EMD MAINTENANCE INSTRUCTION

SERVICE DEPARTMENT · ELECTRO-MOTIVE DIVISION · GENERAL MOTORS · LA GRANGE, ILLINOIS

LOCOMOTIVE TRUCK ASSEMBLIES

FLEXICOIL TRUCKS

INTRODUCTION

Flexicoil trucks are made as six and eight wheel assemblies. The six wheel truck, Figs. 1 and 2, is used in SD and SDP type locomotives and the eight wheel truck, Fig. 3, is used in DD and DDA type locomotives.

DESCRIPTION

The trucks support the weight of the locomotive and provide a means for transmission of power to the rails. They are designed to withstand the stress resulting from road shock due to normal variations in the roadbed and other conditions encountered during operation. An important function of the truck assembly is to absorb and isolate these shocks so they will not be transmitted to the locomotive underframe and the equipment mounted on the underframe.

The locomotive tractive horsepower is supplied to the traction motors. The motors are geared to the driving axles which in turn apply this force to the rail through the wheels. The tractive force is transmitted through the axle journal boxes to the truck frame and through truck frame pressure areas to mating pressure areas on the truck bolster. The bolster then transmits the force through its center bearing to the carbody center plate to move the locomotive and supply the locomotive drawbar horsepower.

Air brake cylinders and brake rigging mounted on the trucks are used to apply

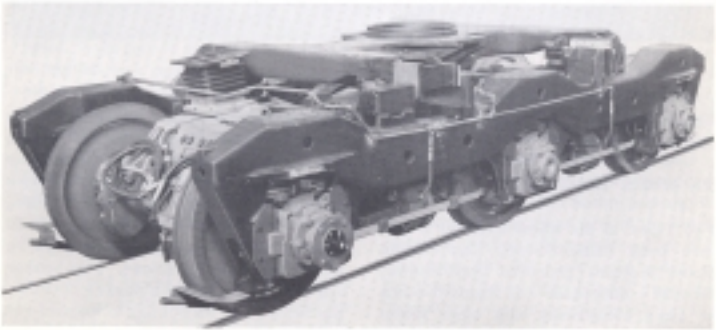

Fig. 1 — Current SD Truck Assembly

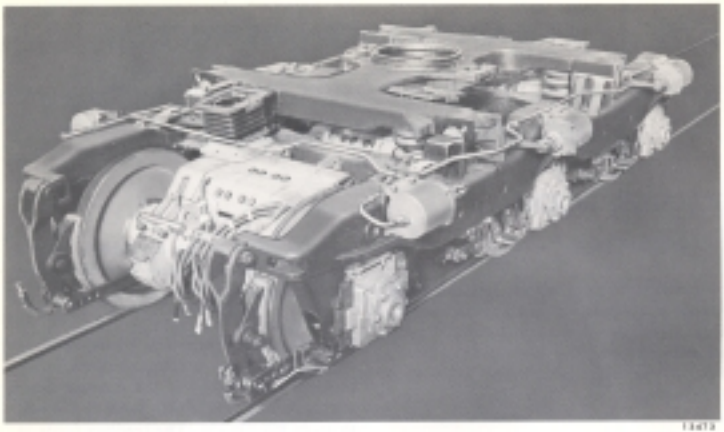

Fig. 2 — Previous SD Truck Assembly

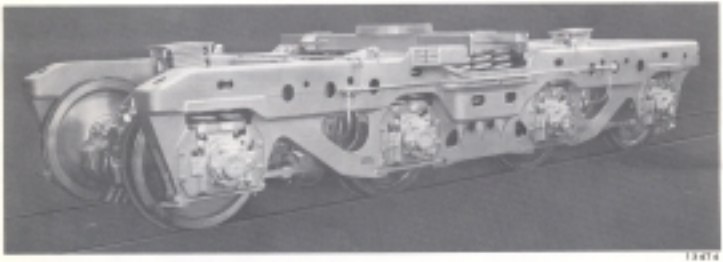

Fig. 3 — DD Truck Assembly

retarding forces to the wheels to slow and stop the locomotive.

SIX WHEEL TRUCK

Two types of six wheel flexicoil trucks have been manufactured. The current model provides improved performance, reduced maintenance and standardization of some components with other model trucks.

The locomotive weight is applied at the bolster center bearing. The "H" design bolster is supported at each of its four corners by double coil spring assemblies mounted in spring pockets in the frame. The four corners of the bolster are held between upright pedestals which are an integral part of the frame. This bolster and pedestal arrangement serves to transmit force from the bolster to the frame or the frame to the bolster.

12. Add 10 pints of lubricating oil to the SD center bearing and 5 pints to the DD center bearing. The DD truck may have the oil added through the oil addition pipe in the underframe after the locomotive is trucked. Refer to the applicable Scheduled Maintenance Instruction for the type of oil to be used.

NOTE: Be sure to remove center bearing vent cap before trucking locomotive.

TABLE B

TRUCK SPRING DATA

	Part Number	Free Height	*Nominal Static Height	Static Load Lbs.
Journal Box Springs	8179174 (Assy)	11-3/4"	8-13/16"	12,800
	8218329	11-3/4"	8-13/16"	1480
	8218330	11-1/2"	8-13/16"	4150
	8218331	11-1/2"	8-13/16"	6970
	8228051 (Assy)	12-15/16"	9-11/16"	14,100
	8268328	12-1/2"	9-11/16"	8280
	8268329	12-1/2"	9-11/16"	4280
	8268330	12-15/16"	9-11/16"	1580
	8272084 (Assy)	15"	11-3/4"	12,600
	8272255	15"	11-3/4"	8350
	8272256	14-11/16"	11-3/4"	4250
Bolster Springs	8179179 (Assy)	22-3/4"	18-1/2"	32,000
	8218527	22-1/2"	18-1/2"	24,400
	8218528	22-3/4"	18-1/2"	8200
	8228050 (Assy)	22-1/2"	18-5/8" ± 1/4"	35,050
	8218527	(See assembly 8179179)		
	8268331	22-1/2"	18-5/8"	12,050
	8334969 (Assy)	23-1/4"	20-3/4"	30,500
	8370696	23-1/4"	20-3/4"	20,900
	8370697	23-1/4"	20-3/4"	9600
Friction Snubber Spring	8325931	8"	6-3/16" ± 1/8"	4400

* ± 3/16" unless noted otherwise

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FILE DRAWINGS

Compression Fixture. 454
Tram Marking Tool. 615
Friction Snubber Retracting Tool. 689

NOTE: File Drawings can be obtained by contacting Electro-Motive Division Service Department, La Grange, Ill.

Four traction motors are supported on their respective drive axles and at suspension assemblies mounted on the truck frame transoms. All motors in one truck face the same direction.

The brake system consists of four double acting brake cylinders, mounted between the first and second wheels and the third and fourth wheels on each side of the truck. Each cylinder provides braking force for two brake shoes. Due to simple linkage and small number of cylinders and brake shoes the maintenance time and costs are greatly reduced compared to conventional clasp brake systems. Composition brake shoes are used to provide comparable stopping distances and increased service life.

MAINTENANCE

TRUCK CLEANING UNDER LOCOMOTIVE

The trucks should be cleaned as often as needed while under the locomotive to remove heavy accumulations of oil, sand, dust, and roadbed dirt.

The engine should be running to supply air under pressure to the traction motors when the trucks are cleaned under the locomotive in order to prevent any liquid spray from entering. Care should be taken that no spray is directed at the motor air discharge openings.

LUBRICATION

The only periodic lubrication required on the truck itself is at the brake rigging slack adjusters on the early SD truck, which should be greased in accordance with the applicable Maintenance Schedule.

The SD truck center bearing should have 10 pints of oil added at the time the unit is trucked. The DD truck center bearing should have 5 pints added either before trucking or after trucking through the oil addition pipe located in the engine room or the inertial filter compartment, depending on which truck is involved. If oil is added before trucking, the cap on the oil addition pipe should be removed during trucking to allow air trapped in the center bearing to be vented out.

No lubrication is required on journal box or pedestal jaw wear surfaces. Special care should be taken to keep bolster and transom rubbing surfaces free of oil or grease.

REMOVAL OF TRUCK FROM LOCOMOTIVE

The trucks may be removed from the locomotive by using an overhead crane or jacks to raise the locomotive, or by use of a drop table. If a drop table is used for removing a DD type locomotive truck, the table must be at least 23' long.

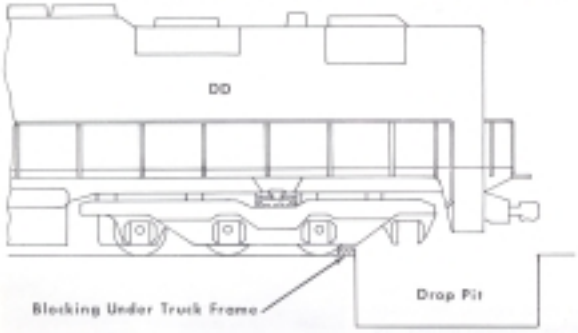
The truck safety pin on the SD truck or safety chain on the DD truck must be removed before any attempt is made to raise the locomotive for truck removal. Make sure that all other physical connections between the trucks and carbody are disconnected, such as the air brake equipment, sanding equipment, traction motor cable, hand brake chain and speed recorder connection.

