

MODELS OT A1 A3 THRU OT T2 G2
MODELS OT A1 A1 B1 THRU OT F3 S3 C2

COMPRESSOR AND MOTOR SHAFT ALIGNMENT

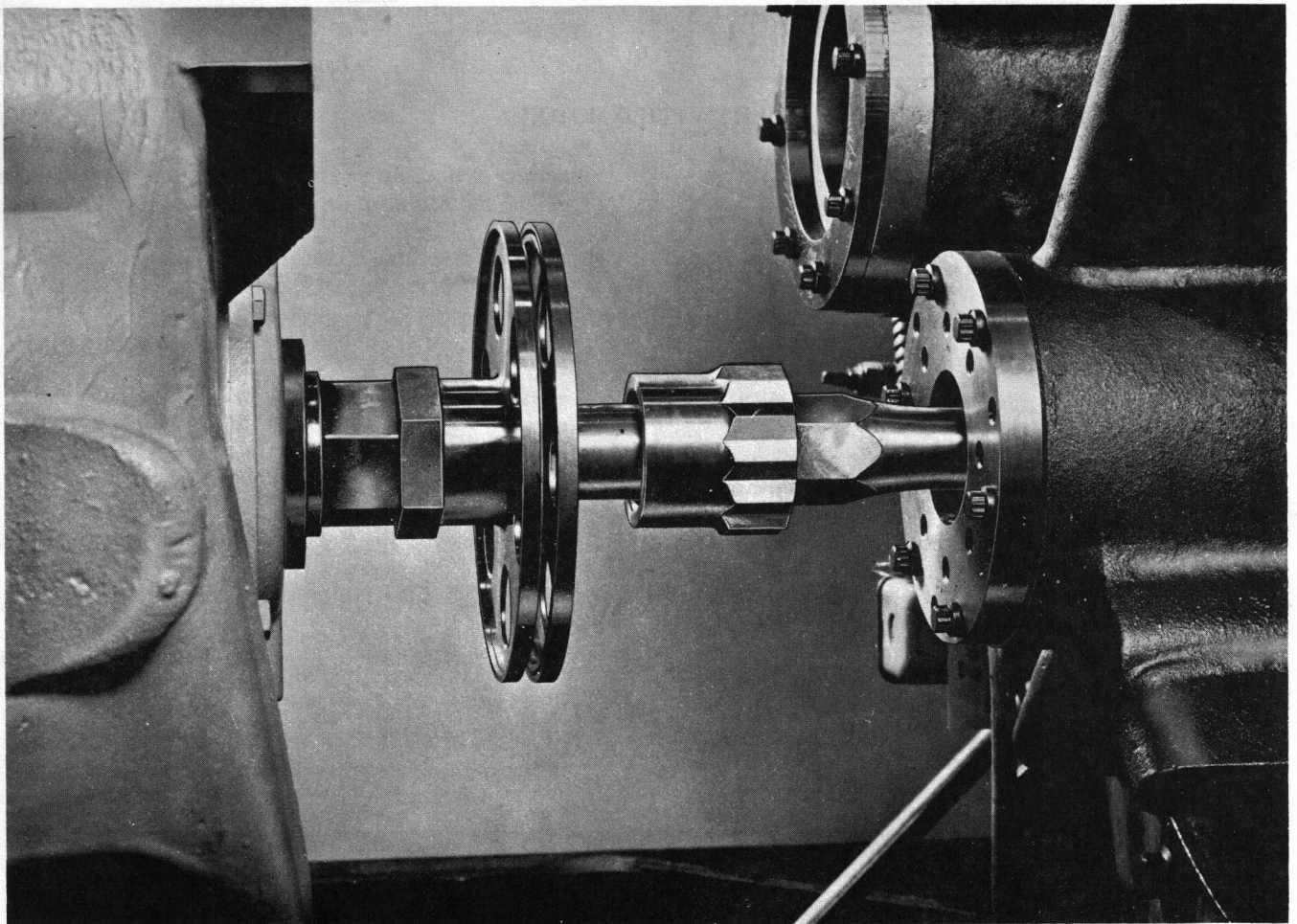


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COMPRESSOR—MOTOR ALIGNMENT

PURPOSE

This instruction is intended to furnish a procedure for field alignment of compressor and motor drive shafts of complete factory-assembled Open Turbopaks, and installation and alignment of motors on Open Turbopaks which are shipped less motor.

This instruction specifically describes the Open Turbopaks, but portions of it may be useful on other alignment jobs. Service personnel with moderate skill and experience in the use of hand tools and precision measuring equipment should be able to perform this operation after reading this instruction.

ALIGNMENT OF MOTOR—COMPRESSOR: OPEN TURBOPAK WITH FACTORY FURNISHED MOTOR (Shipping Forms 1, 2 and 3).

GENERAL

The Open Turbopak is delivered with the motor mounted, bolted and doweled in place, and factory aligned to the compressor. If the unit is shipped disassembled, install the motor-compressor assembly on shell before aligning the coupling. The coupling is shipped loose, together with factory selected coupling shims or spacers. Extra coupling shims or spacers and motor mounting shims are provided. Alignment must be checked, and corrected if necessary, because of possible movement during shipment.

Finally, the coupling must be installed.

TOOLS

The following tools are required, in addition to common hand tools and those furnished with the unit.

1. Two (2) dial indicators, accurate and readable to .001 inch, with clamp for attaching to motor shaft.
2. Torque wrench.
3. No. 1 Morse Taper Reamer (required only if motor is moved).
4. Micrometer, 0 to 1 inch (outside).
5. Feeler Gage.

ALIGNMENT CHECK PROCEDURE

The following is a step by step procedure to be used for checking coupling alignment.

NOTE: Pre-conditions for alignment of OT M1 G1-OT T2 G2 Models are approx. 135°F compressor sump oil temperature and approx. 70 psig system pressure.

1. Prepare Alignment Log, Fig. 1, for taking data by first entering the following information from Table 1, for *Open Turbopak Model* being aligned.
2. Clean the double left-hand threads on the compressor and motor shafts. Next thoroughly clean the flexible coupling parts and check coupling hubs for distortion.

(If hubs are distorted they should not be used.) Then lubricate the shaft threads with York Turbo Compressor Drive Thread Compound, York Part No. 464-14934.

Alignment Log, Fig. 1—

Block D – from Table 1 line 8
Block H – from Table 1 line 13
Block L – from Table 1 line 14
Block Q – from Table 1 line 10
Block R – from Table 1 line 11
Block S – from Table 1 line 12

3. Assemble couplings on hubs of both shafts as follows:
 - a. *Flex-Disc Coupling* – Install .020 shims behind the compressor hub. Screw hubs snugly against shaft shoulders. Do not draw them tight.
 - b. *York-Flex Coupling* – Do not use spacers yet. Screw the female threaded hub on the driving shaft. Screw the nut and male threaded hub on the compressor shaft. Screw hubs snugly against the shafts, but do not draw tight.
4. Fasten indicator clamp on the motor coupling hub or shaft. Install indicators so that one reads in a radial direction on the rim of the compressor hub and the other reads in a direction parallel to the shaft on the back face of the compressor hub, near its outside diameter. (See Fig. 4.) Arrange the indicators to read at nearly the same angular position on the compressor hub. The indicator reading on the rim (No. 1) reads parallel misalignment. The indicator reading on the back face (No. 2.) reads angular misalignment. Use a mirror to facilitate easy dial indicator readings.
5. Check total end play of motor by moving motor shaft axially away and toward compressor, reading indicator No. 2. If this motor has ball bearings the end play should be less than .005" and can be ignored. If the motor has journal bearings, the end play will be greater than .005" and the shaft will be scribed by the factory to indicate its running position, called the magnetic center. Determine and note in block C Alignment Log, Fig. 1, the end play from the shaft full "in" position to

