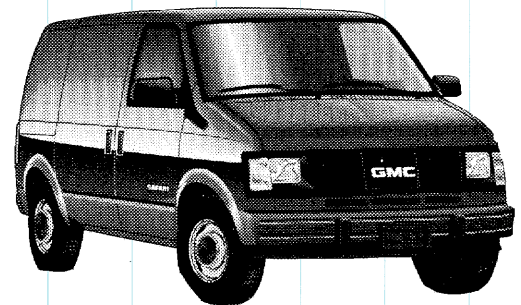
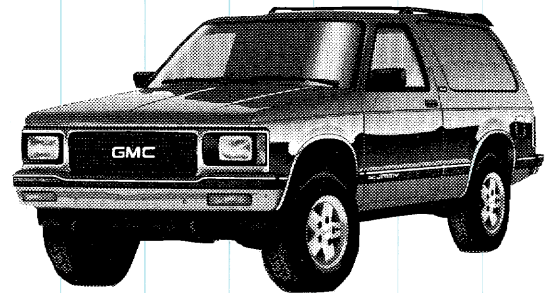
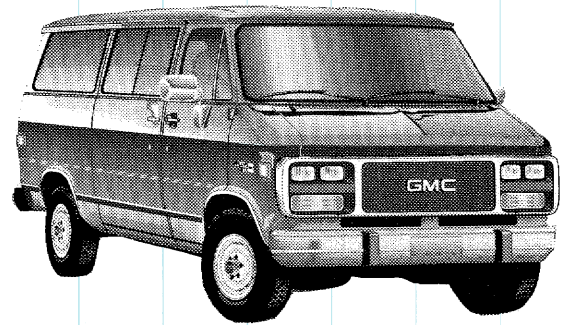
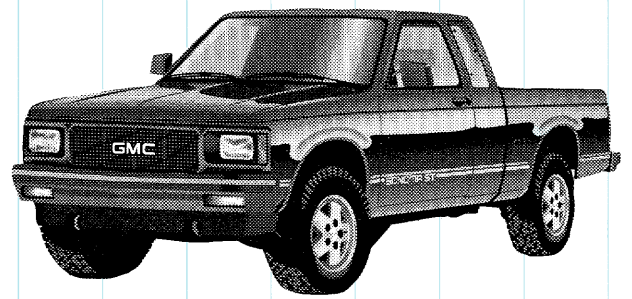


Driveability
And
Service:
Typhoon And
Syclone

REFERENCE #GMCTT-92-06-2



REFERENCE
MANUAL



LEADER GUIDE

The GMC Syclone and Typhoon are totally unique vehicles in the world of trucks . . . and they have unique driving and service requirements that **MUST BE FOLLOWED**. This video and manual are dedicated to fully explaining those service procedures.

In addition, this PPN release is intended to heighten the awareness of everyone in your service department to the problem of owner tampering with the engine and drivetrain. These unauthorized modifications generally void warranty coverage and it's important to the dealership and GMC that everyone in your service department understand how to detect and handle these tampering conditions.

RECOMMENDED PROCEDURE FOR CONDUCTING YOUR MEETING

- We suggest the following format for your meeting:
 - Introduce the subject of the special engine and drivetrain service procedures and service requirements of the GMC Syclone and Typhoon. It is equally important to introduce the subject of "tampering" and how to deal with it.
 - Show the accompanying video.
 - Review this PPN manual.
 - We suggest you "walk" your service personnel page by page through the manual to familiarize them with the easy-to-follow format.
 - Complete and return the response card.

Good luck. We hope this PPN release is helpful to you and your service department.

GMC Service Training

The material in this manual and accompanying video tape are for the exclusive use of GMC Dealership professional technicians. It is not intended for use by any other persons.

ALL MATERIAL PRESENTED IN THIS
VIDEOTAPE IS THE LATEST INFORMATION
AVAILABLE AT THE TIME OF PRODUCTION.

(C) 1992, General Motors Corporation

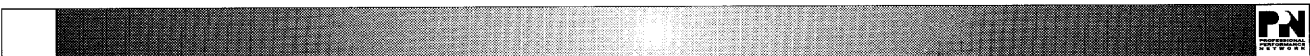


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NOTE: During the video, you will see an alpha/numerical symbol in a box on the upper right corner of the screen. That symbol corresponds with the section and subject in this manual.

This video is intended for use by the professional technician. The information is presented with the understanding that a technician has a working knowledge of the components and systems that are used on the types of vehicle shown in this production.

A UNIQUE CHARACTERISTICS OF THE GMC SYCLONE AND TYPHOON

■ GENERAL COMMENTS

The GMC Syclone and Typhoon are totally unique vehicles in the world of trucks . . . their high performance 4.3 liter turbocharged engine, heavy duty sport transmission and anti-lock brake system require special service procedures.

■ TAMPERING

Many owners of these hybrids cannot resist the temptation to tamper with and modify these trucks, especially the engine, in an attempt to squeeze out even more performance. In so doing, they are jeopardizing both their trucks and their warranties.

B UNIQUE DRIVEABILITY CHARACTERISTICS

■ ROUGH IDLE

To satisfy all of the Federal requirements, the engine has been designed to operate lean when at idle. The "rough idle" condition is proper and should not cause owner concern.

■ HARSH UP-SHIFT

The transmission is a heavy-duty sport transmission and is designed to perform in a hard positive manner.

■ TOWING

The Typhoon is not designed for towing, and to do so could void the warranty. The Typhoon has an approved gross vehicle weight of 5300 pounds.

The Syclone is designed for towing total weights up to 1100 pounds. The total approved gross weight of this vehicle is 4800 pounds.

C UNIQUE SERVICE REQUIREMENTS

Because of the unique performance characteristics of the engine and drivetrain, they require special service procedures which are noted in this PPN release.

Unauthorized modifications and tampering by the owners often adversely effect the performance of these vehicles while jeopardizing their warranty. To minimize the impact of these modifications, GMC has designed special service procedures that **MUST BE FOLLOWED** when servicing the engine and drivetrain.

