

Yale[®]

HOISTS

INSTRUCTIONS AND PARTS LIST

ADT

Air Motor Driven Trolleys

1/4 - 3 Ton Rated Loads

GENERAL

These Air Motor Drive Trolleys are designed for use on YALE[®] YAL air hoists. They attach directly to a suspension bracket or mounting lug at top of hoist. Special field conversion kits (see below) are available to accommodate use of these trolleys on existing hook type YALE air hoists.

Specifications herein subject to change without notice.

▲WARNING

This equipment is not suitable or designed to be used in conjunction with lifting or lowering persons.

YALE HOIST FIELD CONVERSION KITS

Catalog No.	Description
905421	Lug Suspension Kit - 1 Ton
905422	Lug Suspension Kit - 2 Ton
905424	Lug Suspension Kit - 3 Ton

Above lug suspension kits contain a suspension lug assembly which is installed in place of the hoist upper hook. Instructions for installing these kits are not included in this booklet. They are furnished in each kit.

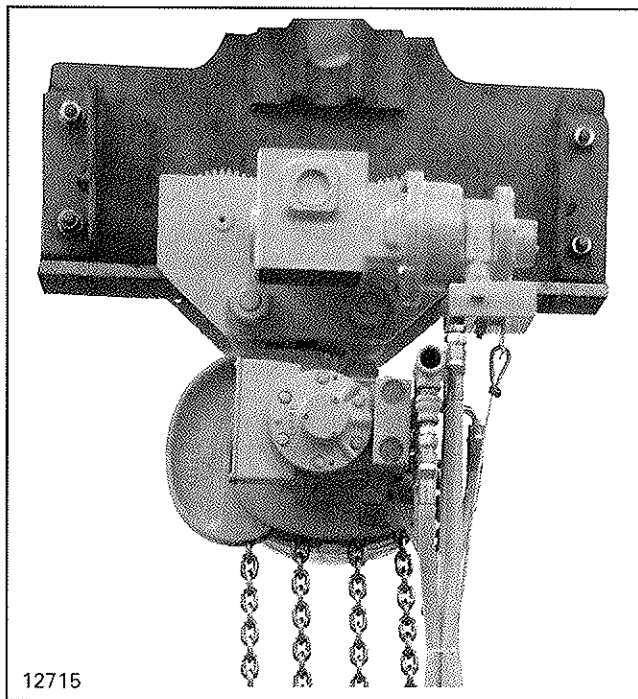


Figure 1. Standard Trolley and Hoist.

A standard 3 ton Air Motor Driven Trolley is illustrated in Figure 1. The pendant and hose assembly is shipped loose and should be attached after trolley and hoist installation.

Assembly of your new trolley to your hoist and installation of the complete unit on its runway beam can be accomplished with a minimum of effort by following the instructions given below.

▲WARNING

Since rigid mounting does not allow hoist to rotate with pull of load, rigid mounted air motor driven trolleys must not be used with hoists having roller type load chain.

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ASSEMBLY OF TROLLEY TO HOIST

NOTE: If trolley is to be used on an existing YALE hoist, the necessary hoist conversion kit should be first installed following instructions furnished with kit.

Place hoist on workbench, suspension lug facing up, and proceed as follows:

1. On YALE hoists make certain that lug on hoist is properly oriented and installed before attachment to trolley. All YALE air hoists are cross mounted so that the reeving is parallel to the beam and the trolley air motor should be on the same side of the runway beam as the hoist air motor.
2. Determine proper spacing for trolley side plates so that adequate wheel clearance (approximately 1/8") is provided on both sides of I-beam, between inside faces of wheel flanges and edges of bottom beam flange. Proper spacing is obtained by varying the number of spacer washers (furnished with trolley) installed on suspension cross pins between suspension lug and trolley side plates (Figure 2).