TABLE 1— OT TURBOPAK COUPLING DATA

Line	Description		1	2	3 ¹	4 ²	5	6 ³	7	8	9	10
1	Compr. Code	60 HZ.	A3 Thru A4	—	B1 Thru C2	—	—	C2	E1 Thru E3	—	G1 Thru G2	—
2		50 HZ.	A3 5 Thru A4 5	—	B1 5 Thru C2 5	B1 Thru B2	A3 5 Thru A4 5	C1 Thru C2	E1 5 Thru E3 5	E1 E2 E3	G1 5 Thru G2 5	G1 5 Thru G2 5
3	Compressor Model		LTD 53,59	LTD 53,59	LTD 67,76,85,95 ¹	LTD 67,76,85,95 ²	LTD 53, 59	LTD 95 ³	LTD 108,120	LTD 120,126	LKA 65,73	LKA 65, 73
4	Coupling Part No.		364-06398	364-20811	364-06503	364-16913	364-27522	364-24518	364-22205	364-21794	364-24655	364-29693
5	Coupling Style		Flex-Disc	Flex-Disc	Flex-Disc	Flex-Disc	York-Flex	York-Flex	York-Flex	York-Flex	York-Flex	York-Flex
6	Coupling Size (Motor x Comp.)		1 x 1	1-1/4 x 1	1-1/4 x 1-1/4	1-1/2 x 1-1/4	1-1/4 x 1	1-1/2 x 1-1/4	1-1/2 x 1-1/2	1-7/8 x 1-1/2	1-7/8 x 1-7/8	2-1/2 x 1-7/8
7	Allowable Axial Shims or Spacers		.040	.040	.040	.040	.169/.208	.169/.208	.215/.280	.215/.280	.215/.280	.215/.280
8	Center Disc Thickness, In.		1.345	1.585	1.585	1.828	None	None	None	None	None	None
9	Max. Horizontal or Vertical Parallel Error, Tir, In.		± .008	± .008	± .008	± .010	± .008	± .008	± .010	± .012	± .012	± .014
10	Max. Horizontal or Vertical Angular Error, Tir, In.		± .006	± .006	± .006	± .007	± .006	± .006	± .007	± .008	± .008	± .009
11	Max. Axial Error, In.		-.005 +.000	-.005 +.000	-.005 +.000	-.005 +.000	+.005 -.000	+.005 -.000	+.005 -.000	+.005 -.000	+.008 +.003	+.008 +.003
12	Horizontal Offset, Tir, (Motor Left of Compressor)		+.005	+.005	+.008	+.008	+.005	+.008	0	0	See Note On Page 3	See Note On Page 3
13	Vertical Offset, TIR, (Motor Above Compressor)		+.008	+.008	+.008	+.008	+.008	+.008	+.010	+.010	See Note On Page 3	See Note On Page 3
14	Coupling Bolt Torque, Lb. Ft.		20	35	35	75	12	12	23	23	23	41

NOTE: Signs (±) on Numerical Values are for use in Tabular alignment log (Fig. 1).

NOTE: ¹ - Use for compressor Models LTG 67, 76, 85, 96 (column 3)

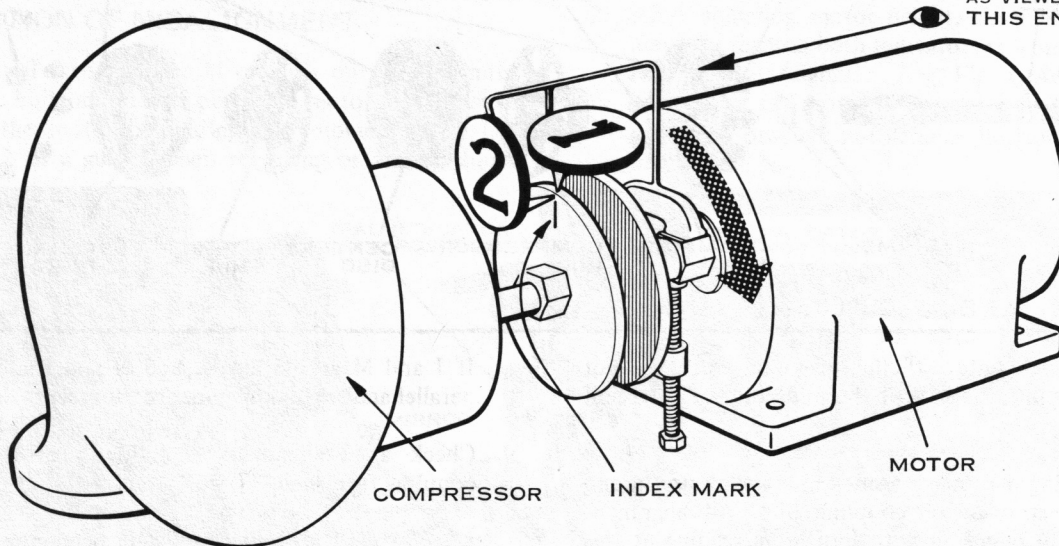
² - Use for compressor Models LTG 67 & 76 (column 4)

³ - Use for compressor Models LTG85-95 (column 6)

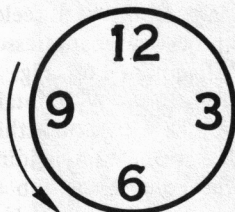
ALIGNMENT LOG

Record reading and calculate per instructions

ROTATE IN COUNTER-CLOCKWISE DIRECTION AS VIEWED FROM THIS END OF MOTOR



CLOCK POSITION AS VIEWED FROM MOTOR



INDICATOR No. ①
PARALLEL

12	
9	
6	
3	

INDICATOR No. ②
ANGULAR

AXIAL MEASUREMENTS

AXIAL GAP

	A
--	----------

HORIZ. MISALIGN.
(3 - 9)*

	G
	H
	J

REQ'D HORIZ. OFFSET

HORIZONTAL ERROR
(G - H)*

VERT. MISALIGN.
(6 - 12)*

	K
	L
	M

REQ'D VERT. OFFSET

VERTICAL ERROR
(K - L)*

ALLOWABLE ERROR

(+ OR -)	Q
----------	----------

(+ OR -)	R
----------	----------

AXIAL TRAVEL
MAG. CTR. TO
SHAFT " IN "

	C
--	----------

A - C

	F
--	----------

ALLOWABLE ERROR

	S
--	----------

ALLOWABLE
SHIMS OR SPACERS

	D
--	----------

* ALGEBRAIC DIFFERENCE

CHECK IF O.K.:

J AND M WITHIN Q

N AND P WITHIN R

FLEX DISC:
F WITHIN S
YORK FLEX:
F WITHIN D

FIG. 1— ALIGNMENT LOG

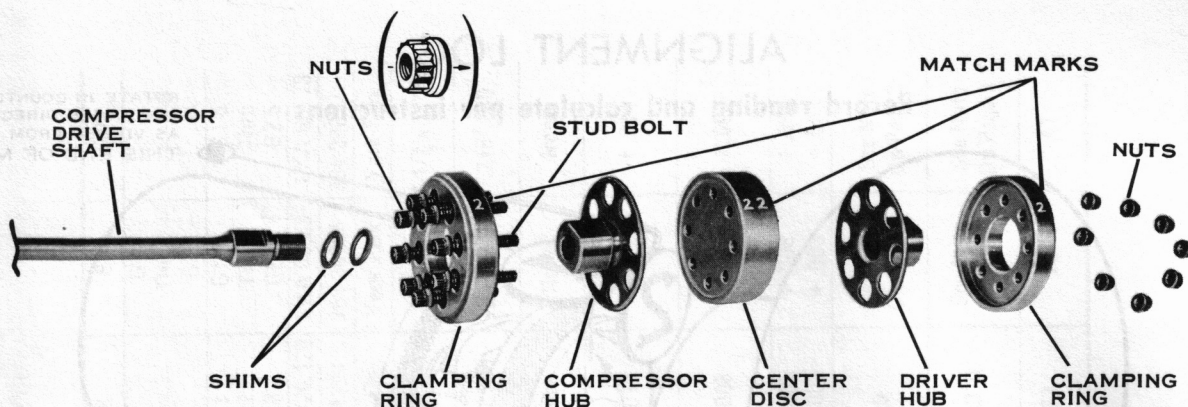


FIG. 2— FLEXIBLE DISC COUPLING

the magnetic center. If the magnetic center is not scribed, assume it to be at the mid-point of total end play.

6. With marking dye, make a small index mark on the rim of the compressor or coupling hub. All alignment readings will be taken with indicators reading at this index mark.
7. Rotate the compressor and motor shafts so that both index mark and indicators are in the 12 o'clock position. (All positions are to be viewed from motor, looking at the end of the compressor). Read both indicators and record on Alignment Log, Fig. 1. Moving both shafts in the counterclockwise direction 1/4 turn at a time, read and record both indicators at 9, 6 and 3 o'clock positions. Both shafts must be kept axially in toward the compressor and motor during these readings. (A jack screw with rubber gasketing on both ends is a convenient device for holding shafts apart during measurements.)
8. Perform the indicated calculations to complete the Alignment Log, Fig. 1, blocks G, J, K, M, N and P. Be sure to use algebraic subtraction.

For example:

$$\begin{aligned}
 (+.005) - (+.008) &= -.003 \\
 (+.010) - (-.003) &= +.013 \\
 (-.010) - (+.003) &= -.013 \\
 (-.005) - (-.008) &= +.003
 \end{aligned}$$

If J and M are within Q, and N and P are within R, parallel and angular alignments are acceptable.