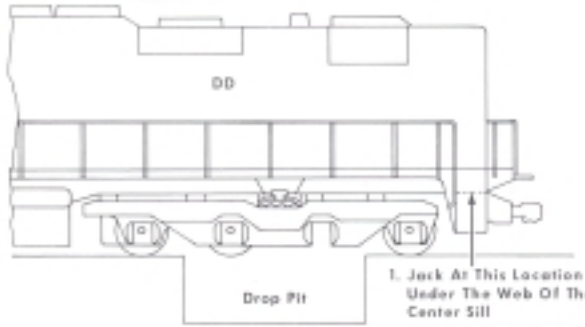
When lifting or jacking a locomotive to remove one or both trucks, all four corners should be raised equally to a height which will permit end removal of complete trucks. The locomotive should be supported on blocking if it is to be held in a raised position.

When removing a DD type locomotive truck with a drop table, locomotive supports capable of handling up to 190,000 lbs. each must be provided. Before lowering the drop table, be sure the truck is centered

on the table. The truck centerline is approximately 15" inboard from the bolster centerline.

To remove a wheel, axle, traction motor assembly from a trucked DD locomotive the jacking procedures shown in Fig. 4 must be followed. When removing one or both of the inboard assemblies the carbody weight MUST BE REMOVED from the truck before the removable tie bar pins are taken out. The carbody weight must be removed by using the locomotive body supports or by jacking under the center sill web adjacent to the underframe end plates, Fig. 4. After the tie bar pins are





Note: Carbody weight must be removed before the pedestal tie bars are removed from the center axles.

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Fig. 4 — Removing Wheel And Axle Assemblies From DD Locomotive

removed it may be necessary in some instances to re-apply a small portion of the vertical load to free the tie bar from the journal box if the bottom of the journal box is binding against the tie bar that must be swung out.

CAUTION: Only a minimum amount of weight should be applied with the tie bar pins removed. Various facility drawings are available covering items used in removing and handling of trucks. A listing of these blueprints and file drawing numbers are given in the Service Tools Catalog.

TANK CLEANING OF INDIVIDUAL TRUCKS

When the truck assembly is removed from the locomotive, the traction motors, wheels, axles, journal boxes, and brake cylinders should be removed if the truck is to be immersed in a cleaning tank containing an alkaline solution. After a sufficient time to assure removal of all foreign material, remove the assemblies and rinse them using hot water. Phenolic or composition wear plates should not be immersed in alkaline solution.

COMPLETE TRUCK DISASSEMBLY

The following general procedure for truck disassembly can be applied to all three trucks.

1. Remove the center bearing dust guard and wear plates and wipe up the oil in the center bearing. Also drain the oil from the traction motor support bearings.

2. Remove individual items mounted on the truck frame such as brake cylinders, piping and brake rigging.

3. Remove the bolster from the truck frame being sure to disconnect the safety links on the previous model SD truck and the safety hooks on the current SD truck. Be sure the pistons in the piston friction devices are blocked to prevent them from being forced out when the bolster is removed from the pedestal jaws. Bolster support springs can now be removed.

4. If space and facilities are available, a considerable time saving can be made by working the truck from this point on in an upside down position. This can be done by turning the frame over endways or sideways with an overhead crane.

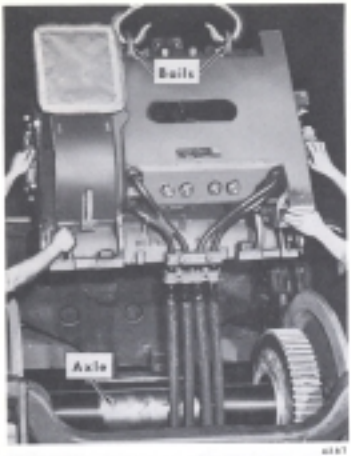
5. After removal of the pedestal tie bars the motor, axle, wheels, journal boxes and gear case can be removed as an assembly, rather than piece by piece. Removal of wear plates, springs, and traction motor nose suspension assemblies will also be accomplished with less labor and more safety with the truck in an inverted position.

6. If the truck cannot be inverted the following method may be used to remove the motors from the wheel and axle assembly.

   a. Remove the bolted traction motor air duct and gear case.

   b. Remove the dust guards, traction motor bearing support caps, axle guards and outer bearing half.

   c. Apply the hoist lifting chains to the bails on the traction motor at the nose suspension side. After the suspension pin keeper bar is removed, and the keeper pins drop down, lift the motor to compress the springs of the suspension assembly. With the suspension assembly compressed, insert 3/4" thick temporary blocks between the spring holder and bolt as indicated in Fig. 5.



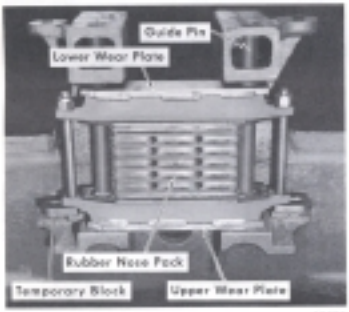


Fig. 5 — Removing Traction Motor

d. Lower the motor sufficiently to free the suspension assembly and remove the assembly by sliding it out of its place between the truck frame lugs.

e. After the suspension assembly is removed, again lift the motor, allowing it to rotate on the axle until the lower lip of the support bearing clears the axle. Fig. 5. Then lift the motor assembly clear of the axle and place it on the floor.

NOTE: Use care in lifting the motor so the support bearings will not fall and be damaged. Pinion protector 8064871 should be applied to the motor to prevent damage to the motor after it has been removed. The support bearing caps should be reapplied at their original location on the motor, since these caps are not interchangeable between motors.

7. To remove the wheel and axle assemblies, remove the pedestal tie bars so when the truck frame is lifted the wheel and axle assemblies will remain on the floor.

8. Remove the remaining brake equipment and pedestal liners from the truck frame. Be careful when removing pedestal liners that journal springs and spring seats do not fall and cause injury.

INSPECTION AND REPAIR

Make a thorough inspection of the truck frame and bolster for the following items and repair as stated.

BROKEN OR CRACKED MEMBERS

Breaks or cracks must be repaired by welding with AWS-7016 electrode. If the broken section can be removed or straightened, it is permissable to weld it back into place after preparing the joint to obtain a 100% section of weld with reinforcement. Broken cast sections may be duplicated with a like shape made from SAE 1018 or 1020 steel, and welded to the truck frame.

BENT SECTIONS

Bent sections may be straightened either cold or after the application of heat. Before

straightening any bent section, determine what effect it will have on the adjoining sections. Jacks, turnbuckles or fixtures designed for straightening members will expedite the straightening of bent sections.

WORN SPOTS

The truck frame should be thoroughly checked for worn spots in areas normally not subject to wear. For example, loose brake levers may wear the clevis slots through which they are pinned. Also, excessive wear on the spring seats may necessitate their reconditioning or replacement.

ELONGATED OR OVERSIZE HOLES

Drilled holes elongated by wear due to loose bolts, pins, sleeves or bushings, should be brought back to normal size as determined by comparison with similar locations on a truck in good condition. The holes should not be worn more than 3/64" on the radius or 3/32" on the diameter.

Holes which are beyond these tolerances can be reconditioned by either ring or plug welding. Holes which are too small to permit proper manipulation of the welding electrode should be drilled oversize to permit proper access for the electrode. The hole should be redrilled to proper size after completion of the welding.

WORN BUSHINGS

Bushings worn 3/32" or more on the inside diameter should be replaced with new bushings. Where bushings are paired to carry a single load, both of the bushings should be replaced, if one bushing is worn sufficiently to warrant its replacement.

Worn bushings can be pressed out. After the bushing is removed inspect the drilled hole in the frame for wear or an out-of-round condition. Holes found unsuitable

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Fig. 6 — Current SD Truck Bolster

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Fig. 7 — Previous SD Truck Bolster

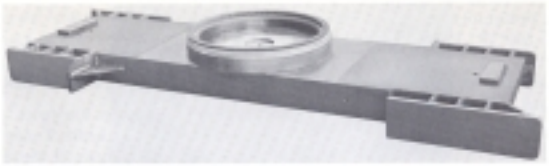


Fig. 8 — DD Truck Bolster

for a new bushing can be reconditioned by ring welding and then drilling to accept the new bushing.

MUTILATED THREADS

All threaded holes should be checked and retapped if required. If the threaded holes cannot be reconditioned by retapping they should be plug welded, redrilled and retapped. An alternate method of reclaiming unsatisfactory threaded holes is to retap them to accommodate an oversize bolt.

BROKEN OR BENT STUDS

Replace any broken or bent studs.

MISSING PARTS

Make a thorough inspection to see if all the necessary parts are intact. Special attention should be given to wear plates, cotter pins and washers.

BOLSTER

The bolster (except DD), Fig. 6,7, and 8, is a steel casting used to transfer the locomotive weight to the truck frame. As previously explained, the truck bolster center bearing mates with the locomotive underframe center bearing. The new SD truck uses a neoprene rubber dust guard, Fig. 9, which clamps over the truck center casting and rides against the underframe to prevent dust and dirt from entering the center bearing. The DD truck uses a felt dust guard as shown in Fig. 8.

Fig. 9 — SD Center Bearing Dust Guard

The DD truck bolster is made of high strength alloy steel, fully machined, and is fitted with two sets of 1"-8 UNC threaded holes for the application of lifting lugs. No lifting chains or wire rope slings should be used to lift the bolster directly.

Welding should not be attempted any place in the stressed area indicated in Fig. 12. Weld repair can be performed only in the lightly stressed chafing plate and supporting structure areas near the bolster ends. Care should be taken to ensure that no accidental arc striking or burning takes place in the highly stressed area.

CAUTION: When welding on the DD bolster use only AWS-9018 electrode with maximum diameter of 3/16". Weld with D.C. reverse polarity or A.C. at 175-275 amps and 20-24 volts. The electrode must be identified by color code as follows:

End color — violet
Spot color on side — orange
Group color on coating — green

1. Prior to welding, the electrode must be dry and preferably placed in an oven at 250° to 300° F. for at least 2 hours.

2. The material to be welded must be clean and free from moisture, oil, grease, mill scale, paint or any foreign substance in the weld and adjacent areas.

