

WEST VIRGINIA DIVISION OF HIGHWAYS
ADMINISTRATIVE OPERATING PROCEDURES
SECTION IV, CHAPTER 5

SECTION TITLE: EQUIPMENT
CHAPTER TITLE: ASSIGNMENT OF REPAIR RESPONSIBILITIES

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 - I. **INFORMATION/POLICY**

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Repair services for DOH heavy equipment are performed at three shop levels; major, intermediate, and minor. The major level is the Equipment Division at Buckhannon; the intermediate level includes the District Shops and the Contract Administration Division Shop, and the minor level includes the County/APD/Interstate Shops.

County Sub-Shops are considered extensions of the County Shop, and their staffing, equipment and work program will be determined by County management so as to best meet the overall needs of the County and District for equipment repairs. However, a Sub-Shop will not be staffed, equipped or programmed for work at a higher level than that prescribed for minor shops.

II. ASSIGNMENT OF RESPONSIBILITIES

The responsibilities of the three shop levels as they relate to equipment repair are listed on the following pages.

A. **MINOR SHOPS (COUNTY, INTERSTATE, AND APD HEADQUARTERS SHOPS)**

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1. Preventive Maintenance (Levels A, B, and C) of all permanently and temporarily assigned equipment.
2. Repair by "component exchange" only within the following equipment systems:

<u>SYSTEM</u>	<u>SCOPE OF WORK</u>
Tires/Chains	All Equipment
Cutting Edges	Bolt-on types only. Weld-on blades with authorization from Equipment Superintendent
Fuel: Gasoline	<u>(only if authorized by the Shop Foreman)</u>
Fuel: Diesel	<u>(only if authorized by the District Equipment Superintendent)</u>
Cooling	All Equipment
Exhaust	All Equipment
Engine Electrical	All Equipment
Operating Electrical (Lights, heater, fans, etc)	All Equipment
Engine Block/Head(s)	<u>(only if authorized by the District Equipment Superintendent)</u> Engine exchange on light field equipment only.
Steering/Front Suspension	On-road equipment only
Transmissions	External components only
Drive Shaft/Axles	On-road equipment only

Rear Suspension	On-road equipment only
Braking	On-road equipment only
Hydraulic	(only if authorized by the District Equipment Superintendent) All equipment
Body/Cab/Frame	Component exchange and minor body work only.
Instruments/Accessories	All Equipment

3. "Minor repairs and adjustments" may be made within the following equipment systems by the Minor Shops.

<u>SYSTEMS</u>	<u>SCOPE OF WORK</u>
Tires/Tracks/Chains	All on-road and light field equipment
Fuel Systems	All gasoline powered equipment
Transmissions	External adjustment and service only
Braking	Adjustments only on heavy field equipment
Body/Cab/Frame	Minor body and welding repairs on assigned equipment only

B. INTERMEDIATE SHOPS (DISTRICT HEADQUARTERS AND CONTRACT ADMINISTRATION SHOPS)

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Although specific categories of repair work are identified for intermediate shops, it is intended that intermediate shops perform all repair work except that expressly excluded. The exclusions are generally those major repairs and other related activities that Equipment Division at Buckhannon is especially equipped and qualified to perform. Questions regarding repair responsibility should be directed to Equipment Division.

1. Preventive Maintenance at all levels on all assigned and temporarily assigned equipment.
2. Diagnosis of uncommon problems.
3. Repairs by component exchange and rebuild within the following equipment systems requires the approval of the District Shop Foreman:

<u>SYSTEMS</u>	<u>SCOPE OF WORK</u>
Tires/Tracks/Chains	All Equipment
Cutting Edges	All Equipment
Fuel	All Equipment
Cooling	All Equipment
Exhaust	All Equipment
Engine Electrical	All Equipment
Engine Blocks/Heads (Exchange only)	(<u>Exchange only - with prior approval from Equipment Division in Buckhannon</u>) All Equipment
Steering/Front Suspension	All Equipment
Transmission/Clutch	<u>Exchange only</u> -All Equipment
Hydraulic	All Equipment
Drive Shaft/Axles	<u>Exchange and Rebuild</u> of Rear Axle and Differential Carrier on All Equipment
Rear Suspension	All Equipment
Braking	All Equipment
Instruments/Accessories	All Equipment

4. Component repair and rebuild within the following equipment systems requires the approval of the District Equipment Superintendent or Contract Administration Equipment Supervisor.

<u>SYSTEMS</u>	<u>SCOPE OF WORK</u>
Engine Block/Heads	With prior approval from Equipment Division, Buckhannon
Transmission (Manual and Automatic)	With prior approval from Equipment Division, Buckhannon
Body/Cab/Frame	Component replacement with associated painting and minor body work on All Equipment. NOTE: If repairs are necessary due to collision damage, approval from Equipment Division in

Buckhannon is required.

