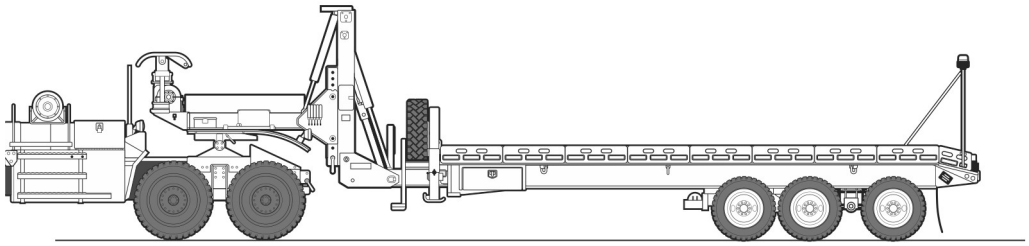
TM 9-2320-451-23&P-1

TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR

MODULAR CATASTROPHIC RECOVERY SYSTEM (MCRS) (NSN 2320-01-560-4409) P/N FWHM983 (EIC 1TC)



G06045100001

HEADQUARTERS, DEPARTMENT OF THE ARMY

19 DECEMBER 2018

OPERATOR

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The Modular Catastrophic Recovery System (MCRS) (Figure 1) is a multi-component recovery system consisting of a Fifth Wheel Towing and Recovery Device (FWTRD), which engages into the Tilt Deck Recovery Trailer (TDRT). The MCRS imposes a downward load on the prime mover at the fifth wheel. Towed weight is evenly distributed on all axles of the prime mover. The operator maintains safe steering and braking of the prime mover and the vehicle in tow. Because the load pivots at the fifth wheel, turning ability and off-road mobility are significantly increased.

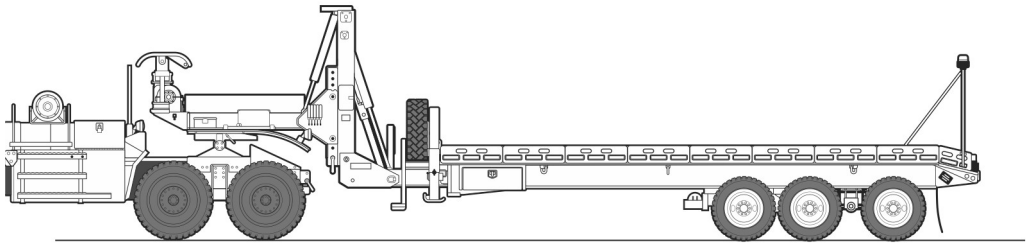


Figure 1. Modular Catastrophic Recovery System.

The FWTRD can be utilized independently of the TDRT. It is equipped with a dedicated 35K power operated drum winch assembly and boom caps to provide a stable platform for recovery winching. The prime mover's heavy duty 45K winch can also be utilized, alone, or with the FWTRD for straight pulls (Figure 2).

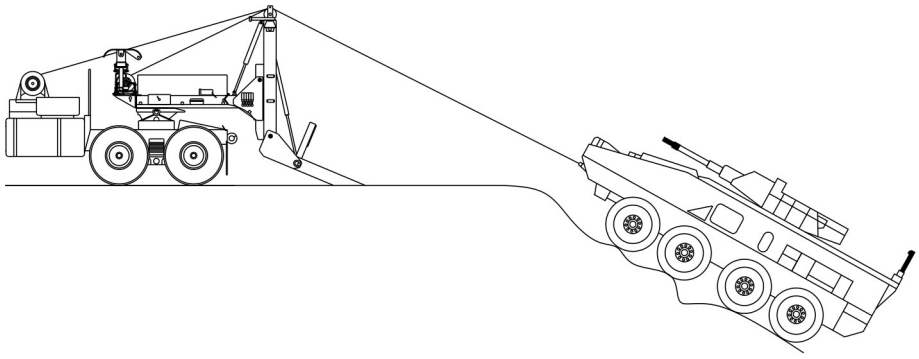


Figure 2. FWTRD Recovery Winching Straight Pull.

The 35K power operated drum winch assembly also allows for recovery of vehicles at 90 degrees to the prime mover (Figure 3).

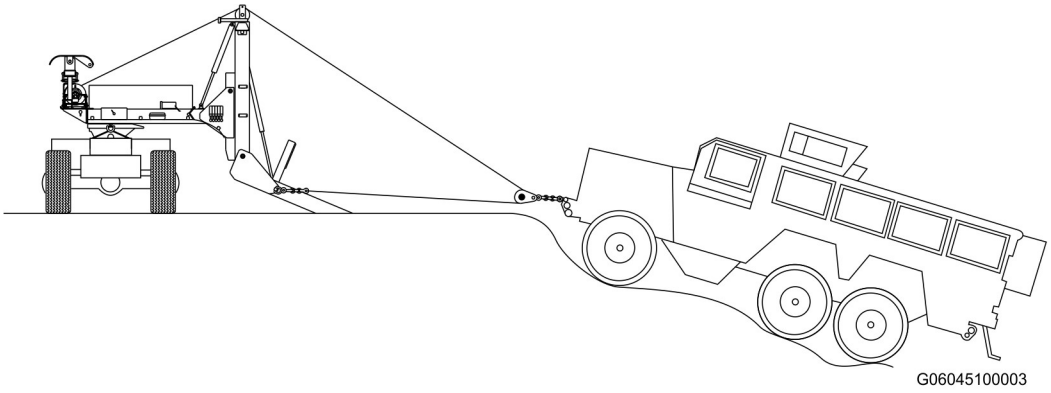


Figure 3. FWTRD Recovery Winching 90 Degree Pull.