9. Check axial alignment as follows, for the type of coupling furnished.
 - a. *Flex-Disc Coupling* — Push the compressor drive shaft into the compressor (against its thrust face) and push the motor shaft into the motor as far as they will go. Hold the center disc between the coupling hubs. Screw compressor hub outward until it holds the center disc in position. With feeler gages determine the axial gap between compressor hub and shims. Record on Alignment Log, Fig. 1, block A. Subtract block C from Block A to obtain the axial error, block F. If block F is not within block S, axial alignment can be corrected by adding or removing shims behind the compressor hub as long as the shim stack is within block D. Use smallest number of shims to make up required shim stack thickness. Note that the sign of the allowable axial error indicates that the shim stack should always be *larger* than the gap, tending to separate the shaft and *load* the compressor thrust bearing.
 - b. *York-Flex Coupling* — Push the compressor drive shaft into the compressor and push the motor shaft into the motor as far as they will go. (For LKA compressors, the shaft cannot be pushed into the compressor because of the internal pressure.) Select a stack of spacers that will fit between the hubs at the extreme outer edges, (See Fig. 5). Record the

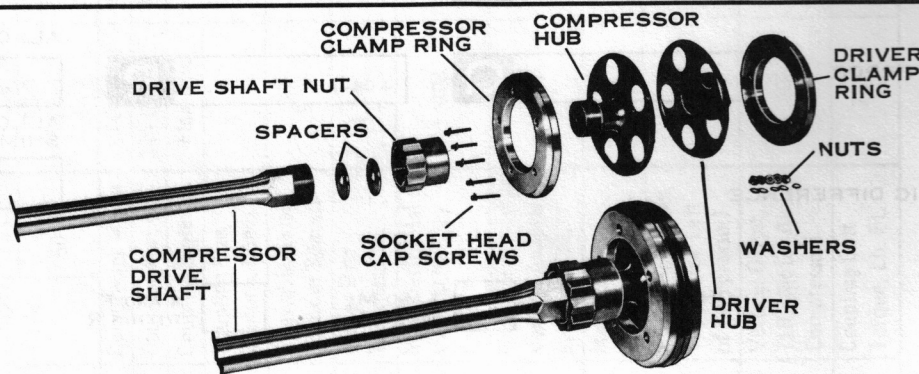


FIG. 3— YORK-FLEX COUPLING

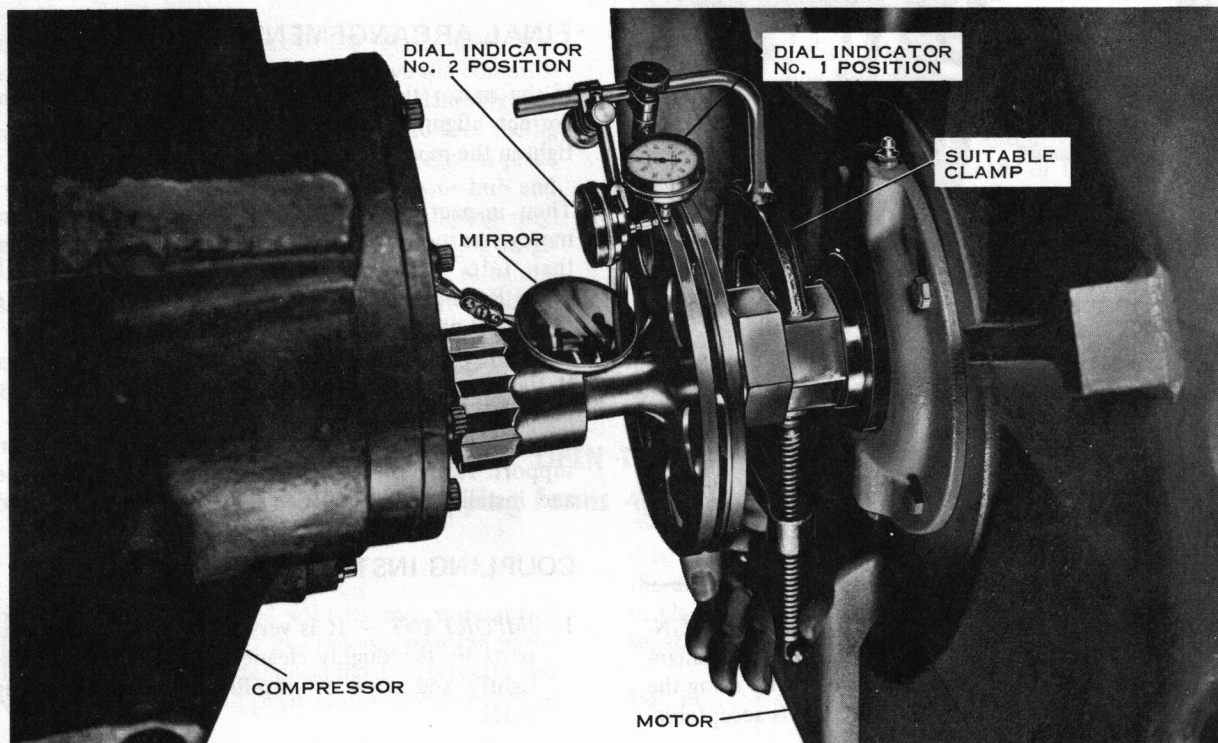
thickness of this stack in block A. (Alignment Log – Fig. 1.) Subtract block C from block A to obtain block F. If block F is within the limits of block D axial alignment is acceptable.

CORRECTION OF MISALIGNMENT

1. If vertical error (blocks M or P) is outside of limits, remove bolts and dowel pins from motor feet. Raise or lower the motor by adding or removing shims. Use Table 2 as a guide. When removing or adding shims,

always add or remove equal thickness of shims under both front or both rear feet. This will maintain a flat motor mounting plane and prevent the motor from rocking.

2. After adjusting motor height, check horizontal alignment by reading both indicators at 3 and 9 o'clock and record it on Alignment Log, Fig. 1. Adjust horizontal position of the motor as necessary (using Table 2 as a guide) to produce in-tolerance horizontal alignments, block J and N.



DIAL INDICATOR IN # 1 POSITION. FOR VERTICAL PARALLEL ALIGNMENT READ AT 12 AND 6 O'CLOCK POSITIONS. FOR HORIZONTAL PARALLEL ALIGNMENT READ AT 9 AND 3 O'CLOCK POSITIONS.

USE STARRETT #196A DIAL INDICATOR OR SIMILAR SIZE AND TYPE (ANTI-MAGNETIC). USE A MIRROR TO FACILITATE EASY READING.

DIAL INDICATOR IN # 2 POSITION. FOR VERTICAL ANGULAR ALIGNMENT READ AT 12 AND 6 O'CLOCK POSITIONS. FOR HORIZONTAL ANGULAR ALIGNMENT READ AT 9 AND 3 O'CLOCK POSITIONS.

NOTE:
MAGNETIC DIAL INDICATOR HOLDERS ARE NOT SUITABLE FOR SHAFT COUPLING ALIGNMENT.

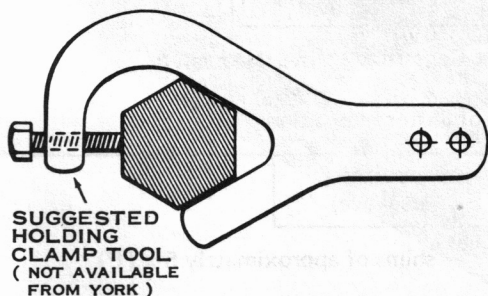
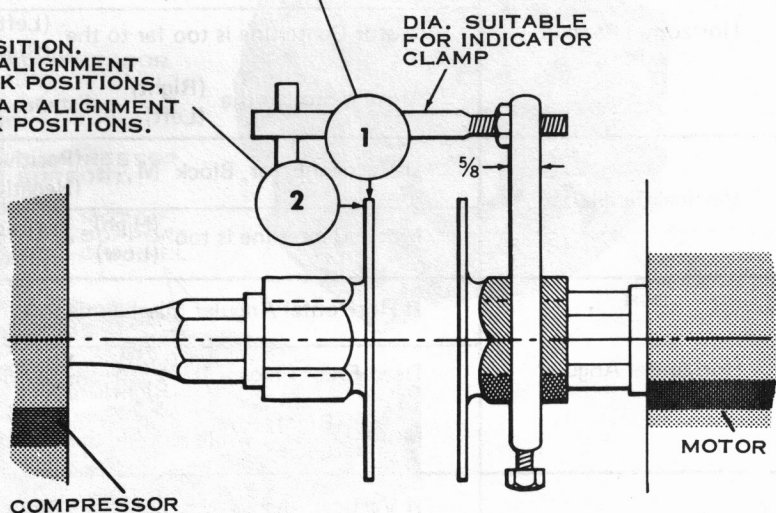


FIG. 4— DIAL INDICATOR ARRANGEMENT AND SUGGESTED CLAMPING

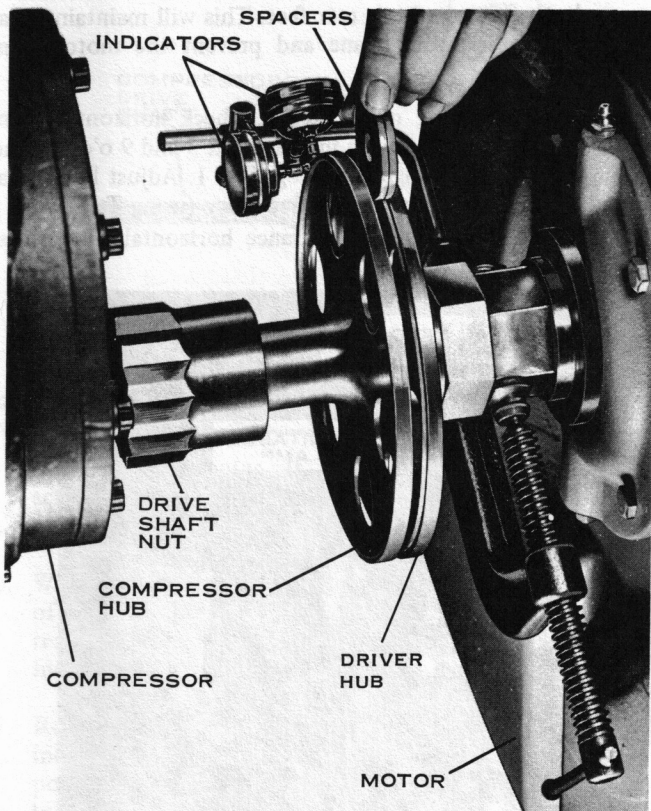


FIG. 5— CHECKING SPACE BETWEEN HUBS

3. Check axial alignment as in paragraph 9 under ALIGNMENT CHECK PROCEDURE page 6. If axial alignment is close enough so it can be corrected by using the allowable shims and spacers (Block D), it is acceptable.