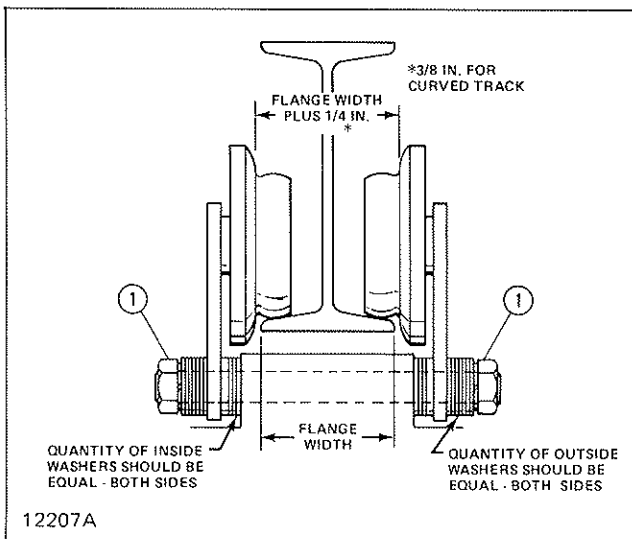


Figure 2. Proper Wheel Spacing.

3. Due to manufacturing tolerances, I-beams having the same size designations may have varying dimensions making it impossible to prescribe the specific number of spacer washers required between trolley side plates and suspension lug for any given beam size. It will, therefore, be necessary to determine the spacer washer requirement by "trial and error" assembly.

a. First measure the exact width of bottom flange on runway beam, and then add 1/4" to that measurement (3/8" for curved beam). The total is the required distance between inside faces of wheel flanges to obtain satisfactory wheel operating clearance. See Figure 2.

b. Temporarily assemble trolley to hoist using about 3 or 4 washers at each end of suspension pins, between side plates and suspension lug. Tighten pin nuts for accurate check of spacing.

c. Measure distance between inside faces of wheel flanges and compare with the total dimension obtained in paragraph a. above.

d. Remove trolley sides and add or remove an equal number of inside spacer washers as required to obtain proper distance between wheels.

e. When wheel spacing is correct, remaining spacer washers are to be installed on outside ends of suspension pins (see note below) and the pins then secured with lockwashers and hex nuts. The nuts (1, Figure 2) should not be completely tightened until after hoist and trolley are mounted on runway beam.

NOTE: It is important that all spacer washers that come with trolley be used. Install remaining spacer washers equally on outside ends of pins.

INSTALLING TROLLEY AND HOIST

1. Hoist and trolley combination may be installed on runway beam by either of two methods.

a. If one end of beam is open or exposed, trolley may be installed by sliding it onto beam.

b. If trolley cannot be slid over end of beam, remove hex nuts (1, Figure 2), lockwashers and outer spacer washers from pins on one side of trolley. Spread or re-

move one side plate to facilitate positioning trolley over bottom flange of beam. Reinstall side plate, outer spacer washers, lockwashers and hex nuts on suspension pins.

⚠ WARNING

After trolley has been installed on beam, make sure suitable stop(s) is secured on open ended beams to prevent trolley from rolling off the beam (stops should contact trolley side plates, not wheels). Make certain that all spacer washers and lockwashers are in place on suspension pins and that hex nuts are tight. Recheck clearance dimensions between wheel flanges and beam flanges (Figure 2).

CONNECTING TROLLEY TO AIR SERVICE

1. The recommended operating air pressure for YALE Air Motor Driven Trolleys is 90 psi. When line pressure exceeds 100 psi (at trolley when trolley is operating), it is recommended that a pressure regulator valve be provided in the air supply to maintain proper pressure.

2. A filter lubricator unit (Figure 3) **must** be installed between air source and air hose leading to trolley. These keep air flowing to trolley free of dirt and add lubricant to air so internal parts of motor are constantly lubricated. Use a good grade of spindle oil, approximate viscosity 180 ssu at 100°F., air powered tool oil, or S.A.E. 10W machine oil. YALE distributors can provide filter-lubricator units.

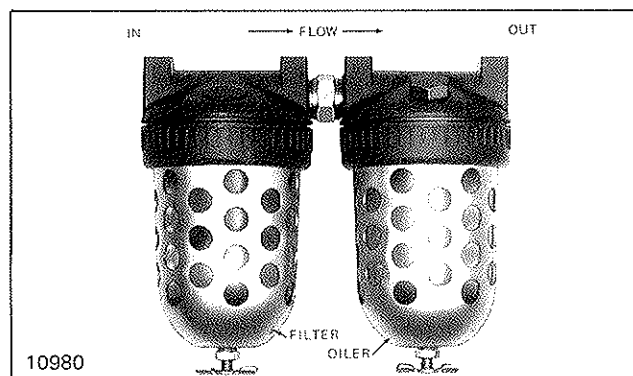


Figure 3. Air Filter and Lubricator Unit.