The axles of the TDRT slide forward allowing the bed to tilt to the rear for loading. The TDRT deck is 102 in (259 cm) wide, and drawers are included for expansion to 114 in (289.5 cm) to accommodate wider vehicles. Disabled vehicles are winched onto the TDRT deck using the FWTRD 35K power operated drum winch assembly and/or prime mover 45K winch (Figure 4, Item 1). With the TDRT axles (Figure 4, Item 2) in transport position, the load is safely moved.

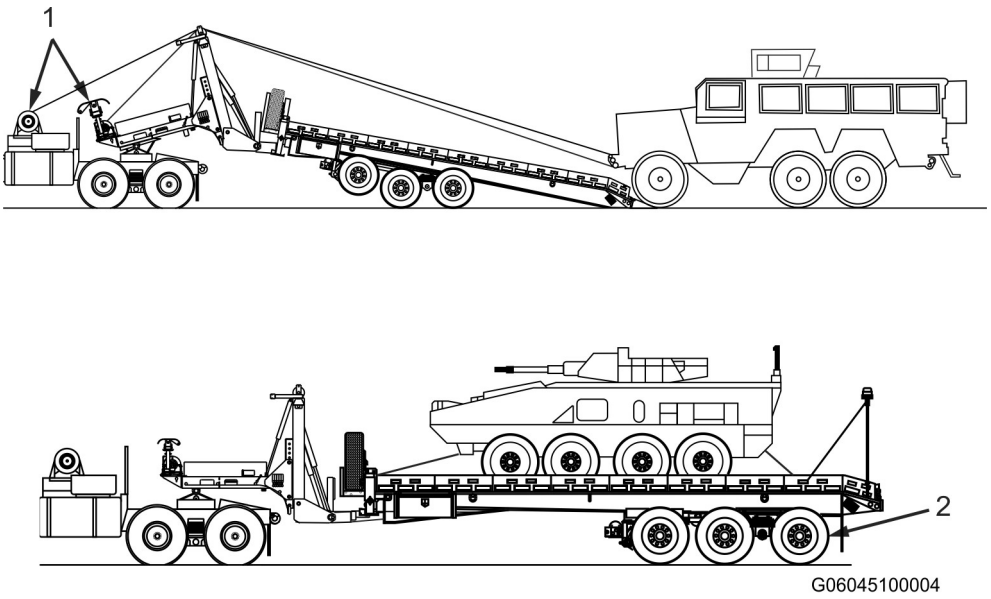


Figure 4. TDRT Recovery Winching and Transport Configuration.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

FIFTH WHEEL TOWING AND RECOVERY DEVICE (FWTRD) (DRIVER SIDE)

