

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-149
Relating to Exemptions under Section 27156
of the Vehicle Code

CUSTOM PRODUCTS SPEED AND MARINE
PREHEAT DUCT TUBE KIT

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the Preheat Duct Tube Kit device manufactured by Custom Products Speed and Marine has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for all 1974 and older model-year vehicles originally equipped with a heated air intake system retrofitted with exhaust headers.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE PREHEAT DUCT TUBE KIT DEVICE.

No claim of any kind, such as "Approved by Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at El Monte, California, this 6th day of November, 1984.


K. D. Drachand, Chief
Mobile Source Division

State of California
AIR RESOURCES BOARD

EVALUATION OF CUSTOM PRODUCTS SPEED AND MARINE'S PREHEAT DUCT TUBE KIT
DEVICE FOR EXEMPTION FROM THE PROHIBITIONS IN VEHICLE CODE SECTION 27156
IN ACCORDANCE WITH SECTION 2222, TITLE 13, OF THE CALIFORNIA
ADMINISTRATIVE CODE.

October 1984

Issue Date: October 1984

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ADMINISTRATIVE CODE.

by

Mobile Source Division
State of California
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the content necessarily reflects the view and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

Custom Products Speed and Marine of 27933 Adon Avenue, Canyon Country, CA 91351, submitted an application for exemption from the prohibitions in Section 27156 of the California Vehicle Code for the company's Preheat Duct Tube Kit device. The applicant has requested that exemption be granted for the installation of this device on all 1974 and older model-year vehicles originally equipped with a heated air intake system and retrofitted with exhaust headers. This device is intended to replace the function of the original equipment manufacturer's (OEM) hot air duct and stove when the OEM exhaust manifold is replaced by exhaust headers.

The staff evaluated the device and found that the Preheat Duct Tube Kit device will not have a significant adverse effect on emissions from 1974 and older model-year vehicles retrofitted with exhaust headers.

The staff, therefore, recommended that the ARB issue Executive Order D-149, allowing the installation of the Preheat Duct Tube Kit device on all 1974 and older model-year vehicles originally equipped with a heated air intake system retrofitted with exhaust headers.

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ADMINISTRATIVE CODE

I. INTRODUCTION

Custom Products Speed and Marine of 27933 Adon Avenue, Canyon Country, CA 91351, submitted an application for exemption from the prohibitions in Section 27156 of the California Vehicle Code for the company's "Preheat Duct Tube Kit" device. Vehicle Code Section 27156 prohibits the installation of any device or mechanism which reduces the effectiveness of required emission control systems on any California certified vehicle. This code also authorizes the Air Resources Board (ARB) to exempt a device from the prohibitions if it can be demonstrated that the device, upon installation on the engine, will not adversely affect the performance of existing emission control systems. The applicant has requested that the exemption be granted for the installation of this device on all vehicles requiring heated air supply system.

II. CONCLUSION

The staff evaluated the device and found that the "Preheat Duct Tube Kit" device will not have a significant adverse effect on emissions from the vehicles originally equipped with a heated air intake system which was connected to the OEM exhaust manifold.

III. RECOMMENDATION

Based upon engineering evaluation made on a sample device, sales brochure and technical data submitted by the applicant, the staff recommends that the ARB exempt the "Preheat Duct Tube Kit" device from the prohibitions of Vehicle Code Section 27156 and that Executive Order D-149 be issued, allowing the installation of "Preheat Duct Tube Kit" device on all 1974 and earlier model-year vehicles retrofitted with exhaust headers and originally equipped with a heated air intake system which was connected to the OEM exhaust manifold.