3. Welding must be done by making single pass stringers at 7" to 10" per minute which do not weave more than twice the diameter of the electrode. Inter-pass temperature must not exceed 350° F. A pyrometer or 250° tempilstick should be used for measuring the heat input. The welding sequence should be arranged so the weld can be alternately applied to several joints rather than wait for cooling between passes on a single joint.

4. All weld joints must be inspected and qualified by a contrast dye penetrant inspection. Any cracked or otherwise defective welds should be repaired by removing the defect by grinding or carbon arc gouging. No flame cutting is permitted.

Any time that a truck is disassembled, the underside of the bolster should be inspected for evidence of cracking.

FRAME AND BOLSTER WEAR PLATES

The wear plates on the truck frame and bolster wear as a result of movement between these surfaces. If the clearances between these wear plates exceed the limits given in Figs. 10, 11, and 12, either the bolster or truck frame wear plates or both should be replaced. Maximum total side clearance between the truck frame and bolster of any of the three truck models must not exceed 5/8", even though adding the allowable wear on each wear plate involved may exceed this figure. The wear plates and their welds should be inspected

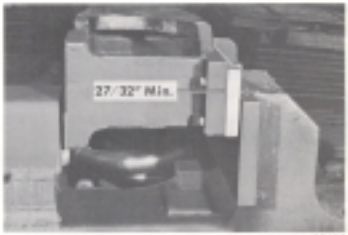
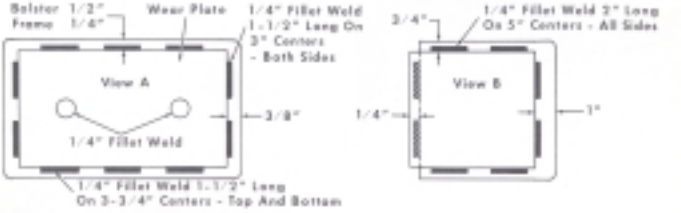


Fig. 10 — Current SD Bolster Wear Plates



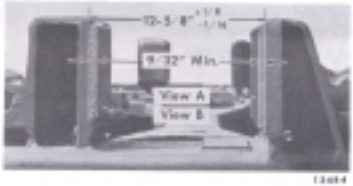


Fig. 11 — Previous SD Truck Frame And Bolster Wear Plates

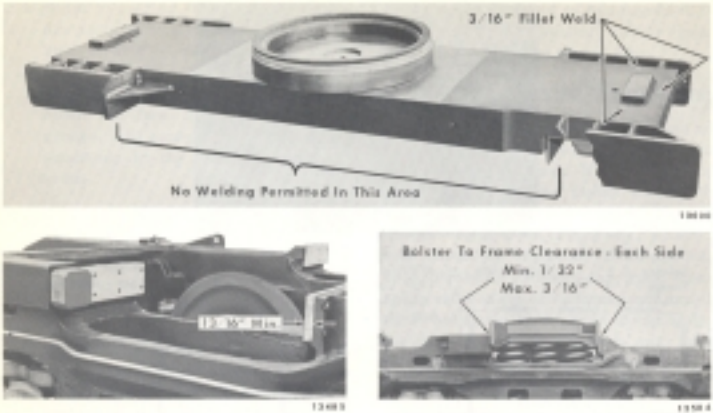


Fig. 13 — DD Truck Bolster Wear Plates

using the magnetic particle method of inspection. Generally, residual magnetism in these truck parts is sufficient to provide an indication when the inspection particles are applied to their surfaces. The wear plates can be removed by grinding or chipping off the fillet welds that secure the plates. If one wear plate is removed, the wear plate at the similar location on the other side of the truck frame or bolster should be removed, as these plate surfaces should be parallel within 1/32". The replacement wear plate should conform to the specifications of the original plate.

Prior to application of new wear plates be sure the mating surfaces of the parts to be welded are clean, smooth and flat. Use AWS E-7016 welding rod when welding standard EMD wear plates made of 1060 steel. However, if wear plates made of 1095 steel are used, AWS E-310-16 stainless steel welding rod must be used or if manganese wear plates are used, AWS E-FeMn-A welding rod should be used. When welding on the DD bolster see the weld note under "Bolster" section.

When welding wear plates, they should be held in the correct position and in full contact with the mating part. Care should be taken during welding to see that the fillet welds do not extend above the wearing surface of the wear plate. Any plate which has a hole or holes for plug welding should have the hole welded first.

SIDE BEARING WEAR PLATES

The side bearing surfaces on the bolster are designed to mate with similar side bearings mounted beneath the carbody underframe as indicated in Fig. 13.

A clearance is provided between the truck bolster side bearings and the carbody side bearings during normal operation. Side bearings are designed to prevent excessive tilting or leaning of the locomotive but are not designed to carry a continuous load.

Side bearing clearance on a new SD assembly is 5/32" to 1/4" and on a new DD assembly 3/16" to 7/16". The minimum allowable side bearing clearance is 1/32", as shown in Fig. 13. However, since the side bearings are more widely spaced on the DD truck bolster, the truck can be operated as long as the side bearings have a positive clearance.

Any time the side bearing clearance approaches the minimum limit the bolster center bearing wear plate should be checked for wear. Side bearings should be flat and in the same plane within 1/32", as the side bearing on the opposite side of the truck. If bearing is misaligned or is uneven, it may be repaired by building up the surface with weld and grinding to a proper level.

The DD and current SD bolsters are provided with a wear plate on each bolster side bearing. The previous model SD locomotives have wear pads applied to the carbody underframe side bearings. The worn side bearing wear plates can be removed by grinding off the fillet welds around the plate. New DD wear plates should be of mild steel 1-3/8" thick and should be applied using a 3/16" fillet weld on the two ends and the outboard side, as shown in Fig. 12. The SD wear plates should be applied with 3/16" fillet welds.

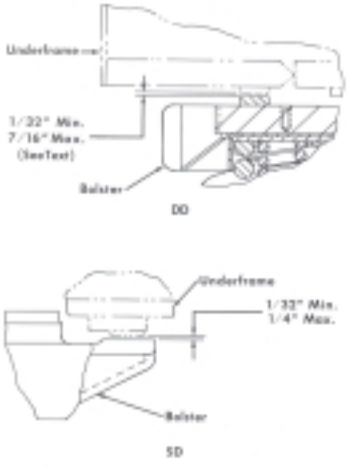


Fig. 13 — Side Bearing Wear Plate

CENTER BEARING WEAR PLATES AND WEAR RING

As mentioned previously, side bearing clearance close to the limit is usually an indication of wear at the center bearing wear plate. The limits for the center bearing wear plate are shown in Fig. 14. The thickness of the plate should be checked whenever the plate is accessible. If the plate thickness is above the minimum limit it may be used again. The truck center bearing wear plate may be used as long as it is not completely deteriorated or broken and as long as there is a positive clearance between the side bearings.

The outside diameter of the carbody center bearing assembly and the inside diameter of the bolster center bearing wear ring should be checked to determine the total clearance between them. The recommended clearance is shown in Fig. 14. The maximum clearance between these parts is 1/8" as indicated.

Center bearing wear plates and wear rings are made of 1/2" thick laminated phenolic material.

Check the center bearing area of the bolster to make sure there are no cracks or voids which might allow lubricating oil to leak out. If any cracks are found, they must be completely removed by flame cutting, chipping, or grinding, and a 60° "V" groove provided for welding. Weld the crack with AWS-E-T016 electrode. Peen the second weld pass and each pass

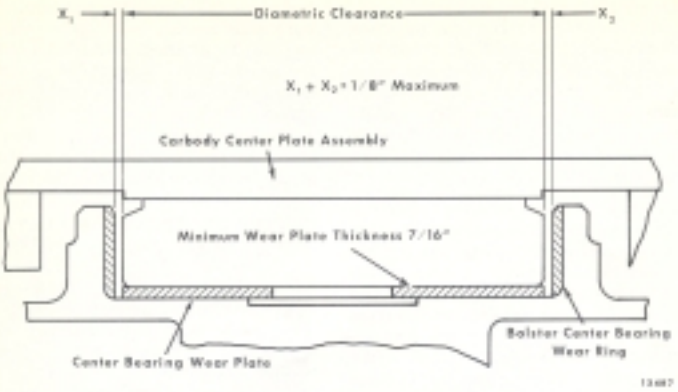


Fig. 14 — Center Bearing Wear Plate And Wear Ring Limits

thereafter to minimize distortion. Grind off excess weld metal so the surface of the center bearing plate will be flat within .020".

NOTE: If any cracks are found on the DD bolster center casting, contact EMD Service Department at La Grange, Illinois for instructions.

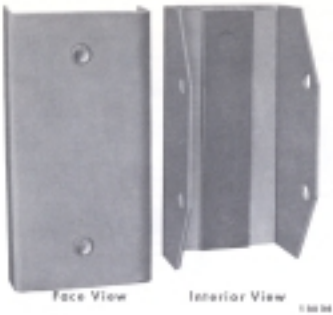
After the old wear plates and wear rings are removed and the necessary repairs made, the bearing bore should be cleaned and the surfaces smoothed so they offer little resistance to the application of the new replacement half rings. Check the replacement half ring surfaces to see that they are smooth. Apply a lubricant to the outside diameter of the half rings and apply the half rings to the center bearing bore. The replacement half rings have an interference fit in the bore, so they must be forced into position in the bolster center casting. Apply so that the split line between the half rings will be 90° from the longitudinal centerline of the locomotive.

