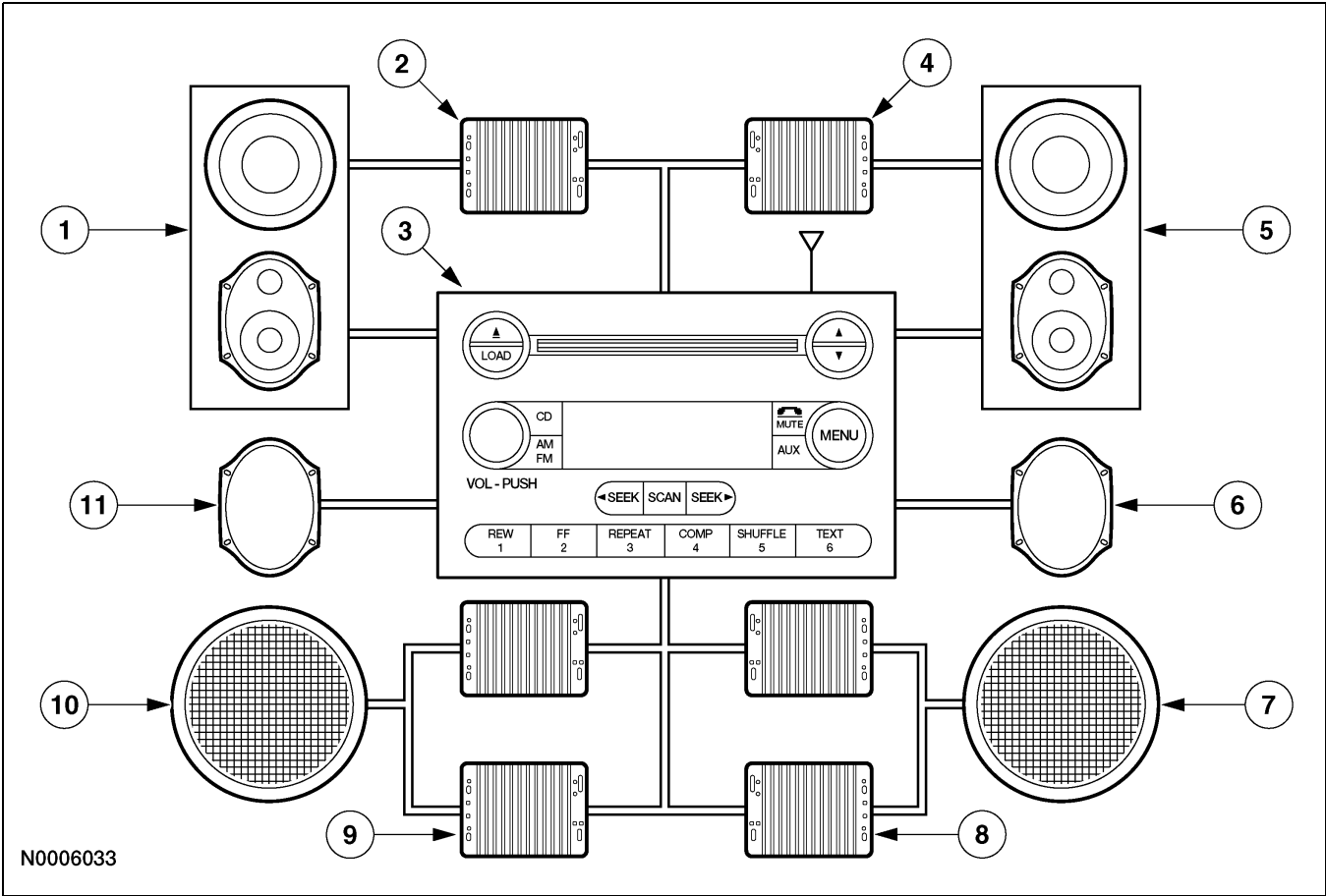
Audio System



Shaker 1000 Subwoofer Enclosure

The Mustang V-6 and the Mustang GT is available with three audio system configurations:

- The Premium sound system is the base system, and includes the following:
 - Premium single CD-AM/FM audio unit (non-MP3)
 - Four full-range speakers, one in each door and two in the package tray panel
- The Audiophile sound system, also referred to as the Shaker 500, includes the following:
 - CDX6-AM/FM with MP3 and in-dash six-CD changer audio unit
 - Speed-sensitive volume control
 - Six speakers and two subwoofer amplifiers
 - Full-range speakers, two in each door and two in the package tray panel
 - The subwoofers can be serviced independently



Shaker 1000

Item	Description
1	Left door speakers
2	Amplifier
3	CDX6 radio
4	Amplifier
5	Right door speakers
6	Right rear speaker

Item	Description
7	Trunk speaker
8	Amplifier
9	Amplifier
10	Trunk speaker
11	Left rear speaker

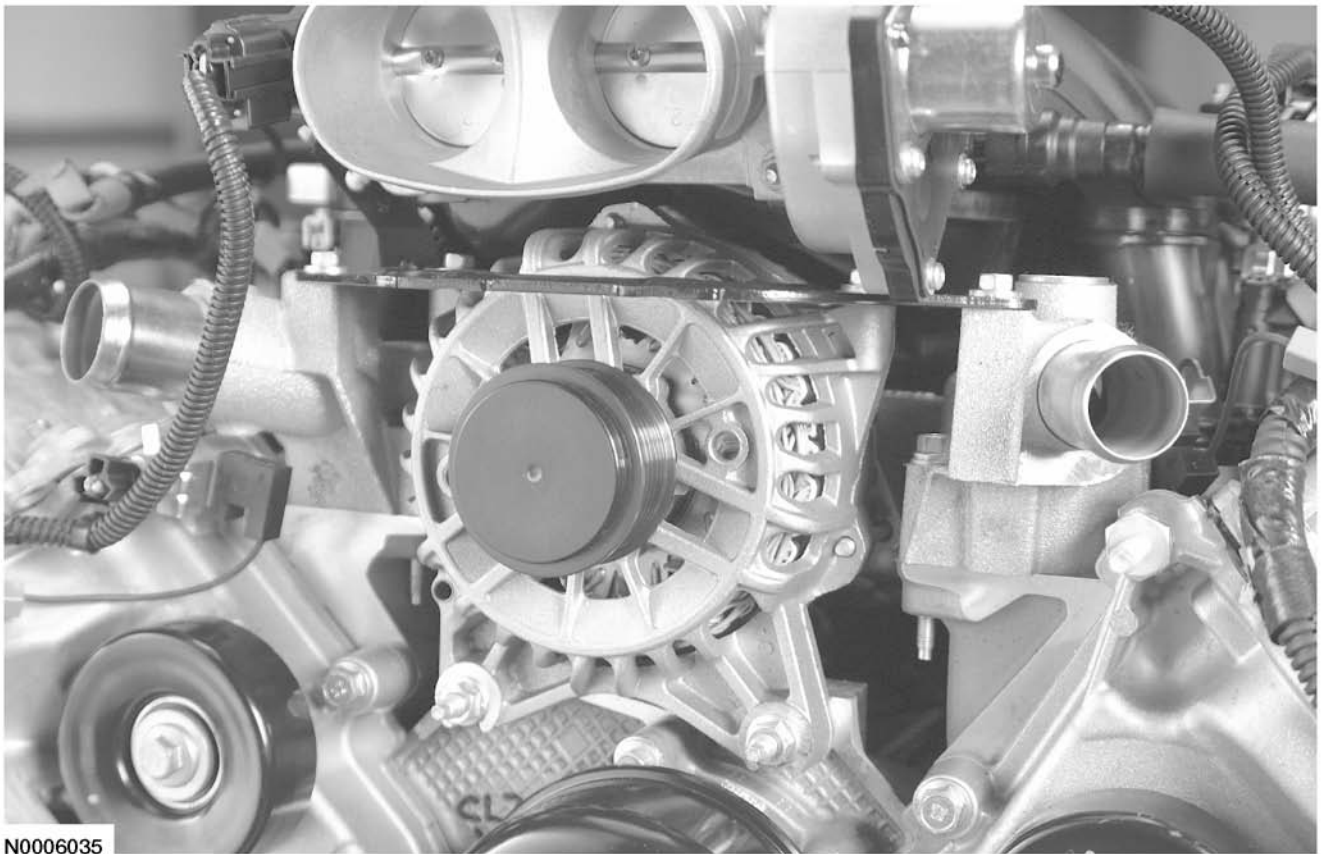
- The Audiophile plus sound system, also referred to as the Shaker 1000, includes the following:
 - All of the components of the Shaker 500 system, plus one additional subwoofer enclosure with two integral subwoofers and four additional amplifiers
 - Both the enclosure and the additional amplifiers are located in the trunk
 - The subwoofers can be serviced independently