IV. SYSTEM DESCRIPTION

The Preheat Preheat Duct Tube Kit device consists of a fabricated heat box, two mounting stainless steel clamps, and a 17-in. long light aluminum flex tubing, with its diameter properly selected to match the air cleaner's original stove pipe attachment. The heat box, which is the heart of this kit, was formed (Figure 2 of Appendix A) from 1/32 inch thick sheet metal. It measures 7/8 inch high, 2 inches wide and 3-1/2 inches long. A 1-1/2 inch diameter by 7/8 inch long, 3/32 inch wall thickness steel tube is welded at the center of the heat box to accommodate one end of the aluminum flex tubing; the other end of the tubing is connected to the air cleaner. The heat box is fastened on one of the header pipes. Air in the engine compartment is drawn into the air cleaner through a 2.38 square inches opening* between the heat box and the header pipe during cold engine starting operation.

*See the air flow area calculation on Appendix D, pp. 8-9.

This device was designed to duplicate the function of the OEM system to enhance the formation of a homogeneous fuel-air mixture in its gaseous state and to hasten the combustion process during cold engine starting operation.

V. DISCUSSION

The ambient air from the engine compartment is conveyed through the heat box, flex tubing, and air cleaner to the carburetor where it is mixed with the fuel. This air/fuel mixture then goes into the intake manifold and is distributed to each cylinder. The minimum cross-sectional flow area of this device is 2.38 square inches compared to the OEM's 1-1/2 square inches. The air passing through the heat box gains heat by conduction, convection and radiation from the surfaces of hot engine parts including the exhaust header pipes. The temperature of the inlet air to the engine during engine cold starting operation is anticipated to be equal or higher than that with the OEM heat riser system. The use of the device for maintaining good cold start engine performance, therefore, does not seem to have any adverse effect on exhaust emissions from 1974 and older vehicles retrofitted with exhaust headers.

APPENDICES

APPENDIX A

INSTALLATION INSTRUCTION FOR
PREHEAT DUCT TUBE KIT

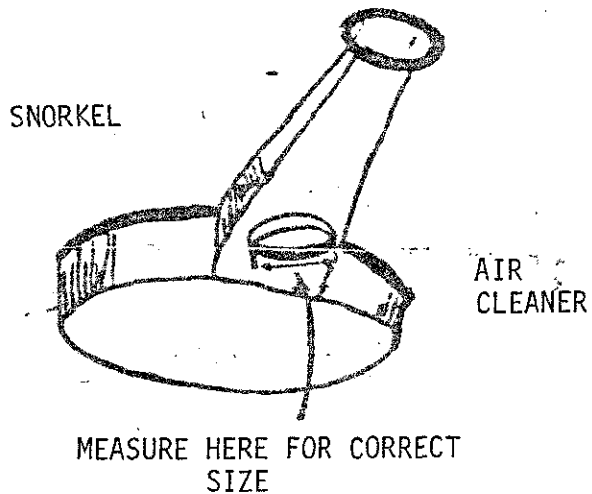


FIGURE 1

SELECT PROPER KIT SIZE.

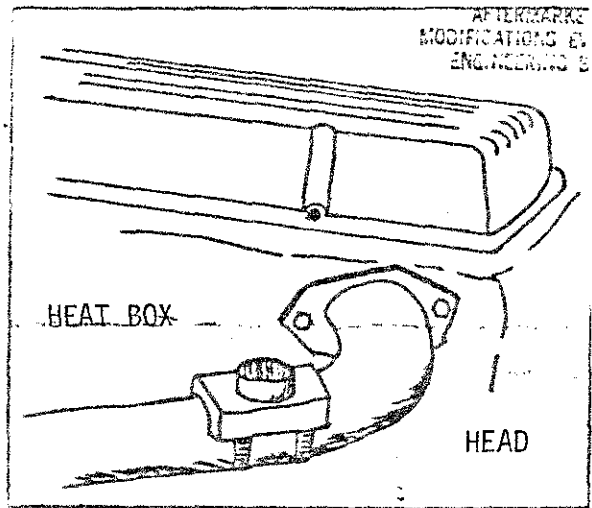


FIGURE 2

CLAMP HEAT BOX TO HEADER AS CLOSE AS POSSIBLE TO THE HEAD.