■ SERVICE PROCEDURE

- 1 When you're satisfied that the engine requires repair and that possibly involves the warranty, run a full series of diagnostic tests using the Tech 1.
- 2 Run the vehicle through SERVICE NET for any significant service history.
- 3 Call GMC TAC, Engine 1-800-832-6346, Drivetrain 1-800-832-8726;
 - describe the problem.
 - They will probably fax a Syclone/Typhoon Overboost and Tamper Items Checklist.
 - Fill it out and fax it back. Then call your TAC Service Engineer.
 - Report any suspected tampering or unauthorized modifications to your TAC Service Engineer.
 - Your TAC Service Engineer will assist you in diagnosis and the proper repair procedure to follow.

SYCLONE\TYPHOON	
OVERBOOST AND TAMPER ITEMS CHECKLIST	
VIN #1GDCT1__Z_M_____	DATE _____
_____ DOES VEHICLE HAVE COMPLETE EXHAUST SYSTEM?	
_____ IS BOOST CONTROL SYSTEM INTACT WITH CLAMPS?	
_____ IS ECM LABEL INTACT?	
_____ ECM LABEL NUMBER?	
_____ IS PROM ID NUMBER 3051, 3961, OR 3971?	
_____ IS WASTEGATE ADJUSTMENT AT 7/8" HOLE?	
_____ DOES VEHICLE HAVE STOCK FUEL PRESSURE REGULATOR?	
_____ DOES VEHICLE HAVE STOCK AIR FILTER?	
_____ ARE ECM WIRES UNDERDASH PINCHED OR BROKE?	
_____ IS TIMING SET AT 0 DEGREES?	
_____ HAS VEHICLE BEEN LOWERED?	
_____ HOW MUCH FUEL IS IN VEHICLE?	
_____ DOES WASTEGATE ACTUATOR HOLD 10 PSI?	
_____ DOES WASTEGATE SOLENOID HAVE 12V W/KEY ON	
ANSWER YES OR NO	

SYCLONE\TYPHOON OVERBOOST AND TAMPER ITEMS CHECKLIST

- There are two ways to adjust the wastegate actuator. The video accompanying this PPN manual showed one method. The method below is a more comprehensive method of adjusting the wastegate actuator.

WASTEGATE ACTUATOR ADJUSTER

NOTE:

Do not attempt to adjust the wastegate actuator outside the range of the specifications in this procedure. Improper adjustment can severely limit performance or cause over-boost, resulting in fuel shut off.

TOOLS REQUIRED:

J 35691 Turbocharger Pressure Gage
J 8001-3 Dial Indicator, Part of J 8001
Dial Indicator set

TO ACCESS WASTEGATE ACTUATOR

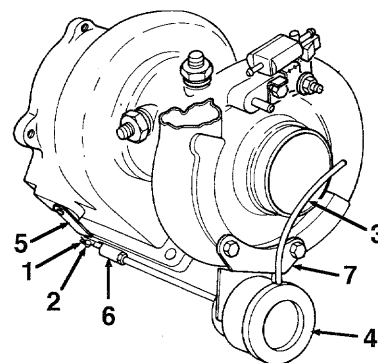
- 1 Remove right front wheel and tire.
- 2 Remove the passenger side wheelhouse panel.
- 3 Disconnect the retaining wire (1) from pin (2).
- 4 Remove special clamp (7) from boost control hose.
- 5 Disconnect boost control hose (3) from wastegate actuator (4).

TO ADJUST WASTEGATE ACTUATOR

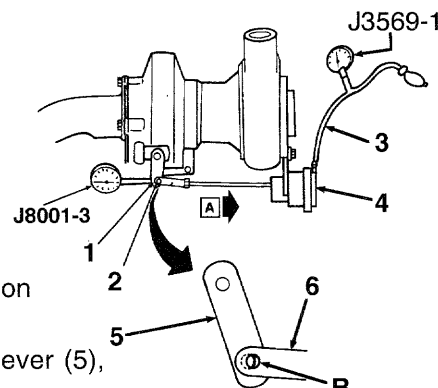
- 1 Connect pressure gage, tool J 35691, to hose connection on wastegate actuator (4) making sure dial reads zero.
- 2 Connect the dial indicator, tool J 8001-3, on end of the lever (5), making sure dial reads zero.
- 3 Apply 31 to 34.5 kPa (4.5 to 5 psi) air pressure with the tool J 35691 and check tool J 8001-3 for pressure reading.
- 4 If the dial indicator, tool J 8001-3, reads greater than 0.5 mm to 1.5 mm (0.02 to 0.06 inch), readjust rod by shortening it a half-turn at rod end (6). If J 8001-3 reads less than 0.5 mm to 1.5 mm (0.02 to 0.06 inch), readjust rod by lengthening it a half-turn at rod end (6).
- 5 Recheck travel at 31 to 34.5 Kpa (4.5 to 5 psi) air pressure.
- 6 Repeat the adjustment until above specifications are met. If specifications can not be met, replace the wastegate actuator.
- 7 If adjustment causes wastegate to open at all, replace wastegate actuator
- 8 Remove tools J 8001-3 and J 35691.

TO INSTALL WASTEGATE ACTUATOR

- 1 Install new clamp (7) on boost control hose (3).
- 2 Connect the boost control hose (3) to wastegate actuator (4).
- 3 Correctly position clamp on hose end and crimp clamp onto hose. Clamp must prevent hose from being capable of pulling off actuator.
- 4 Connect the retaining wire (1) to pin (2).
- 5 Install the passenger side wheelhouse panel.



