EMD MAINTENANCE INSTRUCTION

LOCOMOTIVE RUBBER DRAFT GEAR ASSEMBLIES

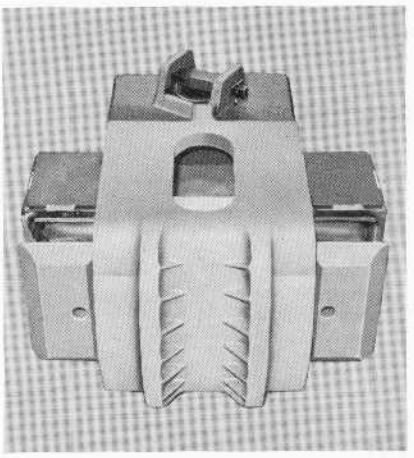
DESCRIPTION

The powerful force exerted by the locomotive to pull its train is applied through the draft gear assembly and coupler of the locomotive. Shown in Fig. 1 is one of the current design rubber draft gears and its application in its draft gear pocket. The draft gear must not only withstand the entire pulling power of the locomotive, but in addition, it must be capable of absorbing the impact shock during coupling and starting, and be sufficiently flexible to conform to the small fluctuations of load during operation.

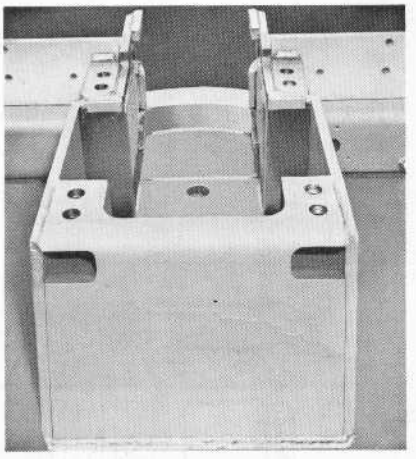
The best type of draft gear assembly to accommodate the different loads, either of shock or fluctuation, is the rubber design draft gear covered in this instruction. Rubber has long been recognized as one of the best materials for cushioning vibration and shock. Although there are a number of different designs of rubber draft gears outlined in this instruction, they all operate on the same principle, differing primarily in size and capacity. The original selection of the draft gear is determined primarily by the number of power units that will operate together and the kind of service in which the locomotive will operate.

The draft gear assembly consists of the draft gear and its yoke, to which the coupler is pinned. When the locomotive is exerting force, the force is transmitted through the draft gear pocket to the draft gear, then through the yoke to the coupler. The draft gear then is interposed between the draft gear pocket, which is an integral part of the locomotive underframe, and the yoke which is connected to the locomotive coupler.

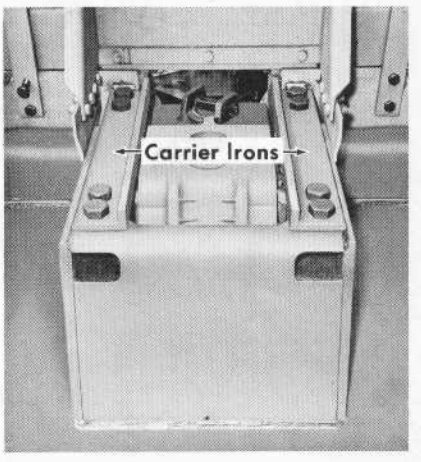
Representative draft gear to yoke applications are shown in Fig. 2.



M-380 Draft Gear Assembly



Draft Gear Pocket



M-380 Draft Gear Installed In Draft Gear Pocket

Fig. 1 - Current Design Rubber Draft Gear And Application

* THIS BULLETIN IS COMPLETELY REVISED AND SUPERSEDES M.I. 1210.

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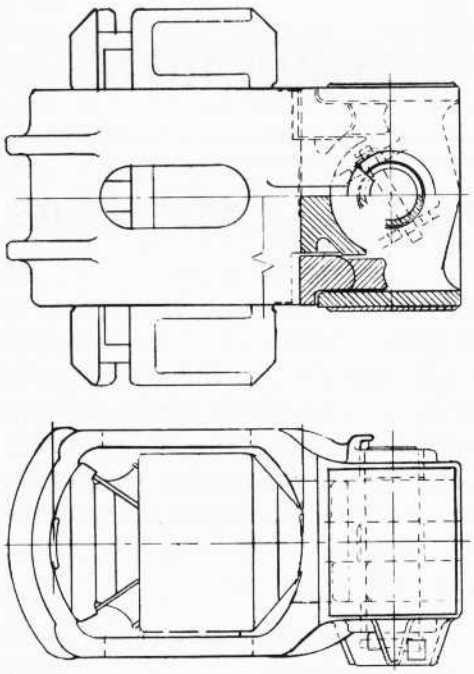
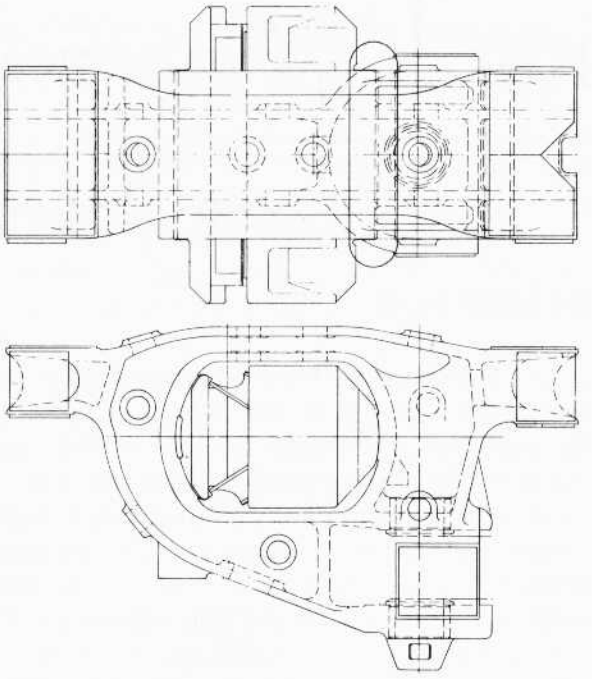
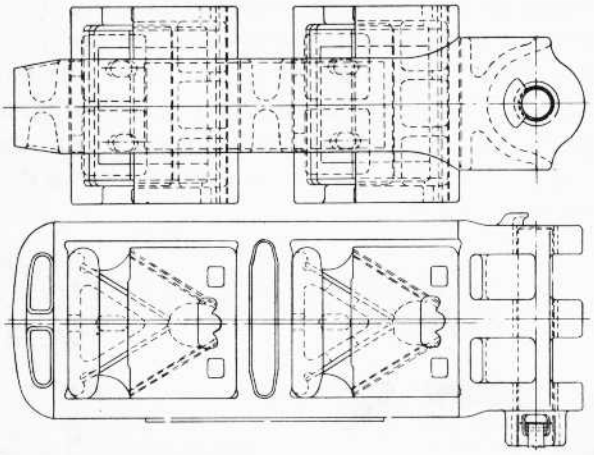


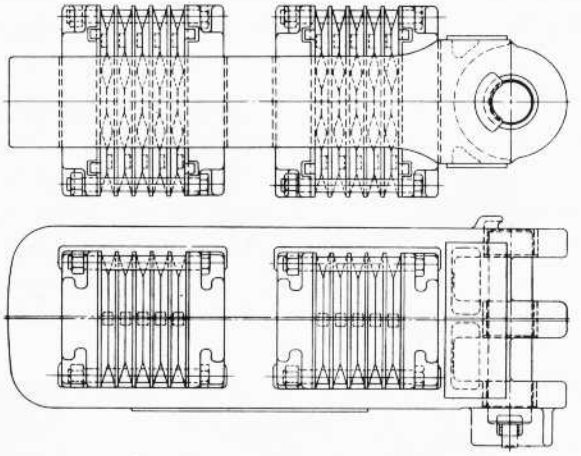
M-380 Plan And Side View



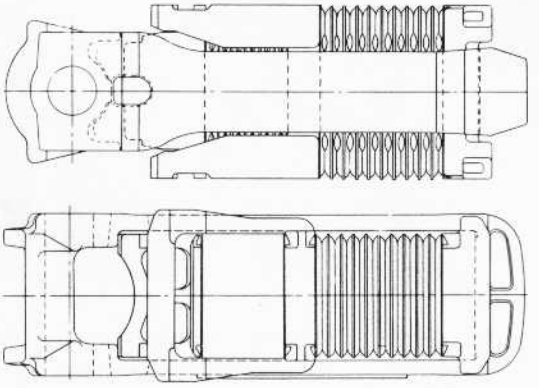
M-380 Overhead Yoke Plan And Side View



M-375 Plan And Side View



MS-485-5A Plan And Side View



MF-275 Plan And Side View

Fig. 2 - Representative Draft Gear To Yoke Application

MAINTENANCE

To insure satisfactory service, the draft gear assemblies should be maintained according to the following recommendations and in compliance with the Bureau of Locomotive Inspection.

NOTE: Clearance and dimensional limits used in this instruction are defined as follows:

1. New limits are those to which new parts are manufactured (drawing tolerances).

2. Rebuild limits are dimensions which should not be exceeded at the time of rebuild, in order to assure satisfactory service until the time of the next scheduled overhaul.