PEDESTAL LINERS

Pedestal liners, Fig. 15, are provided to absorb the wear that occurs from the relative movement between the journal box and the pedestals. For convenience of replacement, the pedestal liners are bolted to the pedestal jaws.

Clearance limits between the longitudinal or lateral wear surfaces, are such that in normal operation the clearance will not exceed the maximum in the period between truck reconditioning. The nominal lateral clearance between the journal box and the pedestal liner is 1/16" at each side of the pedestal as shown in Fig. 16. The truck pedestal to journal box wear limits are shown in Fig. 17. If the clearances are beyond the maximum limits, the wear plates must be replaced. The wear plates should be checked for possible breaks or cracks by visual and magnaflux inspection if they are to be reused.

The clearance between the journal box and the pedestal can be measured using feeler



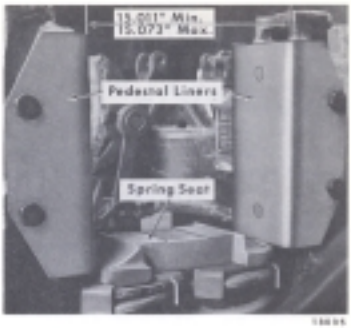


Fig. 15 — Pedestal Liners

gauges. Feeler gauges should be approximately 1" wide and 12" long. Care should be taken in making the measurement to see that the gauge is inserted adequately into the clearance and that it fits into the wearing area so that a true reading is obtained. All measurements should be taken with the journal boxes in the position they are in when the locomotive is stopped. No attempt should be made to shift the journal boxes on the axle while the weight of the locomotive is supported by the boxes.

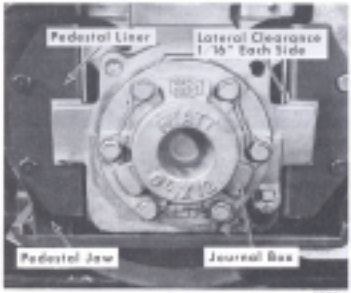


Fig. 16 — Pedestal Liner To Journal Box Clearance

Pedestal Liner Application

Two types of pedestal liners are available. One is made of carbon steel and the other of manganese steel. The manganese steel liners provide increased liner life before replacement is necessary. The current SD truck and the DD truck use different pedestal liners than those used for the previous model SD truck. The correct liner part numbers for the individual trucks are given in the Parts Catalog.

The liners are installed as indicated in Fig. 16. The liners should fit tightly against the pedestal jaws with the mounting holes properly aligned. The mounting bolts should enter the liner and pedestal holes freely, and should be thoroughly tightened. The longitudinal dimension between the pedestal liners should be 15.011" minimum to 15.073" maximum, as shown in Fig. 15.

COIL SPRING SEAT

The current SD and DD trucks use spring seat 8354098, Fig. 15. The previous model SD and DD trucks were equipped with

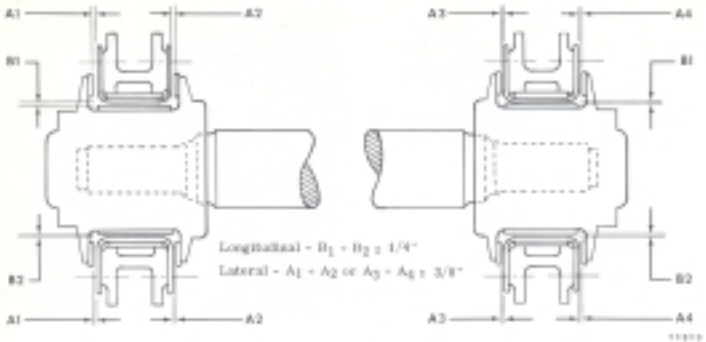


Fig. 17 — Pedestal Liner To Journal Box Wear Limits

spring seats 8178314 and 8258315 respectively. These spring seats can be replaced with the new 8354098 spring seat but in the case of 8178314 a standard 3/4" shim plate, 8044686 must be used also.

When wheels have worn and shimming is necessary to regain coupler height, use 3/4" shim 8044686 or 1-1/4" shim 8112192. Additional shimming can be done by adding 3/8" shim 8080994 between the spring seat and springs. Not more than three of these 3/8" shims can be used under any one spring.

CAUTION: Whenever spring seats and shims are removed, check to see that both the spring seat and shim have the 3" wide × 1/8" deep relief cut across the bottom, as shown in Fig. 19.

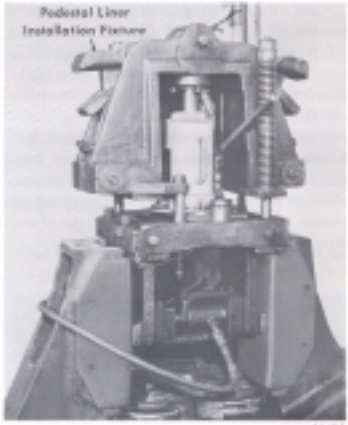


Fig. 18 — Pedestal Liner Application

TABLE A

	Current SD	Previous SD	Previous DD	Current DD
Original Seat	8354098	8178314	8258315	8354098
Replacement Seat	8354098	8354098	8354098	8354098
Shims available 3/4"	8044686	8044686	8044686	8044686
1-1/4"	8112192	8112192	8112192	8112192

Inspect all spring seats during truck reconditioning for evidence of distortion or damage. Limits for dimensions which are subject to change because of wear are shown in Fig. 19.

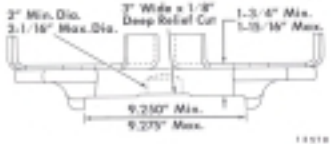


Fig. 19 — Spring Seat Wear Limits

DD TRUCK CENTER PEDESTAL TIE BARS

The two center pedestal tie bars, Fig. 20, on the DD truck are an important part of the load carrying system. They should be checked whenever major maintenance is performed to see that the pin clearances are satisfactory and that the pins or bar itself have not been damaged.

The semi-permanent pin (the pin closest to the center of the truck) is held in place with a small L-shaped clip welded to the frame above the head of the pin. The maximum allowable diametrical clearance between the pin and the holes in frame and tie bar is .015".

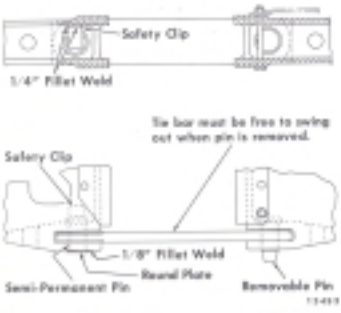


Fig. 20 — DD Truck Center Pedestal Tie Bar Application

The maximum pin to hole clearance on the other pin is .030" or .015" between the pin and the hole in the frame and .015" between the pin and hole in the bar. If this clearance exceeds the maximum and is due to the holes in the frame or tie bar being worn, ring weld the holes using AWS-E-7016 electrode and ream to 2.250^{+} .001" with truck frame inverted and the tie bar in place.

Unlike other pedestal tie bars, these tie bars may be installed in the truck frame, if desired, before the wheel and axle assembly is installed. To install the wheel and axle assembly, swing the removable end of the tie bar out.

If the tie bar has been removed from the frame, it can be installed by positioning in the slot in the pedestal opening. Next insert the tie bar pin that is flat on both ends, through the proper holes in the frame and the hole in the tie bar, as shown in Fig. 20. The L-shaped safety clip to prevent the pin from coming out, is welded to the frame, Fig. 20. A round plate is placed over the hole in the bottom of the frame and welded in place. After the wheel and axle assembly is installed in the pedestals, the removable pin is inserted in the outboard end of the tie bar.

TRACTION MOTOR NOSE SUSPENSION ASSEMBLY

SUSPENSION PACKS

Each time power is applied to the traction motors, the pinion of each motor tries to ride around the axle gear, raising the motor up or pulling it down, depending on the direction of motion. This movement of the motor is arrested by securing the motor to the truck frame transom through a shock dampening rubber suspension pack which is mounted as shown in Fig. 21. Previous model SD trucks were equipped with a coil spring type suspension pack.

Inspect all spring seats during truck reconditioning for evidence of distortion or damage. Limits for dimensions which are subject to change because of wear are shown in Fig. 19.

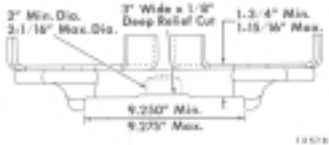


Fig. 19 — Spring Seat Wear Limits

DD TRUCK CENTER PEDESTAL TIE BARS

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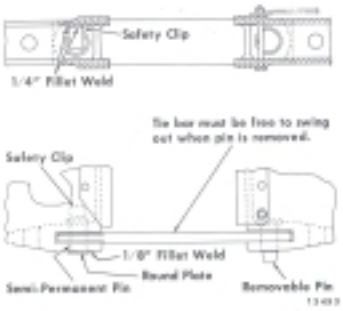

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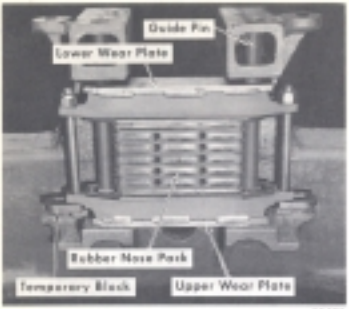


Fig. 21 — Traction Motor Nose Suspension Assembly

The rubber suspension pack provides improved traction motor performance, extended wear plate life and reduced wheel slip. We recommend that only the rubber suspension pack be used. It is completely interchangeable with the coil spring type. Both utilize the same spring holders, wear plates, pins and bolts.

WEAR PLATES

The wear plates on the suspension assembly are subjected to severe shocks and tremendous pressures, causing them to wear, resulting in free movement between the traction motor frame and the suspension assembly. As this movement increases due to wear, the severity of the shocks increases, especially during wheel slip which causes rapid changes of torque.