C. MAJOR SHOP (EQUIPMENT DIVISION SHOP)

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The Equipment Division Shop will perform all repair and PM services for assigned equipment. The Equipment Division shop will also be responsible for major body work, major equipment modifications, component rebuild for inventory, repair and rehabilitation of diesel engines, and repair and rehabilitation of all crawler equipment.

The various shops should strive to perform the repair services specified above. The minor shop is responsible for repairs to the equipment under its jurisdiction to the extent of its authority and qualifications. Repairs that cannot be made in a minor shop should be transferred to an intermediate shop if it is authorized and qualified to do the work, otherwise the repairs should be transferred to Buckhannon. An intermediate shop is responsible for all repairs to equipment under its immediate jurisdiction to the extent of its authority and qualifications. The District shop is also responsible for certain repairs that the minor shops in its jurisdiction are not authorized or qualified to perform. Repairs that an intermediate shop is not authorized or qualified to perform should be transferred to Buckhannon.

The scope of equipment repair differs at the three shop levels. The scope is substantially limited at the minor shop, it is less limited at the intermediate shop and it is unlimited at the major shop. When equipment is transferred to a higher level shop for repairs which the lower level shop is not authorized to perform, then the lower level shop should clean the equipment and perform all needed repairs which it is authorized to perform prior to transfer.

III. AUTHORIZATION TO PERFORM WORK ON EQUIPMENT

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The source of authority to perform work is governed by a number of factors; types of work, cause of damage requiring repair work, ownership of equipment and other factors. The following table identifies type of work and the individual or organization that authorizes the work.

<u>Work Activity</u>	<u>Who Authorizes Work</u>	<u>Conditions Governing Authority</u>
Minor Repair - PM Detected	Shop Foreman	To level of work authorized in "II."
Minor Repair -	Shop Foreman	To level of work

Operator Detected		authorized in "II."
Repair of Hired Equipment	District Equipment Supervisor	When repairs are allowed for in Lease Agreement
Repair of Hired Equipment	Not Applicable	When repairs are <u>not</u> allowed for in Lease Agreement
Repair of Other Agency Equipment	District Equipment Supervisor	Compliance with Applicable Law and Procedure is required
Repair Caused by Unqualified Operation	District Equipment Supervisor	Compliance with applicable procedure is required
Repair Caused by Accident	Equipment Division	Compliance with applicable law and procedure is required
Repairs Caused by Vandalism	Equipment Division	None
New Equipment Preparation	Equipment Division	None
Fabrication and Modification	Equipment Division	None
Preparation of Equipment for Disposal	Equipment Division	None
Component Rebuild for Inventory	Equipment Division	None

IV. MINOR SHOP REPAIRS

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The major shop performs equipment repairs more efficiently than do the intermediate shops. The intermediate shops perform equipment repairs more efficiently than do the minor shops. This improved efficiency results primarily from the following:

- Larger work space
- Better and more sophisticated tools and equipment

- More mechanic and support personnel
- Better opportunity for personnel training
- Larger parts storage
- Greater flexibility in managing personnel and repair work which results in fewer mechanic interruptions.

Repair efficiency is measured in hours of equipment downtime per hour of standard work time. In minor shops, the average efficiency is 1.6 hours of downtime per standard hour of work time for jobs up to three hours in length. Larger jobs have progressively smaller efficiency in minor shops. Intermediate shops, on the other hand, have an average efficiency of 1.25 hours of downtime per hour of standard work time for jobs up to eight hours in length. Larger jobs have progressively less efficiency in intermediate shops.

It is evident from the foregoing that equipment can be transferred from minor to intermediate shops under certain conditions and reduce the downtime of equipment needing repairs.

As a matter of policy, therefore, the Division will consider the transfer of equipment from minor shops to intermediate shops for repair purposed under two (2) conditions:

1. The minor shop is not equipped or authorized to perform the needed repairs, or
2. The minor shop is equipped and authorized to perform the repairs, but a savings in equipment downtime of at least 20% can be realized by having the work done in an intermediate shop. The conditions set forth in the following table will permit such a savings in downtime, and when those conditions prevail and the intermediate shop can perform the repairs without unnecessary delays, then the transfer should be effected.

<u>Standard Hours Required to Perform Needed Repairs</u>	<u>Round Trip Travel Time to Intermediate Shop</u>
4.0 to 4.5	1.0 hour or less
4.5 to 5.0	2.0 hours or less
5.0 to 5.5	3.5 hours or less
5.5 to 6.0	5.0 hours or less

Repair work requiring more than six standard hours should not be done in a minor shop unless it is approved by the Equipment Division.

V. INTERMEDIATE SHOP REPAIRS

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Although the major shop performs repairs more efficiently than intermediate shops, the difference in efficiency is not enough to cause a 20% savings in equipment downtime by transferring repair equipment from the intermediate shops to Buckhannon.