3. Condemning limits are dimensions beyond which satisfactory operation cannot be assured. Parts having clearance and/or dimensional measurements beyond these limits should not be used.

Where extremely low wear rates are normally experienced or where wear is not a highly critical factor, the rebuild limits and the condemning limits may be identical.

INSPECTION ON LOCOMOTIVE

The draft gear should be inspected to see that it is tight in the proper length pocket and that its appearance indicates the gear has been functioning properly.

Checking Free Slack

The draft gear, yoke and coupler on the locomotive should also be inspected for total free slack. If the total free slack of these parts is found to be 1/2" or more, the draft gear and coupler should be removed and corrective reconditioning performed to maintain the slack within the 1/2" limit.

The total free slack may be determined as follows:

1. Bar the coupler and draft gear "in" as far as possible. (This should be done manually so as not to compress the draft gear. Using another locomotive to push the coupler "in" or pull the coupler "out" is not recommended as this would compress the draft gear which would give an incorrect slack indication.)

2. After the coupler is pushed "in," measure from a point on the coupler to the end sill of the locomotive.

3. Bar the coupler and draft gear assembly "out" as far as it will go after taking the measurement in Item 2.

4. With the coupler and draft gear assembly "out" as far as it will go, take another measurement, using the same reference points as used in the Item 2 measurement.

5. The difference between the Item 2 and Item 4 measurement is the total free slack.

6. If the total free slack is 1/2" or greater, the draft gear and coupler should be removed and corrections made to bring the free slack under the 1/2" limit.

Rubber Pad Inspection

Visual inspection of the rubber pads of the draft gear can be misleading. Separation of the rubber from the steel plates and the rubber cracking and breaking off in small pieces or shredding is a natural condition and occurs when the draft gear is subjected to heavy-duty service.

If upon inspection the rubber is completely loose from the steel plate, it will not be necessary to remove the draft gear immediately. The draft gear may be retained in service as cushioning capacity is still available. However, the gear pads should be changed out at the earliest convenient time since the steel plates, previously bonded to the rubber, have a tendency to creep out of the wedge block.

REMOVING DRAFT GEAR FROM LOCOMOTIVE

The method of removing the draft gear from the locomotive varies with the locomotive model, however, they are removed in general as follows:

1. Remove the coupler pin retaining key, coupler pin, and the coupler.
2. If the locomotive has not been removed from the trucks, check the clearance below the draft gear. It may be necessary to jack the locomotive off the trucks.
3. Passenger locomotives equipped with the retractable draft gear assembly must have the entire retractable draft gear removed from the locomotive. The draft gear then is removed from the retractable assembly.
4. On all other locomotives, the draft gears are removed by placing extended jacks under the draft gears, removing the carrier irons and jacking the draft gear down, out of the draft gear pocket. The draft gear should come out of the pocket by its own weight as the jacks are lowered.
5. The draft gear then may be removed from its yoke.

INSTALLATION OF DRAFT GEAR IN LOCOMOTIVE

To apply the draft gear assembly to the locomotive, reverse the general procedure for the removal of the draft gear.

DRAFT GEARS

Maintenance of the draft gears should conform to the following procedure in accordance with the particular type of gear.

TYPE M-350, M-375 AND M-380 DRAFT GEARS

These types of draft gears are the most used type of gear on EMD locomotives. Shown in Fig. 3 are representative details of these gears. They are similar in function, but vary in size and capacity. (The type M-375 draft gear may be replaced by the type MS-485-5A gear outlined under that type draft gears.)

A. Removal Of Draft Gear From Its Yoke

Special clamps may be made to hold the draft gear compressed to aid in the removal or application of the draft gear to its yoke. Shown in Fig. 4 are details of construction and application of the clamps for the gears.

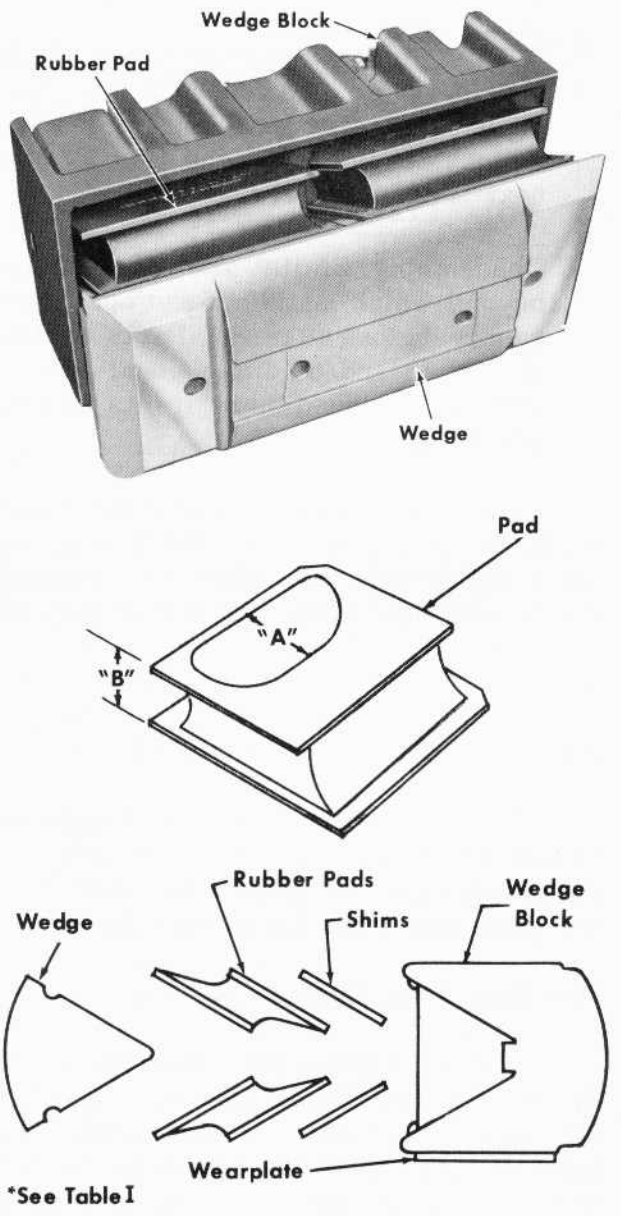


Fig. 3 - Type M-350, M-375 And M-380 Draft Gear Details

1. Using a suitable press or other means, compress the draft gear to enable application of the holding clamps as shown in Fig. 4.

2. After the clamps are applied, remove the draft gear from its yoke. Apply compression pressure to the gear, remove the clamps and slowly remove the holding pressure.

3. After removal of the clamps, the individual parts of the draft gear can be removed.

B. Inspection

1. Wedge

Using Magnaflux procedure, inspect the wedge for cracks. Magnaflux gray powder provides a good contrast. If any cracks are found, the wedge should not be used. (Any Magnaflux machine such as KRH2D capable of providing 600-700 amperes may be used.)

2. Wedge Block

Also Magnaflux inspect the wedge block for cracks. The wedge block should not be used if any evidence of cracks is found.

If the wedge block is equipped with wear plates, examine the plates for excessive gouging, scuffing and washboard type wear; that is, wear of a wavy pattern, or wear to 1/8" thickness or less. If any of these items are apparent, replace the wear plates with new plates of proper thickness.

Inspect the shims, if used, in the wedge block to determine that they are secured in place at about 4" intervals along their length by suitable tack welds of about 1" length. (It may be necessary to replace shims during assembly of the draft gear to maintain correct height.) Shim sizes for the various draft gears are shown in Table I.

TABLE I

Draft Gear Part No.	Pad Part No.	Pad "A" Dim. Min.	Pad "B" Dim. New	Pad "B" Dim. Min.	Pads Used	Shim Size
8247794	8034316	4-1/4"	2-1/2"	2-5/16"	4	8" × 21-5/8"
*8247906	8034316	4-1/4"	2-1/2"	2-5/16"	4	8" × 10-3/4"
8168542	8034316	4-1/4"	2-1/2"	2-5/16"	4	8" × 21-5/8"
8101279	8059892	4-1/4"	2-1/2"	2-5/16"	2	8" × 10-3/4"
*8082639	8034316	4-1/4"	2-1/2"	2-5/16"	4	8" × 21-5/8"
8080369	8080366	3-1/2"	2-1/2"	2-5/16"	2	6-3/8"×9-3/8"

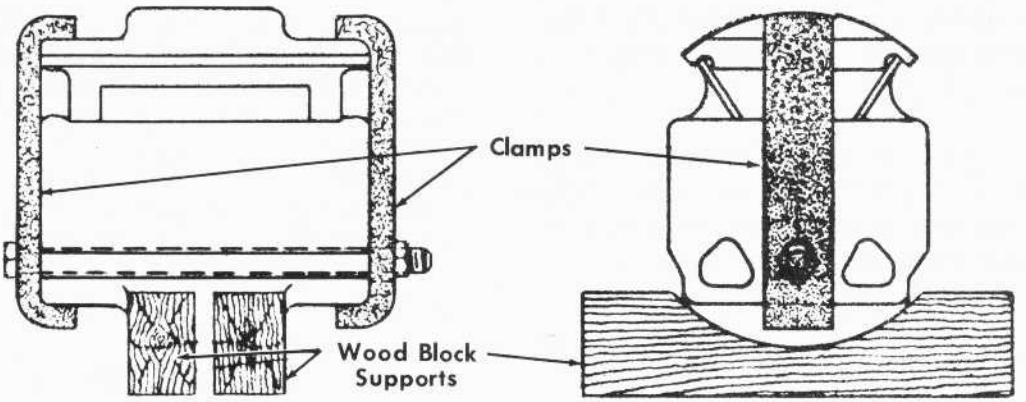
3. Pads

The rubber pads, Fig. 3, should be inspected for condition of the rubber, to see that they are not oil soaked. Oil soaked pads, although of correct thickness (dimension "B,") have no cushioning capacity so should be replaced. If oil soaked pads are found, the source of the oil on the locomotive should be located and stopped.