- (1) Wire Retainer
(2) Lever Pin
(3) Boost Control Hose
(4) Wastegate Actuator
(5) Lever
(6) Rod End
(7) Clamp
(A) Direction to push lever closed
(B) 7/8 of diameter of hole on rod end covered by pin



F CODE 31, MISADJUSTED TV CABLE

■ **THROTTLE VALVE (TV) CABLE ADJUSTMENT**

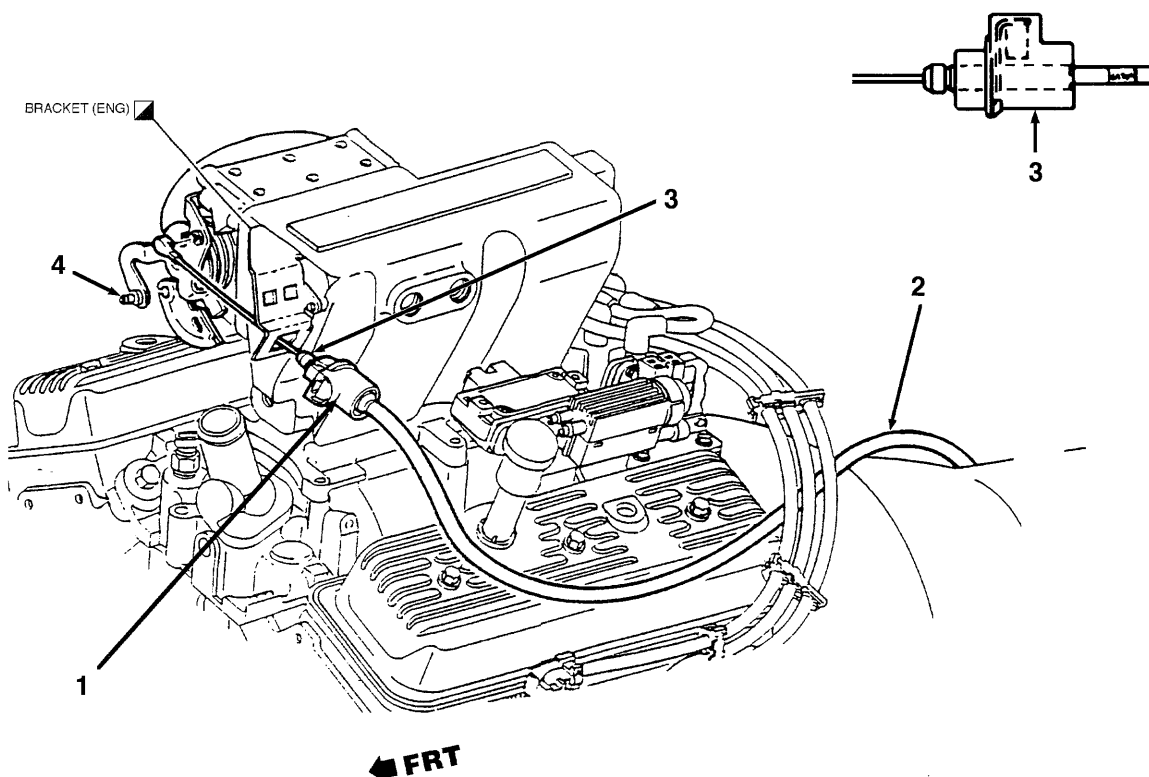
NOTE: Adjustment of the TV cable must be made by rotating the throttle lever at the throttle body. Do not use the accelerator pedal to rotate the throttle lever.

■ **TO ADJUST TV CABLE**

- 1 Remove the driver side floor mat to prevent a false throttle setting.
- 2 Depress and hold down the metal re-adjust tab (1) at the engine end of the TV cable (2).
- 3 Move the slider (3) toward the passenger side until it stops against the fitting.
- 4 Release the readjustment tab (1).
- 5 Rotate the throttle lever (4) to its "full travel position."
- 6 The slider (3) must move or ratchet toward the lever when the lever is rotated to its full travel position.

NOTE: Check that the cable moves freely. The cable may appear to function properly with the engine stopped and cold. Recheck after the engine is hot.

- 7 Road test the vehicle to verify the repair.



- (1) Re-Adjust Tab
- (2) TV Cable
- (3) Slider
- (4) Throttle Lever

G MEMCAL'S (PROMS)

- There are only three (3) memcals that are authorized to be installed in Sycloones and Typhoons. Memcals with I.D.'s other than these, garbled I.D.'s, or with no I.D. number at all, are to be considered unauthorized and may void the engine warranty.
They are to be replaced with authorized GM memcals.

■ **AUTHORIZED GM MEMCALS**

- 1 I.D. 3051 (campaigned, to be replaced by 3961 or 3971).
- 2 I.D. 3961
- 3 I.D. 3971

H ECM CHAFFING/ECM REPLACEMENT

Sycloones built before VIN 1521 may experience overboost due to ECM wiring harness chaffing against the upper mounting bracket. It is necessary to repair the wires and install a new mounting bracket assembly to correct this condition.