TABLE 2— CORRECTION OF ALIGNMENT ERRORS

Horizontal Parallel	If Horizontal Error, Block J , is (Positive) (Negative) :
	Motor Centerline is too far to the (Left) (Right) when viewed from Motor End of Unit. Move Motor to the (Right) (Left) a distance 1/2 the value of Block J .
Vertical Parallel	If Vertical Error, Block M , is (Positive) (Negative) :
	Motor Centerline is too (High) (Low) • (Lower) (Raise) the Motor 1/2 the value of Block M .
Horizontal Angular	If Horizontal Angular Misalignment, Block N , is (Positive) (Negative) :
	Dead End of Motor is (Left) (Right) of the proper Centerline. Move dead end of Motor (Right) (Left) while holding the shaft end of Motor in position.
Vertical Angular	If Vertical Angular Misalignment, Block P , is (Positive) (Negative) :
	Dead End of Motor is too (High) (Low) • (Remove) (Add) shims of approximately $5 \times (P)$ thickness under dead end feet.

If not, move the motor to correct it, then repeat the horizontal alignment as indicated in Paragraph 2.

4. If vertical error is within tolerance, but horizontal error, blocks J or N, or axial alignment (from paragraph 9 under ALIGNMENT CHECK PROCEDURE page 6) are outside allowable limits, loosen the motor tie-down bolts and remove the dowel pins. Then proceed as in the above paragraphs 2, 3 and 4.

FINAL ARRANGEMENTS

If the motor tie-down bolts were removed or loosened to correct alignment, the dowel pins must be reset. First, tighten the motor tie-down bolts.

Then inspect the dowel pin holes to see how much the motor was moved relative to the base, if movement was less than 1/16" the holes may be reamed using a No. 1 Morse Taper Reamer until a smooth hole is produced. Then install the dowel pins.

If the motor is displaced more than 1/16" relative to the base, the original dowel pin holes cannot be used. Drill 23/64" dia. holes through the two front feet and the motor support. Ream the holes with a No. 1 Morse Taper Reamer and install dowel pins. (See Figs. 11, 12, 13, 14, and 15.)

COUPLING INSTALLATION

1. **IMPORTANT** – It is very important that all coupling parts be thoroughly cleaned and degreased. Oil screws lightly and wipe off residual so that no oil drips on parts.

2. *Flex-Disc Coupling* – Remove both coupling hubs. Slip a clamping ring over each shaft with clamping surfaces facing each other. Screw the hubs snugly back in place, being careful to use the same shims behind the compressor hub. Insert the center disc between the two coupling hubs. Slide the two clamping rings in place and line up the match marks on the clamping rings and center disc. Install screw and nuts, tighten gradually and evenly to the torque shown in Table 1, line 14.
3. *York-Flex Coupling* – Screw the drive shaft nut completely on the drive shaft and remove the compressor hub. Remove the driver hub. Slip a clamping ring over the driver shaft with the clamping surface facing the compressor. Screw the driver hub snugly in place on the driver shaft. Assemble the compressor hub and clamping ring to the driver hub and clamping ring, aligning the match marks on the two clamping rings. Fasten the rings together using the bolts, nuts and washers provided. Position the hubs so that the bolts are centered in the large clearance holes in the hub discs. Tighten the nuts gradually and evenly to the torque specified in Table 1, line 14.

Select a stack of spacers which will just fit between the ends of the compressor shaft and compressor hub. With shafts pushed into compressor and motor (for LKA compressors, the shaft cannot be pushed into the compressor because of the internal pressure), record the thickness of this stack as a new value of block A on the Alignment Log Fig. 1. Subtract the old value of block C and obtain a new value block F. For LTD compressor, select two (2) spacers that are 0 to .005" more than block F in total thickness. For LKA compressors, select two (2) spacers that are .003 to .008 more than block F in total thickness. (This thickness must be within the limits of block D.) Install these spacers between the ends of the compressor shaft and compressor hub. Screw the drive shaft nut into a central position over the threads of the shaft and hub. Then hold the compressor shaft and turn the motor shaft slowly counter-clockwise to screw the compressor shaft and compressor hub further into the drive shaft nut. This will take up the end play left by the spacers and pull the motor shaft into the magnetic center position.

4. Install coupling guard. (See Fig. 16.)

ALIGNMENT OF MOTOR-COMPRESSOR: OPEN TURBOPAK WITH FIELD FURNISHED MOTOR (Shipping Forms 4, 5 and 6).

GENERAL

The Open Turbopak is delivered with the motor mounting supports normally tack welded in a random position in the motor mounting base. These supports must be repositioned to accommodate the field supplied motor or other type of

driving equipment and then securely welded in place before the driver can be mounted. The base, with the compressor in place is mounted on the shell (forms 5 and 6) or shipped separate from the shell (form 4).