3. The air intake elbow on the YALE air hoist should point away from the runway beam (see Figure 1).

a. Use close nipple in elbow to attach tee as shown in Figures 1 and 9.

b. Connect hoist to nearest filtered and lubricated air source using 3/4" I.D. air hose attached to tee. Avoid use of hose assemblies of smaller diameters that will cause air flow restrictions and reduce hoist and trolley performance.

c. Provide sufficient hose to reach from air source to farthest point of trolley travel. YALE Hose Trolleys are one recommended means of keeping hose up out of the way.

d. Attach hose assemblies as shown in Figure 11.

e. See hoist manual for hoist air connection requirements.

LUBRICATION

1. Wheel bearings are permanently lubricated and require no additional lubricant.
2. Drive wheel gears are to be lubricated with an open type gear grease which is heavy, plastic, extreme pressure and tacky; such as MOBILTAC 275 NC or equal.
3. The right angle worm gear reducer oil is a synthetic lubricant with excellent wear protection capability and long life. This oil does not require changing. When replacing oil due to repairs, use MOBIL SHC 634 or equal.
4. Servicing air line filter and lubricator unit is of primary importance since it's the only source of lubrication for control valves and air motor. Fill lubricator with a good grade of light spindle oil, air powered tool oil, or S.A.E. 10W machine oil.

MAINTENANCE

1. YALE Air Motor Driven Trolleys are built to give long service, but should be inspected periodically for evidence of damage or wear, particularly when subjected to unusually severe operating conditions.

2. Inspection of pendant throttle control assembly.

a. Disassembly.

- (1) Disconnect three air hoses from top of throttle control assembly.
- (2) Remove wire rope clips holding wire rope strain cable for pendant throttle control assembly and disconnect wire rope.
- (3) Remove two large hex head threaded caps from throttle control assembly side opposite control levers.
- (4) Remove spring from under each cap.
- (5) Remove each spool valve by threading a #10-24 screw into tapped hole in valve and pulling valve out.

b. Reassembly.

- (1) Before assembly, all parts should be thoroughly cleaned and inspected to determine their serviceability. Replace all parts that are worn or damaged.
- (2) Reassemble parts in reverse of the disassembly steps above.

3. Inspection of supply head assembly.

a. Disassembly. (See Figure 9.)

- (1) Disconnect three air hoses leading to the pendant throttle control assembly.
- (2) Remove two hex socket cap screws and lock-washers on side of supply head assembly and remove supply head assembly from air motor body.
- (3) To gain access to the valves, remove the retaining rings and screens at the ports and pull out the muffling material.
- (4) Remove the two pan head screws on the side of the supply head assembly to release the valves inside the assembly.
- (5) Pull valve sleeve, spring, and stem out of the supply head assembly. Valve parts may be reached by using needle nose pliers.

Steps (3) thru (6) can also be accomplished with supply head assembly in place.

b. Reassembly. (See Figure 9.)

- (1) Before assembly, all parts should be thoroughly cleaned and inspected to determine their serviceability. Replace all parts that are worn or damaged.
- (2) Install valve springs and stems in sleeves and lubricate.
- (3) Slide sleeves into position in supply head (small, single hole on side of sleeves must align with retaining screws) and reinstall retaining screws.
- (4) Replace supply head gasket. Position gasket so that no portion of ports is covered.

4. Inspection of air motor.

a. General. For removal of supply head assembly see Paragraph 3.

b. Disassembly. (See Figure 10.)

- (1) Remove four hex socket cap screws and then remove motor from gearbox.
- (2) Remove three fillister head screws, end cap and gasket.
- (3) Remove six hex head bolts holding rear end plate to motor cylinder.
- (4) Hold the shaft in a soft jawed vise and using a puller, adapted to fit the three #10-32 bolt centers of the end cap, remove rear end plate and shim gasket. Do not try to pry the end plate from the motor.
- (5) Remove six hex socket cap screws from front end plate.
- (6) Remove motor body exposing the rotor assembly while leaving front end plate mounted on shaft. This relationship must be maintained to eliminate the necessity of adjusting the motor upon reassembly.
- (7) Remove vanes, springs and pins.