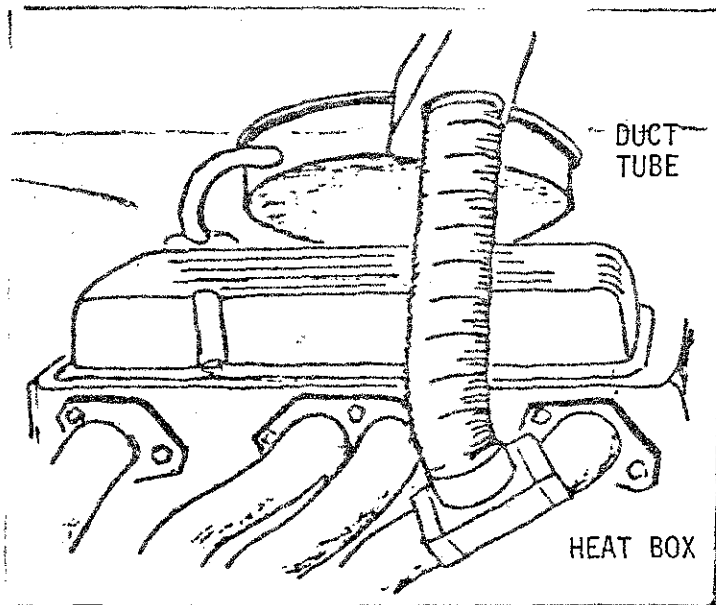


FIGURE 3

CUT DUCT TUBE TO THE LENGTH AND ATTACH IT TO THE TOP OF HEAT BOX AND BOTTOM OF THE PREHEAT INTAKE OF THE AIR CLEANER.

APPENDIX B

Custom Products Service

HELIARC WELDING METAL FABRICATIONS
(805) 251-3636 OR 252-2573

RECEIVED
AUG 28 1984
AFTERMARKET PARTS AND
MODIFICATIONS EVALUATION SECTION
FISHKILL BRANCH - VECO
August 27, 1984

Mr. Crispin de la Cruz
Staff Engineer
Air Resources Board
9528 Telstar Avenue
El Monte 91731

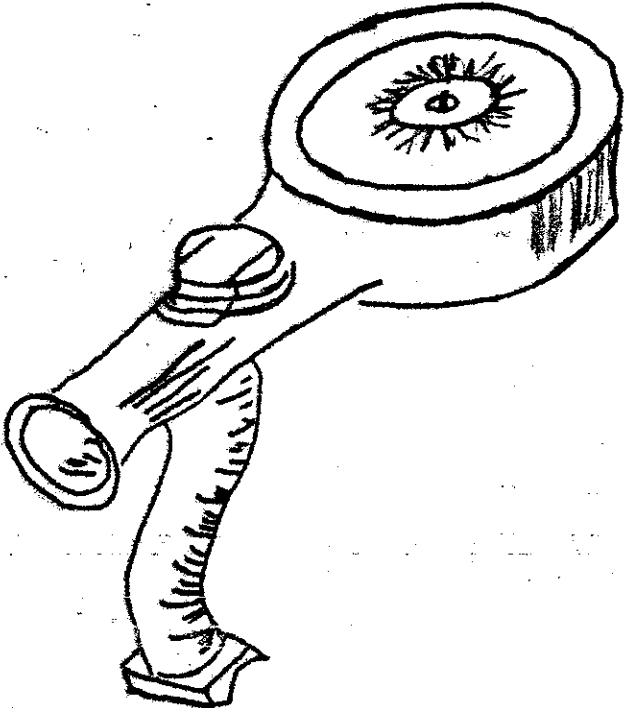
Dear Mr. Crispin de la Cruz,

We mounted a stock T.A.C. type air cleaner from a 350 C.I.D. chevrolet on a superflow flow bench, through inlet nozzle we took a baseline reading at 1 1/2" water and flow rate 100 C.F.M., then with vacuum pump actuated the T.A.C. valve to simulate cold start mode: Results through stock 350 C.I.D. manifold with preheat stove (factory unit) the flow at 1 1/2" water was 30 C.F.M. we also tested flow at 5" water flow 52 C.F.M.. Our preheat ducts tube kit installed on same air cleaner and as installed on headers at 1 1/2" water flow 35 C.F.M., at 5" water flow 63 C.F.M..