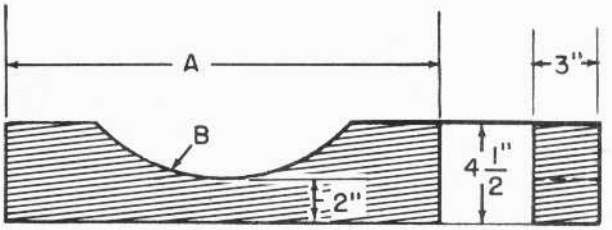
The rubber pads should be checked for the amount of bonding to both plates. This can be measured by placing a thin metal scale between the rubber and the steel plate at about 1" intervals at each side of the pad. The depth to which the scale enters may be measured at the edge of the steel plate and this measurement marked on top of the plate using chalk. By connecting these marks, an outline of the bonded area may be shown on top of the plate, as indicated on the pad shown in Fig. 3, having the "A" dimensions.

The dimension of the bonded area should be measured as shown by dimension "A" on the pad in Fig. 3. If this dimension is less than 4-1/4" or 3-1/2" as shown according to the corresponding draft gear and pad shown in Table I, the pad should be replaced. If the pads have sufficient bonding and no deep cracks are found, they may be reapplied.

The pads should also be inspected for the thickness dimension "B" as shown on the pad in Fig. 3. If the "B" dimension is less than 2-5/16", as indicated in Table I, the rubber pad should be replaced.

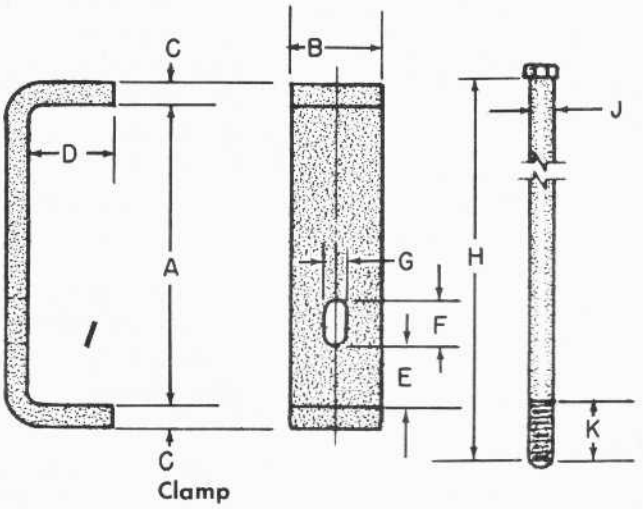


Application Of Clamps



Wood Block Support -2 Req'd Per Gear

Gear Type	A	B
M-350-A	15"	7-1/2"
M-380	15"	8-3/8"
M-375	Has flat bottom	



Clamp

Steel-2 Req'd Per Gear Gear Steel-1 Req'd Per Gear

Gear Type	A	B	C	D	E	F	G	H	J	K
M-350-A	11-1/8"	3"	1-1/8"	1-1/2"	1 "	2 "	1"	18"	7/8"	2-1/2"
M-375	8-7/8"	2"	3/4"	1-1/2"	1 "	1-1/2"	1"	16"	7/8"	2-1/2"
M-380	13-1/4"	4"	1-1/8"	3-3/4"	2-3/4"	2 "	1"	28"	7/8"	2-1/2"

Fig. 4 - Draft Gear Clamps And Supports, Construction And Application

NOTE: The following items should be noted pertaining to the care of the rubber pads.

1. Rubber pads should be renewed in complete sets, new and old pads should not be used together.
2. Old pads are not interchangeable between draft gears.
3. Natural rubber and synthetic rubber pads should not be used together. Pads with synthetic rubber are identified by a strip of red colored rubber near the part number. Natural (crude) rubber pads in current use are identified by the steel plates having one of their corners cut off 5/8" × 5/8".

C. Assembly Of Draft Gears

After all components of the draft gear have been inspected and found to be satisfactory for reuse or replaced by new parts, the gear may be assembled again for application to its yoke.

1. As shown in Fig. 5, place the wedge block on the two cradle blocks, install the rubber pads and apply the pad wedge on top of the rubber units. Position the wedge so that it is centered in the block.
2. Measure, as outlined under "Yokes," the inside dimension of the yoke which is to be used with the particular draft gear.

NOTE: The yoke pocket dimension must be brought back to new dimension before measuring if rebuild limits are exceeded.

3. After the parts of the draft gear have been assembled together, press the assembly to settle the parts, then release. Measure the overall height, as shown in Fig. 6.

The total overall height of the draft gear should be 1/8" to 3/16" greater than its corresponding yoke new diameter if old rubber pads are reapplied, and 3/16" to 1/4" greater if new rubber pads are used.

If the gear does not come up to the required height using used pads, remove any shims which may already be in the gear and apply one steel shim of proper thickness to each of the two pad bearing surfaces in the wedge block. (It should be noted that the wedge will be raised a height equal to about twice the shim thickness used.) The thickness of the shim is not to exceed 3/16" and both shims must be of equal thickness. If the overall height of the gear cannot be obtained

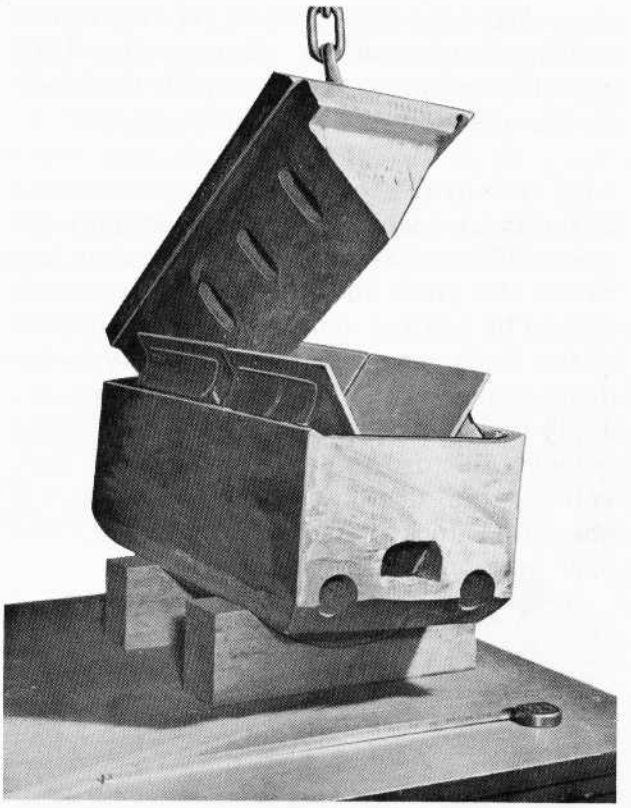


Fig. 5 - Assembly Of Draft Gear

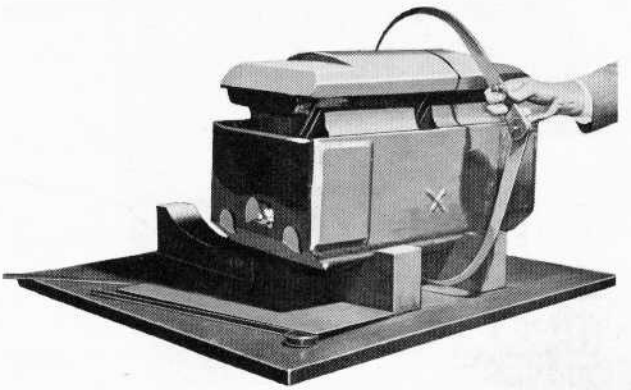


Fig. 6 - Measuring Draft Gear

using shims of 3/16" maximum thickness, new rubber pads and shims of suitable thickness must be applied.

When the proper overall height is obtained, the gear should be placed under a press and compressed sufficiently to permit application of the clamps or other means to hold the gear compressed so as to permit application to the yoke.

D. Assembly Of Draft Gear To Its Yoke

After the assembly of the draft gear and application of its clamps, the draft gear is applied to its yoke with the block at the coupler end as shown in Fig. 7.

The gear should be compressed sufficiently to enable free entrance into the yoke. This will provide a clearance between the yoke and the draft gear which should be held to enable easy application of the draft gear and yoke assembly to the draft gear pocket. To hold this clearance, apply two phenolic blocks about 3/8" thick between the draft gear and its yoke, then release the draft gear compression. If phenolic blocks are not available, two 3/8" nuts may be used.

A lifting fixture, shown in Fig. 7, to facilitate M-350 and M-380 draft gear to yoke application, may be made according to construction details shown on print 8107525 which is available upon request.