NOTE: Motors requiring further disassembly should be sent to an authorized YALE repair station for repairs.

(8) Check for worn or damaged rotor vanes. Inspect ball bearings and check condition of rotor, shaft, cylinder and end plates. Any repairs beyond replacing vanes, springs, and pins would best be done at an authorized YALE repair station. Repair or replace defective parts as noted in following steps:

(a) Rotor. Examine end faces for roughness and vane slots for wear and burrs. A new vane should move in and out without binding. Smooth roughness on end faces and remove sharp edges or burrs at slot corners using a hone. Replace motor if rotor and shaft assembly is excessively worn or damaged.

(b) Cylinder. Examine surface of bore diameter for rough circular grooves from scoring. If the cylinder is badly scored, it must be replaced. A badly scored cylinder cannot be restored

by honing, since it will only enlarge bore diameter, widening seal point between rotor and cylinder, resulting in loss of speed and power. If cylinder is replaced, new shim gaskets of the proper thickness are required to maintain the original spacing of the end plates.

(c) End Plates. Check faces of front and rear end plates for wear or scoring. If wear depth is greater than .005 inch, end plates should be replaced. Light score marks can be lapped out with 150-grit abrasive cloth on a flat surface.

(d) Rotor Vanes and Springs. Inspect the rotor vanes for wear, scoring, warpage or other damage. Compare the width of the old vane with a new one to determine the amount of wear that has taken place on the width. If the old vane is more than 3/64" less than the new vane (in width), it must be replaced. An old vane that shows wear on the thickness must also be replaced. Vanes worn in this manner will eventually fail, cause costly repairs, and unexpected down-time on the trolley. Warped vanes must also be replaced as the vanes must move in and out of the rotor slot without binding. Inspect leaf springs and centering pins. Worn areas on springs can cause eventual spring breakage and motor lock up. Replace worn springs, particularly when vanes are replaced.

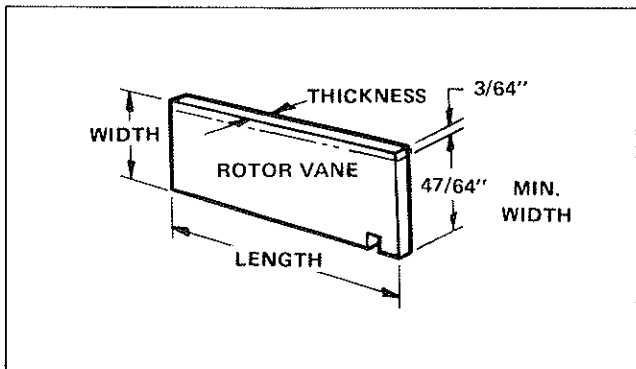


Figure 4. Rotor Vane.

(e) Motor Bearings. Check motor bearings, especially the bearing at the extended shaft end of the motor, for excessive looseness or binding. If bearing requires replacement, send motor to an authorized YALE repair station. Do not, under any circumstances, wash sealed bearings nor blow off with a high pressure air hose.

c. Reassembly.

(1) Before assembly, all parts should be thoroughly

cleaned and inspected to determine their serviceability. Replace all worn or damaged parts.

(2) Position assembly vertically with rotor facing upward. Insert push pins in rotor. Place shim gasket and motor body on end plate, using dowel pins for positioning. Insert vanes and springs into rotor. Take care that spring tab is positioned in slot of vane.

(3) Install six hex socket head screws through front end plate.

(4) Place shim gasket and rear end plate on body, using dowel pins for positioning. Press rear bearing onto rotor shaft by pressing on inner race. Bearing outer race should not be bottomed on rear end plate. Shaft must not move laterally in front bearing.

(5) Install six hex head bolts through rear end plate.

(6) Replace end cap and gasket and install three fillister screws.

(7) Rotor and shaft must turn freely in body.

(8) Position motor in proper orientation on trolley gearbox with key in place and fasten with four hex socket head screws.