Accordingly, intermediate shops should strive to perform all equipment repair services specified for intermediate shops in part "II.". Equipment repairs to be sent to Buckhannon will be those for which the Buckhannon shop is especially equipped to perform. In the event intermediate shops are not initially equipped to perform all repair services specified in Paragraph (2) above, then they should make special arrangement with the Equipment Division to have the needed repairs performed. Thereafter, the deficient shop should acquire the needed tools and equipment and perform the specified services.

VI. COMMERCIAL REPAIRS

The demand for equipment repairs may become so great at certain locations and at certain times that the existing capability will not permit an efficient rendering of the needed repair services.

If a backlog of repairs should develop at a minor shop so that equipment must be down for at least five working days before needed repairs can be started, then negotiations should be undertaken with the intermediate shop to share the repair workload.

If a backlog of repairs should develop at an intermediate shop so that equipment must be down for ten working days or more before needed repairs can be started and the equipment is in demand in performing the current workload, then the shop should consult the Buckhannon shop for assistance in performing the needed repairs. If the Buckhannon shop cannot perform the needed repairs and improve the ten working day downtime, then Equipment Division may authorize the repairs to be performed at a commercial shop. Procedures to implement this policy must be prepared by Equipment Division and approved by the Deputy State Highway Engineer-Operations.

If a backlog of equipment should develop in the Equipment Repair Line in Buckhannon so that equipment must be down for 30 working days or more before needed repairs can be started, and the equipment is in demand in performing the current workload, then Equipment Division may have the equipment repaired in a commercial shop. Procedures to implement this policy must be prepared by Equipment Division and approved by the Deputy State Highway Engineer-Operations.

VII. EQUIPMENT TRANSPORT

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Equipment may be transported to and from shops or between shops for the purpose of performing repairs or preventive maintenance (PM).

Operating organizations (Counties/APD/Interstate/Contract Administration Division, etc.) have a certain capacity to transport equipment. This capacity is evidenced in the smaller tilt trailers, utility trailers, flat bed trucks, etc.

When an operating unit transports equipment for the purpose of PM or repair, it will use its transport equipment to the limit of its carrying capacity to provide the necessary transportation. Equipment transport provided by the operating unit, including unproductive use accruing to the transport equipment on the day(s) of transport, will be charged to

Equipment Division. Whole days of unproductive use of this transport equipment will be charged to the owning organization.

Equipment Division also has a capacity to transport equipment. Its capacity is evidenced in the larger trailers (lowboys, large tilt trailers, etc.). These trailers are located at Buckhannon and at the various District Headquarters. Equipment transport provided by Equipment Division, including unproductive use accruing to the transport equipment on the day(s) of transport, will be charged to Equipment Division. Whole days of unproductive use of this equipment will also be charged to Equipment Division.

The foregoing relates to the transportation of equipment for the purpose of performing PM or repair.

The transport of equipment from Buckhannon, an equipment pool, or a user organization to another user organization will be charged to the receiver.

The following examples will illustrate the foregoing:

1. Gilmer County has an endloader (Class 353) assigned to a maintenance crew when it became inoperative. The County uses a Class 371 dump truck and a Class 253 trailer to deliver the endloader to the County shop. On the day of transport, the truck and trailer performed no other service; therefore, all costs accruing to the truck and trailer on the day of transport are charged to Equipment Division.
2. A few days after an endloader was placed in the Gilmer County shop for repairs, it was required to be transferred to the District shop at Weston for additional repair work. Gilmer County used its Class 253 trailer and a Class 371 dump truck to transfer the endloader. The trailer performed no other service on the day of transport but the dump truck did perform other services. The total cost for the trailer on the day of transport is charged to Equipment Division but only a prorated portion of the truck cost is charged. The balance of the truck cost is charged against the other activity performed.
3. Wetzel County had a Class 401 grader down. The District Equipment Supervisor sent a tractor-trailer rig to deliver the grader to the District shop and the same rig was used to return the grader to Wetzel County. All costs accruing to the tractor-trailer rig on the days of transport were charged to Equipment Division.
4. Clay County needs a Class 300 dozer to perform maintenance work. The (County) Highway Administrator informs the Assistant District Administrator-Maintenance of his need. The Assistant District Administrator-Maintenance locates the equipment in Mason County and authorizes its transfer. The District Equipment Supervisor provides a tractor-trailer to move the dozer to Clay County. The cost of the tractor-trailer for the full transport is charged to Clay County since the tractor-trailer performed no other service on that day.
5. Clay County needs to transfer its Class 300 dozer from one job to another but its transport equipment does not have sufficient carrying capacity. The District Equipment Supervisor provides a tractor-trailer to transfer the dozer to the new job. The cost of the tractor-trailer is charged to the job receiving the dozer if it is funded; otherwise, it is charged to the County in which the new job is located.