LESSON 4: ELECTRICAL

NOTE: Premium sound speakers are labeled either 6 OHMS or 8 OHMS.

The base radio is standard on deluxe models. Shaker 500 is standard on premium models. All models can upgrade to Shaker 1000 except the Mustang V-6 deluxe models.

Charging System



Alternator Overrunning Clutch

In addition to the standard PCM-regulated alternator, the Mustang GT models are also equipped with an overrunning pulley. The overrunning clutch allows the alternator armature to freewheel during high rpm upshifts to prevent accessory belt whip. The one-way clutch is not servicable.

NOTES

OBJECTIVES

- Describe the operation of the passive restraint system.
- Describe the occupant classification sensor (OCS) seat system.
- Describe changes to the uni-body construction.

LESSON 5: BODY AND MISCELLANEOUS

Seating

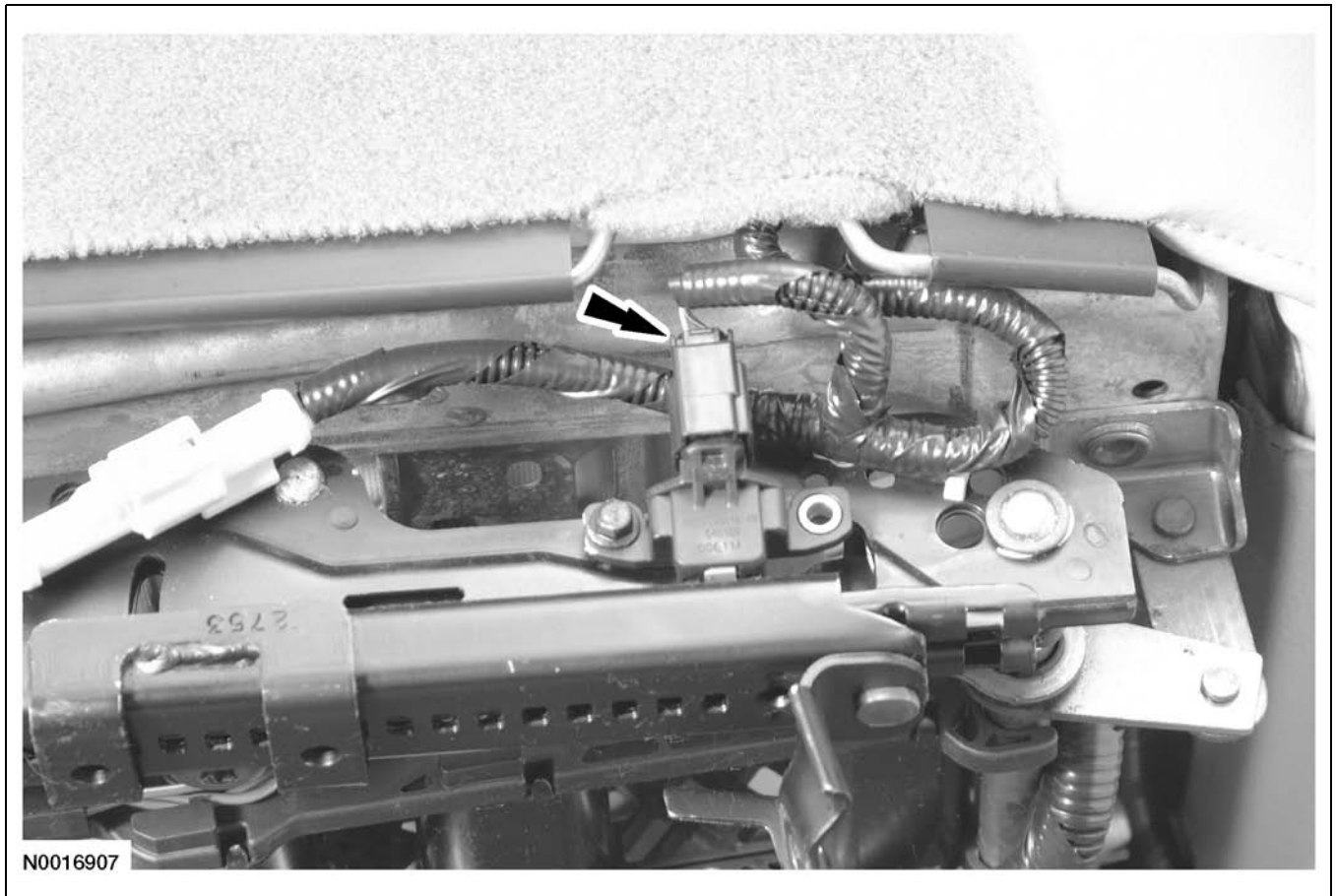


Front Seat Backrest Latch

Never repair the front seat backrest latch components as individual components. If a front seat backrest latch or component is non-functional or damaged, a new front seat backrest latch must be installed.

The Mustang V-6 and Mustang GT may include optional power bolster and lumbar switches on the inboard side of the seat.

- The backrest bolster/lumbar adjusting pads are serviced together; the cushion bolsters are serviced separately.
- The pump and solenoid module are serviced as an assembly with the front seat cushion frame.