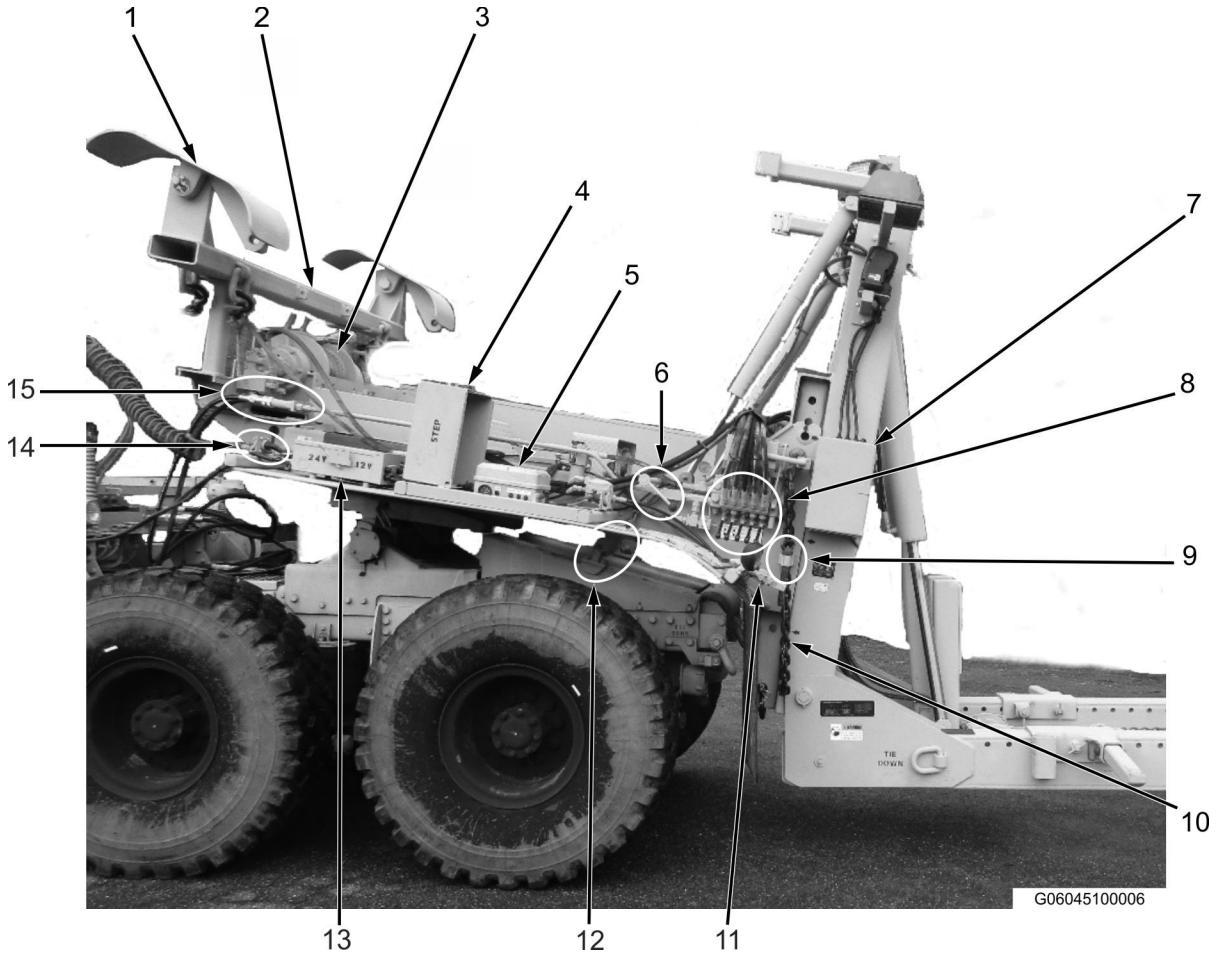


Figure 5. FWTRD Major Components (Driver Side).

Table 1. FWTRD Major Components (Driver Side).

Item Number	Component	Description
1	Sledding Shoes	Used to recover STRYKER with catastrophic damage to either the front or rear axle/suspension.
2	Stabilizer Bar	Used in conjunction with sledding shoes to recover vehicles with catastrophic damage to either the front or rear axle/suspension.
3	35K Power Operated Drum Winch	A hauling device consisting of a cable winding around a horizontal rotating drum, turned by a motor. Rated capacity is 35,000 lb (15,875 kg).
4	Vehicular Components Cover	Provides protection for the modified power distribution console.
5	Modified Power Distribution Console	Provides power to hydraulic pumps/motors during electric operation.
6	Manual Control Lever	Provides the ability to engage or disengage the vehicular tow bar adapters.
7	Alternate Outer Distribution Box	Stowage box for the power distribution console assembly.

Item Number	Component	Description
8	Hydraulic Manifold Assembly with Levers	Manual controls for FWTRD hydraulic functions.
9	Pivot Pin	Allows mast to be folded or unfolded during FWTRD operation.
10	Double Hook 6 ft Chain Assembly	Allows for rear chaining of lift-tow procedures.
11	Rear Hose Coupling Assembly	Allows the FWTRD to supply air for the towed vehicle brakes via air line connections.
12	Vehicular Tow Bar Adapters (Transport Leg Assembly)	Supports FWTRD during transport. Transport legs are not used during lift-tow operation.
13	Modified Junction Box	Contains voltage selector switch and provides 12 VDC or 24 VDC to modified power distribution console.
14	Blackout Junction Branched Wiring Harness Electrical Receptacle	Provides FWTRD with prime mover power.
15	Wet Line Connections	Provides the FWTRD with prime mover hydraulics.

FIFTH WHEEL TOWING AND RECOVERY DEVICE (FWTRD) (PASSENGER SIDE)

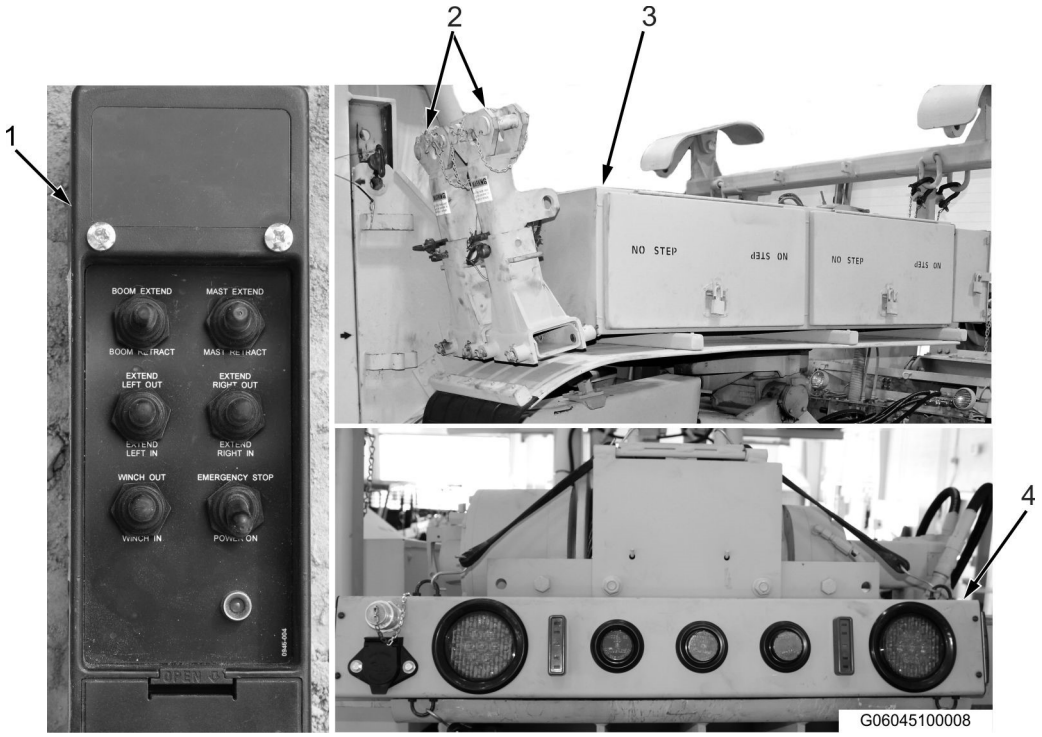


Figure 6. FWTRD Major Components (Passenger Side).