REPLACEMENT PARTS

The following parts list and illustrations cover standard model YALE air motor driven trolleys. Typical units are used as the basis for the exploded parts illustration; therefore, certain variations may occur from the parts information given. For this reason always give the catalog number and model number of the trolley when ordering replacement parts. For gearbox give complete nameplate data.

The factory recommends complete replacement of the air motor or gearbox. Service is available, however, from you local authorized YALE repair station.

The numbers assigned to the parts of our various assemblies in our parts lists are not the part numbers used in manufacturing the part. They are identification numbers, that when given with the trolley serial number, permit us to identify, select or manufacture, and ship the correct part needed for any trolley.

Supply complete numbers from the identification plate of the gearbox that match the numbers (including digits — where x's appear) in the lower right hand corner of the parts illustration for the motor and gearbox assemblies.

INDEX OF PARTS ILLUSTRATIONS		
Title	Figure No.	Page No.
Trolley Frame and Wheels (3-1/8" & 5" c/c Pins)	5	5
Trolley Frame and Wheels (6" c/c Pins)	6	7
Air Motor and Gearbox Assembly (3-1/8" & 5" c/c Pins)	7	8
Air Motor and Gearbox Assembly (6" c/c Pins)	8	10
Supply Head Assembly	9	12
Air Motor	10	13
Pendant Throttle Control	11	14