Mustang Seat Track Position Sensor

The Mustang V-6 and Mustang GT seats are equipped with a standard driver seat track position sensor. They also include a new head restraint which requires a tool for removal. The seats also feature:

- New dual-side recliner
- Passenger occupant classification sensor (OCS)

LESSON 5: BODY AND MISCELLANEOUS

Occupant Restraints

Restraint System



Front Safety Belt

When any new active occupant restraint components are installed, use only the replacement parts specified in the Ford Customer Service Division Master Parts Catalog. The active restraint system consists of the following:

- Front safety belt buckles, attached to the inboard side of the seats
- Front safety belt retractors and pretensioners, located behind the lower B-pillar trim panels
- Belt tension sensor (BTS), located at the passenger front safety belt anchor point
- Rear safety belt retractors, mounted to the rear package tray
- Rear safety belt buckle assemblies, attached to the floor pan
- Rear child safety seat tether anchors, at both seating positions, welded to the underside of the package tray
- Rear lower anchors and tethers for children (LATCH) at both seating positions, attached to the floor pan



WARNING: ALL SAFETY BELT ASSEMBLIES INCLUDING RETRACTORS, BELT TENSION SENSOR (BTS), IF EQUIPPED, BUCKLES, FRONT SEAT BELT BUCKLE SUPPORT ASSEMBLIES (SLIDE BAR), IF EQUIPPED, SHOULDER BELT HEIGHT ADJUSTERS, IF EQUIPPED, CHILD SAFETY SEAT TETHER BRACKET ASSEMBLIES, IF EQUIPPED, AND ATTACHING HARDWARE SHOULD BE INSPECTED AFTER ANY COLLISION. FORD RECOMMENDS NEW SAFETY BELT ASSEMBLIES BE INSTALLED UNLESS A QUALIFIED TECHNICIAN FINDS THE ASSEMBLIES SHOW NO DAMAGE AND OPERATE CORRECTLY. SAFETY BELT ASSEMBLIES NOT IN USE DURING A COLLISION SHOULD ALSO BE INSPECTED AND NEW ASSEMBLIES INSTALLED IF EITHER DAMAGE OR INCORRECT OPERATION IS NOTED. THE AUTOMATIC LOCKING RETRACTOR (ALR) FEATURE OF THE SAFETY BELT RETRACTOR MUST BE CHECKED BY A QUALIFIED TECHNICIAN TO VERIFY THAT THE ALR FEATURE FOR A CHILD SEAT IS FUNCTIONING CORRECTLY, IN ADDITION TO OTHER CHECKS FOR CORRECT SAFETY BELT SYSTEM FUNCTION. A NEW BELT AND RETRACTOR ASSEMBLY MUST BE INSTALLED IF THE SAFETY BELT ASSEMBLY'S "AUTOMATIC LOCKING RETRACTOR" FEATURE OR ANY OTHER SAFETY BELT FUNCTION IS NOT OPERATING CORRECTLY WHEN INSPECTED ACCORDING TO THE FUNCTIONAL INSPECTION PROCEDURES IN THE WORKSHOP MANUAL. FAILURE TO INSTALL A NEW BELT AND RETRACTOR ASSEMBLY COULD INCREASE THE RISK OF INJURY IN COLLISIONS.

The air bag and safety belt pretensioner supplemental restraint system (SRS) is designed to provide increased collision protection for front seat occupants in addition to that provided by the three-point safety belt system. Safety belts must be used for maximum occupant protection and to receive the full advantages of the SRS.

NOTE: The air bag warning lamp illuminates when the RCM fuse is removed and the ignition switch is ON. This is normal operation and does not indicate a supplemental restraint system (SRS) fault.



WARNING: EACH SEATING POSITION IN THE VEHICLE HAS A SPECIFIC SAFETY BELT ASSEMBLY WHICH CONSISTS OF ONE BUCKLE AND ONE TONGUE. THE SAFETY BELT ASSEMBLY IS DESIGNED TO BE USED AS A PAIR AND IS NOT TO BE USED ACROSS SEATING POSITIONS.

LESSON 5: BODY AND MISCELLANEOUS

Safety Belt Buckle Switch



Safety Belt Buckle Switch

As part of the supplemental restraint system (SRS), the driver and passenger safety belt buckles are equipped with a Hall-effect safety belt buckle switch. The safety belt buckle switches indicate to the restraints control module (RCM) whether the safety belt buckles are buckled or unbuckled. The RCM uses this information in determining the deployment rate of the dual-stage driver and passenger air bag modules. The safety belt buckle switches are also used for the driver safety belt warning system and the driver and passenger Belt Minder.



WARNING: ALL SAFETY BELT ASSEMBLIES INCLUDE RETRACTORS, BUCKLES, FRONT SEAT BELT BUCKLE SUPPORT ASSEMBLIES (SLIDE BAR, IF SO EQUIPPED), SHOULDER BELT HEIGHT ADJUSTER (IF EQUIPPED), CHILD SAFETY SEAT TETHER BRACKET ASSEMBLIES (IF EQUIPPED) AND ATTACHING HARDWARE SHOULD BE INSPECTED AFTER ANY COLLISION. FORD RECOMMENDS NEW SAFETY BELT ASSEMBLIES BE INSTALLED UNLESS A QUALIFIED TECHNICIAN FINDS THE ASSEMBLIES SHOW NO DAMAGE AND OPERATE CORRECTLY. SAFETY BELT ASSEMBLIES NOT IN USE DURING A COLLISION SHOULD ALSO BE INSPECTED AND NEW ASSEMBLIES INSTALLED IF EITHER DAMAGE OR INCORRECT OPERATION IS NOTED.