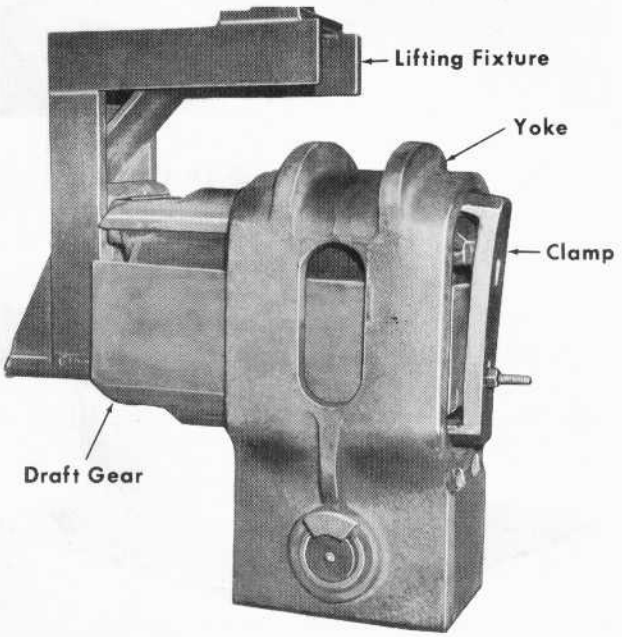


Fig. 7 - Draft Gear To Yoke Application

TYPE MS-285 DRAFT GEARS

A type MS-285 draft gear is shown in Fig. 8. It consists of rubber pads made up of steel plates with a rubber cushion bonded to each side. End pads only have rubber on one side of the plate. The pads are kept in relative position by a rubber protrusion on one side of the pad entering a receiving slot on the following pad. The end pads have metal extensions which are bent into indentations in the follower blocks.

A. Gear Disassembly

The MS-285 draft gear is easily disassembled after removal from the yoke. The individual pads may be separated, however, this is not recommended unless it is apparent that one or more of the pads require replacement.

B. Inspection

The pads should be inspected to see that the bonding to the plate is firm. If not, the pad should be replaced. (When replacing an unsuitable used pad, it should be replaced by another used one which is in good condition. Old and new pads should not be used together.

Inspect the follower blocks for excessive roughness on the surface and smooth up if necessary.

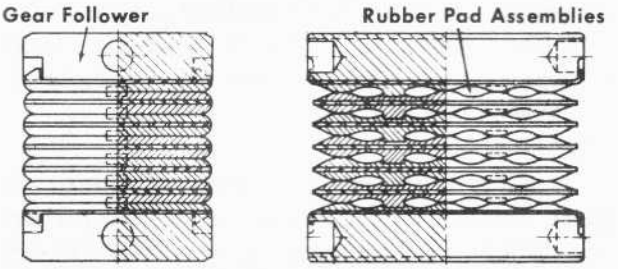


Fig. 8 - Type MS-285 Draft Gear Details

C. Assembly Of Draft Gear

The draft gear in the free state (not compressed in any way) should always be larger than the pocket in which it is to be used. During use, the individual pads take a set. However, once this set has taken, any additional set is unlikely to occur. Therefore, a draft gear having used pads which have taken a set need only be slightly larger than the pocket in which it is to be used since the set does not affect the gear capacity.

Shims may be added to the follower block if the used gear free height is slightly less than the pocket in which it is to be used. However, depending upon the difference in yoke pocket and draft gear height, it may be advisable to use a used pad that is in good condition in addition to the shims. New pads should not be used with pads which have been used and which have taken a set. If the draft gear height cannot satisfactorily be obtained as outlined, a new draft gear assembly should be used. This will bring the assembly back to its original condition.

D. Draft Gear To Yoke Application

The draft gear assembly should be compressed sufficiently by the use of a press, or other suitable means, to enable easy installation in the yoke pocket. Drilled holes 1-1/2" in diameter in the follower block are provided for application of suitable holding bars to hold the gear after it has been compressed. Another means to hold gear compressed is the use of metal straps around each end of the gear.

After the gear is compressed and properly held, it may be installed in its yoke. The gear should be held compressed in its yoke to facilitate installation of the draft gear into the draft gear pocket in the locomotive.

After installation in the yoke, place two phenolic blocks between the gear follower and the yoke. (A nut may be used if phenolic blocks are not available.) The blocks should be placed diagonally across the gear follower. The item holding the gear compressed should be released and removed. When the assembly is installed in the locomotive, the phenolic blocks will be released when the locomotive starts pulling or they will be disintegrated.

TYPE MS-485 DRAFT GEAR

Shown in Fig. 9, is a typical MS-485 draft gear. It consists of either four or five high capacity stacked interlocking full pads and two half end pads. The pads in this gear, although similar to other gears of this type, nevertheless provide for more contact between the pads and reduce the set of the pad. Protrusions on the end pads fit receptive areas in the follower to position the pads. The entire assembly is held by two bolts located diagonally to each other extending through the followers, as shown in Fig. 9. These bolts are not tight, but only serve to hold the pieces as an assembly.

A. Gear Disassembly

Unless it is obviously apparent that one or several of the rubber pads are damaged, it is not recommended that the gear be disassembled.

When necessary, disassembly is easily accomplished after removal of the assembly bolts from the gear followers. On assembly of the gear, the nuts of these bolts are tack welded to the bolt. After the tack is removed, the nuts may be removed and the bolts taken from the gear.

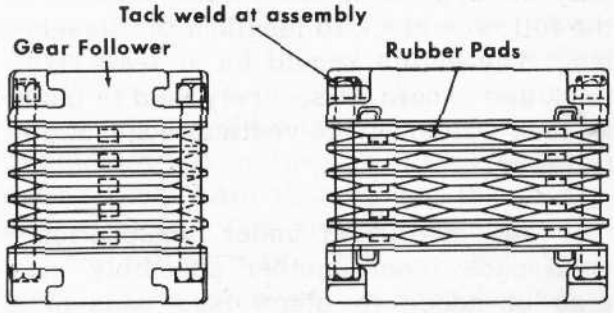


Fig. 9 - Type MS-485 Draft Gear Details

B. Inspection

The pads of the gear should be inspected to see that there is firm bonding to the plates. Check that the pad location protrusions are intact and not broken off. Pads which are not securely bonded or have the locating protrusions broken off should not be used. It should be noted that a good used pad which has taken a set should replace a pad in a group of pads which have likewise taken a set. A new pad should not be used with used pads.

The follower block surfaces should be inspected for any roughness or gouging, and if found, smoothed down.

C. Assembly Of Draft Gear

The draft gear assembly in the free state (not compressed in any way) should always be at least 1/2" to 3/4" larger then the yoke pocket in which it is to be used. During use the individual pads take a set, the amount depending upon length of service and forces applied. After use, the set stabilizes and reaches a point where any further set is unlikely to occur. The capacity of the draft gear is not affected by the set so long as the individual pads otherwise are in good condition. Therefore, a draft gear having used pads need only be larger than the opening in which it is to fit to require compression to permit application.

If the free length of the used draft gear is slightly less than the yoke pocket in which it is to be used, steel shims may be applied to the inside surface of the follower block to lengthen the assembly. The shims should be at least 1/8" thick and should be securely held in place by tack welds on the vertical edge of the follower.

As mentioned under "Inspection," used pads from another assembly may also be added to other used pads in a gear to give the needed compression for gear application to the yoke. It may also be required to use a combination of used pads and/or shims to obtain a free height of the gear greater than the yoke pocket in which it is to be applied.

New pads should not be used with used pads. If the assembly cannot satisfactorily be made up using shims and/or other used pads, a new gear assembly should be applied.

In either case, after assembly the gear should be put in a press to force the pads together. The assembly holding bolts should then be applied at diagonal corners to hold the assembly. The bolts should not be tight, but slightly loose. After the bolts are applied, again tack weld the nut to the bolt.

The assembled draft gear should then be compressed to a height of about 1/2" less than the yoke pocket in which it is to be applied to make application easy. The gear is likewise held in this compressed condition in the yoke to make installation in the locomotive draft gear pocket easy.

D. Draft Gear To Yoke Application

Place the assembled gear in a suitable press and reduce its height to the required dimension. This height can then be held by application of a phenolic block of proper thickness between the nut and the draft gear follower block. The draft gear may then be installed easily in the yoke.

After application in the yoke, place phenolic blocks between the follower block and the yoke to hold the clearance. The blocks should be placed at the top left and bottom right of the follower, diagonally opposite each other. The blocks should then be removed from under the nuts to permit the gear to hold itself in the yoke. This will provide clearance for the gear when the assembly is installed in the locomotive draft gear pocket.

E. Application Of MS-485-5A Draft Gear In Place Of M-375 Type Gear

The MS-485-5A draft gear used with a new coupler and yoke may be used to replace a M-375 type gear. This new assembly 8269424 consists of draft gear 8246351 and yoke 8269667. A new coupler pivot pin 8269421 is also used with this assembly. This assembly provides a higher capacity gear, improved draft gear and yoke guiding surfaces at the head and tail areas of the yoke. In addition, the yoke pin diameter has been increased to 3".

This assembly is interchangeable with the M-375 gear as far as the draft gear pockets are concerned, however, the existing draft gear pocket should be reconditioned as outlined under "Draft Gear Pockets" to further upgrade the draft gear application.

When the MS-485-5A draft gear is applied replacing the M-375 gear, the following consideration should be given.