Table 2. FWTRD Major Components (Passenger Side).

Item Number	Component	Description
1	Remote Switching Control (Stowed in Accessories Stowage Box)	Allows for remote switching control of all FWTRD hydraulic functions.
2	Vehicular Tow Bar Adapters	Provides stable connection between FWTRD and vehicular tow bar adapter attachment point of towed vehicle.
3	Accessories Stowage Box	Purpose is to store tools and Basic Issue Items (BII).
4	12/24 Volt Tow Light Bar	The 12/24 VDC tow light has combination stop, turn, taillights, red clearance lights on both sides, and blackout lights.

FIFTH WHEEL TOWING AND RECOVERY DEVICE (FWTRD) (FRONT VIEW)

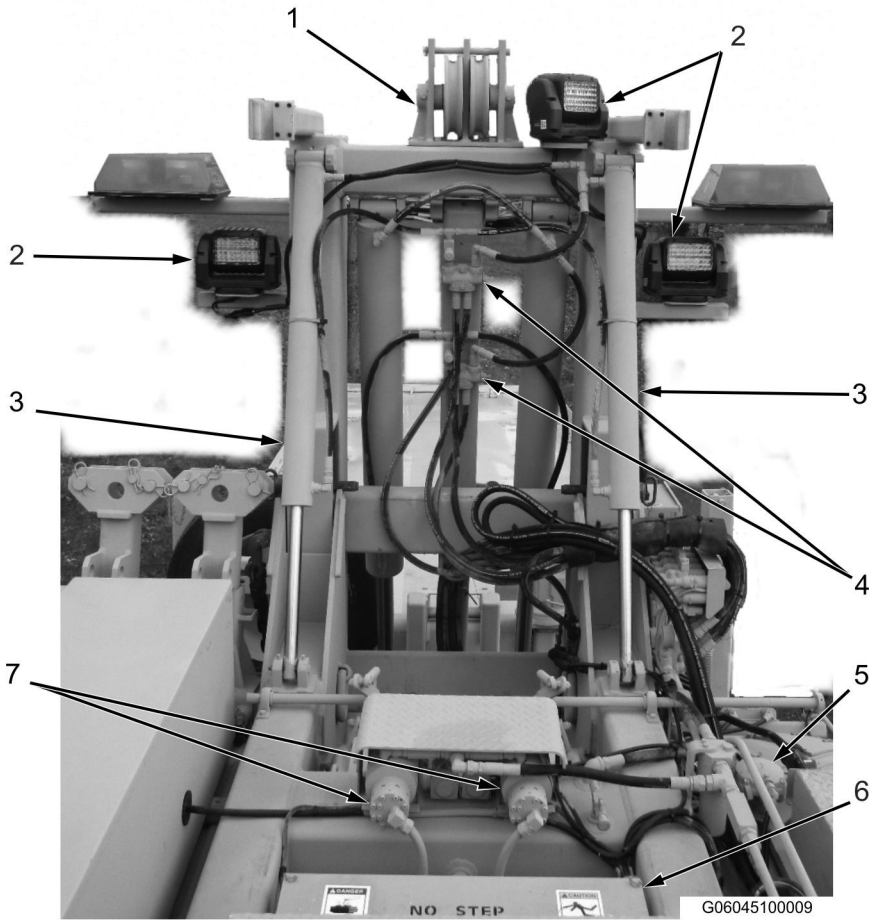


Figure 7. FWTRD Major Components (Front View).

Table 3. FWTRD Major Components (Front View).

Item Number	Component	Description
1	Groove Pulley	Accepts wire rope during winch recovery operations.
2	Floodlight Assembly	Allows for nighttime recovery operations utilizing white or infrared light.
3	Linear Actuating Cylinder Assembly (Mast Cylinder)	Hydraulically allows positioning of the mast.
4	Hydraulic Safety Valves	Prevents accidental hydraulic cylinder movement if FWTRD manual control levers are engaged with no hydraulic pressure present.
5	Air Pressure Relay Valve	Pressure relay valves are used to isolate auxiliary air systems from the brake system. This is done to preserve air for braking in the event that the auxiliary system develops a major leak.
6	Battery Box	Contains two 12-volt deep cycle wet batteries in a cradle so that no matter what position the FWTRD is operated in, the batteries remain upright to eliminate any potential acid spill.
7	Hydraulic Motors	Consists of fittings and hoses. The hydraulic motor provides hydraulic pressure when electric operation of FWTRD is needed.