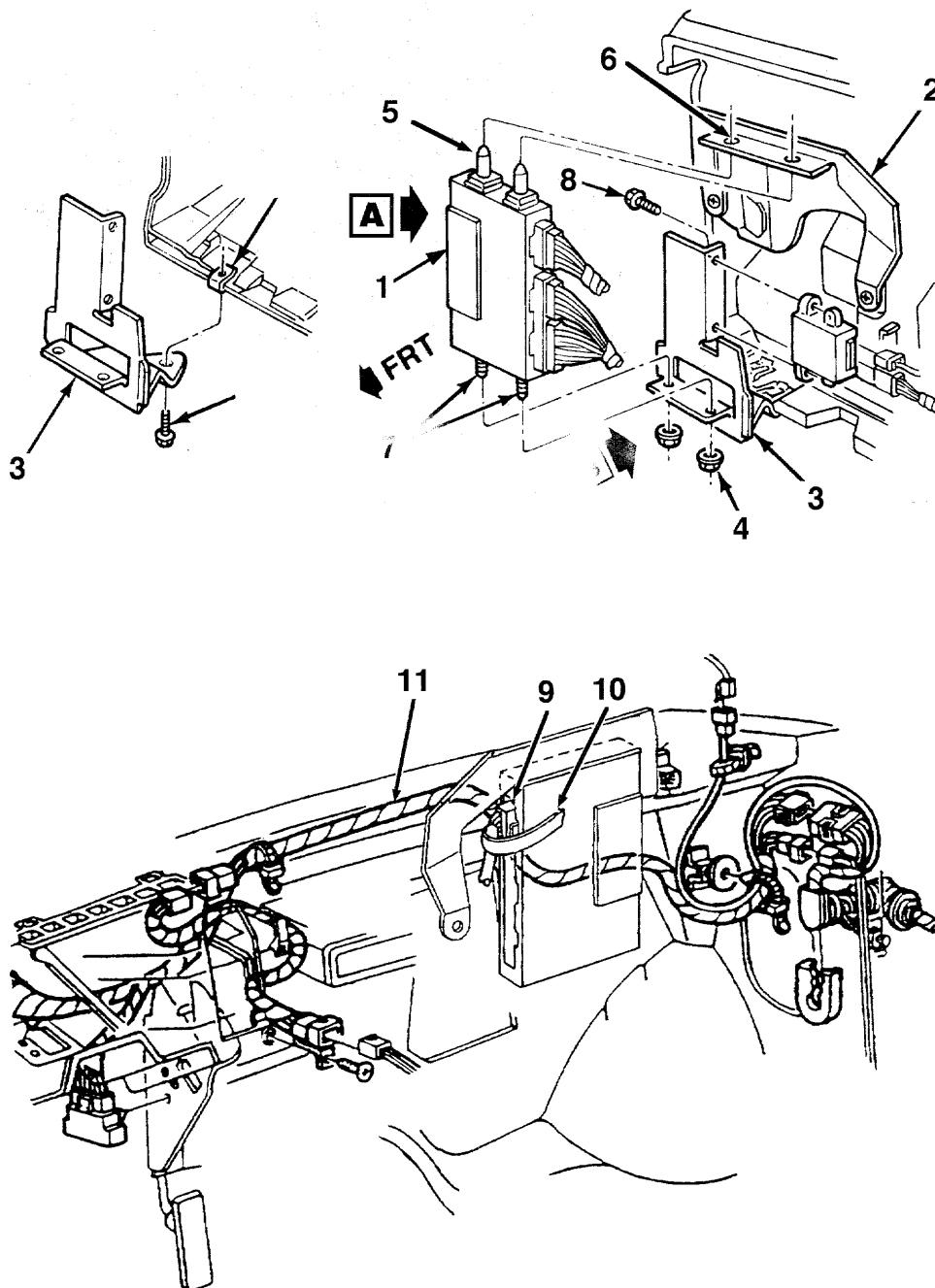
■ **ECM BRACKET REPLACEMENT**

- 1 Disconnect the negative (-) battery cable.
- 2 Disconnect wiring harness.
- 3 Remove the ECM from the upper bracket.
- 4 Remove the upper mounting bracket.
- 5 Repair the "chaffed" wiring harness in the approved GM manner.

■ **INSTALL NEW MOUNTING BRACKET**

- 1 Mount upper mounting bracket (2) to the I.P.
- 2 When installing the ECM into the passenger compartment position the wire out of the top (green) connector (9) between the connector thumb latch and the tab on grey comb. Place tape (10) to retain wire in this position during ECM installation. To avoid interference, it will be necessary to move the cross body power door lock harness (11) prior to ECM installation.
- 3 Mount ECM (1) into the upper mounting bracket (2) by inserting the ECM mounting pins (5) into the upper bracket mounting holes (6).

- 4 Secure the lower mounting bracket (3) to the I.P. using the lower mounting bracket mounting bolt (8).
- 5 Install right hush panel.
- 6 Reconnect negative (-) battery cable.
- 7 Verify all ECM functions with a Tech Scan tool.

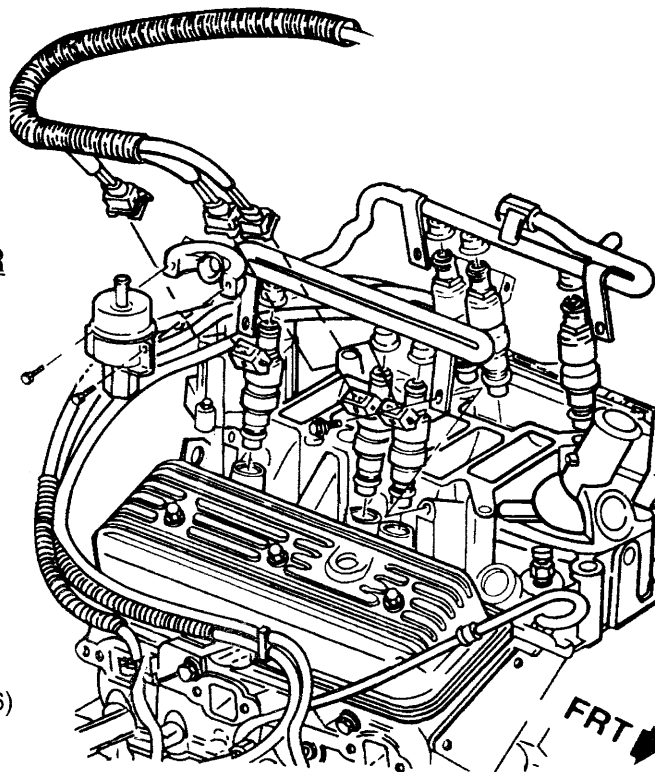


- (1) ECM Assembly
- (2) Upper Mounting Bracket
- (3) Lower Mounting Bracket
- (4) Nut
- (5) ECM Mounting Pins
- (6) Upper Bracket Mounting Holes
- (7) ECM Mounting Studs
- (8) Lower Mounting Bracket Bolt
- (9) Connector
- (10) Tape
- (11) Cross Body Power Door Lock Harness

- **NOTE:** Before servicing an injector, fuelrail, or pressure regulator, it is necessary to relieve the pressure in the fuel system, to minimize the risk of fire and personal injury. To reduce the chance of personal injury, cover the fuel line with a shop cloth to collect the fuel, and then place the cloth in an approved container.