Very truly yours,



Donald A. Fee
President (Owner)



**Introduction offer to our
New Line of Custom Built Products**

Phone Orders
(805) 251-3636
(805) 251-9809

Mail Orders
27949 Adon Ave.
Canyon Country, CA
91351

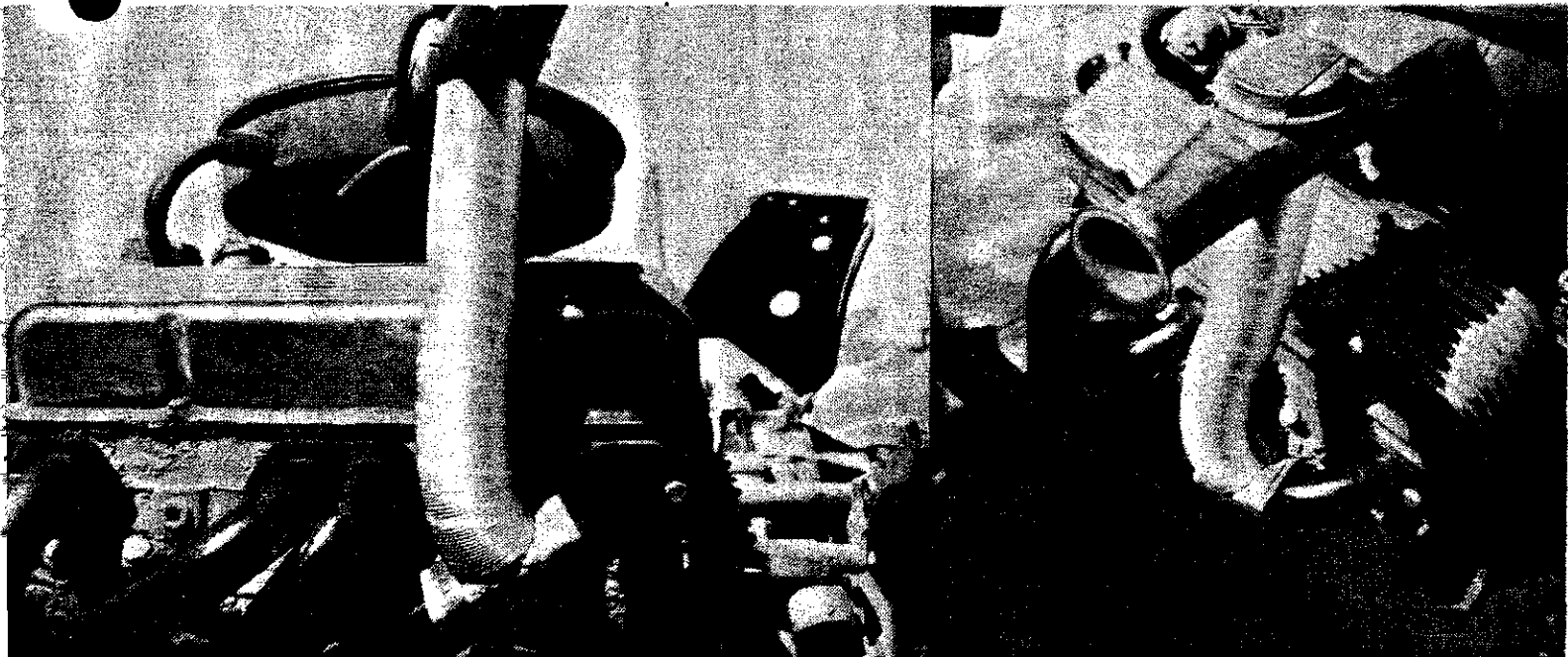
1 3/4" & 2" - Kit #101
1 1/2" - Kit #102, Fabrication