Wear plates should be periodically replaced to ensure not more than 1/4" free movement in the traction motor nose suspension to obtain maximum cushioning effect from the suspension pack. If the wear plates, which are 1/2" thick when new, are worn enough to permit more than the 1/4" free movement or if the wear plates are worn more than the limits given in Fig. 22, the suspension pack should be removed and the wear plates replaced.

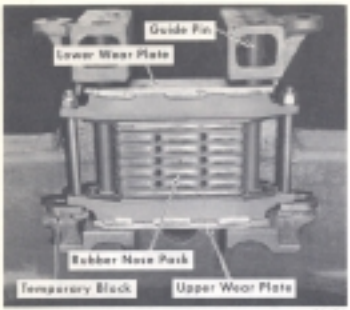
The upper and lower wear plates are identical so the lower wear plate, which has a minimum limit of 7/16" may be removed to the upper position if it is still within the 13/32" upper wear plate limit.

The old wear plate can be removed from the spring pack by grinding or chipping off the tack welds holding it. The new wear plate should conform to the dimensions of the original plate. The current wear plate used on all trucks is made of manganese steel which has a longer service life than the plates used on previous model SD trucks. Any truck still equipped with the old type wear plate should have the manganese steel plate applied at the first opportunity. The wear plate should be applied to the suspension pad with 3/8" fillet welds 2-1/4" long spaced 3-3/4" apart. When welding manganese steel wear plates use an AWS-E-FeMn-A welding rod.

MOTOR NOSE SUSPENSION LUGS

The lugs on the truck frame transom that support the traction motor suspension assembly are subject to wear due to the chafing of the suspension assembly. The maximum dimension between these surfaces is 12-1/8" as shown in Fig. 22. If this limit is exceeded, it will be necessary to build up the lug faces by welding and machining or grinding to obtain the original dimension of 12" plus or minus 1/32". The ground or machined surfaces of the lugs should be in the same plane within 1/32".

Current practice is to install a 3/16" thick manganese steel wear plate on each of the four truck frame suspension lugs. If manganese wear plates are used on the suspension assembly they should also be used on the suspension lugs. This will



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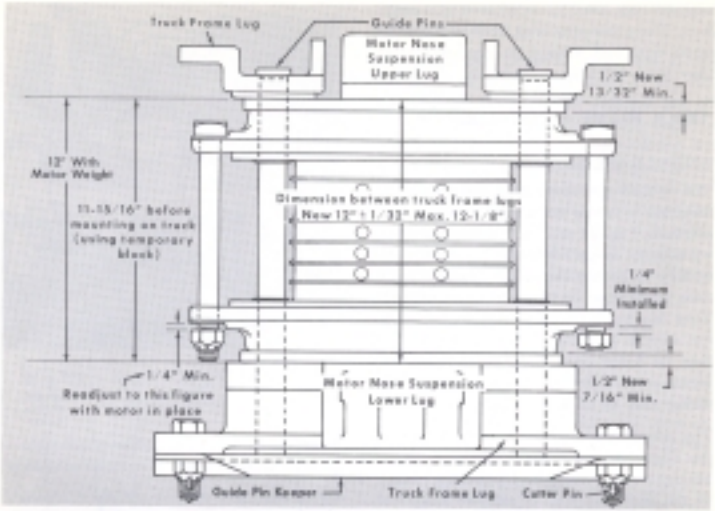


Fig. 22 — Traction Motor Nose Suspension Wear Plates

reduce wear at these points and allow an extended period between rework. The wear plates are applied to the lugs with a 3/16" fillet weld using an AWS E-FeMn-A welding rod. Weld the plate on three sides as shown in Fig. 23. After the wear plates are applied, the surfaces must still be in the same plane and the dimension between the upper and lower lugs must be 12" ± 1/32".

The guide pin holes in the frame lugs should be checked for size. The holes are drilled to a nominal 1-5/16" diameter when new. If they become worn or elongated by 3/32" or more, they must be ring or plug welded and redrilled to the correct dimension. An optional method of repairing the guide pin holes is to drill the worn holes to 1.875" ± .002" and press in bushing 8308240. Weld the bushing to the

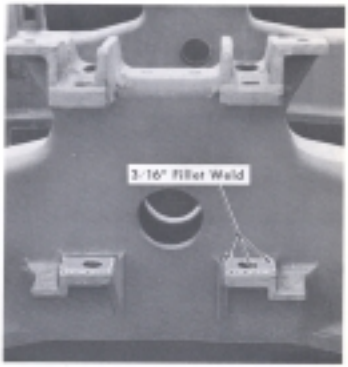


Fig. 23 — Truck Frame Motor Nose Suspension Lugs

support lugs after it is pressed into position. The guide pins are 1.250" in diameter when new and should be replaced when they have worn to a diameter of 1.230".

TRUCK FRAME PEDESTAL REPAIR

WHEELBASE SPACING

The wheelbase spacing is the measured distance between the axle centerline, as shown in Fig. 24 and 25. To determine the wheelbase on an SD truck it is first necessary to locate the truck frame middle axle centerline or transverse centerline. This can be done by measuring between the middle pedestals. The wheelbase can then be found by measuring between the transverse centerline and each axle centerline, as shown in Fig. 26.

The wheelbase spacing may be found on the eight wheel or DD truck by placing a straight edge along the longitudinal faces of the pedestal jaws of any two axles and measuring the distance between the two axle centerlines.

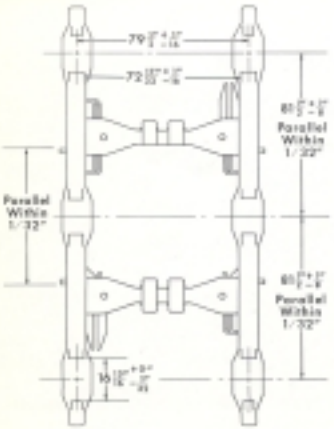


Fig. 24 — SD Truck Frame Dimensions

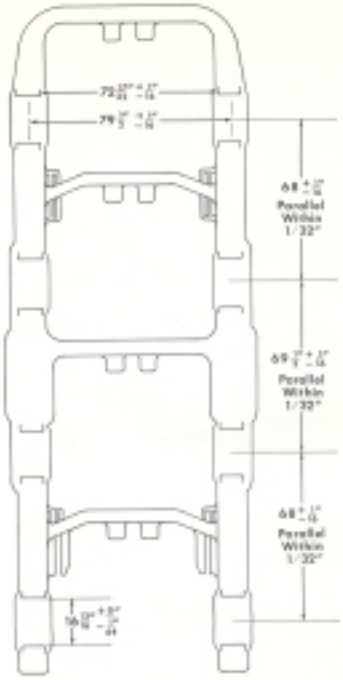


Fig. 25 — DD Truck Frame Dimensions

TRANSVERSE PEDESTAL SPACING

The transverse pedestal spacing refers to the dimension between the inside machined surface of the pedestal jaw and the longitudinal centerline of the truck. The dimensions for the individual trucks are shown in Fig. 24 and 25. The transverse measurements may be made as shown in Fig. 26. The pedestals may lean in or out, providing both pedestals of each set lean in the same direction and are within the plus or minus tolerance allowed from the

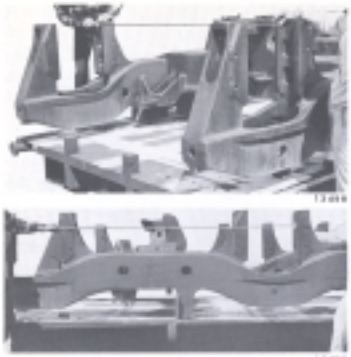


Fig. 26 — Measuring Wheelbase And Pedestal Spacing

longitudinal centerline of the truck frame to the inside face of the pedestal.

Pedestals which do not conform to the dimensional limits can be corrected by straightening the truck frame, hot or cold.

LONGITUDINAL PEDESTAL SPACING

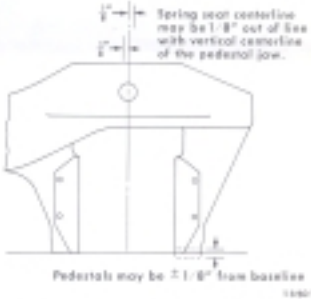
The longitudinal pedestal spacing refers to the distance between the inside surfaces of the pedestal jaws on the same side of the truck, as indicated in Figs. 24 and 25. Incorrect pedestal spacing is caused by a bent frame or bent pedestals, either of which require straightening to obtain the correct pedestal spacing.

HORIZONTAL PEDESTAL ALIGNMENT AT THE BASELINE

The horizontal pedestal alignment at the baseline is the relationship from one pedestal jaw to any other pedestal jaw on the truck frame, as indicated in Fig. 27. This alignment can be determined by measuring from a straight edge tool or wire spanning the pedestals, as shown in Fig. 27, and may be above or below the pedestal baseline by no more than 1/8". A condition in excess of this can only be corrected by straightening the truck frame.