■ **FUEL PRESSURE REGULATOR REPLACEMENT**

- 1 Remove the pressure regulator from fuel rail. Place shop cloth around base of regulator to catch any spilled fuel.
- 2 Install the new pressure regulator on fuel rail.
- 3 Test the fuel pressure regulator for accurate performance. (See Sec 6E3-A Page 20 of GMC Truck 1992 Syclone, Typhoon, Sonoma GT Service Manual Supplement X-9276) for complete procedure.

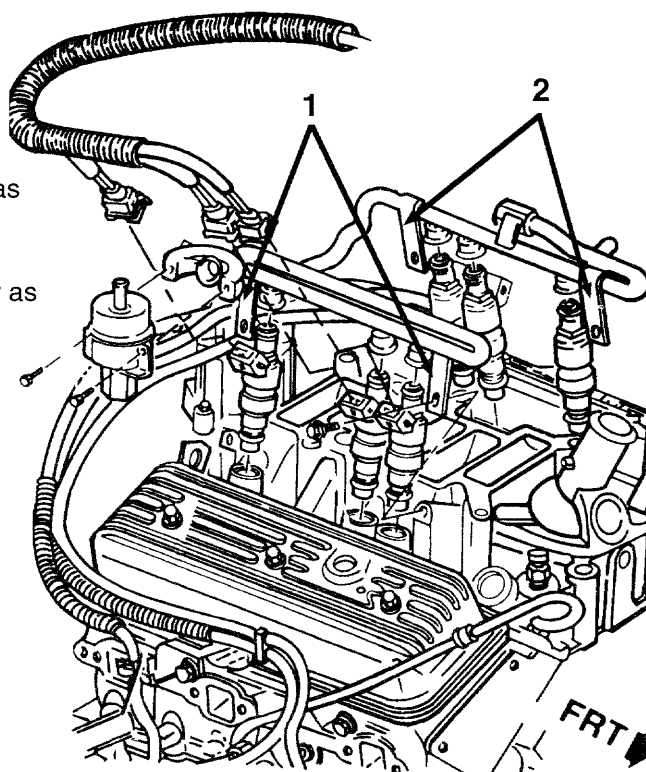


- Injector noise is caused by the fuel rails seated too close to the engine causing the fuel injectors to contact the intake manifold. The repair procedure involves raising the height of the fuel rail, thus relieving the metal to metal contact of the fuel injectors to the manifold. This depressed fuel rail condition can also cause the fuel to boil in the fuel rail because heat is transferred directly from the intake manifold through the injectors to the rail. This can cause poor engine performance.

■ TO SET THE RAIL TO THE CORRECT HEIGHT

■ If fuel rail brackets are slotted:

- 1 On a cool engine loosen the passenger side fuel rail brackets (1).
- 2 Then loosen the driver side fuel rail brackets (2).
- 3 Raise the passenger side fuel rail as far as the bracket slots (1) permit, tighten the bolts.
- 4 Raise the driver side fuel rail as far as the fuel rail bracket (2) permits, tighten the bolts. This should correct the injector noise and heated fuel rail condition.



■ If fuel rail brackets have holes:

- 1 Depression of the fuel rail can only be caused by bent brackets, forcing the rail down. Straighten bent brackets to raise the fuel rail height. This should correct the injector noise and heated fuel rail condition.

- (1) Passenger Side Fuel Rail Brackets
(2) Driver Side Fuel Rail Brackets

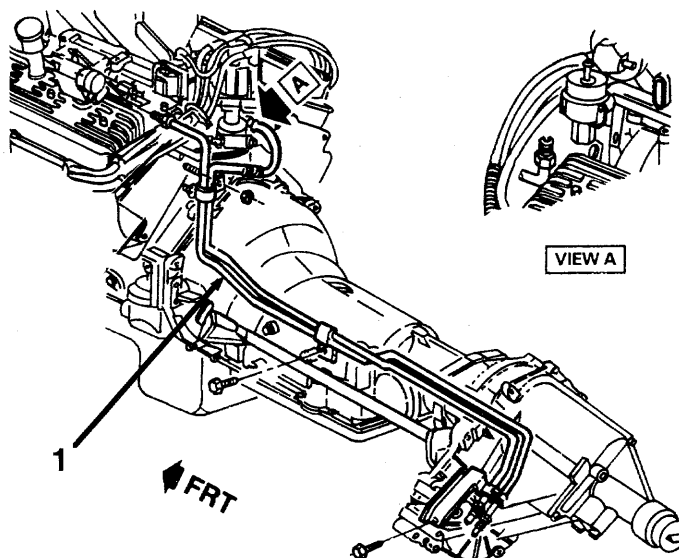
K FUEL SYSTEMS, FUEL LINE NOISE

■ Complaint: Customer may complain about noise (tapping sound) coming from the lower I.P. area.

■ Cause: There are two probable causes. Check out both:

- 1 Fuel lines (1) improperly routed over the transmission — there is too much clearance above the transmission and they are vibrating against the floor pan.

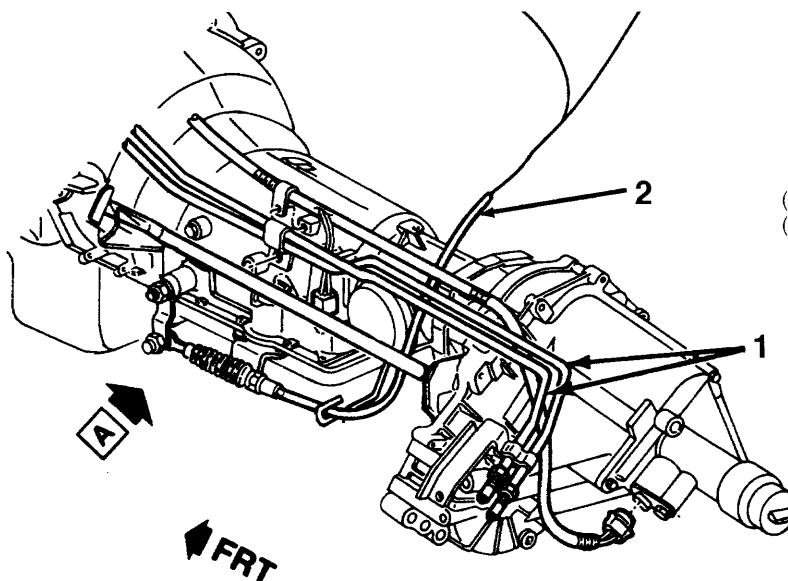
Correction: Adjust fuel line to achieve proper clearance from both the floor pan and the transmission.