For Form 4 shipment, the motor may be installed in the

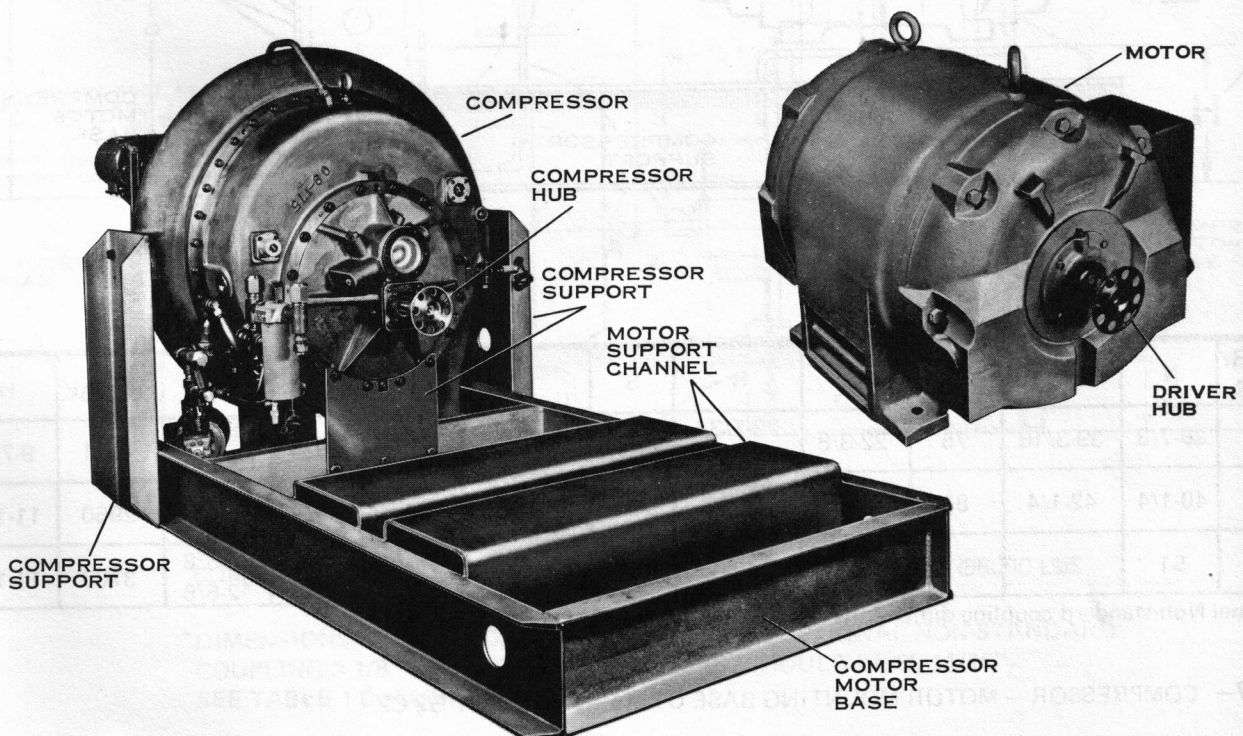
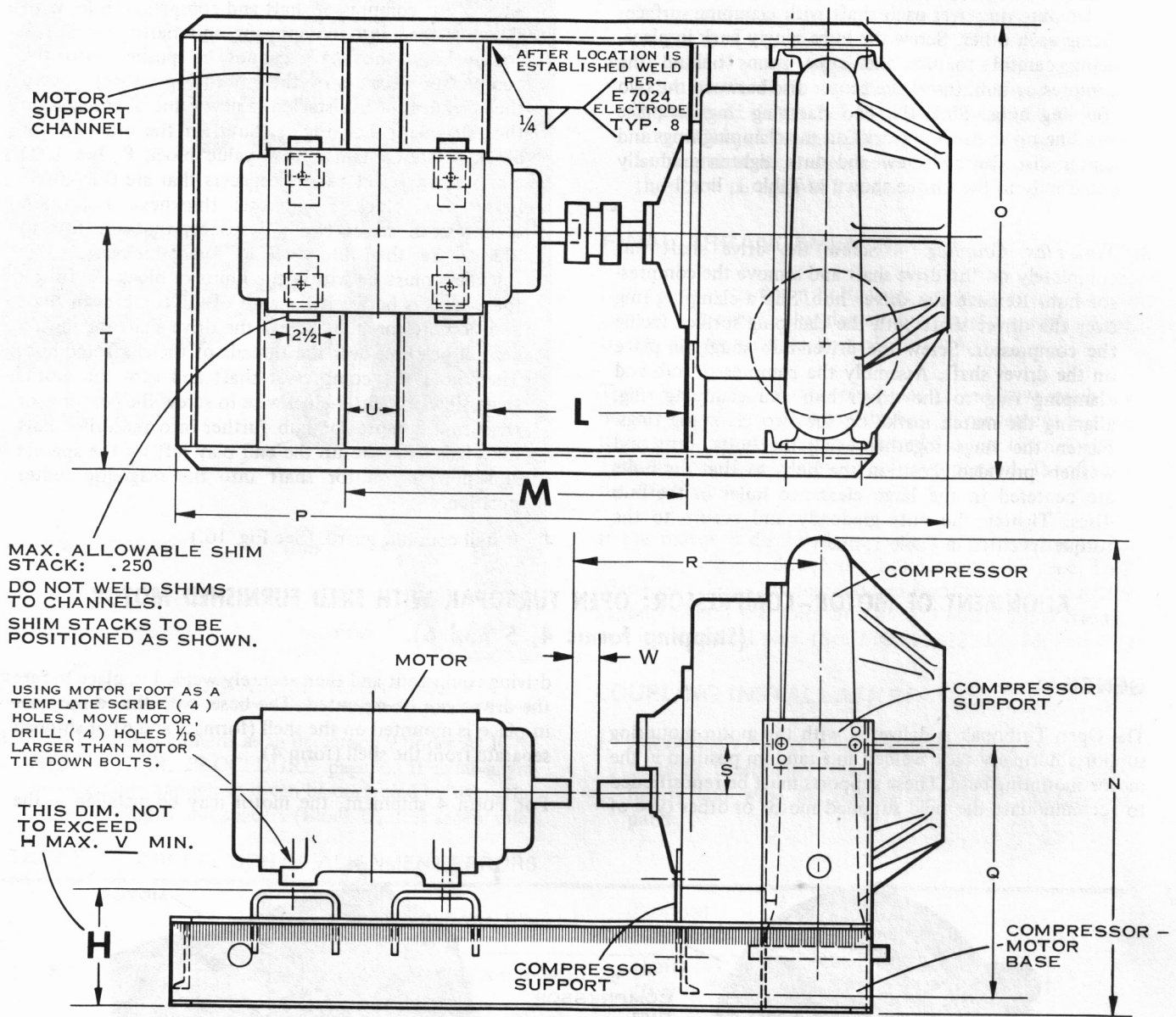


FIG. 6— BASE WITH COMPRESSOR AND FIELD SUPPLIED MOTOR

DIMENSIONS—INCHES
LOCATING FIELD SUPPLIED MOTOR ON COMPRESSOR—MOTOR MOUNTING BASE
MODELS OT A1 A3 THRU OT G2 C2



COMPR. CODES	N	O	P	Q	R	S	T	U	V	W	Weight	H
A3	38-7/8	39-3/16	75	22-3/8	23-7/32	4-1/2	20-15/32	3 Min.	5-1/4	2-1/8	1881	9-7/8
A4					*23-9/32					*2-3/16		
B1	40-1/4	42-1/4	83	22-1/4	26-1/4	5-1/2	21-15/16	3 Min.	3-3/4	2-1/2	2950	11-1/2
B2					*27-1/4					*3-1/2		
C1	51	52	86-1/4	28	27-1/2	5-1/2	24	3 Min.	4	*2-5/8	3700	11-1/2
C2					*27-5/8					*2-5/8		

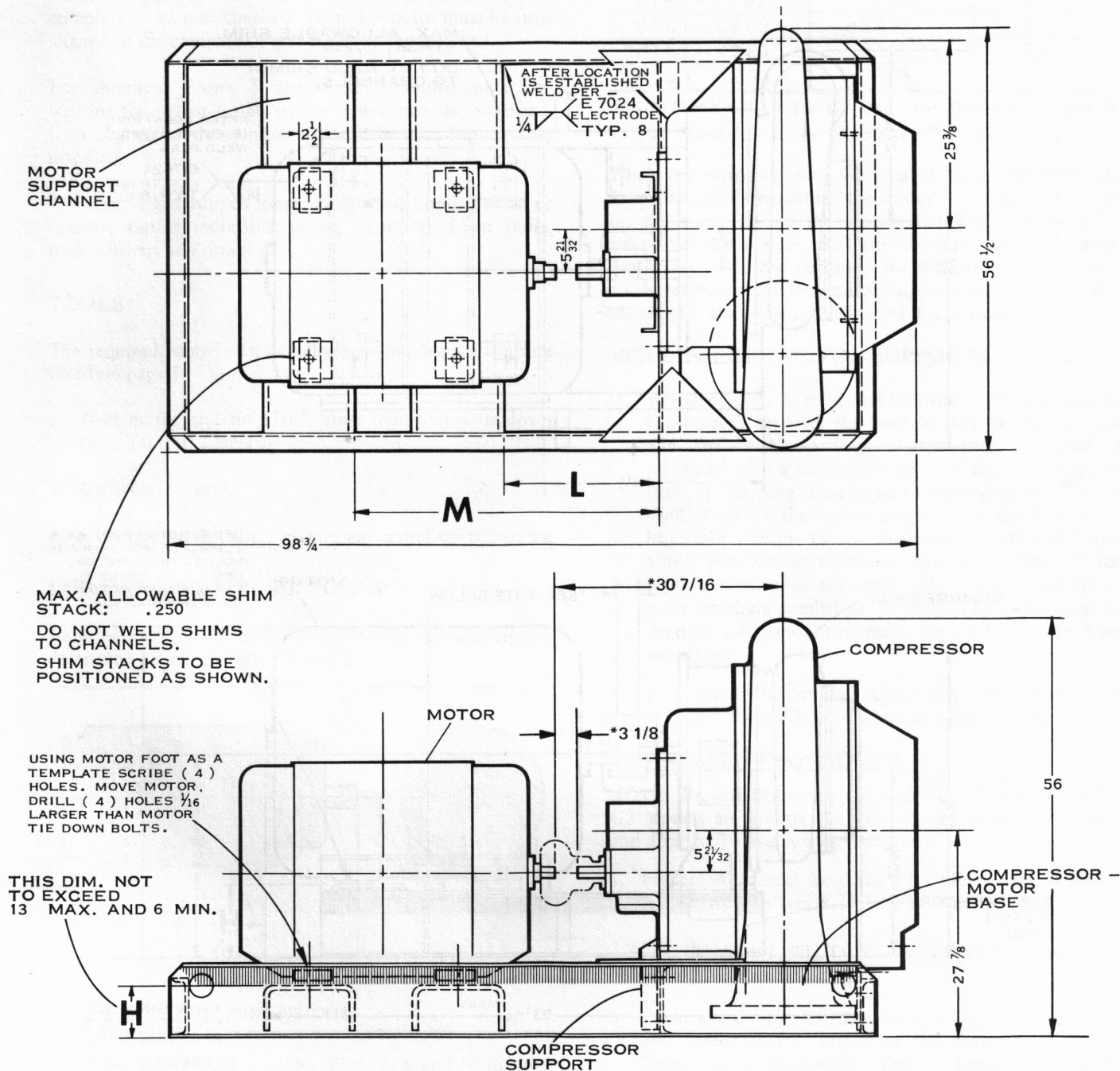
*Optional Non-standard coupling dimensions see Table 1 columns 5, 4 and 6.