FIFTH WHEEL TOWING AND RECOVERY DEVICE (FWTRD) (REAR VIEW)

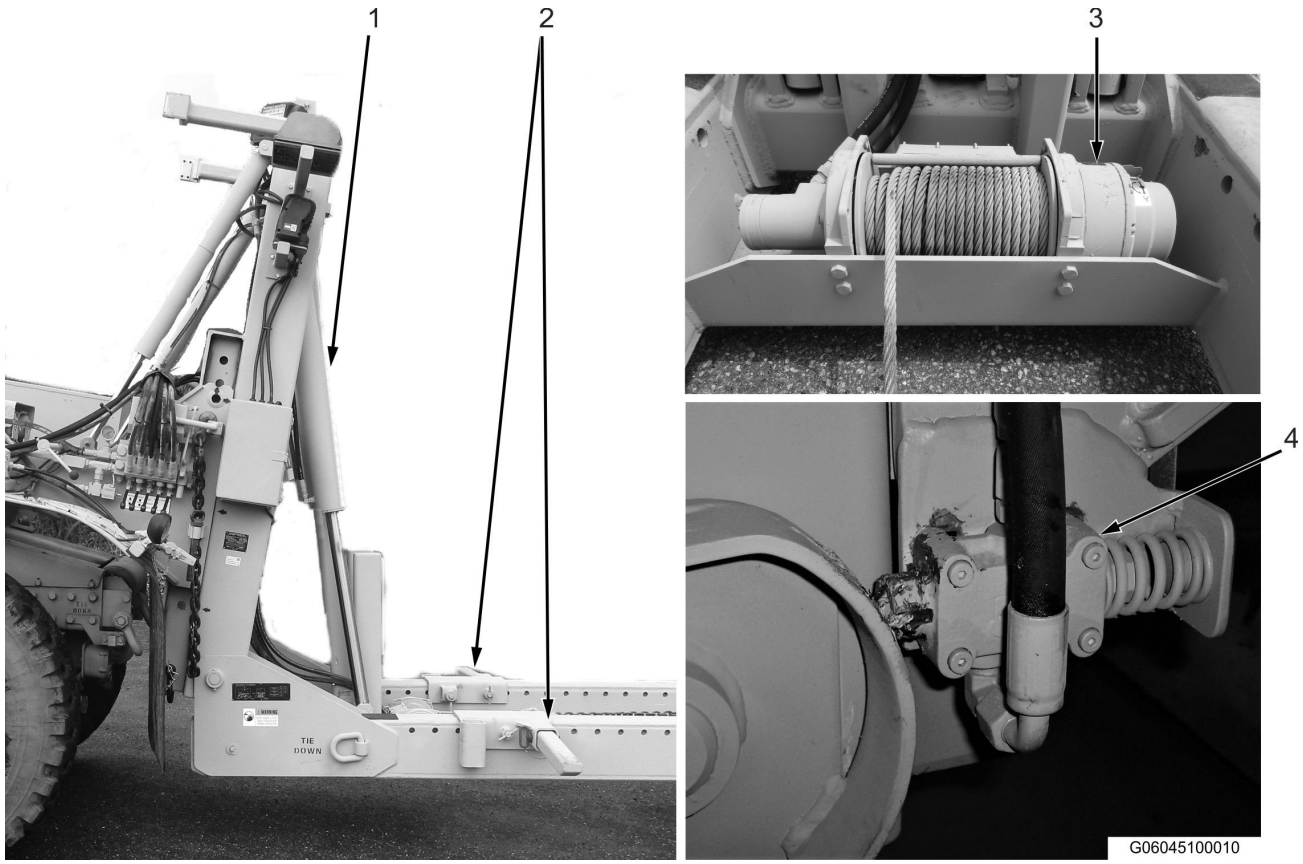


Figure 8. FWTRD Major Components (Rear View).

Table 4. FWTRD Major Components (Rear View).

Item Number	Component	Description
1	Linear Actuating Cylinder Assembly (Boom Cylinder)	Hydraulically allows positioning of the booms.
2	Receiver and Mechanical Stop Assembly	Acts as a forward stop and allows vehicle being towed to stay at desired distance from FWTRD.
3	18K Vehicle Mounting Drum Winch	A hauling device consisting of a cable and single leg chain assemblies winding around a horizontal rotating drum, turned by a motor. Rated capacity is 18,000 lb (8,164 kg).
4	Safety Relief Valve	Prevents accidental overextension of the mast during lift-tow operations.

FIFTH WHEEL TOWING AND RECOVERY DEVICE (FWTRD) (FIFTH WHEEL SECTION)

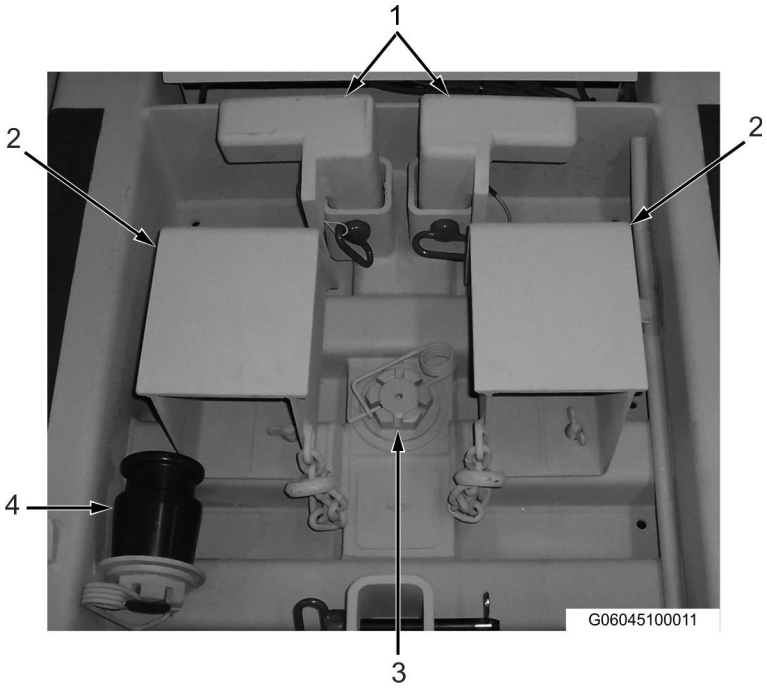


Figure 9. FWTRD (Miscellaneous Major Components).