Safety Belt Tension Sensor



Safety Belt Tension Sensor

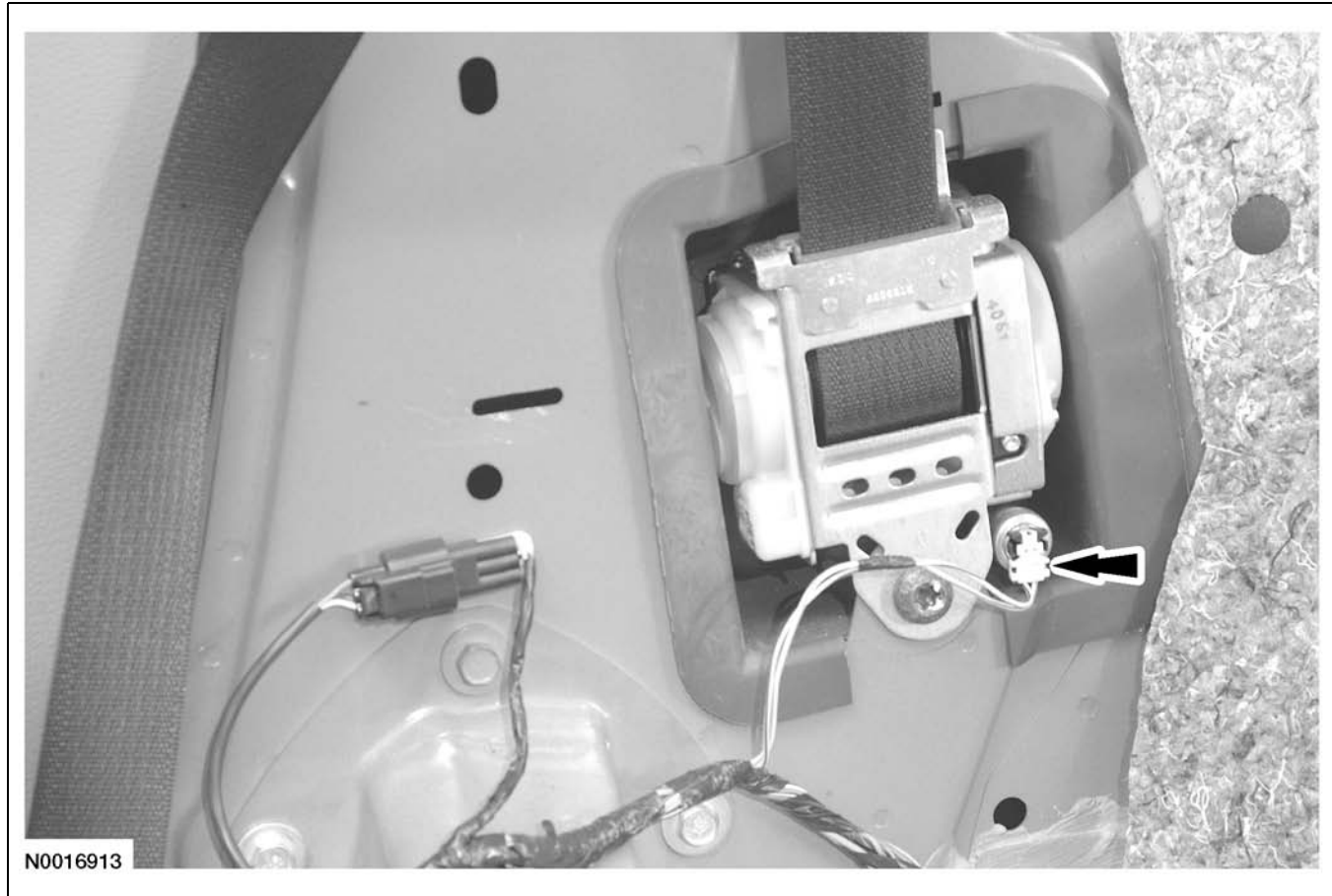
The OCS system interprets a variable voltage signal provided by the safety belt tension sensor to identify the presence of a child safety seat in the front outboard passenger seat. The OCS system then transmits that information to the restraints control module (RCM). The safety belt tension sensor is a three-wire Hall-effect sensor that is part of the front passenger safety belt and the front outboard passenger safety belt and retractor assembly. It is located at the safety belt anchor point and should not be confused with the pretensioners.

The OCS system uses the safety belt tension sensor to identify the presence of a child safety seat on the front outboard passenger seat. When the safety belt tension sensor detects tension on the safety belt assembly, it provides an output to the OCS system electronic control unit (ECU), indicating that the safety belt assembly is cinched. It then senses the weight of the occupant and uses the safety belt tension sensor input to determine how the occupant should be classified. This information is then sent to the restraints control module (RCM). If the occupant is classified as a child, the RCM automatically deactivates the passenger air bag module.

⚠ CAUTION: The shipping clip on a new retractor must remain attached prior to the installation of the retractor into the vehicle. The clip must be removed after the retractor is installed.

LESSON 5: BODY AND MISCELLANEOUS

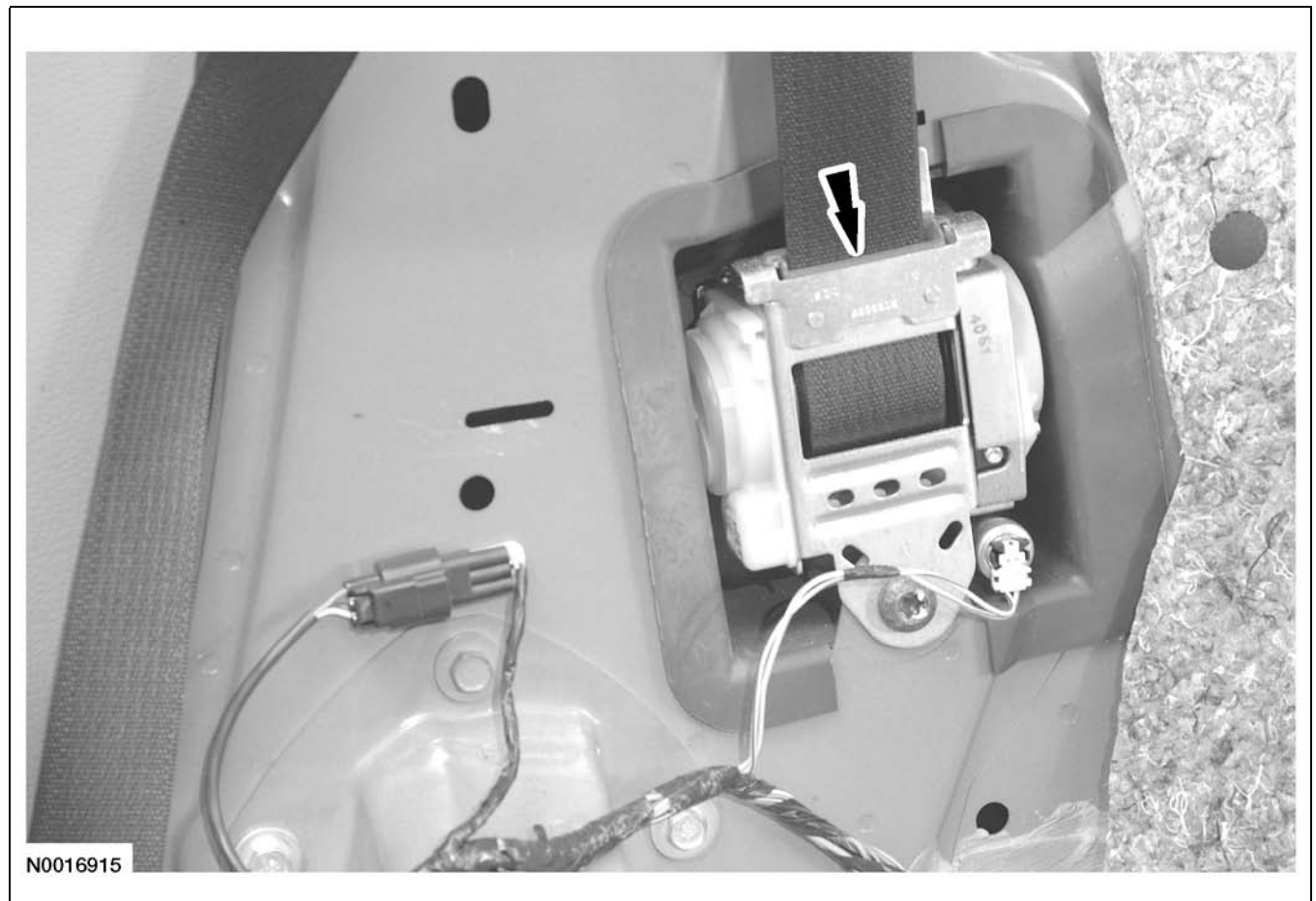
Safety Belt Pretensioners



Safety Belt Pretensioner Connector

The safety belt buckles are equipped with pretensioners. When activated by the RCM, the pretensioners remove excess slack from the safety belt webbing. The RCM activates the pretensioners during a deployable situation.

Dual Locking Safety Belt



Dual Locking Safety Belt Retractor Assembly

The dual locking mode retractor on the shoulder belt portion of the combination lap/shoulder safety belt for the front seat passenger and rear seat outboard passengers operates in two ways.