LOCATION OF JOURNAL BOX COIL SPRING SEATS

The centerline of the coil spring seats should be held within 1/8" on either side of the centerline of the pedestal opening, as indicated in Fig. 27. The coil spring



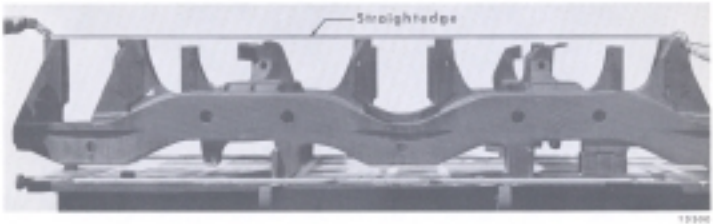


Fig. 27 — Pedestal Base Horizontal Alignment

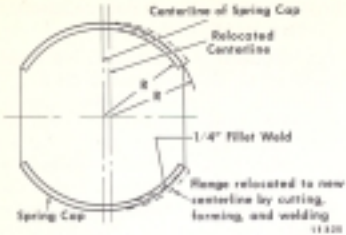


Fig. 28 — Relocation Of Spring Seat Centerline

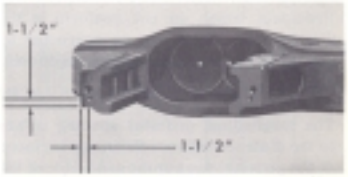
seat location should be checked for alignment when any rework is done on the pedestals. If the misalignment is more than 1/8" it may be corrected as indicated in Fig. 28. A section of each of the two spring seat flanges is flame cut and spread to accept the coil spring on the new center. Then spread the flanges to their new position and reweld them as illustrated. Grind the new welds smooth so that no high spots remain which would cause localized loading on the coil springs.

TRAMMING OF TRUCKS

The truck pedestals are trammed to determine if they are in correct alignment with each other, that is, to determine if the distance between pedestals is equal to or within the alloweable limits. The diagrams shown in Fig. 29 indicate which pairs of pedestals should have equal distances between them.

Tramming is accomplished using a trammel beam as shown in Fig. 30, with the truck frame inverted on a level table or level location. In addition to the diagonals shown in Fig. 29, it may be necessary to check the tram of the pedestals both longitudinally and transversely as indicated in Fig. 30.

The tram assembly is made up of two trammels attached to a wooden or metal beam of such construction that it will hold the assembly rigid. This assembly facilitates taking comparative measurements of varying lengths, which could not be done



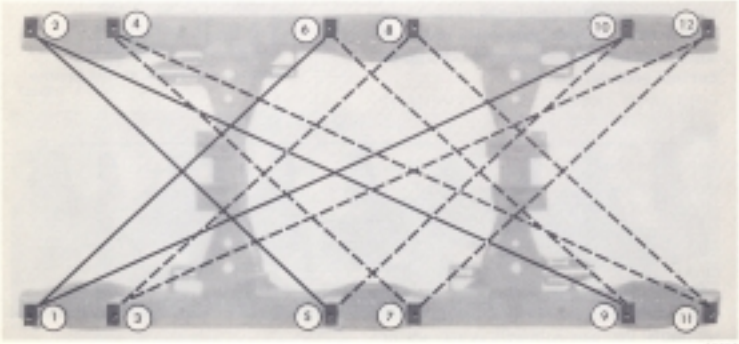
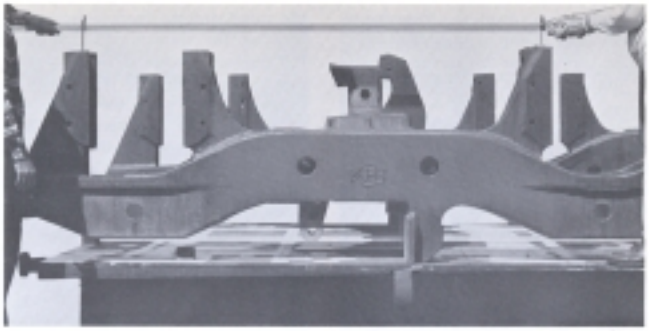


Fig. 29 — Truck Frame Tramming Diagrams



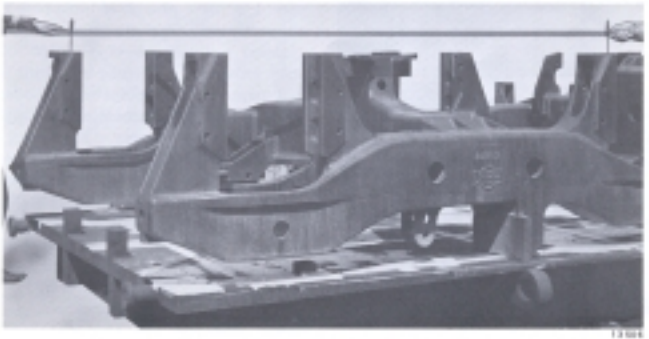


Fig. 30 — Application Of Trammel Beam

using conventional dividers. The adjustable trammels permit any distance separation on the beam so the various dimensions to be trammed can be compared.

Tram marks are made on the end or bottom of each pedestal jaw at the time of original manufacturing inspection of the truck frame. These marks, which are small punch indentations, are placed at identical locations on each pedestal to assure an accurate comparison. They may be either 1-1/2" from the outside corner of the pedestal or on the longitudinal centerline of the pedestal just inward from the tie bar bolt hole. The important consideration is that the mark is made at an identical location on each pedestal.

A special tool shown in Fig. 31, for locating the tram marks on the pedestal can be made from File Drawing 615, which is available upon request. This tool is used to make two scribe marks at right angles to each other at the 1-1/2" or other required dimension on the bottom of the pedestal. The hardened end of the scriber on the tool is placed at the intersection of the scribe lines and is lightly tapped with a hammer to make a small identation in

Fig. 31 — Tram Marking Tool

the metal for the tram points. To aid in locating the tram marks, the bottom of the pedestal should first be cleaned and then coated with blue layout dye. In the event of rework on the truck such as straightening of bent pedestals, it will be necessary to remove the old tramming mark and relocate a new mark.

Each pedestal should be checked for leaning at the inside surface and the side facing the center of the truck before tramming. The pair of pedestals opposite each other (one on each side of the frame) which are found to be square or nearly square, are used as starting points for tramming. The pedestals are checked using a straight edge and square, as shown in Fig. 32.

If the diagonal measurements shown in Fig. 29 are not equal, it will be necessary to tram the pedestals longitudinally and transversely, as shown in Fig. 30, to locate the pedestals that are out of alignment and determine how much they are out of alignment.

A typical example of the tram measurements on a six wheel truck is shown in Fig. 33. The diagonal trams 3-6, 1-6, 2-5, and 4-7 are shown to be unequal by plus 1/8", 0", plus 1/32" and plus 1/16" respectively. The diagonal trams are allowed a tolerance of ± 1/16" so the only pedestals exceeding this limit is the 3-6 diagonal. This indicates that pedestals 3-6 are out of alignment either longitudinally or transversely. Tramming also indicates that longitudinally all the pedestals are equal as shown by the equal "0" longitudinal measurements. Transverse tramming indicates that pedestals 7-8 are equal to pedestals 1-2, but pedestals 5-6 and 3-4 are wider than the other two pair by 1/16" and 7/32" respectively.

Since pedestals 3-4 are plus 7/32", it accounts for the plus 1/8" and plus 1/16"

Fig. 32 — Checking Pedestal Squareness

length of the diagonal trams 3-8 and 4-7 going to these pedestals. Since 3-8 plus 1/8" is twice the plus 1/16" of 4-7, it can be seen that pedestal 3 needs to be bent inward twice as much as pedestal 4. If pedestal 3 is bent inward 5/32" and 4 is bent inward 1/16", the diagonals 3-8 and 4-7 will be reduced and diagonal 3-8 will be within the limit of 1/16". The same correction would be necessary for pedestals 5-6, if diagonals 1-6 or 2-5 were out of their limits.

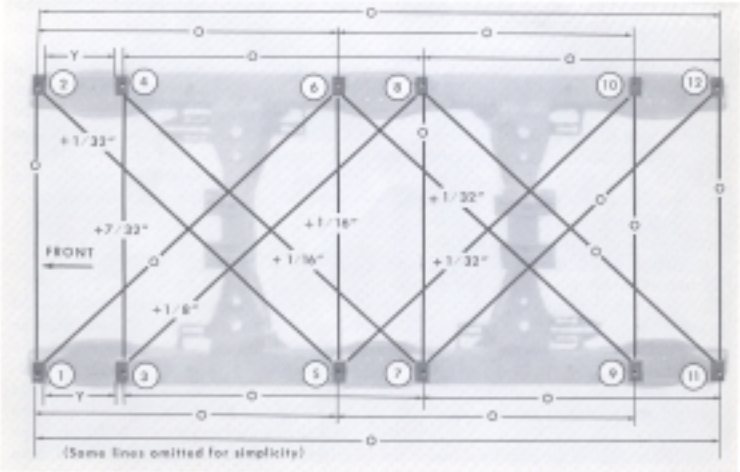


Fig. 33 — Typical Example Of Tram Measurements

TRUCK SPRINGS

The flexicoil truck assembly is equipped with coil springs above each journal box and under each corner of the bolster. Various combinations of springs are used to accommodate the loads which may be applied according to the weight specification of a particular locomotive. Spring shim plates and shims of different thickness are used to maintain the proper coupler height. It is important to identify each of the springs according to part number so the spring may be tested at the proper value as listed in Table B.

The current SD and DD trucks use a double coil spring above the journal box assembly which is identical to that used in GP and F type trucks. The old style SD truck uses a triple coil spring which is not interchangeable with the double coil spring.

SPRING TESTING

Springs may be tested on any reliable calibration type testing press or a spring testing machine, Fig. 34, may be made as outlined in File Drawing 647, which is available from Electro-Motive upon request. The fixture may be used to test elliptic type spring assemblies as well as coil springs. Safety wire mesh encloses the working parts of the fixture. When the two hinged doors at the front of the fixture are opened, a movable table within the fixture can be pulled out to facilitate the application of the spring assembly to be tested. The table with the spring to be tested is then pushed into place in the fixture and the eccentric rollers supporting the table are released to provide complete support for the spring. The protective front access doors are closed and locked in place before testing.