1. A new draft gear carrier plate 8269428 should be applied, or the original carrier plate should have an additional 3/8" thick wear plate welded on top the existing plate to raise the draft gear to the proper height. This wear plate should be 1/4" smaller in width and length than the existing wear plate.

2. A new type "E" coupler 8269426 is absolutely necessary since the yoke pin diameter is increased to 3".

3. It is not permissible to rebore prior used yoke 8080365 and coupling 8034983 as reboring these pieces will result in weakened parts.

F. Application Of MS-485-5A Draft Gear To Upgrade M-375 Draft Gear

If it is desired to retain the yoke 8080365 and coupler 8034983 used with the M-375, the M-375 gear can be replaced by the MS-485-5A gear 8246351. This can be done, however, a M-375 and a MS-485-5A draft gear should not be used in one yoke together.

Intermixing of the MS-485-5A yokes, pins and couplers with M-375 yokes, pins and couplers is not possible due to the pivot pin diameter.

TYPE MF-275-1 DRAFT GEAR

The MF-275-1 draft gear 8196781 is shown in Fig. 10. This draft gear has a front section consisting of a compensating yoke, coupler follower and pads, and a back section consisting of pads and follower block. The "F" type coupler is used with this draft gear.

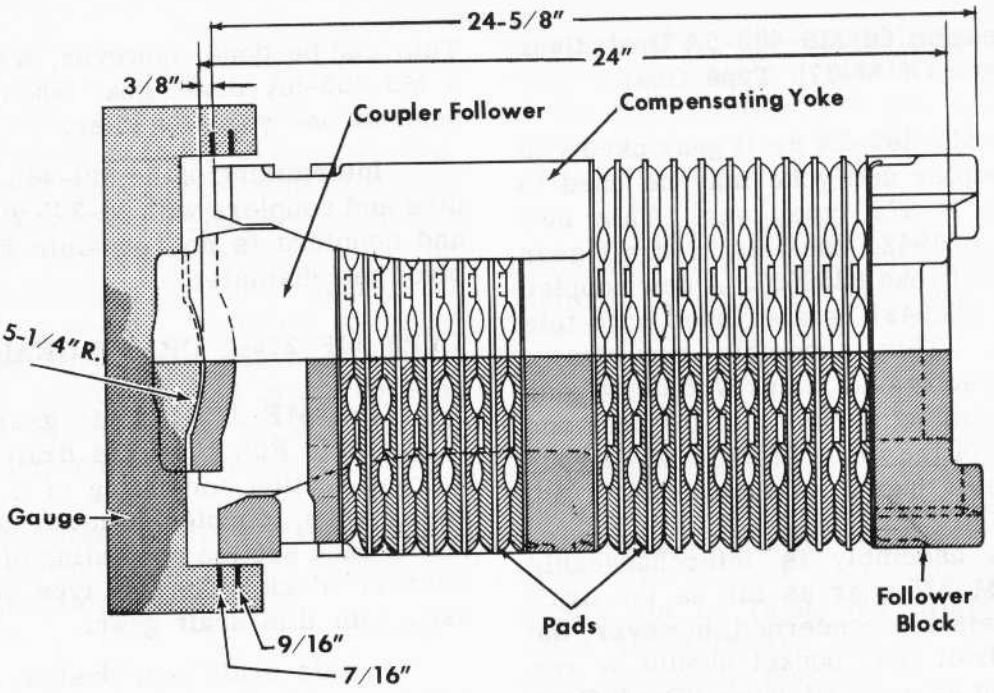
In this draft gear design, the front section and the back section function during buff (when the locomotive is pushing). However, in drag (when the locomotive is pulling) only the back section is effective.

A. Inspection

These draft gears may be inspected as follows to determine the set of the pads and what shim thickness is required.

A gauge, made to the dimensions shown in Fig. 11, is used to determine the shim thickness required at "C," Fig. 10, at the inside of the compensating yoke. Note that the gauge has a 7/16" and 9/16" mark on each side, which are used to determine the shim thickness required.

To determine the shim thickness required, apply the gauge to the coupler follower, as shown in Fig. 10. Any slack in the gear should be taken up before the gauge is applied. If the top of the compensating yoke is even with or falls within the 7/16" and 9/16" marks, no shim is required. The shim thickness required is the distance from the top of the compensating yoke down to or within the marks on the gauge. The concave surface of the coupler follower is 7/16" or 9/16" above the top of the compensating yoke depending what gauge mark is at the top of the compensating yoke.



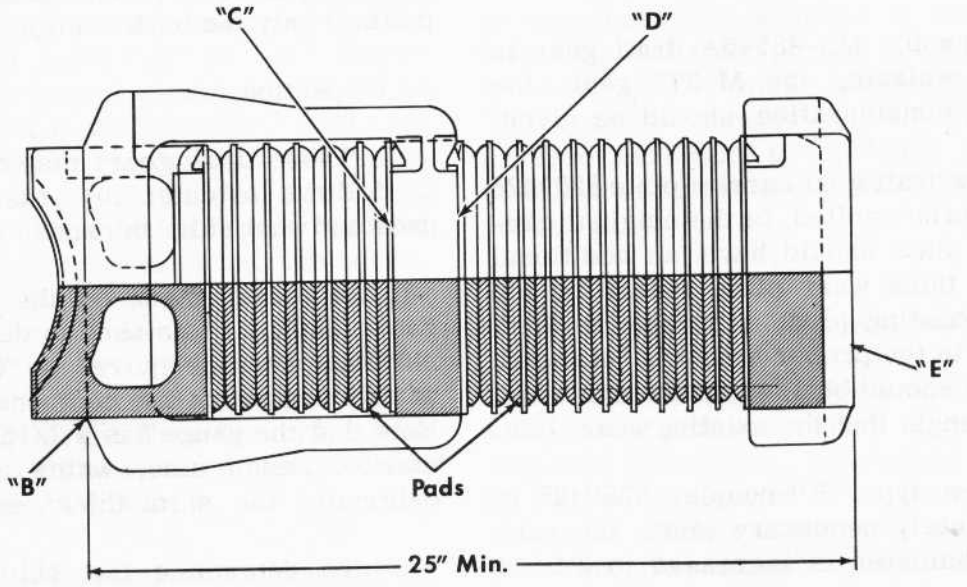


Fig. 10 - Type MF-275-1 Draft Gear Details

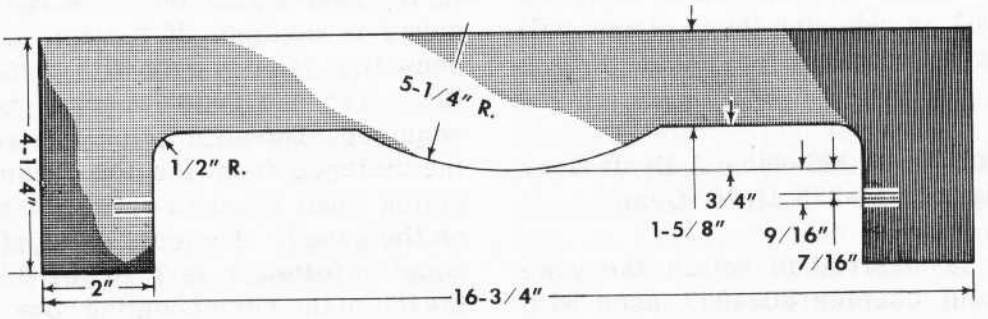


Fig. 11 - Shim Thickness Gauge Used With Draft Gear MF-275-1

The shim for the front section is applied at the "C" location, Fig. 10, of the compensating yoke after removal of the front section pads. The shims should be 8-1/2" × 12" of the determined thickness, and given a vertical weld at each side.

The front section pads are held in place by the metal tabs in the coupler follower. The pads may easily be removed by releasing the tabs at one side and pushing the pads out. Installation is made by applying the pads, then bending over the holding tabs.

The draft gear should also be measured from the forward faces of the compensating yoke point "B," Fig. 10, to the rear face point "E" of the rear gear follower. This dimension should not be less than 25" in the free state. If the dimension is less than 25", the shim thickness required will be the difference of the measurement taken to equal 25".

The shim for the rear section, if found necessary, as outlined in the preceding paragraph should be applied at the back side of the compensating yoke follower at point "D," as shown in Fig. 10. The shim should be 8-7/8" × 12" of the required thickness. The shims should have a 45° chamfer at the top and bottom edge on the 12" length. To hold the shim in place weld on the vertical sides of the shim.

B. Draft Gear To Yoke Application

The draft gear is held in the yoke so that the coupler follower is pushed back to permit coupler application and to make easy application of the draft gear to its pocket on the locomotive. After the gear is assembled, it is compressed and straps applied holding the coupler follower and rear section follower compressed. The gear then is applied to its yoke. The clearance between the draft gear and yoke is taken up by applying blocks to hold the draft gear compressed and the straps holding the gear then are removed.

A precompression block 2" thick, made of composition material, should be applied between the front end of MF-275 gear 8196781 and the yoke to permit coupler application. The preloading block should be left in place until type "F" coupler is applied. This block may be left in place as during operation it will be disintegrated by the action of the draft gear.

