



(This Service Letter Is FAA Approved)

SUBJECT: Installation of Hanlon & Wilson Exhaust System

MODELS AFFECTED: M-21 (M-20B), Serial Numbers 1701 thru 1939

TIME OF COMPLIANCE: At Owner's Discretion

This Service Letter reidentified as
Service Bulletin M-20-86
per Service Instruction M20-15.

INTRODUCTION:

The purpose of this service letter is to introduce you to the entirely new exhaust system offered to you by Mooney Aircraft. This exhaust system, which is made for Mooney by the Hanlon & Wilson Company, is now standard equipment on the 1962 Model M-21 (M-20C) and has proven quite successful in the many tests to which we have subjected it. Some of the advantages offered by this system are as follows:

- (1) Lighter weight
- (2) Greatly decreased engine noise
- (3) Higher carburetor heat temperature
- (4) Higher cabin air temperature

Although the use of this system is not mandatory, we highly recommend the use of this system on 1961 Model M-21 (M-20B) aircraft.

INSTRUCTIONS:

To install the new exhaust system, the following sequence should be followed in the order listed:

1. Remove the following equipment from the aircraft:
 - a. Alternate air source, carburetor heat, and cabin heat ducts.
 - b. Exhaust system (P/N 6363).
 - c. Exhaust extensions (P/N 6035) from cylinders.
 - d. Landing light and landing light adjustment screws.
2. Remove the engine crank case quick drain from the right side of the engine and re-install it on the left side of the case. The quick drain is installed in the same manner on the left as it was on the right side.
3. Rework the cabin heat valve as shown in Figure 2, Detail C.
4. Rework the landing light bracket as shown in Figure 3.
5. Install the following equipment in the sequence listed below:
 - a. Install P/N 6504-1 on carburetor air box as shown in Figure 2, Detail B. DO NOT tighten clamp or install screw at this time.
 - b. Install Hanlon & Wilson No. 637 Muffler Assembly.
 - c. Hanlon & Wilson No. 637-11, -12, -13, & -14 exhaust extensions on cylinders as shown in Figure 1, Detail B. Leave the nuts attaching extensions very loose at this time.
 - d. Install exhaust extensions on muffler assembly as shown in Figure 1, View A-A. Nuts should be installed on the bolts only far enough so that the cotter pins may be installed. DO NOT TIGHTEN THE NUTS.
 - e. Shake muffler assembly slightly to seat the exhaust extensions to the muffler and tighten nuts attaching exhaust tubes to cylinders to 110-150 inch/pounds torque.
 - f. Install Hanlon & Wilson No. 637-60 tail pipe as shown in Figure 1.
 - g. Attach 6484-5 duct to heater and 6504-1 elbow. Rotate elbow on carburetor air box to obtain 1/8" to 1/2" clearance between 6484-5 and 6179 air intake duct. Tighten clamp and install screw to secure P/N 6504-1 elbow.
 - h. Install P/N 6467 alternate air source tube as shown in Figure 2, View A-A.
 - i. Re-install P/N 6060 cowl brace at firewall attachment.
 - j. Install P/N 6484-1 & -3 ducts as shown in Figure 2.
 - k. Seal the original alternate air source inlet on the landing light bracket as shown in Figure 3, View A-A.
 - l. Install landing light as shown in Figure 3.
6. To correct aircraft Weight and Balance Data, correct the Equipment List as follows:

	Wt.	Arm	Mom.
Exhaust System Removed	- 18.75	- 10.0	+ 187.5
Exhaust System Installed	+ 15.00	- 12.8	- 192.0
Totals	- 3.75		- 4.5
Add Aircraft Empty Weight	=====	=====	=====
Adjusted Aircraft Empty Weight	=====	=====	=====