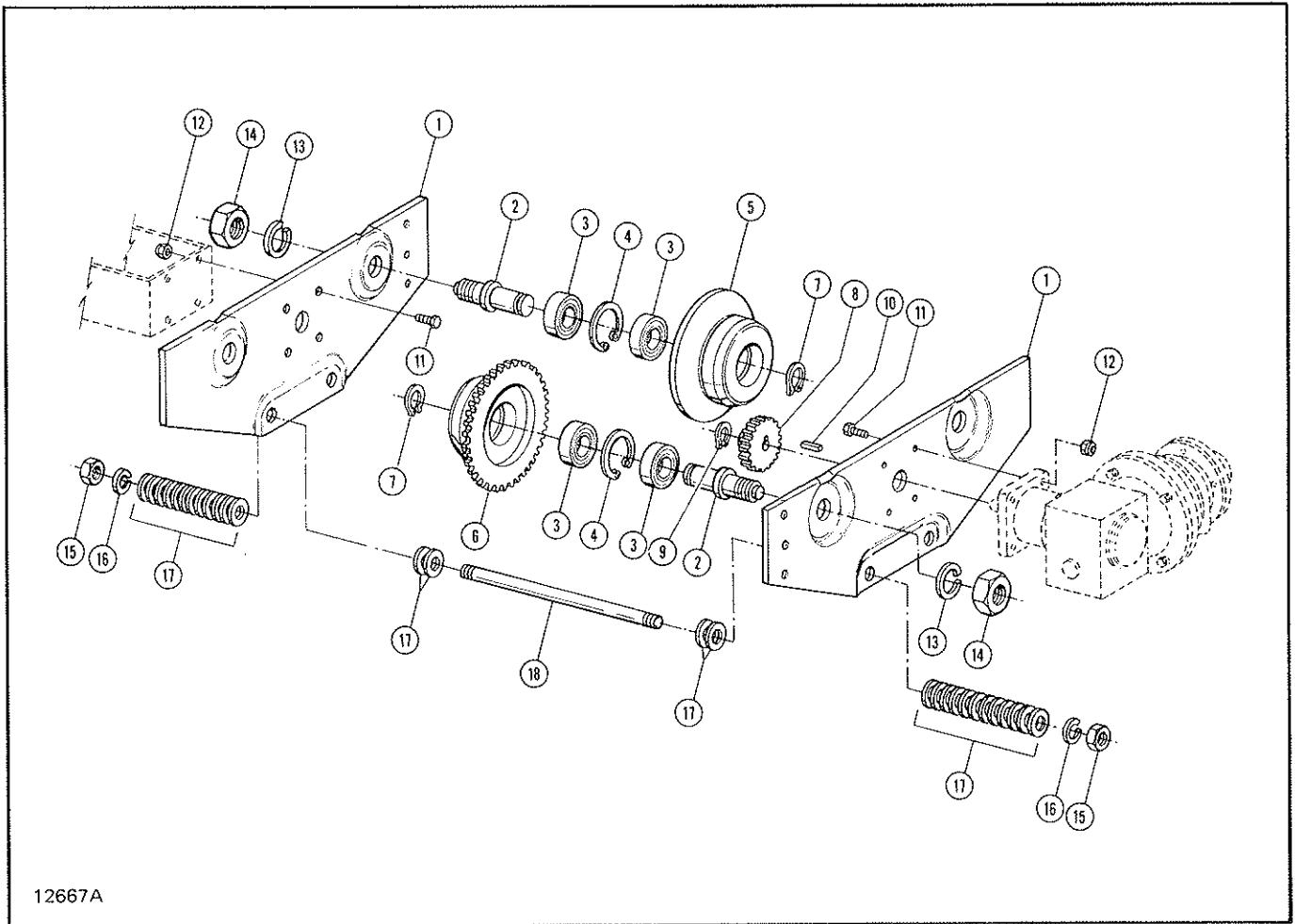


Figure 5. Trolley Frame and Wheels.
(3-1/8" & 5" c/c Pins.)

Ref. No.	Description	3-1/8" c/c Pins		5" c/c Pins	
		Part Number	Qty. Req'd.	Part Number	Qty. Req'd.
1	Plate Assembly — Side				
	For 3" to 5" Flange Widths Standard and Spark Resistant	BET-2700	2	---	---
	For 5-1/8" to 7-1/4" Flange Widths	BET-2701	2	---	---
	For 7-1/2" to 9-1/8" Flange Widths	BET-2702	2	---	---
	For 3-5/8" to 6" Flange Widths Standard and Spark Resistant	---	---	BET-2703	2
	For 6-1/4" to 8-5/8" Flange Widths	---	---	BET-2704	2
2	Shaft — Wheel				
	For 8-7/8" to 11-1/4" Flange Widths	---	---	BET-2705	2
2	Shaft — Wheel	BET-2706	4	BET-2706	4
3	Bearing — Ball	BET-2707	8	BET-2707	8
4	Ring — Retaining	BET-2708	4	BET-2708	4
5	Wheel — Plain (Except Spark Resistant)	BET-2709	2	BET-2709	2
5	For Spark Resistant Only	BAT-400	2	BAT-400	2
	Wheel — Geared (Except Spark Resistant)	BET-2711	2	BET-2711	2
6	For Spark Resistant Only	BAT-401	2	BAT-401	2
	Ring — Retaining	BET-2713	4	BET-2713	4
8	Pinion — Motor	BET-2714	1	BET-2715	1
9	Ring — Retaining	BET-2716	1	BET-2716	1
10	Key — Motor Pinion	BET-2717	1	BET-2717	1
11	Screw — Hex Cap	BET-2718	8	BET-2718	8
12	Nut — Self-Locking	BET-2719	8	BET-2719	8
13	Lockwasher	BET-2720	4	BET-2720	4
14	Nut — Hex Jam	BET-2721	4	BET-2721	4
15	Nut — Hex Jam	BET-2722	4	BET-2721	4
16	Lockwasher	BET-2723	4	BET-2720	4
17	Washer — Spacer	BET-2724	56	BET-2725	36