Table 5. FWTRD (Miscellaneous Major Components).

Item Number	Component	Description
1	Vehicle Mounting A-Frame	Used in place of mechanical stops during STRYKER recovery.
2	Boom Caps	When installed, act as spades for the FWTRD booms during winch recovery operations.
3	Kingpin	3.5 in (8.9 cm) provided for use with FWTRD.
4	Kingpin	2 in (5.08 cm) provided for use with FWTRD.

TILT DECK RECOVERY TRAILER (TDRT) (MAJOR COMPONENTS)

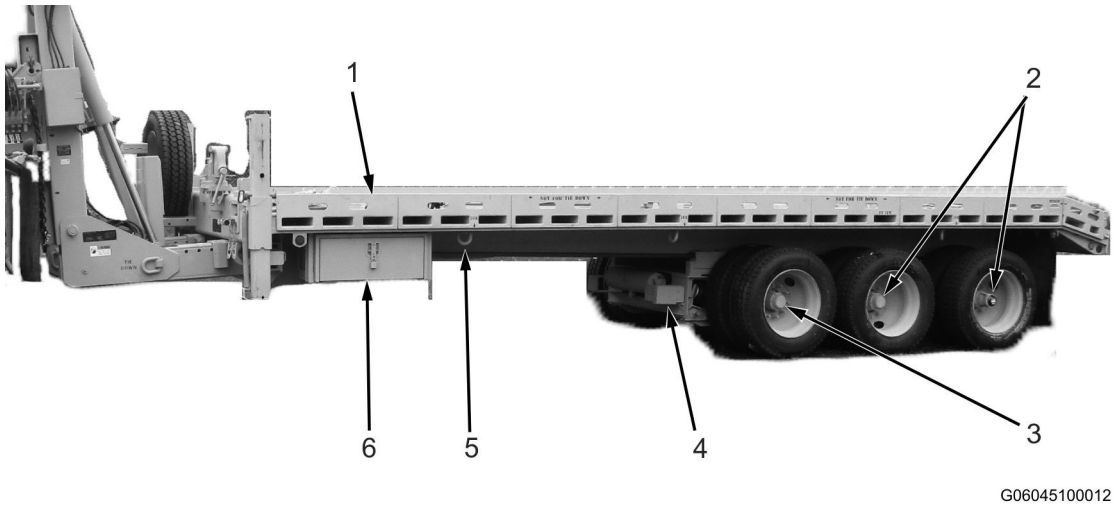


Figure 10. TDRT (Major Components).

Table 6. TDRT (Major Components).

Item Number	Component	Description
1	Trailer Platform Sections	The TDRT deck is expandable from 102 in (259 cm) to 114 in (289 cm). There are a total of 18 trailer platform sections, nine on each side of the TDRT. Expand the TDRT by sliding the drawer sections out and securing with setscrews.
2	Tandem Rear Axle	Main axles of TDRT with a combined payload capacity of 52,000 lb (23,586 kg).
3	Lifting Axle Assembly	Air-operated axle that when deployed increases payload capacity by 25,000 lb (11,339 kg).
4	TDRT Control Panel	This panel contains the controls for the axle assembly locking pin, and the forward lift axle control.
5	Supplemental Tie Down Rings	Six located below TDRT deck. Used for securing TDRT for transport. Rated for 10,000 lb (4,535 kg).
6	Accessories Stowage Box	There are two accessories stowage boxes, one on each side of the TDRT. The accessories stowage box stores tools and other necessary equipment.

TILT DECK RECOVERY TRAILER (TDRT) (FRONT VIEW)