FIG. 7— COMPRESSOR – MOTOR MOUNTING BASE OT A1 A3 THRU OT G2 C2

DIMENSIONS—INCHES

LOCATING FIELD SUPPLIED MOTOR ON COMPRESSOR—MOTOR MOUNTING BASE

MODELS OT H1 E1 THRU OT K3 E3

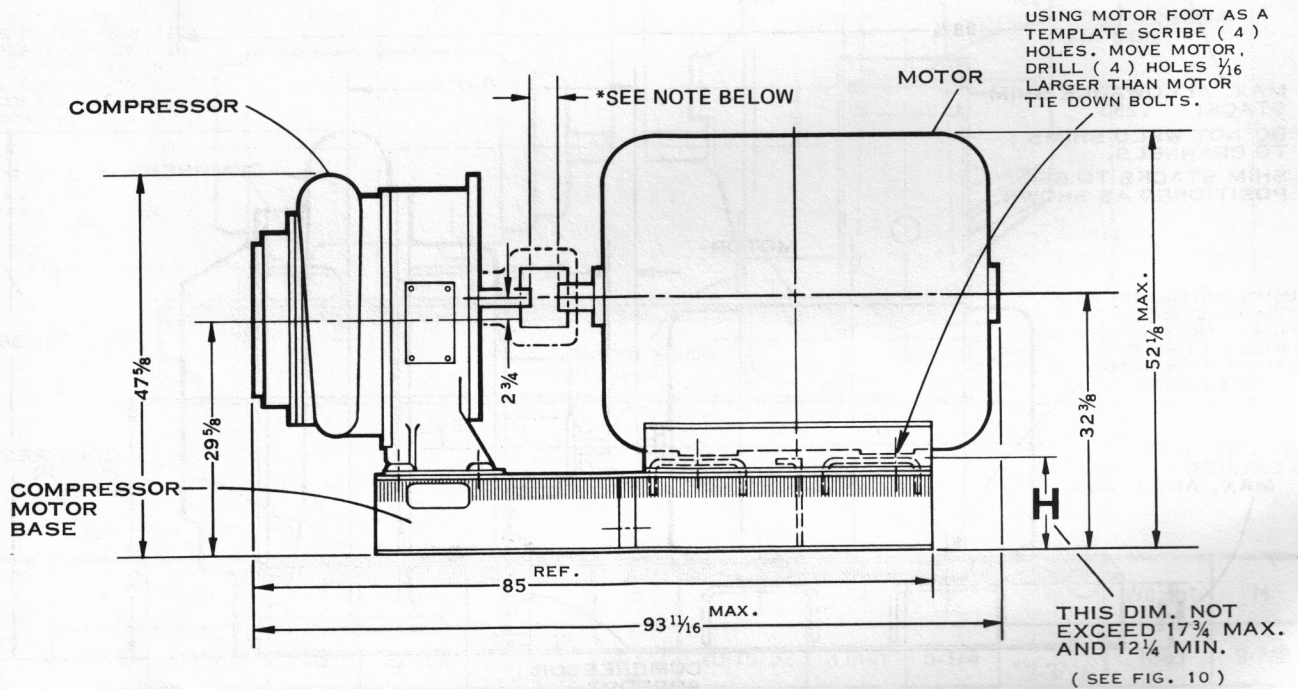
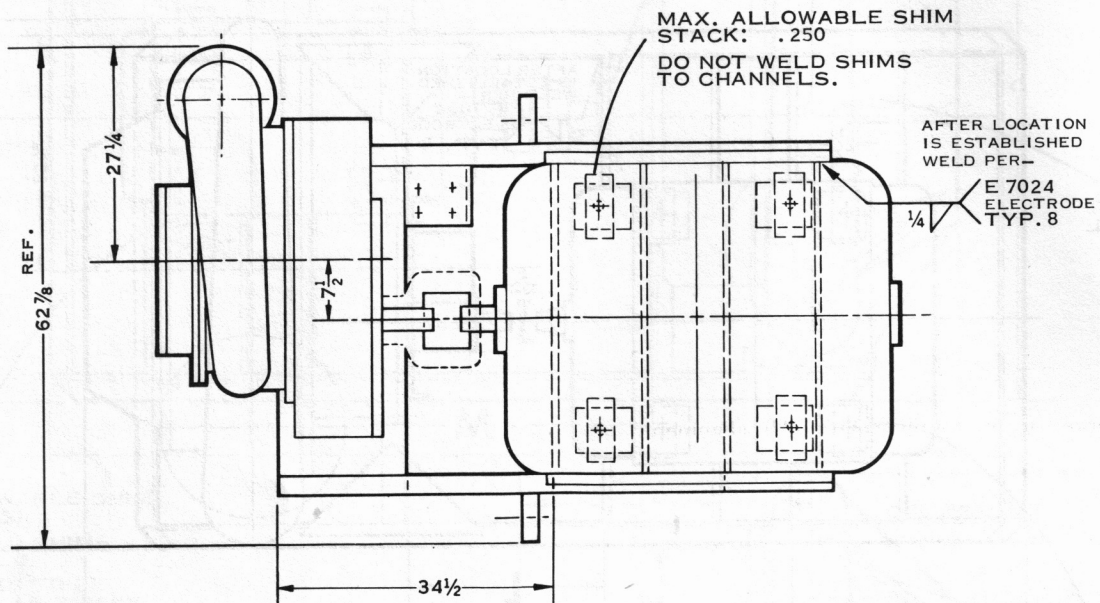


COMPRESSOR BASE WEIGHT ASSEMBLY LESS MOTOR – WEIGHT 6000 LBS.

*DIMENSIONS FOR STANDARD COUPLING – FOR OPTIONAL NON-STANDARD COUPLING $3 \frac{1}{8}$ " SHOULD BE $3 \frac{3}{8}$ ", $30 \frac{7}{16}$ " SHOULD BE $30 \frac{11}{16}$ ".
SEE TABLE 1 COLUMN 8.

FIG. 8 — COMPRESSOR – MOTOR MOUNTING BASE OT H1 E1 THRU OT K3 E3

DIMENSIONS—INCHES
 LOCATING FIELD SUPPLIED MOTOR ON COMPRESSOR—MOTOR MOUNTING BASE
 MODELS OT M1 G1 THRU OT T2 G2



*Compressor Base Assembly less Motor — Weight 3100 Lbs.

NOTE:
 3-5/8" BETWEEN SHAFTS WITH
 STD. 1-7/8" COUPLING
 4" BETWEEN SHAFTS WITH
 OVERSIZE (2-1/2 x 1-7/8) COUPLING

FIG. 9 — COMPRESSOR — MOTOR MOUNTING BASE OT M1 G1 THRU OT T2 G2

base before or after the base is assembled on the shell. See Instruction Form 160.58-N1 (R-11 turbopaks) and Form 160.63-N1 (R-12 turbopaks) for assembling base to shell. If the motor is assembled in the base first, it should be rough aligned before going on the shell. The base should be welded in place and the suction and discharge connections completed and leak checked. Then the motor must be final aligned to the compressor and the coupling installed.

For shipment Forms 5 and 6, after repositioning and welding the motor supports, the motor must be mounted, final aligned to the compressor and the coupling must be installed.

The coupling is shipped loose, along with coupling shims or spacers, motor mounting shims, motor tie-down bolts, nuts, washers and dowel pins.

TOOLS

The required tools listed as follows are in addition to those listed on page 3.

1. Drill motor and bit 1/16" larger than motor tie down bolt; Table 1, Line 16.
2. Carpenter's Level.

LOCATING AND WELDING MOTOR SUPPORTS

LOCATING MOTOR SUPPORTS:

Refer to Fig. 10, the motor must be carefully measured to determine dimensions B, C, D and K.

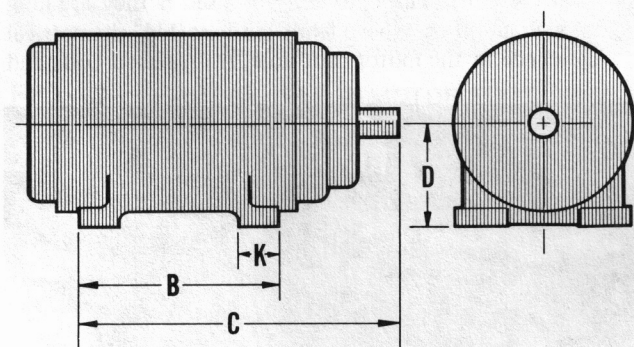


FIG. 10— MOTOR DIMENSIONS

The dimensions H, L and M, Figs. 7, 8 and 9, locating motor support members are calculated as follows:

$$H = X - D$$

$$L = C - B + \frac{K}{2} + Y$$

$$M = C - \frac{K}{2} + Y$$

Refer to Table 3 for the values of X and Y.

TABLE 3— CONSTANTS FOR MOTOR SUPPORT LOCATING EQUATIONS

Model OT	X	Y
A1 A3 - A5 A4	17.75	6.88
B1 B1 - C2 B2	16.625	6.5
D1 C1 - G2 C2	22.38	6.5
H1 E1 - K3 E3	22.09	7.9
M1 G1 - T2 G2	32.25	*

*For OT M1 G1 - T2 G2, Do Not Calculate L and M. Use Fixed Locations Shown in Fig. 9.