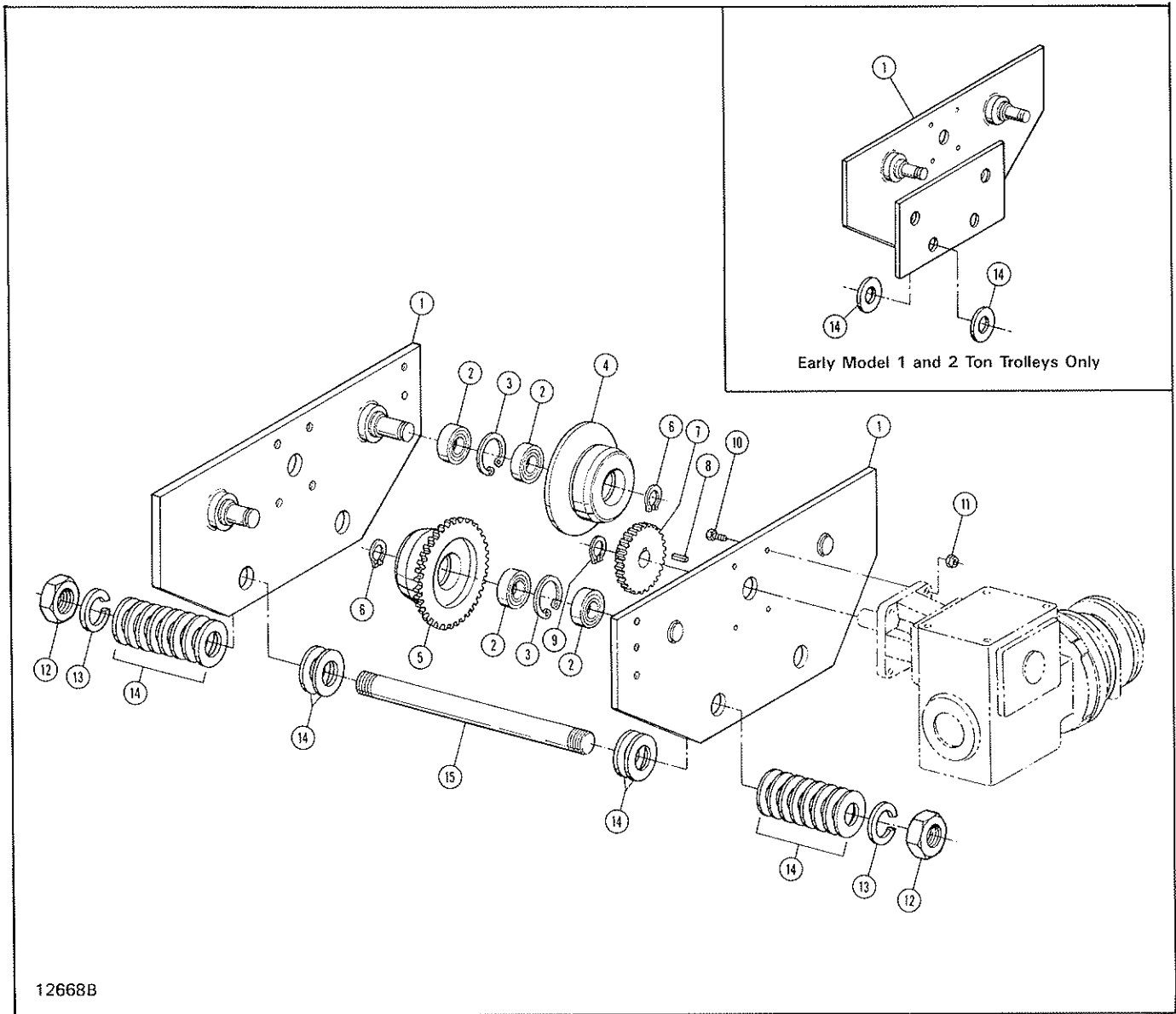
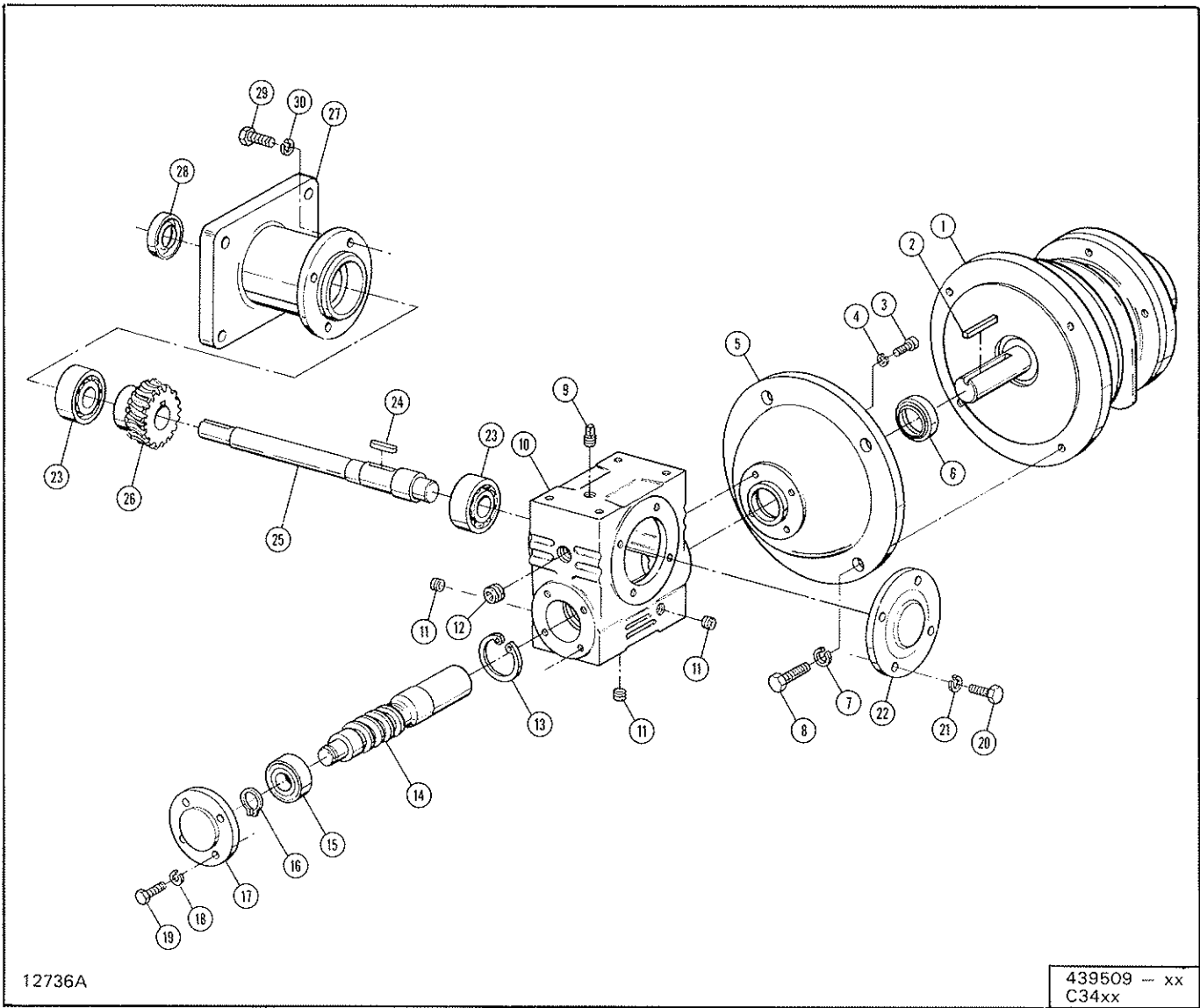