(1) Fuel Lines

- 2 Fuel line is vibrating against the shift cable.

Correction: Adjust fuel line to achieve clearance from the shift cable.



(1) Fuel Lines
(2) Shift Cables

L SPARK PLUGS

■ NOTE: Always replace spark plugs with:

- R42TS, or
- R42CTS, or
- ones with equivalent heat range

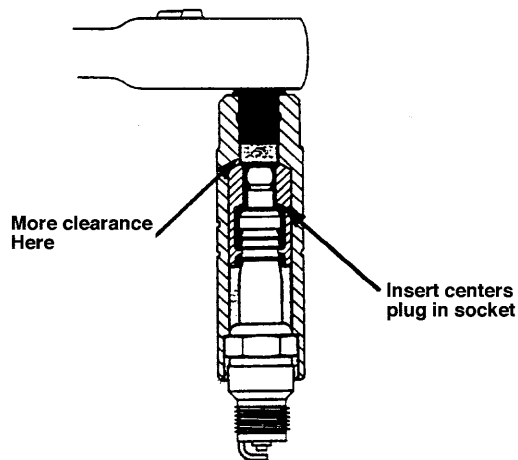
NEVER REPLACE WITH "HOTTER" PLUGS.

■ The Syclone and Typhoon use the Quantum Plugs, which, among other differences, are longer than the plugs that you routinely work with. Because of this longer length, you'll have to use Snap-On tool #S9706KA spark plug socket to service the plugs. The illustration below shows the prime characteristics of this new plug.

■ **PLUG CHANGE-OUT PROCEDURE**

- 1 Raise and support the truck in the usual manner.
- 2 Remove the front wheels.
- 3 Remove the spark plug wires.
- 4 Remove spark plugs using tool S9706KA.

HINT: Perform a compression check at this time. This may save you a lot of aggravation and time later.



- 5 Replace plugs with new plugs . . . reverse these steps to complete the plug change-out.

M ENGINE TIMING

■ NOTE: Advancing the timing will not improve the performance of this engine. It will hinder its performance.

■ Timing must be set at zero (0) degrees BTDC. If you encounter any other setting, reset the timing to zero (0) degrees BTDC in the usual manner.

N PROPSHAFT CONDITION, PROPSHAFT JOINT FAILURE

- A general comment about traumatic failure of propshaft or joint . . . they can generally reflect tampering to increase engine torque. Be sure to look for signs of engine modification.

■ FRONT PROPSHAFT JOINT FAILURE

If there has been a failure in the universal or propshaft joint, be sure to look for signs of tampering. The most likely areas to check are:

- after market memcals.
- modified wastegate adjustment.
- turboboost control systems.

O PROPSHAFT CONDITION, PROPSHAFT SEAL (BOOT) FAILURE

- Due to tooling problems, some seals have split at the clamp edge. Remove and replace the entire propshaft.

■ REPLACEMENT PROCEDURE OF FRONT PROPSHAFT

- 1 Raise and support the vehicle in the approved manner.

NOTE: It is essential that the position of all driveline components relative to the propeller shaft be observed and reference marked prior to dis-assembly. These components include the propshafts, drive axles, pinion flange, output shafts, etc. All components must be reassembled in the same relationship to each other as they were removed to maintain the factory balance.

- 2 Remove the bolts (4) from the flange at the transfer case (3).

- 3 Remove the bolts (5) from the flange at the front axle (1).

- 4 Remove the propshaft by pulling forward and down.

- 5 Install the new front propshaft.

- Be sure to align the reference marks on the new shaft. Failure to do so could cause lack of balance in the assembly.

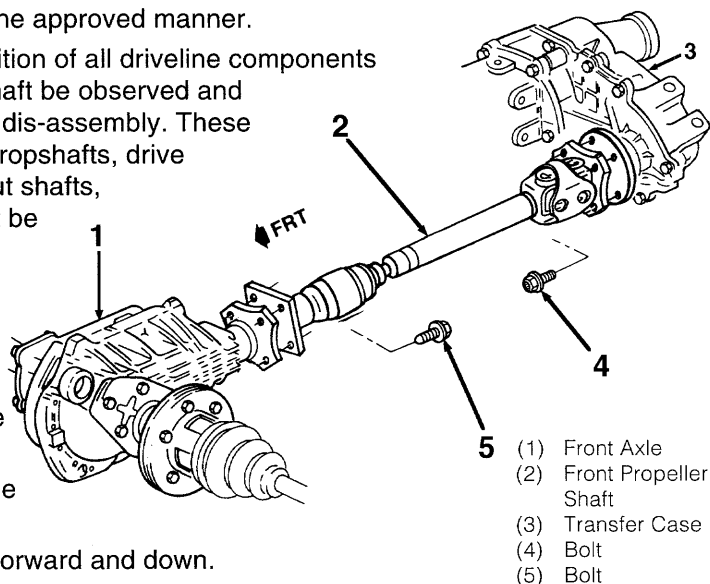
- 6 Install and tighten bolts (4) at the transfer case.

- 7 Install and tighten bolts (5) at the front axle.

NOTE: Tighten all bolts of 70 N.m (52 feet pounds)

- 8 Test drive the vehicle to verify repair.

NOTE: On the test drive, put the vehicle into a tight right turn. If you hear tire chugging, as with a four wheel drive vehicle, it means the viscous coupling in the transfer case is locking up. If so, replace the transfer case.