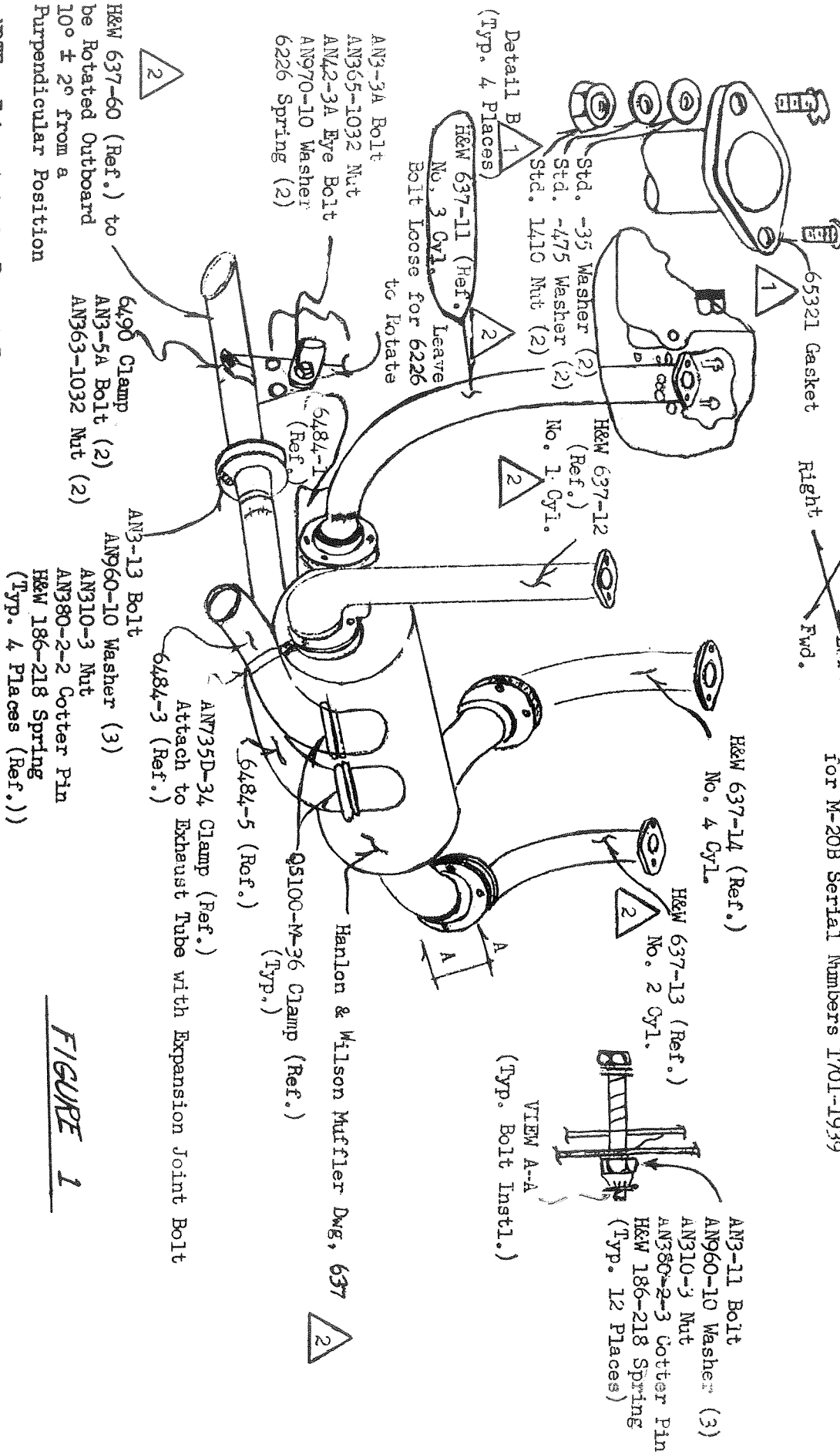
After the empty Weight and Balance (Page 3, Section 5) is adjusted, a new loading schedule may be made, if desired. The required forms are included for this purpose.