When the motor supports are located using dimensions H, L and M calculated above, the motor feet will be centered on the supports and the motor shaft axis will be 1/8" below the compressor shaft axis to allow for shims under motor feet. It is not necessary for the motor support feet to be centered on the motor support members, so the values of L and M may be adjusted if necessary.

WELDING THE MOTOR SUPPORTS

1. Remove the tack welds holding the motor supports in the base. Then level the base so that the longitudinal and transverse members of the base are level as measured with a carpenter's level. If the base is on the shell, the leveling must be accomplished by leveling the shell. Position the motor supports in the base using blocks or clamps. Check dimensions L, M and N and adjust positions as necessary. Check each member for level transverse to the shell axis. Check level across both members parallel to the shell. The objective is to produce a flat mounting plane for the four motor foot locations.

Tack weld the motor supports to the base, then complete the welding as shown in Figs. 7, 8 and 9.

ALIGNMENT PROCEDURE

NOTE: Pre-conditions for alignment of OT M1 G1-OT T2 G2 Models are approx. 135°F compressor sump oil temp. and approx. 70 psig system pressure.

1. Prepare Alignment Log, Fig. 1 for taking data. Refer to ALIGNMENT CHECK PROCEDURE paragraph 1.
2. Set the motor on the motor supports, roughly in position.
3. Clean the double left-hand threads on the compressor and motor shafts. Lubricate the shaft threads with York Turbo Compressor Drive Thread Compound, York Part No. 464-14934.
4. Check the total end play of the motor with an indicator clamped to the compressor shaft. With the indicator ball on the end of the motor shaft determine the total end play.

If the motor has ball bearings, the end play should be less than .005", and it may be ignored. If the end play is greater than .005", as is usually the case with journal bearings, the shaft will be scribed near the motor

housing to indicate its running position, called magnetic center. Determine the end play from the extreme shaft "in" position to the magnetic center and log this on the Alignment Log, Fig. 1, block C. (If the magnetic center is not scribed, log half the value of total end play in block C.

5. Assemble coupling hubs on both shafts as follows:

a. *Flex-Disc Coupling* – Install .020" shims behind the compressor hub. Screw hubs snugly against shaft shoulders. Do not draw tight.

b. *York-Flex Coupling* – Do not use spacers at this time. Screw the nut and male threaded hub on the compressor shaft. Screw hubs snugly against shafts, but do not draw them tight.

6. Bring the motor to the approximate alignment, using shims under the motor feet. Check rough alignment by holding a straight edge across the rims of the coupling hubs at the 3 and 12 o'clock positions. Arrange separation between coupling hubs as follows:

a. *Flex-Disc Style* – Push the compressor drive shaft into the compressor and push the motor shaft into motor as far as they will go. Hold the center disc between the coupling hubs. Adjust motor location so that feeler gages, set at the value of block C, Alignment Log, Fig. 1, will just fit between center disc and hub.

b. *York-Flex Coupling* – Push the compressor drive shaft into the compressor and push the motor shaft into motor as far as they will go. (For LKA compressors, the shaft cannot be pushed into the compressor because of the internal pressure.) Select a stack of spacers equal in thickness to block C of the Alignment Log, Fig. 1, plus the mean value of block D. Adjust the motor position until the stack of spacers just fit between the hubs at their extreme outer edges. (See Fig. 5.)

7. Arrange indicators as in paragraphs 4 and 6 under Alignment Check.

8. Rotate the compressor and motor shafts so that the index marks and indicators are in the 3 o'clock position (All positions are as viewed from the motor facing the compressor). Read indicators No. 1 and No. 2 and record in the block provided on the Alignment Log, Fig. 1. Repeat the above mentioned procedure at the 9 o'clock position. Calculate the horizontal parallel and angular misalignments (blocks G and N) and the horizontal parallel error, block J.

9. Adjust the motor position to correct the horizontal misalignments referring to the correction procedure Table 3. When blocks J and N, Alignment Log Fig. 1, are within the allowed limits Q and R, repeat the axial location check, refer to paragraph G – a. or b. With horizontal and axial alignment in tolerance the motor mounting holes can be drilled.

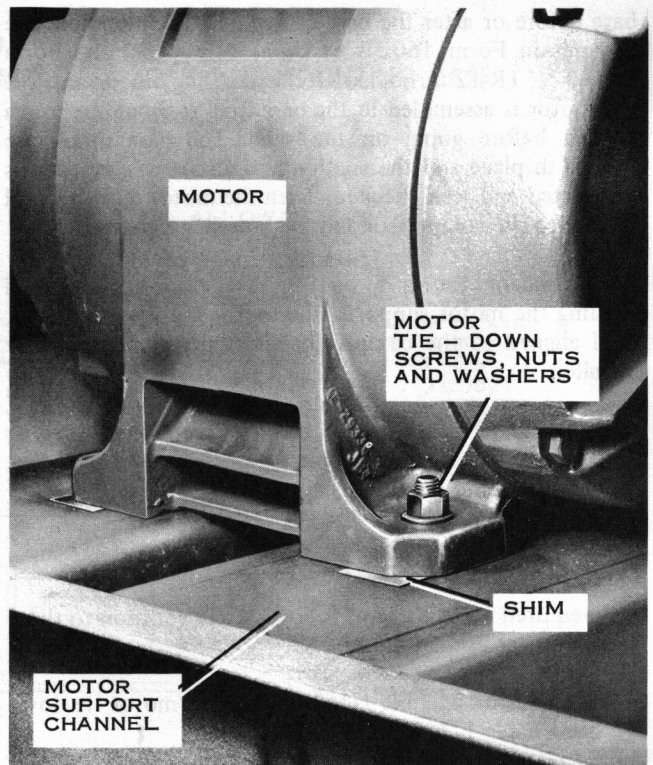


FIG. 11— INSTALLATION OF MOTOR TO MOTOR SUPPORT

10. Using the motor foot holes as a template, scribe the locations on the motor supports. Remove the motor or move it aside. Carefully find the center of the hole locations and center punch. Drill the four motor tie-down holes using a drill 1/16" larger in diameter than the motor tie-down bolts. The bolts furnished with the Open Turbopak may be used if they are long enough and if they have from 1/32" to 1/4" diametrical clearance in the motor foot hole. If furnished bolts and



FIG. 12— DRILLING MOTOR FOOT, SHIM AND MOTOR SUPPORT

nuts are not applicable other screws must be procured and should be selected for 1/32" to 3/32" diametrical clearance in the motor foot holes.

11. Replace the motor, with motor holes aligned with the holes in the supports. The motor will probably rock slightly on two diagonally opposite feet. These feet are on high points of the supports. Place shims under the other two feet until the rocking is eliminated.
12. Assemble the coupling hubs to the shafts per paragraph 5, page 13.
13. Add shims under the motor to obtain an approximately

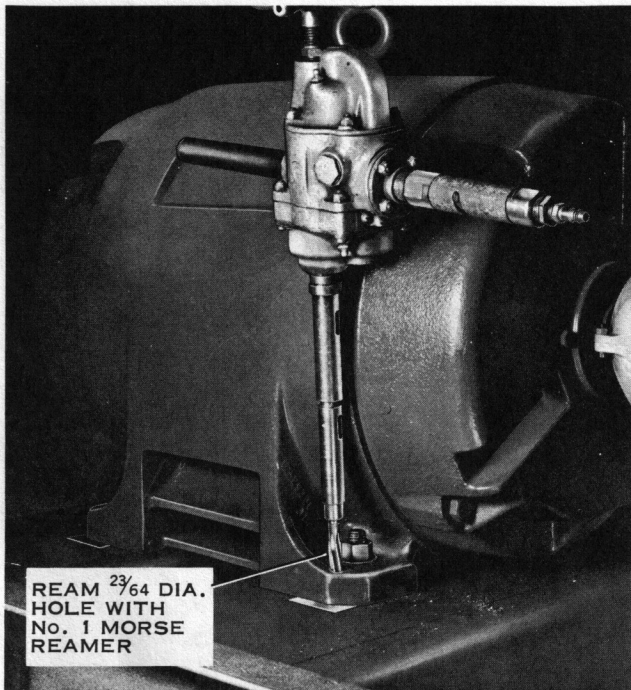


FIG. 13— REAMING HOLE IN MOTOR FOOT, SHIM AND MOTOR SUPPORT

correct vertical alignment. When adding or removing shims, always add or remove equal thicknesses of shims under both front or both rear feet. This will maintain the flat mounting plane established in the above paragraph 11.

14. Arrange dial indicators per paragraph 4 under ALIGNMENT CHECK PROCEDURES. Install motor tie-down bolts and tighten them. (See Fig. 11).

Read indicators No. 1 and 2 at the 6 and 12 o'clock positions and record on Alignment Log Fig. 1. Calculate the vertical parallel error block M and vertical angular misalignment, block P. If M is greater than Q, or P is greater than R, correct the vertical alignment using Table 3. Then repeat as previously stated in this paragraph.