- In the vehicle-sensitive (emergency locking) mode, the shoulder belt retractor allows the occupant to move freely. It locks tightly only on hard braking, hard cornering or impacts of approximately 8 km/h (5 mph) or more. The front and rear outboard safety belt retractors can also be made to lock by pulling/jerking on the belt.
 - When the combination lap/shoulder belt is unbuckled and allowed to retract completely, the retractor switches to the vehicle sensitive (emergency) locking mode.
- In the automatic locking mode, the shoulder belt retractor locks automatically and remains locked when the combination lap/shoulder safety belt is buckled, restricting occupant movement. This mode provides tight lap/shoulder belt fit on the occupant and on a child safety seat or infant carrier installation restraint.
 - The automatic locking mode must be used when installing a child safety seat on the front passenger seat and rear outboard seats where dual locking retractors are provided. To use this mode, connect the seat belt around the child seat and remove all of the slack from the seatbelt.

LESSON 5: BODY AND MISCELLANEOUS



WARNING: REAR-FACING INFANT SEATS SHOULD NEVER BE PLACED IN THE FRONT SEATS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Air Bag Modules



Driver Air Bag Module

The driver air bag module is a dual-stage air bag. It deploys at one of two different rates, depending on impact severity, safety belt usage and driver seat position.

The passenger air bag module is a dual-stage air bag. Like the driver side module, it deploys at one of two different rates, depending on impact severity, occupant classification and safety belt usage.

LESSON 5: BODY AND MISCELLANEOUS

NOTE: The air bag warning lamp illuminates when the RCM fuse is removed and the ignition switch is ON. This is normal operation and does not indicate a supplemental restraint system (SRS) fault.

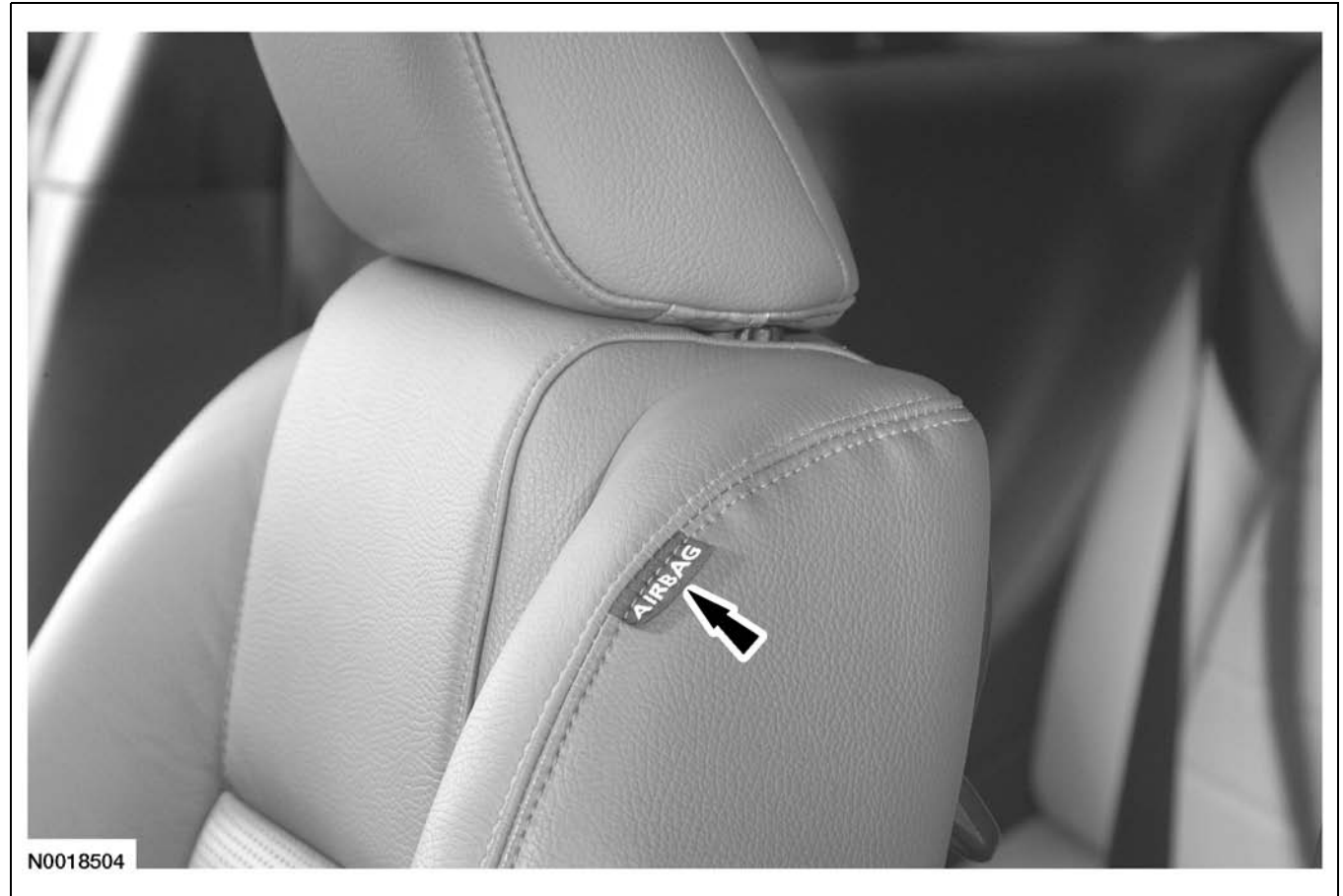


WARNING: NEVER PUT A REAR-FACING CHILD SEAT ON THE FRONT SEAT OF A VEHICLE WITH A PASSENGER AIRBAG. IF THE AIRBAG DEPLOYS, IT CAN HIT THE BACK OF THE CHILD SEAT WITH ENOUGH FORCE TO CAUSE SEVERE PERSONAL INJURY OR DEATH TO THE INFANT.



WARNING: A FORWARD-FACING CHILD SAFETY SEAT SHOULD ONLY BE PLACED IN THE FRONT SEAT WHEN IT IS UNAVOIDABLE. IF YOU MUST PLACE A FORWARD-FACING CHILD SEAT IN THE FRONT, ALWAYS MOVE THE SEAT AS FAR BACK AS POSSIBLE, BECAUSE THE FORCE OF THE DEPLOYING FRONT PASSENGER AIR BAG COULD CAUSE DEATH OR SERIOUS INJURY TO THE INFANT. IF THE VEHICLE IS EQUIPPED WITH A PASSENGER AIRBAG DEACTIVATION SWITCH, THE PASSENGER AIRBAG MUST BE DEACTIVATED.