TYPE RF-333 DRAFT GEAR

The type RF-333 draft gear 8226352 is shown in Fig. 12. It is a fully enclosed, self-contained unit. The unit is assembled with initial spring pressure so that all parts are tight in relation to one another. When installed in a 24-5/8" draft gear pocket in combination with a 2-1/4" follower plate, the 8226352 gear tightly fills the pocket and will provide satisfactory service.

A. Inspection

When a 8226352 draft gear has been removed from the locomotive for inspection, it is suitable for further service if the following conditions are met.

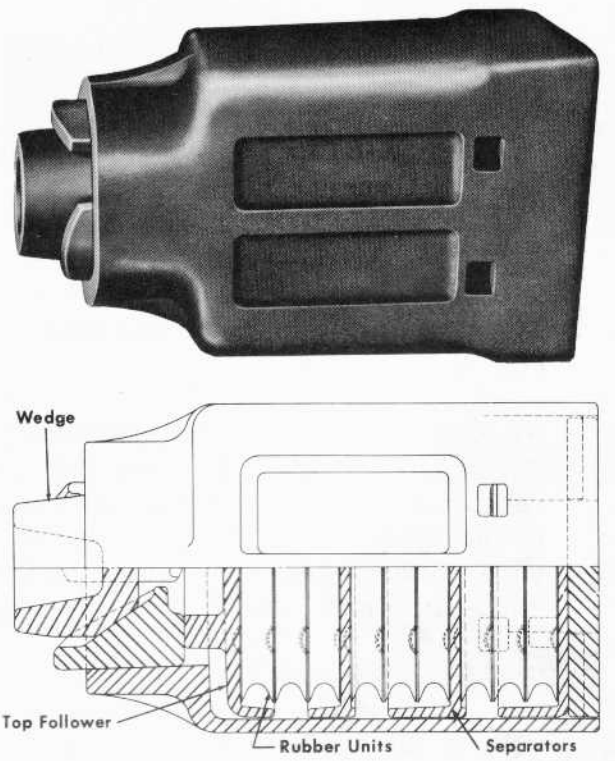


Fig. 12 - Type RF-333 Draft Gear 8226352

1. The housing is not broken and is without cracks.
2. The friction clutch consisting of wedge and shoes is not broken, and is without cracks.
3. The friction clutch is tight. A loose part would indicate that the rubber spring is set or that a part of the friction clutch not visible to the eye is defective.
4. There is less than 1/8" wear in the 15/16" metal thickness at the mouth of the friction bore housing contacted by the friction shoes.

A draft gear not conforming to the preceding will require reconditioning and should be returned to the manufacturer.

B. Draft Gear To Yoke Application

To apply the draft gear and follower block to the yoke, it is necessary to place the items under a press to compress them so they may easily be installed.

1. Place the follower block on top the wedge end of the draft gear.
2. Compress the assembly to provide at least 1/2" clearance when the assembly is installed in the yoke. Hold the assembly compressed using steel straps or other suitable means.
3. Apply the assembly to the yoke, placing two phenolic blocks or nuts between the draft gear and the yoke to hold the clearance.
4. Release the holding straps, permitting the compression in the assembly to remain close to the blocks between it and the yoke. This will allow the yoke and draft gear assembly to easily enter the draft gear pocket.

TYPE WMD-6B DRAFT GEAR

No maintenance information on this gear is provided since it has been replaced by the M-380 type draft gear.

YOKES

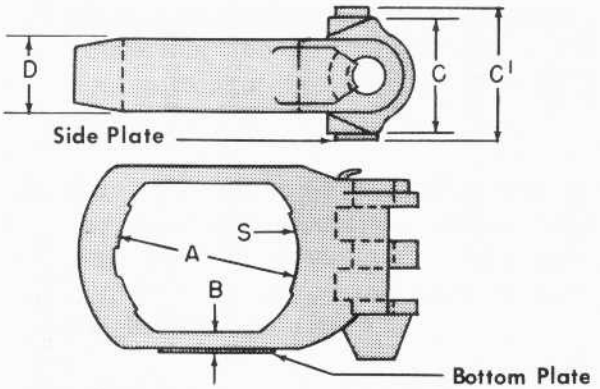
Details of the draft gear yokes are provided in Fig. 13. In Table II pertinent information is tabulated in relation to the dimensions shown in Fig. 13, as well as current draft gears which have been used in the various yokes. The pockets of the respective yokes, shown in Fig. 13, should be inspected to the limits given in Table II according to their part numbers and particular dimension. If the yoke is worn to or past the maximum or minimum limit as the case may be, shown in Table II, the yoke should be reconditioned to the new dimension.

If required, shims not less than 1/8" thick should be applied at areas marked "S," to bring the dimension back to the new dimension. The shims should be welded in place along both sides, the full length of the shim. Applied shims should not be transversely welded.

The wear plates on the yokes should be inspected for wear, excessive roughness or gouging of the metal, and for possible cracks in the weld holding the shims or wear plates. If the wear plate is worn so that the minimum dimension shown in Table II is not met, new wear plates should be applied. Roughness of the wear plates should be smoothed down by a power emery wheel. If cracks are found, they should be entirely ground out and a new weld applied at the area. This also is true of cracks found in other parts of the yoke. They also should be ground out and repaired to provide a satisfactory safe yoke.

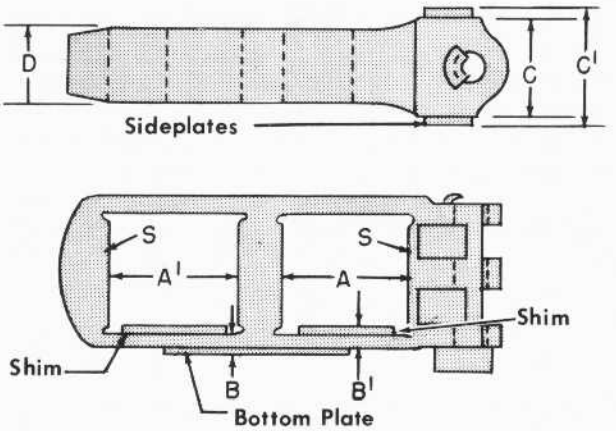
YOKE COUPLER PIN BUSHINGS

The yoke coupler pin bushings should be measured at the time of yoke reconditioning. If the bushings are cracked, loose, scuffed in the inside diameter or broken in any way, they should be replaced. If the bushings are otherwise in good condition, a measurement should be made of their inside diameter. If the inside diameter is worn to or exceeds the maximum diameter shown in Table III,



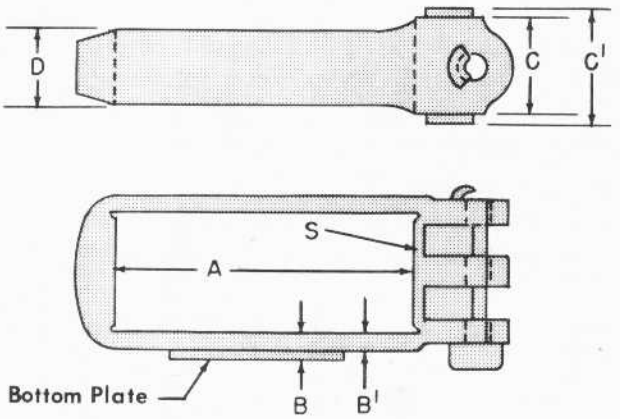
Yokes 8042460, 8051616,
*8034302, *6915380

Type I



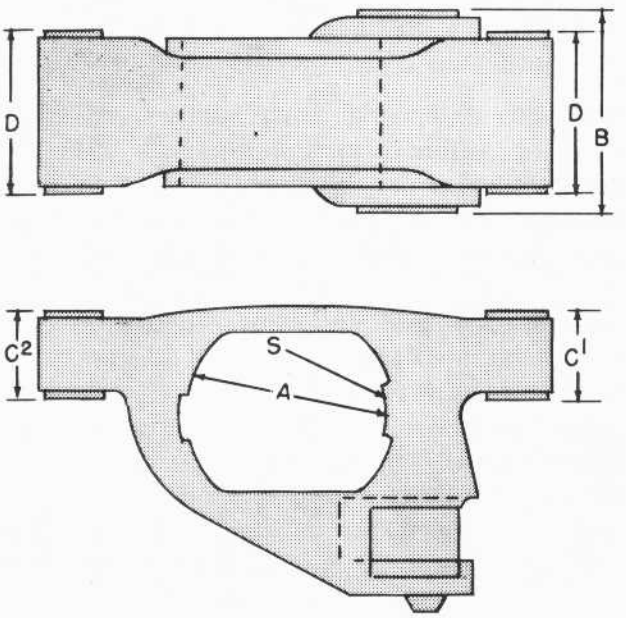
Yokes ‡ +8236889, * +8269667,
+8080365

Type II



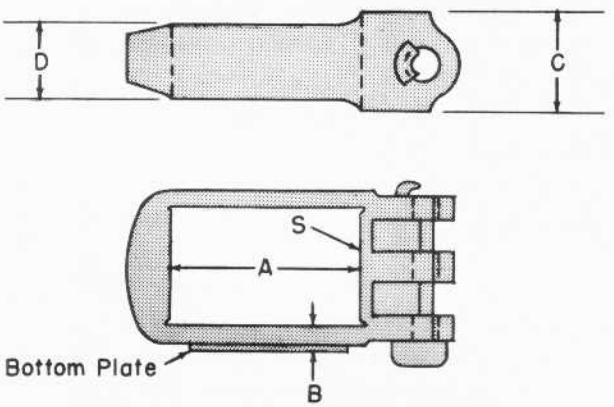
Yokes +8210544, *8209976

Type III



8081028

Type IV



+8191279

Type V

Symbol Legend

\+ Equipped with bottom wear plate.
* Equipped with side plates.
‡ Equipped with shim in yoke pocket.