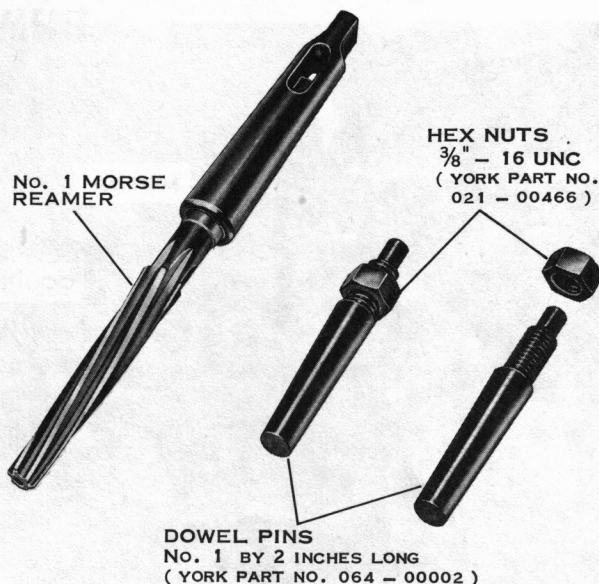


FIG. 14— NO. 1 MORSE REAMER AND DOWEL PINS

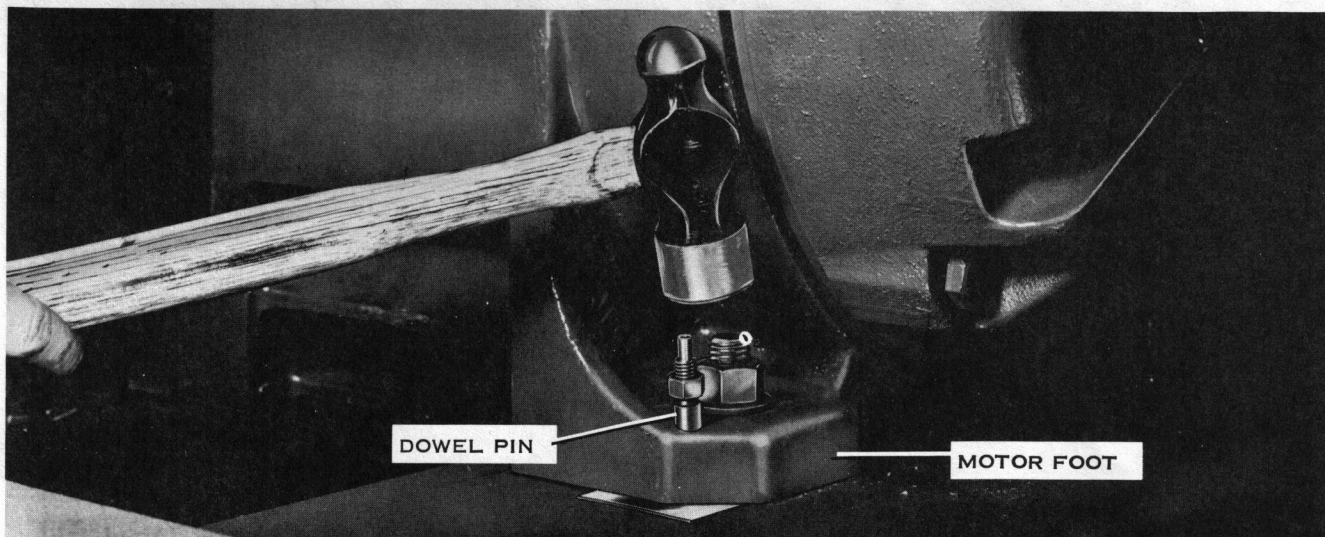


FIG. 15— INSTALLING DOWEL PIN

15. Establish axial separation per paragraph 6 a. or b.
16. Check horizontal alignment by reading both indicators at 3 and 9 o'clock positions and record on Alignment Log, Fig. 1. Calculate the horizontal parallel error, block J, and horizontal angular misalignment, block N. Compare these values with allowable errors, blocks Q and R. If blocks N or J is outside of tolerance, loosen the tie-down bolts, adjust the motor location per Table 3 retighten the bolts and repeat procedure as previously mentioned in this paragraph.
17. Referring to the Alignment Log, Fig. 1. When a full set of dial indicator readings result in J and M within Q, N and P within R, and axial separation is adjusted correctly, the unit is ready for coupling installation. (If the axial separation of a Flex-Disc Coupling needs final adjustment, it can be accomplished by adding or

removing shims behind the coupling nut, within the limits of block D.)

18. Tighten motor tie-down bolts securely. Drill one 23/64" dia. hole through each front foot of the motor, shims and motor support (See Fig. 12). Ream these holes with a No. 1 Morse Taper Reamer (See Figs. 13 and 14). (Install the two provided dowel pins and check to see that they engage both motor foot and support.) If necessary ream the holes for deeper seating. Finally tap the dowel pins tightly in place. (See Fig. 15).
19. Install the coupling per COUPLING INSTALLATION page 8.
20. Install coupling guard. (See Fig. 16)

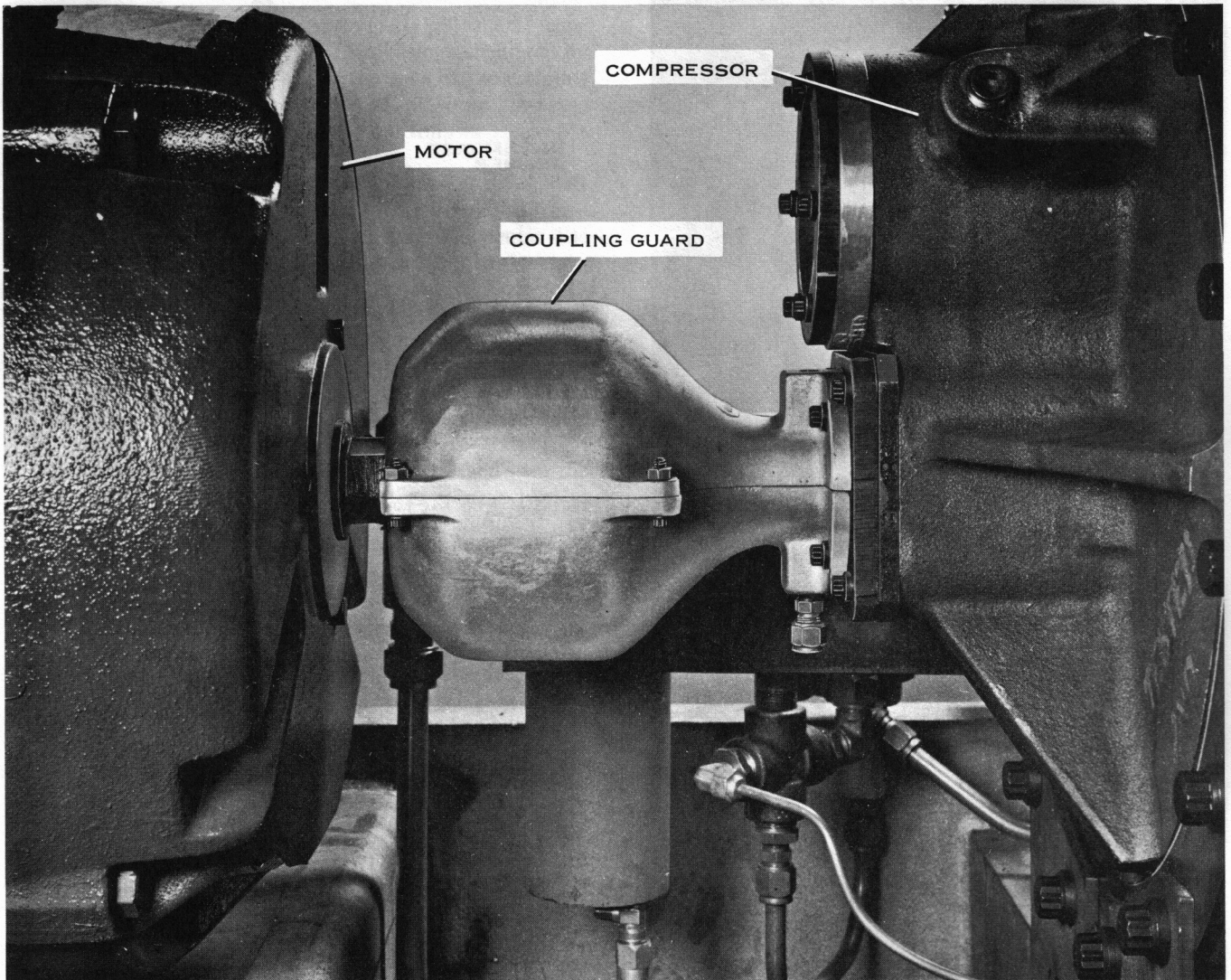


FIG. 16— COUPLING GUARD INSTALLED

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