Seat Side Air Bags



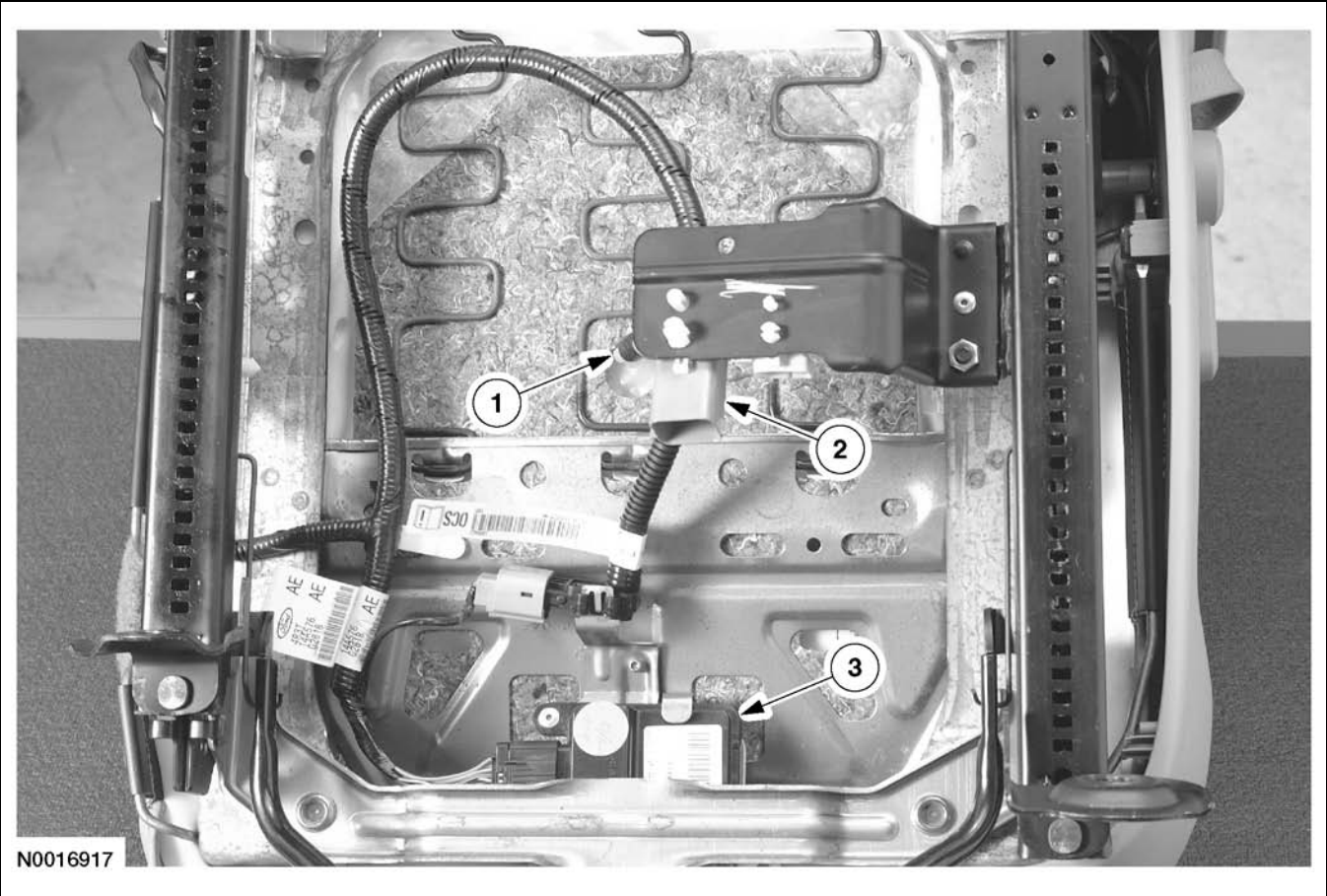
Seat Side Air Bag

The seat side air bags are optional on the 2005 Mustang V-6 and Mustang GT. Driver and passenger seat side air bags are attached to the seat backrest frame.

- Front seat backrest trim covers installed on seats with seat side air bags cannot be repaired. Install new front seat backrest trim covers. Cleaning is permissible.
- If a seat side air bag deployment took place, a new seat back foam pad, trim cover, seat side air bag module, bracket and nuts, U-nuts and bolts must be installed. Install a new seat backrest frame, if necessary.
- As with other air bag modules, the RCM controls the deployment.

LESSON 5: BODY AND MISCELLANEOUS

Occupant Classification Sensor



Occupant Classification Sensor System Components

Item	Description
1	Bladder pressure tube
2	Pressure sensor

Item	Description
3	Occupant classification sensor electronic control unit

The OCS components are the seat cushion foam pad, bladder with pressure sensor and electronic control unit. They are calibrated to each other and are serviced as an assembly. **The OCS system components must not be installed separately.**

When an OCS system fault is present, the air bag indicator lamp will illuminate. If an OCS system has a fault and cannot illuminate the lamp for some reason, the air bag warning chime will be activated. The SRS then defaults the passenger air bag module to ON (activated) regardless of the size of the occupant in the front outboard passenger seat.

NOTE: If installing a new OCS system, OCS system component or seat cushion foam pad, a new OCS system service kit must be installed as an assembly.

NOTE: The PTS website includes an 11 minute video with additional information on the OCS system.



CAUTION: The OCS system components must be installed as a unit.

The operation of the OCS system is as follows:

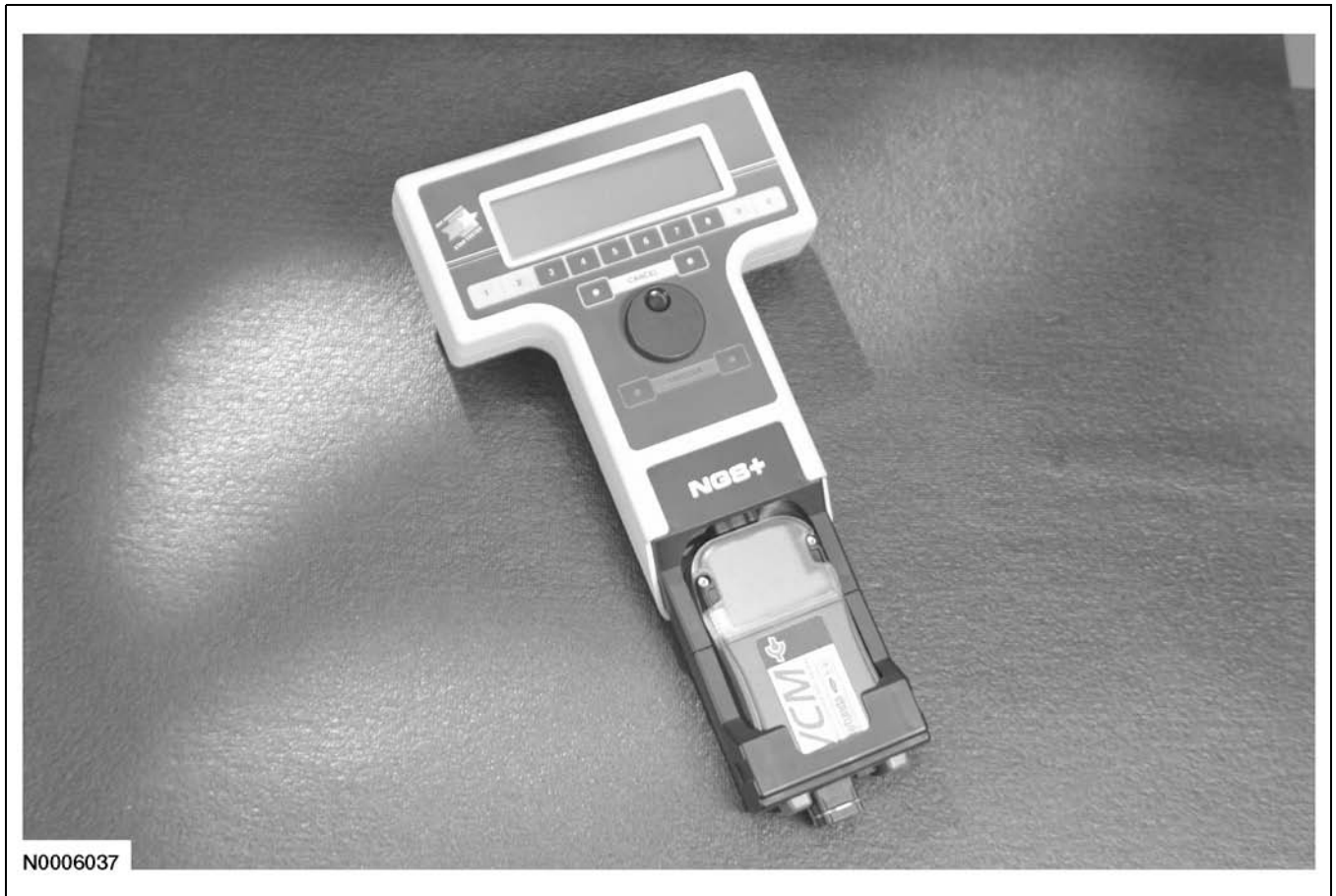
- Pressure is applied to the OCS system bladder when weight of any occupant or object is present in the front passenger seat.
- The pressure is then transferred through a tube and sensed by the OCS system pressure sensor.
- The pressure sensor converts the air pressure signal to an electrical signal and sends it to the OCS electronic control unit (ECU).
- The OCS system ECU informs the restraints control module (RCM) via the HS-CAN restraints subnetwork.
- The RCM uses this information in determining whether the passenger air bag module must be deployed in the event of a deployable collision.
- The RCM may also use this information to determine when to illuminate the passenger air bag deactivation (PAD) indicator.
- The OCS system interprets a variable voltage signal provided by the safety belt tension sensor to identify the presence of a child safety seat in the front outboard passenger seat. The OCS system then transmits that information to the restraints control module (RCM).

LESSON 5: BODY AND MISCELLANEOUS

Zeroing the OCS System

Whenever any maintenance or repairs are performed to the front passenger seat cushion or the OCS system, it is necessary to rezero the system. A scan tool is used to trigger the active command to rezero the OCS system. Make sure the seat is completely assembled before rezeroing. Before starting the rezeroing process the following precautions must be taken:

- Make sure the OCS system is at a temperature between 0°C (32°F) and 45°C (113°F) before initiating the rezeroing process. If subjected to extreme hot or cold temperatures, the vehicle must be exposed to and kept at a temperature within this temperature range for at least 30 minutes.
- Make sure the OCS system components are connected and no faults are present.
- Make sure nothing is present on the passenger seat before rezeroing and nothing is placed on the seat during the rezeroing process.
- After cycling the ignition switch ON, allow a minimum of eight seconds to pass before starting the rezeroing process.



New Generation STAR Plus (NGS+) Tester

When using a New Generation STAR plus (NGS+) tester, you must use the appropriate memory card with the latest update to carry out this function. To rezero the OCS system with the NGS+:

1. Select the vehicle from the menu.
2. Select “SERVICE BAY FUNCTIONS.”
3. Select “RCM.”
4. Select “SYSTEM RESET.”
5. View the on-screen information, then press “TRIGGER.”
6. The NGS+ screen will then display “OCS RESET: REZERO.”
7. Press “DONE” (button 8) to rezero the OCS system.
8. Cycle the ignition switch.

NOTE: If the first attempt to rezero the OCS system is unsuccessful, a second attempt must be made.

LESSON 5: BODY AND MISCELLANEOUS



Worldwide Diagnostic System (WDS)

To rezero the OCS system using the Worldwide Diagnostic System (WDS):

1. Select the “Toolbox” icon.
2. Select “Body” from the menu.
3. Select “Restraints” from the menu.
4. Select “Seat Weight Sensor ReZero.”
5. Follow the on-screen prompts to rezero.
6. Cycle the ignition switch.

NOTE: If the first attempt to rezero the OCS system is unsuccessful, a second attempt must be made.

Passenger Air Bag Deactivation (PAD)



Passenger Air Bag Deactivation (PAD) Indicator

The passenger air bag deactivation indicator (PADI) is a visual indicator used to inform the front seat occupants of the passenger air bag deactivation (PAD) state. It is located in the integrated control panel (ICP) so that it is visible to each front seat occupant. When the PAD indicator is lit, the passenger air bag module is deactivated (OFF). The PAD indicator is part of the ICP assembly and cannot be serviced separately. Installation of an incorrect ICP can trigger a fault in the supplemental restraint system and illuminate the air bag warning indicator in the instrument cluster.

⚠ CAUTION: The passenger air bag deactivation (PAD) indicator is part of the hazard/traction control switch assembly and cannot be separately serviced.

- An all-new three-gang center stack switch accommodates the traction control, hazard lights and PADI.
- The restraints control module (RCM) controls the state of the PAD indicator. This is done through a direct hardwire connection and based on information provided by the OCS system.
 - The PAD indicator is always unlit when the passenger air bag module is activated (ON).
 - One exception to this, however, occurs when the front passenger seat is determined to be empty. In such cases, indication of a deactivated passenger air bag module is not necessary.

LESSON 5: BODY AND MISCELLANEOUS

- Turning the ignition switch to the RUN position signals the RCM to initiate the PAD indicator prove-out procedure. The RCM briefly activates the PAD indicator to prove the indicator function and alert the front occupants that the PAD indicator is functioning properly.
- The PAD indicator will illuminate, or will turn off if illuminated within 1.0 ± 0.5 seconds of a change of state from the OCS system.
- When an OCS system fault is present:
 - The SRS defaults the passenger air bag module to ON (activated), regardless of the size of the occupant in the front outboard passenger seat.
 - The PAD indicator is unlit.

Restraints Control Module (RCM)

The 2005 Mustang V-6 and Mustang GT are equipped with a new RCM which includes several new features. The new features are:

- Serial number traceability
- Multiple event-type recording
- Buffered crash data for independent sensors

NOTE: Be very careful to follow the proper procedures for deactivating the restraint system before disconnecting and connecting the RCM electrical connectors. Disconnecting, striking or moving the RCM with the restraints active can deploy all of the air bags.