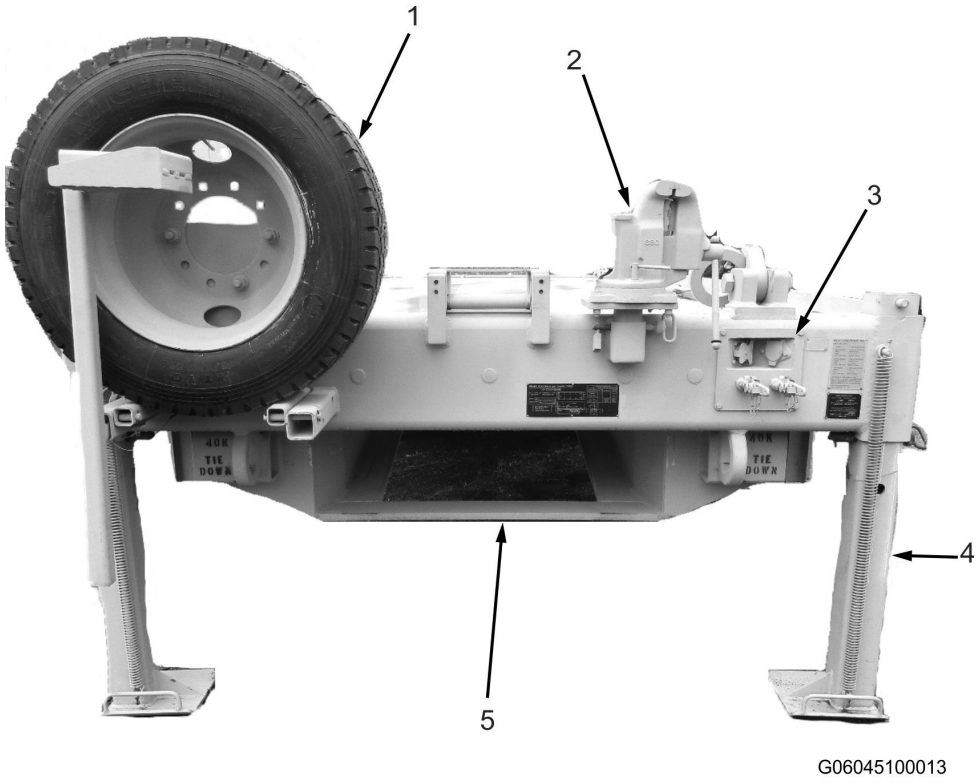


Figure 11. TDRT Major Components (Front View).

Table 7. TDRT Major Components (Front View).

Item Number	Component	Description
1	Vehicular Pneumatic Tire	Replaces damaged tire.
2	Bench and Pipe Vise	Secures components during maintenance.
3	TDRT Junction Box	Allows for lighting and supply air for brakes.

Item Number	Component	Description
4	Landing Legs	These legs are manually positioned and pinned as needed for operation. Supports TDRT when not in use.
5	Mating Cove	Accepts FWTRD booms during coupling.

TILT DECK RECOVERY TRAILER (TDRT) (REAR VIEW)

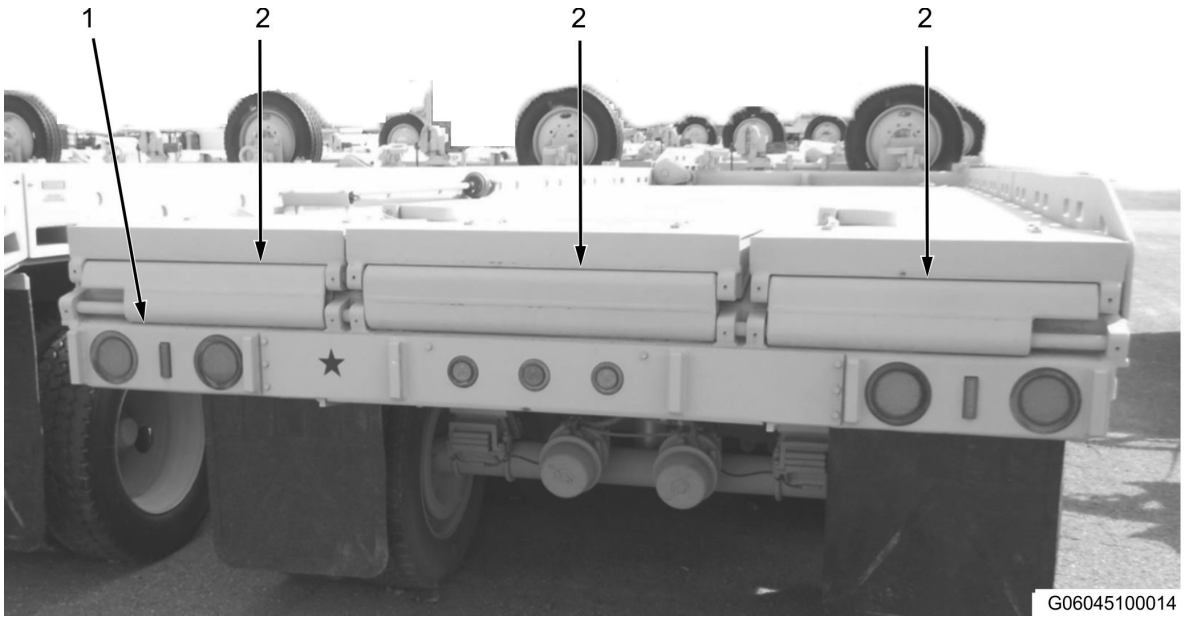


Figure 12. TDRT Major Components (Rear View).

Table 8. TDRT Major Components (Rear View).

Item Number	Component	Description
1	Tail Light Assembly	Includes stop, turn, and blackout lighting for TDRT operation.
2	Three-Piece Ramp Sections	The tail of the TDRT is made up of three sections that fold up onto trailer deck for transport. When unfolded, they allow for a wider approach angle.

TILT DECK RECOVERY TRAILER (TDRT) (MISCELLANEOUS)