P**TORQUE CONVERTOR - TCC SHUDDER**

- **Complaint:** Customer complains of an aggressive vibration at 40 to 45 MPH, which stops with a slight increase or decrease in acceleration.
- **Cause:** The probable cause of this condition is Torque Converter Clutch Shudder - TCC Shudder. This means that the torque converter is repeatedly attempting to lock-up but is unable to do so.
- **Correction:** There is no way to repair a torque converter experiencing this type of problem. Remove and replace it.

Q**RIDE HEIGHT ADJUSTMENT****■ "Z" HEIGHT****■ "Z" HEIGHT MEASURE**

- 1 Raise the front bumper 1-1/2 inches and let settle. Repeat three times.
- 2 Measure the trim height.
- 3 Raise the front bumper and let settle three more times and measure again.
- 4 Average the two measurements to obtain actual "Z" height of the vehicle.
- 5 "Z" height should be 63.6 mm plus or minus 6 mm, or 2.5 inches plus or minus .2 inches.

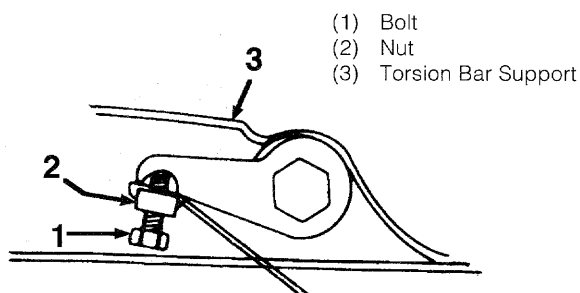
■ "Z" HEIGHT ADJUSTMENT

To raise the trim height: Rotate the bolt (1) into the nut (2) one complete revolution for each additional 6 mm or .2 inches of height.

To lower the trim height: Rotate the bolt (1) out of the nut (2) one complete revolution for each reduction of 6 mm or .2 inches of height.

Measure trim height to determine the accuracy of the adjustment. Repeat the adjustment process again, if necessary.

NOTE: 1 mm (0.04 inches) clearance must be provided between the adjuster arm and nut after adjustments are completed.



■ "D" HEIGHT

■ "D" HEIGHT MEASURE

- 1 Raise the rear bumper 1-1/2 inches and let settle. Repeat three times.
- 2 Measure the trim height.
- 3 Raise the rear bumper and let settle three more times and measure again.
- 4 Average the two measurements to obtain actual "D" height of the vehicle.
- 5 "D" height should be 100.2 mm plus or minus 6 mm, or 3.9 inches plus or minus .2 inches.

■ "D" HEIGHT ADJUSTMENT

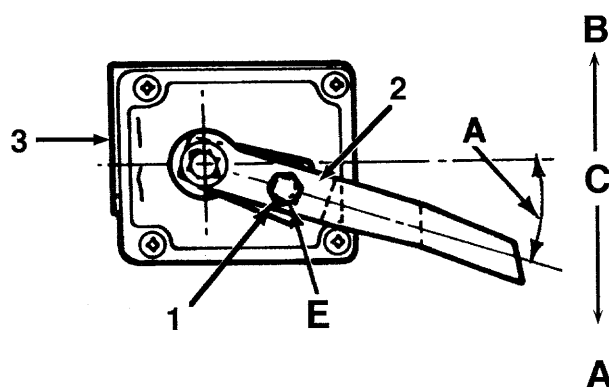
Syclone:

The Syclone "D" height cannot be changed. If the actual measurement shows a significant difference from the 3.9 inches, look for tampering or owner abuse.

Typhoon:

"D" height can be changed in the following manner:

- 1 Loosen the lock bolt (1).
- 2 Adjust the plastic actuating arm (2) up or down depending on the correction:
 - TO RAISE the vehicle trim height move the plastic actuating arm (2) upward. Tighten lock bolt (1).
 - TO LOWER the vehicle trim height move the plastic actuating arm (2) downward. Tighten lock bolt (1).
- 3 Measure the new trim height in the above manner and repeat the adjustments, if necessary.



- (1) Lock Bolt
- (2) Plastic Actuating Arm
- (3) ELC Height Sensor

- PAS Inc., the final stage manufacturer of the 1992 GMC Typhoon, has determined that a defect which relates to motor vehicle safety exists in certain early built 1992 GMC Typhoons. The Electronic Level Control (ELC) sensor link may become disconnected from the ELC sensor assembly arm and the sensor arm could then become captured between the rear axle assembly and the right rear brake line near the junction block. In this position, normal suspension movement can cause the arm to wear through the rear brake line resulting in a loss of rear braking. If this occurs, the front braking would remain functional; however, a reduction of braking ability at a time when a minimum stopping distance is required could result in a vehicle crash without prior warning. To correct this condition, it will be necessary to install a revised ELC system. Additionally, the brake pipe and ABS wire will be inspected for signs of damage and replaced if necessary.

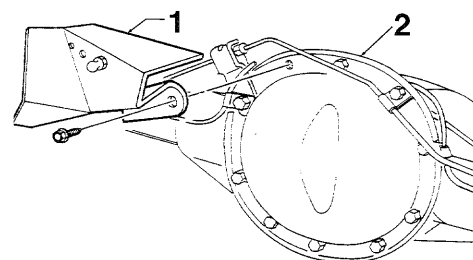
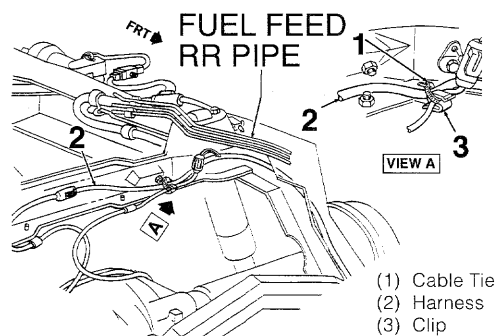
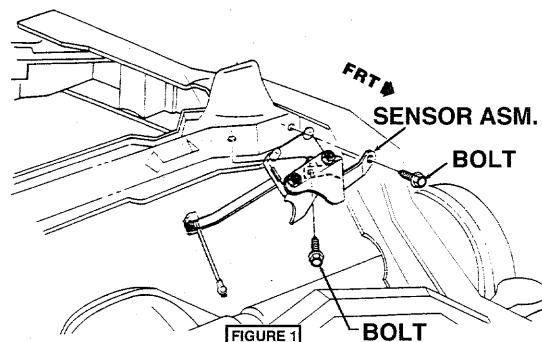
■ VEHICLES INVOLVED