A hydraulic jack arrangement above the spring is actuated to apply force to locate the spring at the correct height for the test. A pressure gauge adjacent to the fixture shows the pounds of force applied to the spring. A pointer at the side of the fixture indicates the height of the spring under test.

To operate the spring tester, the directional valve, Fig. 34, is positioned so the ram will compress the spring when force is applied. The pump application valve is then opened to initiate the force to lower the spring below the static height to be measured. The directional valve is then placed in the neutral or non-directional position. The relieving valve is then opened slightly to adjust the hydraulic ram pressure to the static pressure at which the spring should be tested.

Springs should be tested at the static height and load value provided in Table B, for the particular spring assembly. As the spring is compressed to 1-1/2 times the static load, take a reading at the specified static load and record the height of the spring. Stop the compression of the spring at 1-1/2 times the static load, then gradually decrease the load to the specified static load. Record the height of the spring and average the two height measurements. The static height of the spring should be within the limits given for that particular spring. After determining the static height, mark the spring assembly according to the following color code.

COLOR CODING SPRINGS

A color code is used to indicate the loaded height of new springs. Brown paint is applied on springs or spring assemblies that are more than 1/16" but do not exceed 3/16" above the nominal static height specified for the spring. Nominal height is the spring height which is used for purposes of identification and as a base for the tolerance limits. Blue paint is applied on springs or spring assemblies

that are 1/16" below to 1/16" above the nominal static height specified for the spring when under the specified load. Green paint is applied on springs or spring assemblies that are more than 1/16" but do not exceed 3/16" below the nominal static height specified.

White paint is applied on springs to identify springs or spring assemblies that are 3/16" to 5/16" below the nominal static height specified for the spring.

Springs that have been tested, color coded and qualified for use should be stored in a protected area to avoid the formation of rust and pits. Pits can cause stress concentration that may result in spring failure when under load. The springs should be stored in groups corresponding to their color code to make their selection easier.

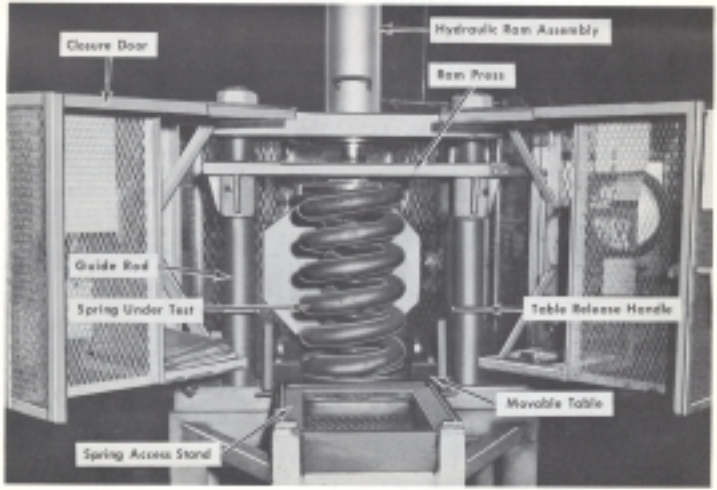


Fig. 34 — Spring Testing Fixture

TRUCK SPRINGS

The flexicoil truck assembly is equipped with coil springs above each journal box and under each corner of the bolster. Various combinations of springs are used to accommodate the loads which may be applied according to the weight specification of a particular locomotive. Spring shim plates and shims of different thickness are used to maintain the proper coupler height. It is important to identify each of the springs according to part number so the spring may be tested at the proper value as listed in Table B.

The current SD and DD trucks use a double coil spring above the journal box assembly which is identical to that used in GP and F type trucks. The old style SD truck uses a triple coil spring which is not interchangeable with the double coil spring.

SPRING TESTING

Springs may be tested on any reliable calibration type testing press or a spring testing machine, Fig. 34, may be made as outlined in File Drawing 447, which is available from Electro-Motive upon request. The fixture may be used to test elliptic type spring assemblies as well as coil springs. Safety wire mesh encloses the working parts of the fixture. When the two hinged doors at the front of the fixture are opened, a movable table within the fixture can be pulled out to facilitate the application of the spring assembly to be tested. The table with the spring to be tested is then pushed into place in the fixture and the eccentric rollers supporting the table are released to provide complete support for the spring. The protective front access doors are closed and locked in place before testing.

A hydraulic jack arrangement above the spring is actuated to apply force to locate the spring at the correct height for the test. A pressure gauge adjacent to the fixture shows the pounds of force applied to the spring. A pointer at the side of the fixture indicates the height of the spring under test.

To operate the spring tester, the directional valve, Fig. 34, is positioned so the ram will compress the spring when force is applied. The pump application valve is then opened to initiate the force to lower the spring below the static height to be measured. The directional valve is then placed in the neutral or non-directional position. The relieving valve is then opened slightly to adjust the hydraulic ram pressure to the static pressure at which the spring should be tested.

Springs should be tested at the static height and load value provided in Table B, for the particular spring assembly. As the spring is compressed to 1-1/2 times the static load, take a reading at the specified static load and record the height of the spring. Stop the compression of the spring at 1-1/2 times the static load, then gradually decrease the load to the specified static load. Record the height of the spring and *average* the two height measurements. The static height of the spring should be within the limits given for that particular spring. After determining the static height, mark the spring assembly according to the following color code.

COLOR CODING SPRINGS

A color code is used to indicate the loaded height of new springs. Brown paint is applied on springs or spring assemblies that are more than 1/16" but do not exceed 3/16" above the nominal static height specified for the spring. Nominal height is the spring height which is used for purposes of identification and as a base for the tolerance limits. Blue paint is applied on springs or spring assemblies

that are 1/16" below to 1/16" above the nominal static height specified for the spring when under the specified load. Green paint is applied on springs or spring assemblies that are more than 1/16" but do not exceed 3/16" below the nominal static height specified.

White paint is applied on springs to identify springs or spring assemblies that are 3/16" to 5/16" below the nominal static height specified for the spring.

Springs that have been tested, color coded and qualified for use should be stored in a protected area to avoid the formation of rust and pits. Pits can cause stress concentration that may result in spring failure when under load. The springs should be stored in groups corresponding to their color code to make their selection easier.

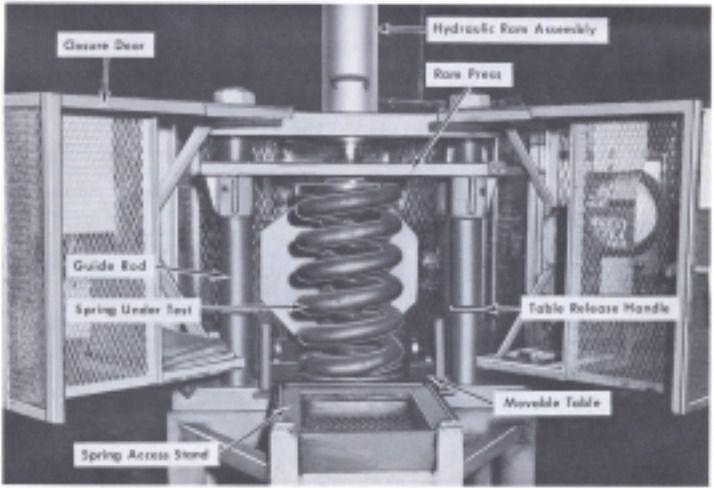


Fig. 34 — Spring Testing Fixture

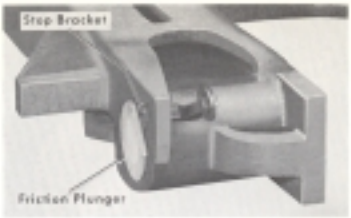
When coil springs are removed from a truck assembly, check them for evidence of cracked or broken coils and replace the assembly if found defective. Recommended practice is to replace both spring sets on one spring seat if any coils have failed. However, if a satisfactory loaded height can be maintained on the old spring set, then the old set may be used. For best performance, individual coils should be matched in assemblies by color and assemblies should be matched as near as possible in trucks.

BOLSTER FRICTION SNUBBERS

Damping of the bolster suspension springs is performed by two friction snubbers on each current SD and DD truck. The old style SD truck had four friction snubbers, one contained in the end of each leg of the bolster, Fig. 35. The current system, Fig. 36, has the snubber pistons or plungers installed in housings which are an integral part of the truck frame at diagonally opposite corners.

A snubber retracting tool and retracting nut, Fig. 36, are used to retract the friction plunger into the friction plunger housing while the bolster is being applied to the truck frame. The tool is screwed into the back of the friction plunger and extended through the plate at the rear of the friction plunger housing as the plunger is installed in the housing. The retracting nut is installed on the tool and tightened until the friction plunger is drawn into the housing enough to allow the bolster to be installed on the truck frame. The retracting tool can be made as outlined in File Drawing 689.

While removing the bolster from the truck frame the friction plunger must again be retracted into the cylinder by using the snubber retracting tool and retracting nut. It is very important to do this or the plunger could fly out of the cylinder when the bolster is removed and possibly cause injury.



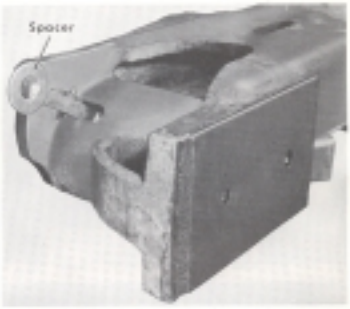


Fig. 35 — Previous SD Friction Snubbing Piston

When the friction plunger is worn 1/4" on its wear surface, a 1/4" spacer can be placed behind the plunger spring to re-establish the correct damping force. This may be repeated after the second 1/4" wear has occurred but after a total of 3/4" wear has occurred, the friction plunger must be replaced.