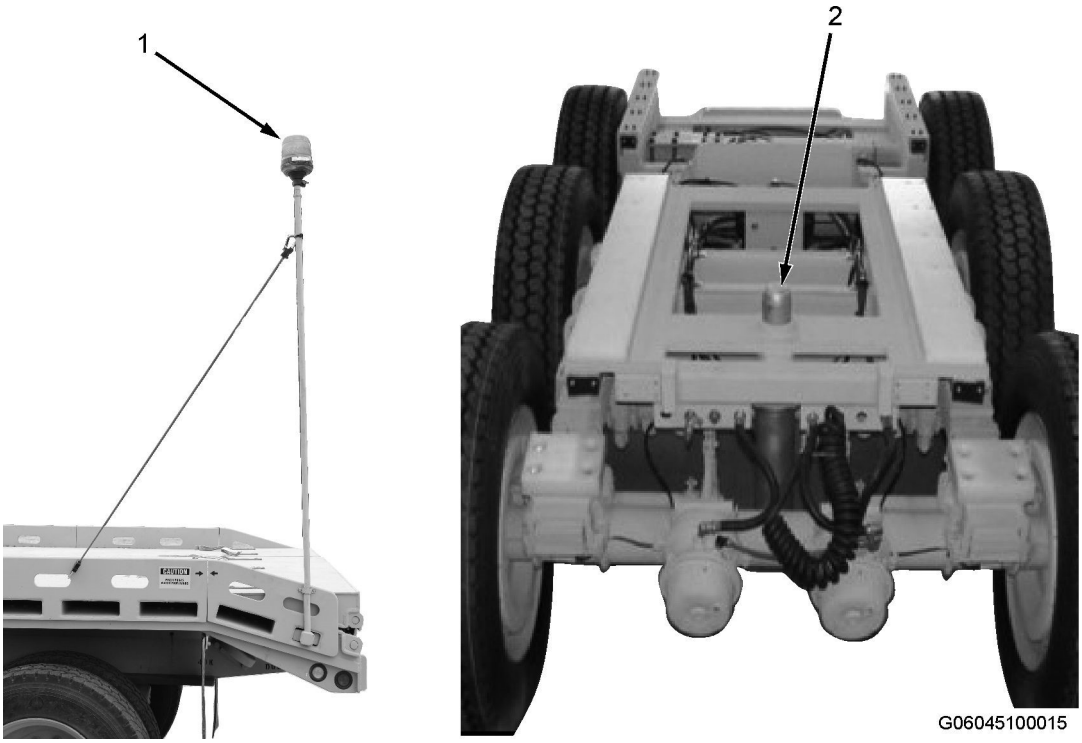


Figure 13. TDRT Major Components (Miscellaneous).

Table 9. TDRT Major Components (Miscellaneous).

Item Number	Component	Description
1	Pole Light	Installed on TDRT during convoy transport operations.
2	Sliding Axle Locking Pin (Axle removed for clarity)	This pin locks the axles in the transport configuration.

EQUIPMENT DATA

Table 10. MCRS Equipment Data.

Item	Characteristics
Overall Dimensions:	
MCRS	
Length (FWTRD coupled to TDRT)	42 ft 10 in (13.0m)
Length (MCRS coupled to M983A4 LET)	63 ft (19.2 m)
FWTRD	
Length (Fully Extended)	30 ft 7 in (9.35m)
Length (Transport Configuration)	12 ft 6 in (3.81 m)
Width	7 ft 7 in (2.31 m)
Height (Transport Configuration)	5 ft 4 in (1.53 m)
Height (Towing Configuration)	9 ft 4 in (2.84 m)
Height (Maximum Height on Ground)	13 ft 6 in (4.11 m)
Height (Maximum Height, Coupled, Boom Vertical)	11 ft 7 in (3.53 m) + height of fifth wheel
TDRT	
Length (Travel)	28 ft 9 in (8.75m)
Length (Load)	30 ft 7 in (9.35m)
Width (Drawers retracted)	8 ft 6 in (2.60m)
Width (Drawers extended)	9 ft 6 in (2.90m)
Height (Deck)	4 ft 3 in (1.30m)
Height (Overall)	7 ft (2.1m)
Vehicle Weights:	
Net Weight (FWTRD w/BII)	11,470 lb (5,214 kg)
Net Weight (TDRT less FWTRD)	27,980 lb (12,718 kg)
Maximum Towing Gross Combined Weight (Highway or Improved Roads)	150,000 lb (68,038 kg)
Maximum Towing Gross Combined Weight (Cross Country)	150,000 lb (68,038 kg)
Electrical Item:	
Type	12/24 VDC
Lights	12/24 VDC
Hydraulic Electrical Motor (Primary)	12 VDC
Hydraulic Electrical Motor (Isolated)	12 VDC
Batteries	12 VDC
Solenoids (Primary)	12 VDC
Solenoids (Isolated)	12 VDC
Speed:	
Transport (Highway and Improved Roads)	50 mph (80.5 km/h)
Transport (Unimproved Roads and Cross Country)	50 mph (80.5 km/h)
Towing (FWTRD - Highway and Improved Roads)	50 mph (80.5 km/h)
Towing (FWTRD - Unimproved Roads and Cross Country)	15 mph (40.2 km/h)
Towing (MCRS - Highway)	45 mph (72.5 km/h)
Towing (MCRS - Improved Roads)	30 mph (48.5 km/h)

Item	Characteristics
Towing (Unimproved Roads (Graded Gravel) and Cross Country)	10 mph (16.0 km/h)
Hydraulic System:	
Total System Capacity	19.0 gal (71.9 L)
FWTRD Reservoir Capacity	8.75 gal (33.1 L)
Operating Pressure during mast and boom operations (No Load)	300-800 psi (2,068-5,515 kPa)
Operating Pressure during mast and boom operations (With Load)	Up to 3,000 psi (20,684 kPa)
Winches:	
18K Vehicle Mounting Drum Winch Capacity	18,000 lb (8,164 kg)
18K Vehicle Mounting Drum Winch with Pulley Block Capacity	36,000 lb (16,329 kg)
35K Power Operated Drum Winch Capacity	35,000 lb (15,875 kg)
35K Power Operated Drum Winch with Pulley Block Capacity	70,000 lb (31,751 kg)

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