Involved are certain 1992 GMC Typhoons built within the following VIN breakpoints:

1992 Model Year From N0810001 To N0810754

■ REPAIR/REPLACEMENT PROCEDURE

- 1 Raise and support the vehicle on a hoist.
- 2 Inspect brake line assembly in area of ELC (electronic level control) system for signs of abrasion or gouging. If any is noted, brake lines should be replaced following the procedures in service manual X-9229, Section 5A.
- 3 Inspect the wiring harness to both rear wheel speed sensors for signs of damage. If any is noted, replace the affected rear wheel speed sensor assembly according to procedures in service manual X-9229, Section 5E1.
- 4 Remove entire ELC sensor control system assembly (Figure 1).
- 5 Arrange ABS wheel speed sensor wires as shown in Figure 2. Tie wrap as shown in View A, Figure 2.
- 6 Install new level sensor assembly using the existing bracket mounting bolts. Be sure to check that the wiring harnesses in the area around the level sensor assembly are not pinched. Refer to Figure 2 for proper wiring harness placement. Torque mounting bolts to 14-20 N.m. (10-15 lbs. ft.) (Figure 1).
- 7 Remove the old axle bracket and loosely install the new axle bracket using existing mounting bolt (Figure 3).



(1) Axle Bracket
(2) Axle ASM.

- 8 Be sure that there is at least 12.7 mm (0.5 in.) between the new axle bracket assembly and the brake junction block mounting bracket. Also, there is to be 6.35 mm (0.25 in.) clearance between the axle bracket and the right rear brake pipe assembly. Torque bolt to 18-24 N.m. (13-18 lbs ft.) (Figures 4A and 4B).
- 9 Connect ELC lower sensor link to axle bracket and close snap lock (Figure 5).
- 10 Install lower link retainer to axle bracket assembly and torque bolt to 15-20 N.m. (11-15 lbs. ft.)(Figure 5).
- 11 Cable tie right rear wheel sensor harness to brake pipe between bracket mounting bolt and next clockwise bolt on axle cover as shown in Figure 5.
- 12 Perform ELC preliminary check as found on page 9 of the Electrical Diagrams and Diagnosis Manual in the rear of the 1992 Syclone, Typhoon and Sonoma GT Service Manual Supplement, X-9276.
- 13 Install "Campaign Identification Label."

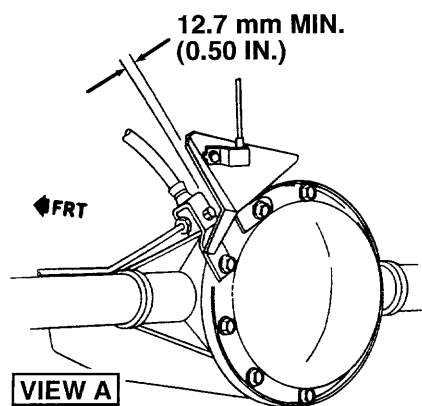
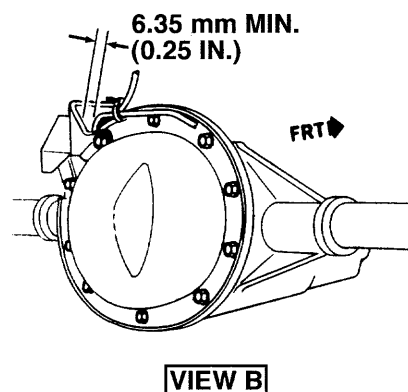


FIGURE 4



VIEW B

- 1 Link
- 2 Axle
- 3 Lower retainer
- 4 Bolt
- 5 Cable tie

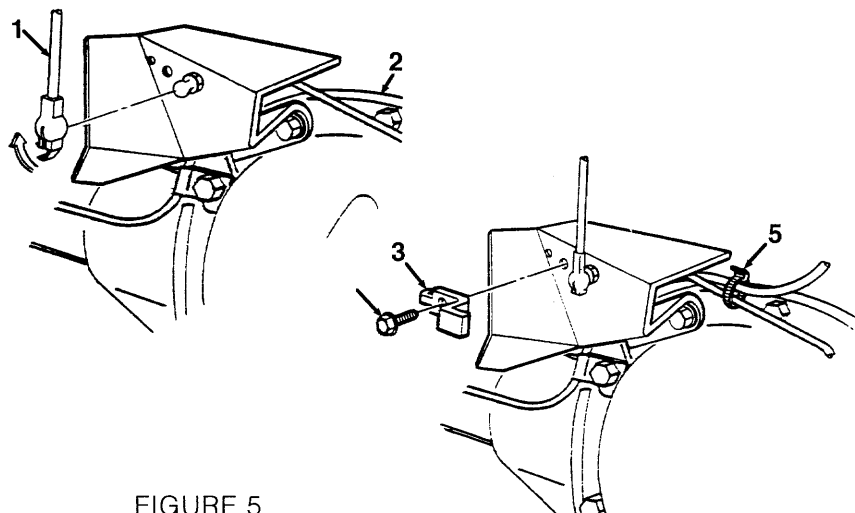


FIGURE 5

Repairs outlined in this manual may need authorization. Publication in this manual does not authorize automatic reimbursement of warranty. If you have questions on warranty applicability, please check with your District Service Team and where noted, TAC.

We believe the sources and their equipment listed in this manual to be reliable. There may be additional manufacturers of such equipment. General Motors does not endorse, indicate any preference for, or assume any responsibility for the products or equipment from these firms or for any such item which may be available from other sources.

In the video, references were made to the District Service Manager (DSM) and the Service Development Manager (SDM). However, these titles were changed due to GMC Truck's reorganization. The new title for the District Service Manager is District Service Manager—Telemanagement. The new title for the Service Development Manager is District Service Manager—Direct Contact.