7. After completion of this service letter, fill out the enclosed compliance card and return to us for our records.

S.L. KIT 20-86 - Exhaust System Installation Equipment

- | | | |
|-----------------------------|---|-------------------------------------|
| 1 6504-1 Elbow | 7 AN365-1032 Nut | 4 AN366-1032 Nut Plate |
| 1 6484-1 Tube | 3 AN363-1032 Nut | 3 AN520-1032R-16 Screw |
| 1 6484-3 Tube | 2 AN735-6 Clamp | 7 #6 x 3/8 Sheet Metal Screw |
| 1 6484-5 Tube | 7 QS100-M-36 Clamp | 8 AN470-AD3-6 Rivet |
| 1 6461-7 90° Offset Bracket | 1 6467 Alternate Air Source Tube Assembly | 3 AN526-1032R-8 Screw |
| 4 AN735-34 Clamp | 4 AN470-AD4-8 Rivet | 1 AN3-6A Bolt |
| 2 AN42-3A Bolt | 1 6490 Clamp | 2 AN742D20 Clamp |
| 5 AN3-3A Bolt | 2 AN3-5A Bolt | 1 .020 Aluminum Plate (2.12 x 3.50) |
| 2 AN970-3 Washer | 4 65321 Lycoming Gasket | |
| 9 AN960-10 Washer | 1 Hanlon & Wilson Muffler Dwg. #637 | |

Installation for H. & W. Exhaust System
for M-20B Serial Numbers 1701-1939

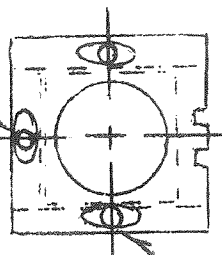


NOTE: Exhaust to be Routed Through
R.H. Augmenter Cavity

- 2 Supplied by Hanlon & Wilson
- 1 Supplied by Lycoming Engine Model 0-360

FIGURE 1

Detail C



Install in Same Manner as Existing Plate Nuts and Screws

- AN526-1032R-8 Screw
- AN366-1032 Plate Nut
- AN470AD3 Rivets (2)
- Typ. 3 Places

8042 Cabin Air Valve Ass'y. (Ref.)



.193/.200 Dia. Hole thru

- AN735-D34 Clamp
- AN42-3A Eye Bolt
- AN3-3A Bolt
- AN970-3 Washer
- AN960-10 Washer
- AN365-1032 Nut

Installation for H. & W. Exhaust System for M-20B, Serial Numbers 1701-1939

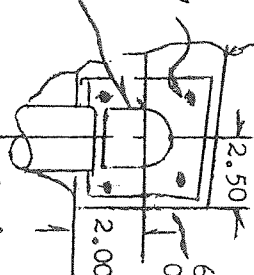


6078 Baffle (Ref.)

Drill .128/.133 Dia. (4) to Match 6467 AN470-AD4 (4)

Drill 2.50 Dia. thru 6078 Baffle

View A-A



6078 Baffle (Ref.)

6467 Centered Over Hole in 6078

Muffler Ass'y. (Ref.)

- AN735-6 Clamp
- AN735-D34 Clamp
- AN3-3A Bolt
- AN365-1032 Nut
- AN960-10 Washer (2)

6484-5 (Ref.)

6461-7 45° Offset Brt.

- AN3-3A Bolt
- AN363-1032 Nut
- AN960-10 Washer (2)

AN735-34 Clamp (Attach to Exhaust Tube Expansion Joint Bolt)

6484-3 Duct

6060 Cowling Brace (Ref.)

6235 Carburetor Air Box Ass'y. (Ref.)

6484-5 Duct

See Detail B

6021-2 Firewall (Ref.)

6010 Firewall Ass'y. (Ref.)

6484-5

6504-1

6484-1

AN735-34 Clamp

AN735-6 Clamp

AN3-3A Bolt

AN365-1032 Nut

AN960-10 Washer (2)

AN960-10 Washer (2)

Attach Fuel Pump Blast Tube to Carb. Heat Dump

AN742D20 Clamp (2)

AN3-6A Bolt

AN960-10 Washer (2)