The previous model SD truck friction plunger is cylindrical with a notch on one side where a tee shaped stop bracket seats preventing rotation of the friction plunger during service. This stop bracket also retains the friction plunger during removal or application of the bolster. After application of the plunger assembly, the stop bracket should be welded in place as shown in Fig. 37. During installation

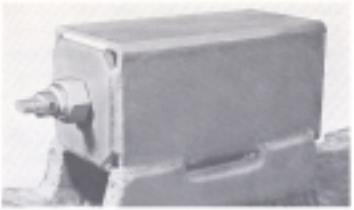


Fig. 36 — Current SD And DD Friction Snubbing Assembly

of the bolster on the truck frame, a 1" spacer is inserted between the stop bracket and notch in the friction plunger to hold the friction plunger inside the housing. Once the bolster is in place the spacers can be removed by pulling the "T" handle.

A special fixture is used, Fig. 37, to apply or remove the friction plunger to the bolster. Construction of this fixture is outlined in File Drawing 454.

After continued use, the wear on the friction plunger will reduce its length and reduce the effect of the spring on the piston. The minimum length permissable from the end of the plunger to the plunger offset is 2-3/4".

BRAKE RIGGING

Inspect the brake rigging to ensure that brake pins, bushings and brake shoes are usable. The wear surfaces of the brake rigging are equipped with replaceable hardened bushings, pins and bolts. Any of these connecting parts that are worn more than 1/16" should have both parts replaced. Never use a new pin with an old bushing or vice versa.

Cylinder levers, brake levers, brake rods and connecting straps that are bent should be re-used only if they are restored to their original shape. Connecting straps worn more than 1/16" should be replaced. If wear is caused by the connecting strap contacting the wheel, the lever pins, bushings, and stabilizer condition and position should be carefully examined. Bolts and nuts that are not subject to wear can be re-used if they are not damaged but cotter pins should always be replaced.

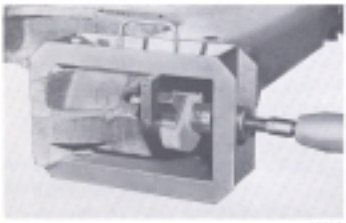


Fig. 37 — Installing Previous Style Friction Snubbing Piston

Due to the current SD brake system being of single shoe design, there are about 1/2 as many maintenance items as on the previous model SD truck.

The current SD and DD trucks use a composition brake shoe rather than the standard cast iron shoe. Since erroneous installation of cast iron brake shoes to the single shoe type SD or DD brake system would result in low braking effort, the brake heads on these models have been designed so that application of the cast iron shoes is impossible.

The current SD trucks are equipped with a release valve mounted on the side frame of the truck, Fig. 38, which bleeds off any resisting air pressure from the brake cylinder that controls the brake shoe connected to the hand brake as the hand brake is applied.

Brake shoe slack adjustment can be made on the current SD or DD truck by loosening the locknut at the plunger end of each brake cylinder, Fig. 38, and turning the cylinder plunger until each brake shoe clears the wheel by at least 3/8". Be sure to tighten the locknut after adjustment is made.

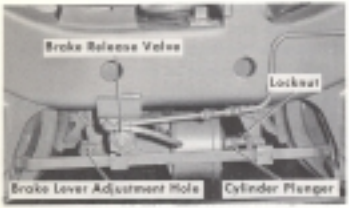


Fig. 38 — Current SD And DD Brake Shoe Adjustment

In addition to this, another method is provided which should be used when a greater amount of adjustment is needed, such as after wheel turning. This adjustment is made by moving the position of the brake lever on the support lug at the inactive side of the double acting brake cylinders. This can be done most conveniently while the locomotive is on a raised track or over a pit.

The previous model SD truck slack adjustment can be made by raising the hinged lock, Fig. 39, and turning the slack adjuster screw head until the brake shoe is at the desired location. When the adjustment has been made, lower the hinged lock over the adjustment screw to prevent the adjustment screw from turning.

When greater adjustment is needed, the position of the brake lever on the connection strap can be adjusted by changing the proper brake lever to an alternate hole location of the connection strap.

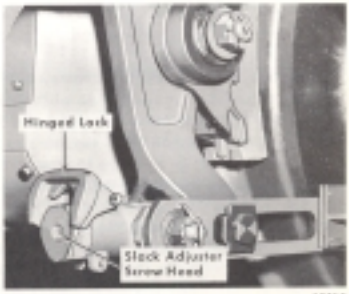


Fig. 39 — Previous Model SD Brake Adjustment

ASSEMBLY OF TRUCK

1. Set the truck frame in an inverted position on blocks at any convenient working height.

2. Install the traction motor nose suspension assembly in place between the frame lugs. Compress the suspension

pack assembly by placing temporary blocks under the nose suspension assembly bolt heads and tightening the nuts. Install the suspension pack retainer pin and pin keepers.

3. Install journal box coil spring assemblies, spring seats, spring shims, and pedestal liners and bolt in place where required.

4. Install brake levers in place, bearing them back to provide enough clearance for the wheel and axle assemblies to be installed.

5. Install pre-assembled wheel, axle and motor assemblies in place by lifting the assembly with a lifting fixture similar to the one in Fig. 40, and lowering between the truck frame pedestals until the journal boxes rest on the coil spring seats.

6. Install brake cylinders and stabilizer bar assemblies on current SD and DD type trucks. On the previous style SD truck install the pedestal tie bar, brake connection straps, slack adjusters and sander guide assemblies.

7. Install tie bar and sander guide assemblies to pedestals on current SD and DD trucks. The DD truck center pedestal tie bars are part of the frame assembly and should already be in place. However, while installing the wheel and axle assemblies in these pedestals the removable pin in one end of the tie bar is taken out and the tie bar swung out to provide clearance for the wheel and axle assembly. When the wheel and axle assembly is installed the tie bars must be swung back into place and the pin inserted through the holes in the truck frame and tie bar.

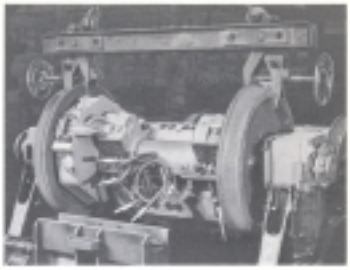


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Fig. 40 — Installing Wheel And Axle Assembly

CAUTION: The two center tie bars on the DD trucks are an important part of the vertical load carrying system and should never be removed when a vertical load is being supported by the truck.

8. Turn the truck assembly over on its wheels and install air brake piping. On the previous SD truck the brake cylinders must be installed at this time.

9. Install the bolster support springs, then set the bolster in place between the bolster pedestals, being sure the friction snubbing plungers are retracted into their housings. Release the friction snubbers so they press against their mating wear plate.

10. When the bolster is set in place be sure the SD truck safety hooks are engaged. The previous style SD truck must have the pin and nut installed in the lower slot of the suspension bars.

11. Install center bearing wear plate and wear ring. Apply a light coat of grease to the dust guard and install on the center casting.

A spring-loaded snubbing piston is located at two diagonally opposite corners on the current model truck frame. These snubbers press against a wear plate on an upright pedestal or bolster wear surface to dampen the oscillating action of the bolster support springs. Stops are provided on the bolster which may contact the inboard side of the bolster stops on the frame, to limit the bolster side movement.

The previous model truck is equipped with a suspension link pinned at each corner of the bolster and extending down through the bolster support spring assembly. The slotted lower end of the link is pinned to the truck frame. The slotted arrangement allows vertical movement of the bolster, but will prevent separation of the bolster from the main frame. The current truck has two diagonally opposite lifting lugs located on the side frame. This arrangement provides easier accessibility as well as reduced number of mechanisms to engage or disengage when installing or removing the truck.

The main frame of the truck is supported on sets of double coil springs, two of which are above each journal box. The journal box transmits the load directly from the springs to the axle. Each journal box is held between two pedestal jaws, which are an integral part of the truck frame. Each pair of pedestals is joined at the bottom by a pedestal tie bar. Renewable pedestal liners and journal box wear plates provide control of clearances between the pedestals and journal boxes.

Three traction motors are supported on their respective drive axles and at suspension assemblies mounted on the frame transoms.

The current model truck incorporates a single shoe brake system, with only one brake shoe contacting each wheel rather than two as on clasp brake systems used on previous SD trucks. Composition brake shoes used on this system provide comparable stopping time from all speeds even with half the number of shoes. Only four brake cylinders are used instead of the six on the previous model SD truck. Since there are fewer parts to wear and fewer shoes to be replaced the maintenance costs are considerably reduced.

EIGHT WHEEL TRUCK

The large diameter bolster center bearing supports the locomotive weight. At each end of the bolster three double coil springs support the bolster and absorb vertical roadbed deflections. The bolster ends are held in place by upright pedestals which are an integral part of the frame. This bolster and pedestal arrangement serves to transmit motive force from the frame to the bolster.

Two snubber housings mounted on the truck frame at diagonally opposite corners of the bolster house spring loaded friction snubbers to dampen the oscillating action of the bolster support springs. Stops are provided on the bolster which may contact the inboard side of the bolster stops on the frame, to limit the bolster side movement.

The main frame of the truck is supported on sets of double coil springs, two above each journal box. The journal box transmits the load directly from the springs to the axle. Each journal box is held between two pedestal jaws, which are an integral part of the truck frame. Each pair of pedestals is joined at the bottom by pedestal tie bars. The two center pedestal tie bars are an important part of the weight carrying system and should not be disconnected with the locomotive weight on the truck. Renewable pedestal liners and journal box wear plates provide control of clearances between the pedestals and journal boxes.