The RCM is mounted on the center tunnel under the instrument panel. The RCM carries out the following functions:

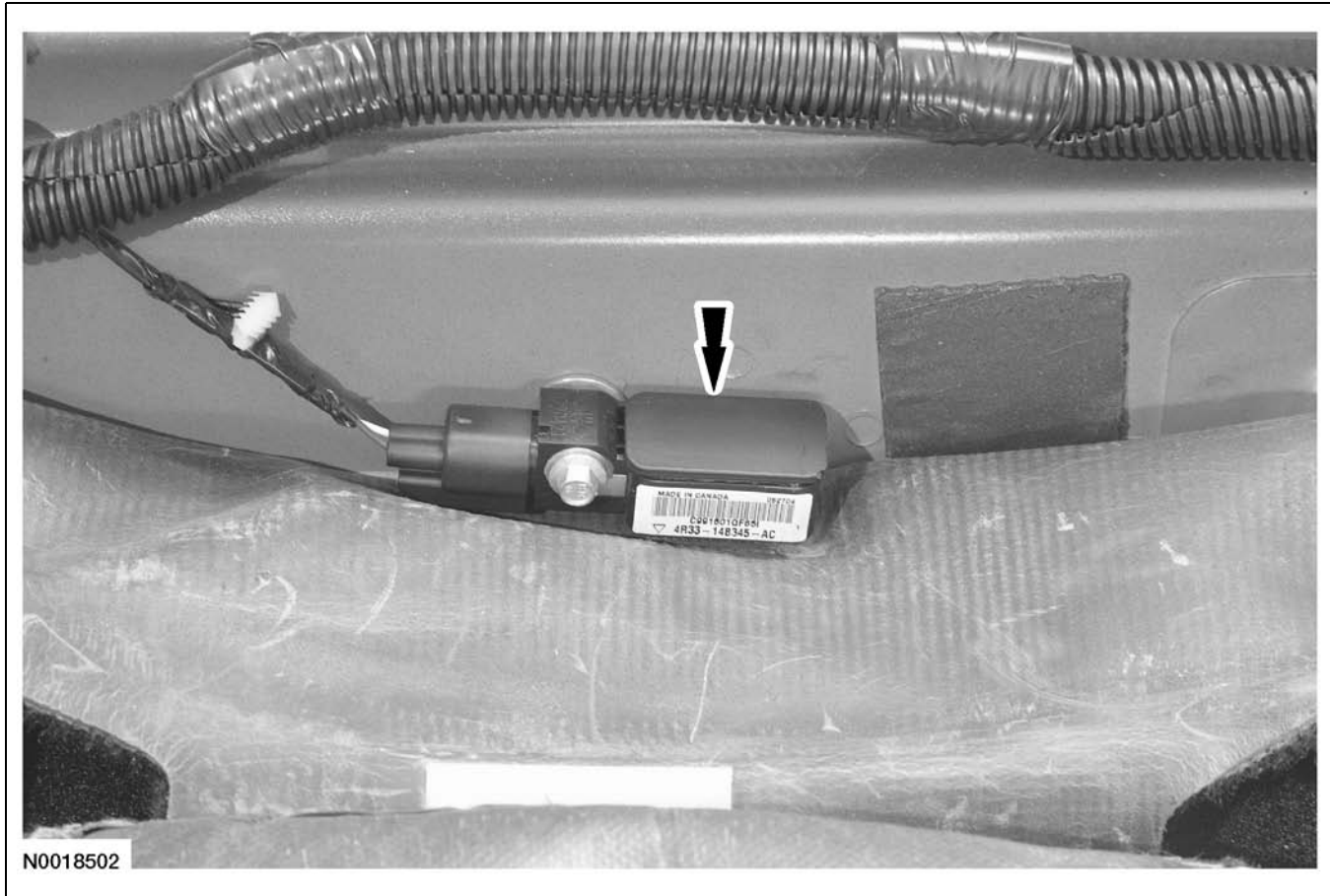
- Deploys the air bags in the event of a deployable impact.
- Activates the safety belt buckle pretensioners to remove slack from the safety belt webbing.
- Monitors the SRS for faults.
- Illuminates the restraints indicator lamp (RIL) if a fault is detected.
- Illuminates the passenger air bag deactivation (PAD) indicator.
- Flashes the restraints indicator lamp to indicate the lamp fault code (LFC) detected.
- Communicates the current or historical diagnostic trouble codes (DTCs) via the data link connector (DLC).
- Signals the instrument cluster module to activate a chime if the restraints indicator lamp is not available and another SRS fault exists.
- Records deployable and non-deployable impact data.



WARNING: MOUNTING ORIENTATION OF THE IMPACT SENSORS AND THE RCM IS CRITICAL FOR CORRECT SYSTEM OPERATION. IF A VEHICLE HAS BEEN INVOLVED IN A COLLISION IN WHICH THE CENTER TUNNEL AREA HAS BEEN DAMAGED, INSPECT THE RCM MOUNTING AREA FOR DEFORMATION. INSPECT THE IMPACT SENSOR MOUNTING AREA FOR DAMAGE. IF DAMAGED, A NEW RCM AND SENSORS MUST BE INSTALLED WHETHER OR NOT THE AIR BAGS HAVE DEPLOYED. IN ADDITION, MAKE SURE THE MOUNTING AREA OF THE RCM AND IMPACT SENSORS ARE RESTORED TO THE ORIGINAL PRODUCTION CONFIGURATION.

LESSON 5: BODY AND MISCELLANEOUS

Impact Sensors



Seat Side Impact Sensor

The impact sensors provide the RCM with the data needed to calculate impact severity. A front impact severity sensor is located in the front center of the vehicle, behind the grille. Vehicles equipped with seat side air bags also have side impact sensors located near the base of each B-pillar.



WARNING: MOUNTING ORIENTATION OF THE IMPACT SENSORS AND THE RCM IS CRITICAL FOR CORRECT SYSTEM OPERATION. IF A VEHICLE HAS BEEN INVOLVED IN A COLLISION IN WHICH THE CENTER TUNNEL AREA HAS BEEN DAMAGED, INSPECT THE RCM MOUNTING AREA FOR DEFORMATION. INSPECT THE IMPACT SENSOR MOUNTING AREA FOR DAMAGE. IF DAMAGED, A NEW RCM AND SENSORS MUST BE INSTALLED WHETHER OR NOT THE AIR BAGS HAVE DEPLOYED. IN ADDITION, MAKE SURE THE MOUNTING AREA OF THE RCM AND IMPACT SENSORS ARE RESTORED TO THE ORIGINAL PRODUCTION CONFIGURATION.

Uni-Body Subframe and Mounting



Uni-Body Subframe

The 2005 Mustang V-6 and Mustang GT feature a new frame structure which includes:

- A new front subframe steel stamping which is unique for McPherson front suspension geometry
- A new front crossmember

LESSON 5: BODY AND MISCELLANEOUS



Transmission Mount and Crossmember

- There is also a new transmission mount and crossmember.
- Subframe
 - Two fasteners secure to the rail on each side of the subframe.
 - Two fasteners secure to the front torque box on each side of the subframe.
 - Alignment of the subframe during repair or replacement requires the use of a locating tool. Refer to the Workshop Manual for additional information. Proper alignment of the subframe is required for proper suspension alignment.
- Front Crossmember
 - Front stabilizer bar is mounted to the crossmember.
 - Radiator is decked onto the crossmember.
 - An alignment locating pin is located between the two rail attachments on each side.
 - Two fasteners secure to the rail on each side of the crossmember.

ESSENTIAL SPECIAL SERVICE TOOLS

NOTES

APPENDIX: ESSENTIAL SPECIAL SERVICE TOOLS

GLOSSARY OF TERMS

NOTES