AN365-1032 Nut

6235 Carburetor Air Box Ass'y. (Ref.)

6484-5 Duct

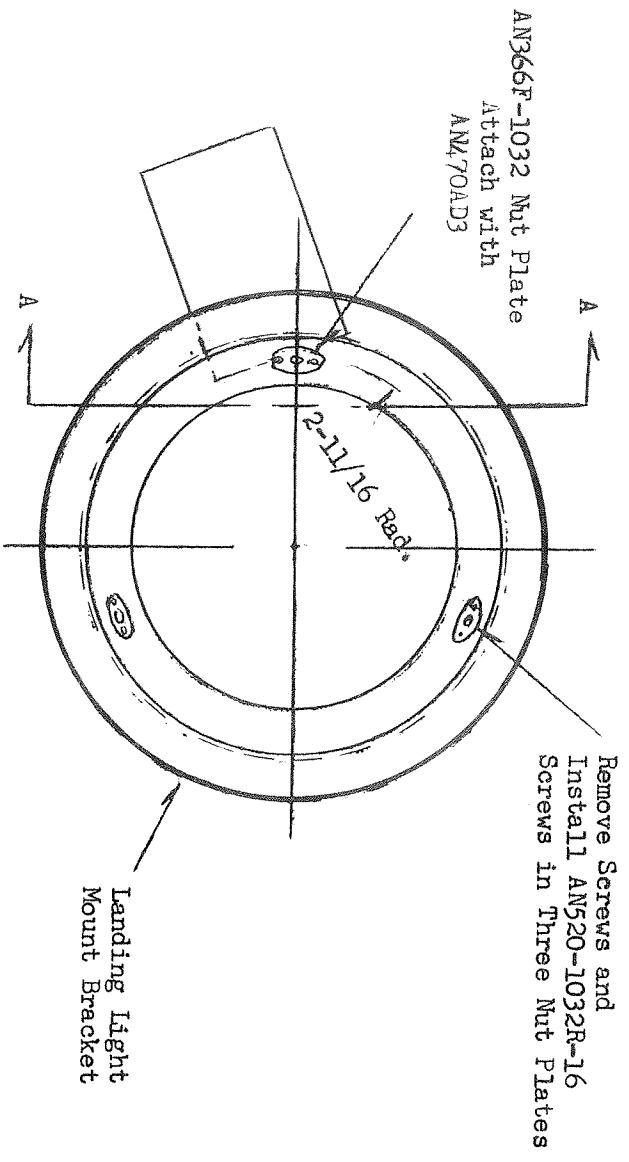
6484-3 Duct

6060 Cowling Brace (Ref.)

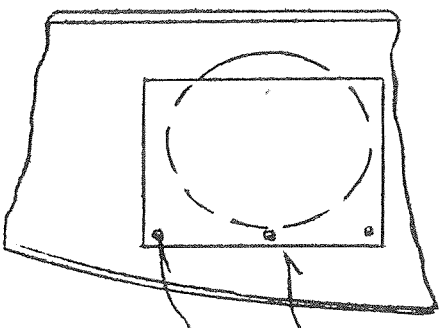
6235 Carburetor Air Box Ass'y. (Ref.)

6484-5 Duct

FIGURE 2



VIEW SHOWN LOOKING FORWARD



VIEW A-A

#6 x 3/8 Sheet Metal Screws (3)
 .020 x 2.12 x 3.50
 2024-T3 Clad Alum.
 Form to Match Bkt. Contour

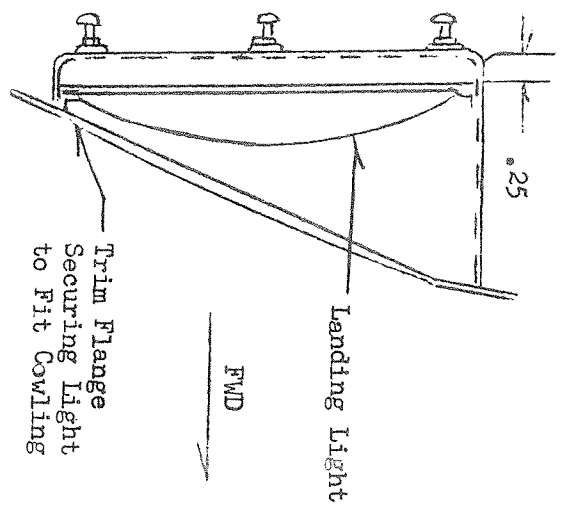


FIGURE 3