Fig. 13 - Draft Gear Yoke Details

TABLE II

Yoke	Type	Draft Gear Yoke Dimensions									Draft Gear Used
		A and/or A_1			B and/or B_1		C and/or C_1		D		
		New	Max. "R"*	Max. "C"*	New	Min. "C"*	New	Min. "C"*	New	Min. "C"*	
8034302	I	16-3/4"	16-27/32"	16-31/32"	1-1/4"	1-1/8"	C_1 - 15" $^{+0}_{-1/8"}$	14-3/4"	14-1/4"	14"	8082639 8247906
6915380	I	16-3/4"	16-27/32"	16-31/32"	1-1/4"	1-1/8"	C_1 - 15"	14-3/4"	14-1/4"	14"	8168542 8247906 8248657
8051616	I	14-7/8"	14-31/32"	15-1/32"	1-1/4"	1-1/8"	9-1/2"	9-1/4"	6"	5-3/4"	8101279
8042260	I	14-7/8"	14-31/32"	15-1/32"	1-1/4"	1-1/8"	9-1/2"	9-1/4"	6"	5-3/4"	8101279
8080365	II	A - 10-7/16" A_1 - 10-9/16"	10-1/2" 10-11/16"	10-9/16" 10-3/4"	1-1/2"	1-3/8"	8-1/2"	8-1/4"	6"	5-3/4"	8080369
8236889	II	A - 10-7/16" A_1 - 10-9/16"	10-1/2" 10-11/16"	10-9/16" 10-3/4"	B - 1-1/2" B_1 - 1-5/8"	1-3/8" 1-1/2"	8-1/2"	8-1/4"	6"	5-3/4"	8236890 8246351
8269667	II	A - 10-7/16" A_1 - 10-9/16"	10-1/2" 10-11/16"	10-9/16" 10-3/4"	1-1/2"	1-3/8"	C_1 - 8-1/2"	8-1/4"	6"	5-3/4"	8246351
8210544	III	25-1/2" approx.	None - gear has variable shim		1-3/8"	1-1/4"	8-1/2"	8-1/4"	6-1/4"	6"	8196781 8248738
8209976	III	24-5/8"	24-3/4"	24-7/8"	B_1 - 1-1/4"	1-1/8"	C_1 - 8-1/2" $^{+1/32"}_{-1/16"}$	8-1/4"	6"	5-3/4"	8226352
8081028	IV	16-3/4"	16-27/32"	16-31/32"	17" $\pm$ 1/16"	16-3/4"	C_1 - 6-3/4" C_2 - 6"	6-1/2" 5-3/4"	14-3/4"	14-1/2"	8247794
8191279	V	11-5/8"	11-3/4"	11-7/8"	1-1/2"	1-3/8"	8-1/2"	8-1/4"	6"	5-3/4"	8253666 6913085

* "R" = Rebuild Limits, "C" = Condemning Limits. See limits note, page 3.

the worn bushings should be removed and replaced with new bushings.

COUPLER PIN

The coupler pin should be inspected to see that its diameter is not less than the minimum diameter shown in Table III. All pins worn to the minimum diameter should be replaced. The date of removal and inspection of pins to be reused should be legibly marked on the head of the pin and all prior dates obliterated.

COUPLER BUSHING

In conjunction with the inspection of the yoke bushing and pin, the coupler bushing also should be inspected.

As outlined for the yoke bushings, the coupler bushings should be replaced if they are broken, cracked, scuffed, or the inside diameter is worn to the maximum dimension as given in Table III.

NOTE: It should be noted that the total free slack between the coupler and yoke must not exceed 3/16". The individual parts, each worn to their condemning limit, would exceed this limit considerably. Therefore, it is necessary to check the clearance of each coupler and yoke assembly and if the free slack exceeds 1/4", replace some of the parts before they reach their condemning limit.

TABLE III

YOKE BUSHING, COUPLER BUSHING AND PIN DIAMETER

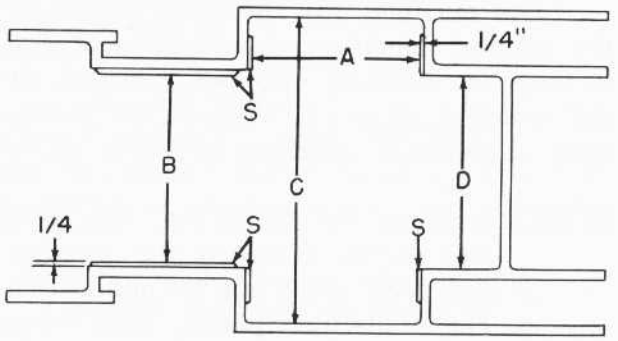
Yoke	Yoke Bushing Dia. New	Yoke Bushing Dia. Max.	Pin Dia. New	Pin Dia. Min.	Coupler Bushing Dia. New	Coupler Bushing Dia. Max.
8191279	2-5/16"	2-1/2"	2-1/4"	2-1/8"	2-5/16"	2-1/2"
8080365	2-5/16"	2-1/2"	2-1/4"	2-1/8"	2-5/16"	2-1/2"
8236889	2-5/16"	2-1/2"	2-1/4"	2-1/8"	2-5/16"	2-1/2"
8209976	2-5/16"	2-1/2"	2-1/4"	2-1/8"	2-5/16"	2-1/2"
8051616	3"	3-3/16"	2-21/32"	2-27/32"	3"	3-3/16"
8042260	3"	3-3/16"	2-21/32"	2-27/32"	3"	3-3/16"
8269667	3-1/16"	3-1/2"	3"	3-3/16"	3-1/16"	3-1/2"
6915380	3-9/16"	3-3/4"	3-1/2"	3-3/8"	3-9/16"	3-3/4"
8210544	3-9/16"	3-3/4"	3-1/2"	3-3/8"	3-9/16"	3-3/4"
8034302	3-9/16"	3-3/4"	3-1/2"	3-3/8"	3-9/16"	3-3/4"
8081028	4" $\pm$ .005"	4-3/16"	3.940" $\pm$ .005"	3-3/16"	4" $\pm$ .005"	4-1/8"

DRAFT GEAR POCKETS

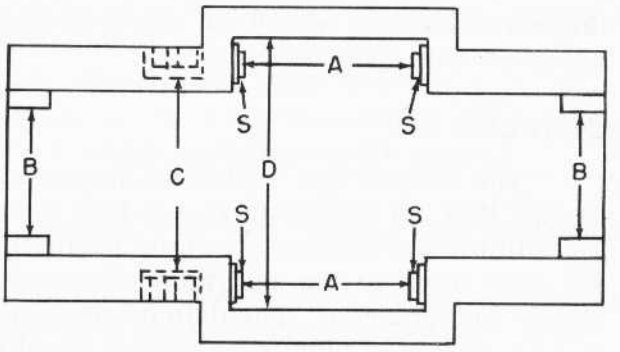
Shown in Fig. 14 are representative outline drawings of the several types of draft gear pockets with pertinent dimensions. Table IV shows the draft gears which may be used with the type of pocket shown in Fig. 14, as well as governing dimensions affecting the draft gear pockets.

Inspect the wear areas of the pocket for roughness or galling. Using an emery wheel or equally effective means, smooth up any roughness.

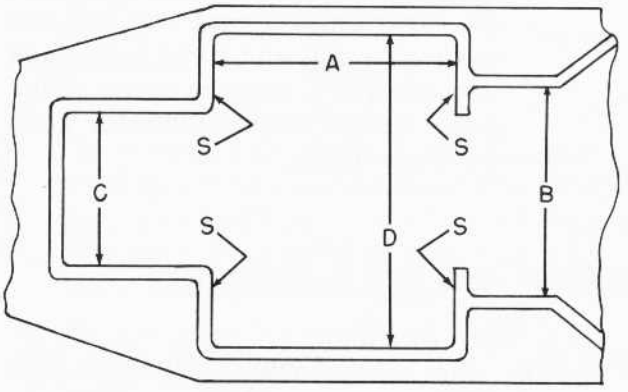
Measure the dimensions shown in Fig. 14 on the draft gear pocket, where