Emission Control Duct Tube Kit

Replaces lost or missing preheat tube assemblies on header equipped and most stock vehicles with T.A.C. type Air Cleaner

2 Kits cover most cars and trucks
Foreign and Domestic



Replacement Duct also available, 18" x 1 1/2" or 18" x 2", \$1.50 ea.

WHY SEND YOUR CUSTOMER SOMEWHERE ELSE!

Incr as YOUR Profits!!!

Call For Stocking Dealer Prices!!

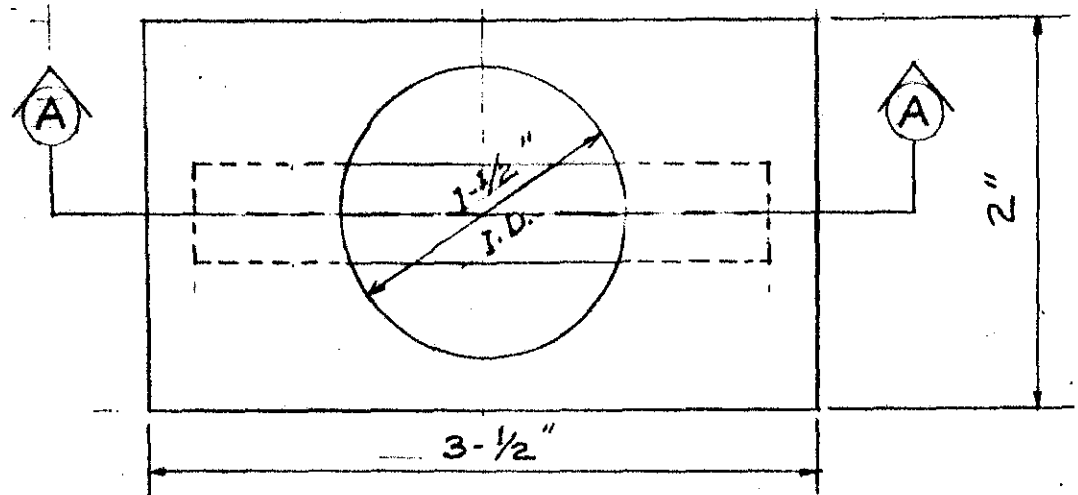
\$20.95
Your Cost

\$28.95
List

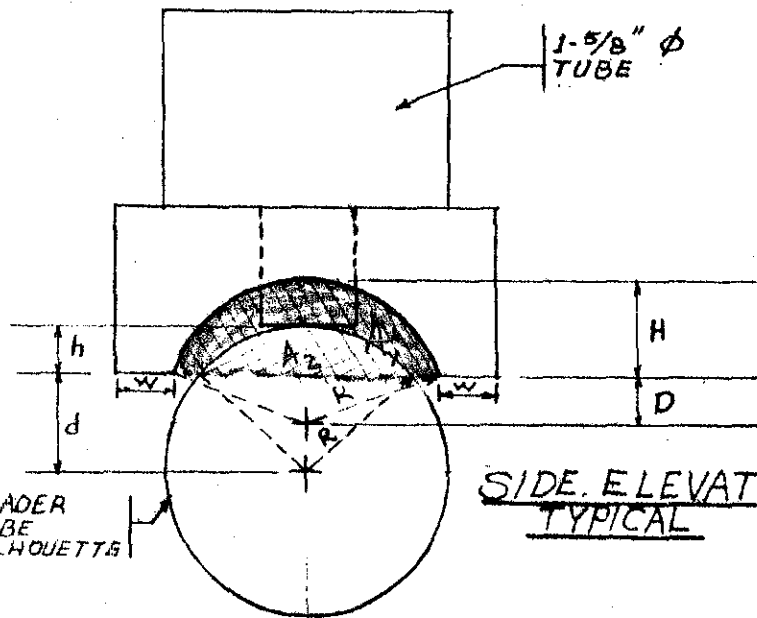
HEAT BOX
DETAIL

NOTE:

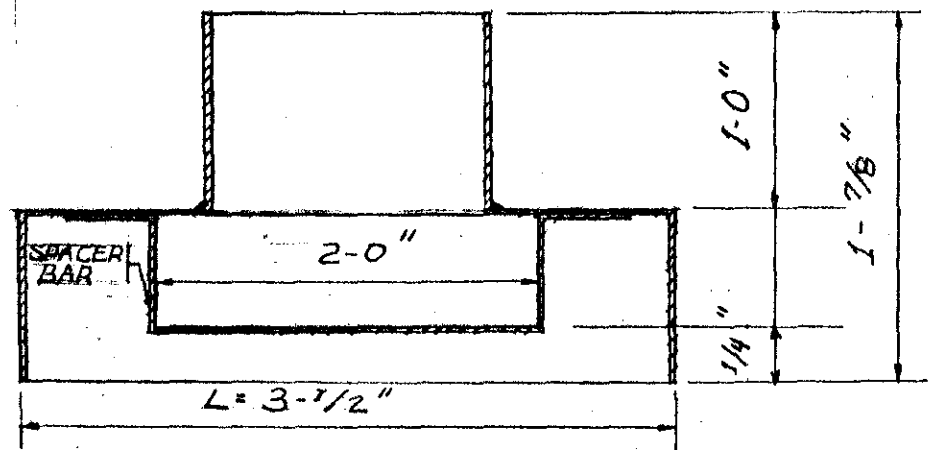
ALL MATERIALS ARE
SHEET METALS (STD.
MILD STEEL) EXCEPT
WHEN SPECIFIED.



PLAN



SIDE ELEVATION
TYPICAL



SECTION A-A

APPENDIX E

CALCULATION OF THE FLOW AREA THROUGH THE HEAT BOX

FROM THE PRECEDING DRAWING, APPENDIX D, P. 8:

$$R = 3/4 \text{ inch}$$

$$W = 1/4 \text{ inch}$$

$$d = 1/2 \text{ inch}$$

$$L = 3 - 1/2 \text{ inches}$$

$$D = 1/4 \text{ inch}$$

ALSO:

AREA OF A SEGMENT IS:

$$A_1 = R^2 \cos^{-1} \frac{D}{R} - D \sqrt{R^2 - D^2}$$

AND:

$$A_2 = R^2 \cos^{-1} \frac{d}{R} - d \sqrt{R^2 - d^2}$$

A RECTANGLE IS:

$$A_3 = WL$$

AGAIN FROM THE FIGURE, THE TOTAL AIR FLOW AREA IS:

$$A_T = 2(A_1 - A_2 + A_3)$$

$$A_T = \left\{ \left[\left(\frac{3}{4} \right)^2 \cos^{-1} \left(\frac{1/4}{3/4} \right) - \frac{1}{4} \sqrt{\left(\frac{3}{4} \right)^2 - \left(\frac{1}{4} \right)^2} \right] \right. \\ \left. - \left[\left(\frac{3}{4} \right)^2 \cos^{-1} \left(\frac{1/2}{3/4} \right) - \frac{1}{2} \sqrt{\left(\frac{3}{4} \right)^2 - \left(\frac{1}{2} \right)^2} \right] \right. \\ \left. + \left[\frac{1}{4} \left(3 \frac{1}{2} \right) \right] \right\} 2$$

$$A_T = 2.38 \text{ square inches.}$$