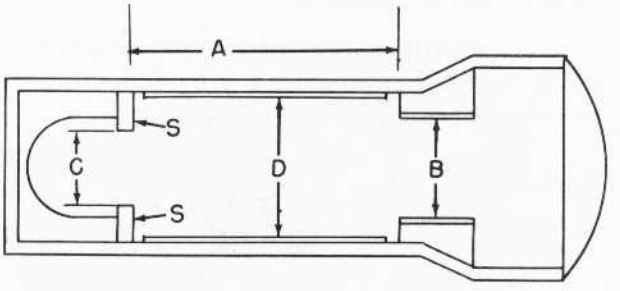
Type I Pocket



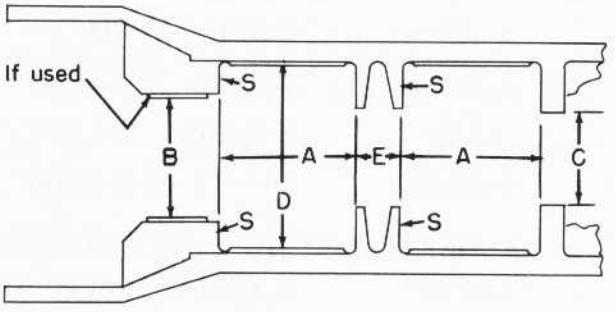
Type II Pocket



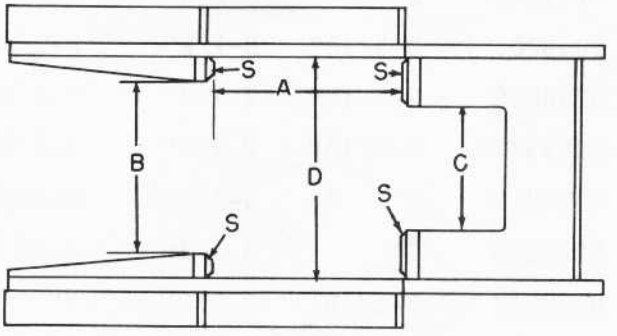
Type III Pocket



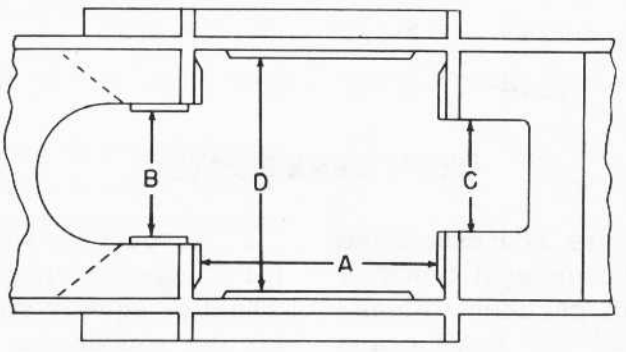
Type IV Pocket



Type V Pocket



Type VI Pocket



Type VII Pocket

Fig. 14 - Draft Gear Pocket Details

TABLE IV

Draft Gear No.	Pocket Type	Draft Gear Pocket Dimensions														
		A			B			C			D			E		
		New	"R"*	"C"*	New	"R"*	"C"*	New	"R"*	"C"*	New	"R"*	"C"*	New	"R"*	
8082639 8247906 8168542 8248657	I I I I	13-3/4"	13-27/32"	13-31/32"	15-1/4" $^{+1/16}_{-0}$	15-1/2"	15-1/2"	25-1/16" ±1/16	None	None	15-3/4"	16"	16"			
8247794	II	13-3/4" $^{+1/16}_{-0}$	13-27/32"	13-31/32"	14-3/4"	15-3/8"	15-3/8"	17-1/8" $^{+1/16}_{-0}$	17-3/8"	17-3/8"	25" $^{+1/8}_{-0}$	None				
8101279	III	11-19/32" $^{+0}_{-1/16}$	11-11/16"	11-13/16"	9-3/4" ±1/16	10"	10"	7-1/2"	7-3/4"	7-3/4"	15" ±1/8	None				
8248738 8196781 8226352	IV IV IV	24-5/8" $^{+5/32}_{-0}$	24-13/16"	24-7/8"	8-11/16" $^{+1/8}_{-1/16}$	9"	9"	6-1/2" $^{+1/16}_{-3/16}$	6-5/8"	6-5/8"	12-7/8" $^{+1/8}_{-1/16}$	None				
8246351 8236890 8080369	V V V	10-9/16"	10-11/16"	10-13/16"	8-11/16" $^{+1/8}_{-1/16}$	9"	9"	6-1/2" $^{+1/16}_{-3/32}$	6-5/8"	6-5/8"	12-7/8"	None		3-1/2"	3-1/2"	
6913085 8253666	VI VI	11-5/8" $^{+1/16}_{-0}$	11-3/4"	11-7/8"	9-1/4"	9-7/16"	9-7/16"	6-7/8"	7"	7"	13" ±1/8	None				
8253666 6913085	VII VII	11-5/8" $^{+1/16}_{-0}$	11-3/4"	11-7/8"	8-5/8" $^{+1/8}_{-1/16}$	9"	9"	6-1/2" $^{+1/16}_{-3/32}$	6-5/8"	6-5/8"	13" ±1/8	None				

* "R" = Rebuild Limits, "C" = Condemning Limits. See limits note, page 3.

wear would occur. Compare the measurement to the respective limit shown in Table IV for the particular dimension. If the measurement shows wear beyond the rebuild limit given in Table IV, the area should be reconditioned to bring the dimension to the "new" dimension for that location as shown in Table IV. If required, shims should be applied to the draft gear pocket at the areas marked "S" to bring the dimension to the "new" limit. The shims applied should be at least 1/8" thick and securely held in place by a number of tack welds along the top and bottom of the shim.

IMPROVEMENT OF DRAFT GEAR POCKET 8157667

It is recommended that the draft gear pocket 8157667 be improved by reworking as shown in Fig. 15. This will provide a greatly increased service life with the M-375 draft gear or the MS-485-5A if it is used to replace the M-375 gear.

The rework procedure, wear plate dimensions, and material specifications are shown on Fig. 15. This rework will increase the chafing area at the head of the pocket which will reduce the wear rate.

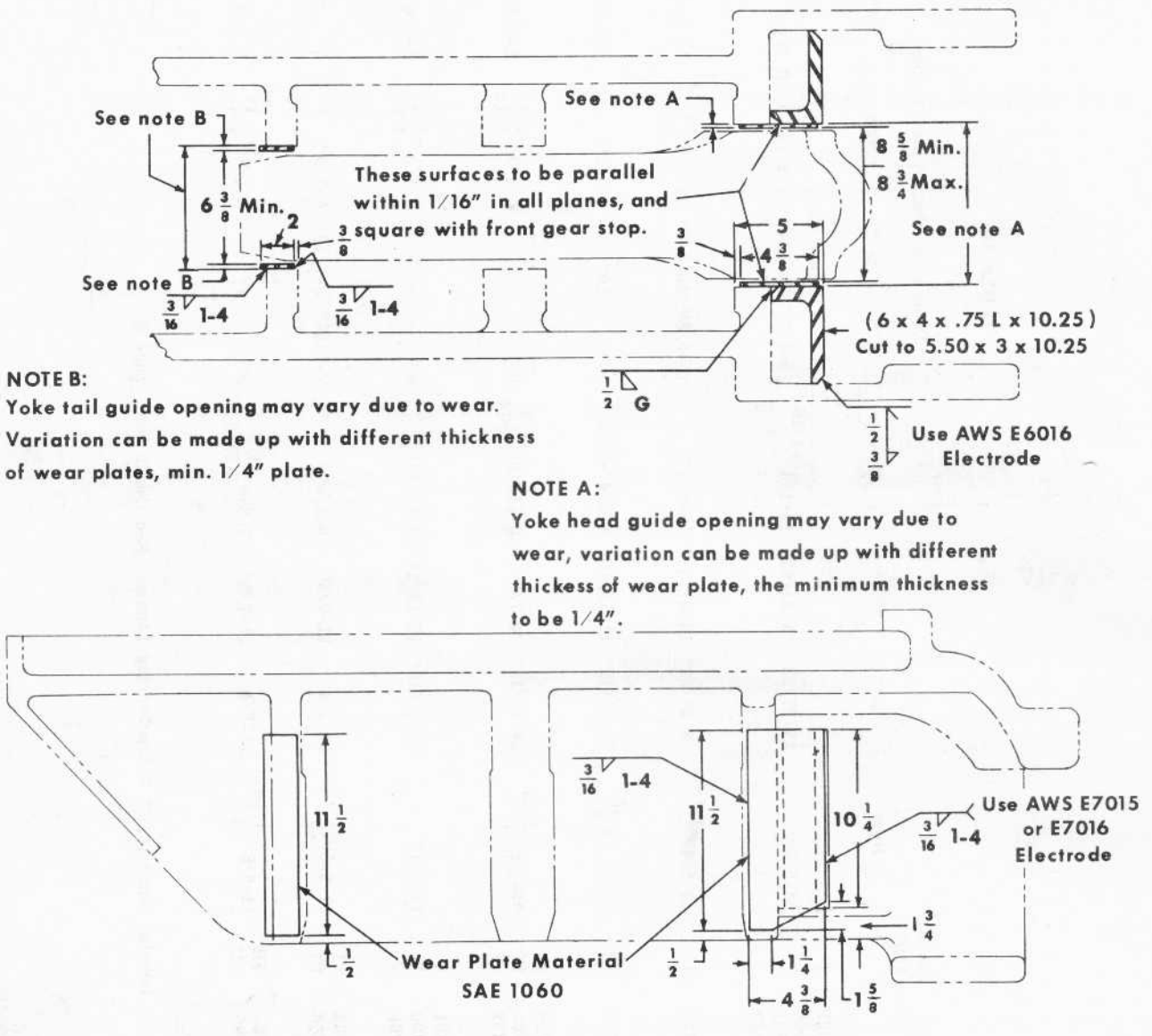


Fig. 15 - Draft Gear Pocket 8157667 Rework