Figure 6. Trolley Frame and Wheels.
(6" c/c Pins.)

Ref. No.	Description	Early Model 1 Ton Trolleys		Early Model 2 Ton Trolleys		3 Ton Trolleys	
		Part Number	Qty. Req'd.	Part Number	Qty. Req'd.	Part Number	Qty. Req'd.
1	Plate Assembly — Side	BAT-500	2	BAT-501	2	BET-2800	2
2	Bearing — Ball	BET-2803	8	BET-2803	8	BET-2803	8
3	Ring — Retaining	BET-2804	4	BET-2804	4	BET-2804	4
4	Wheel — Plain (Except Spark Resistant) For Spark Resistant Only	BET-2805	2	BET-2805	2	BET-2805	2
5	Wheel — Geared (Except Spark Resistant) For Spark Resistant Only	BET-2807	2	BET-2807	2	BAT-502	2
6	Ring — Retaining	BET-2808	2	BET-2808	2	BAT-503	2
7	Pinion — Motor	BET-2809	4	BET-2809	4	BET-2809	4
8	Key — Motor Pinion	BET-2810	1	BET-2810	1	BET-2810	1
9	Ring — Retaining	BET-2811	1	BET-2811	1	BET-2811	1
10	Screw — Hex Cap	BET-2812	1	BET-2812	1	BET-2812	1
11	Nut — Self-Locking	BET-2813	4	BET-2813	4	BET-2813	4
12	Nut — Hex Jam	BET-2814	4	BET-2814	4	BET-2814	4
13	Lockwasher	BAT-504	4	BAT-505	4	BET-2815	4
14	Washer — Spacer	BAT-506	4	BAT-507	4	BET-2816	4
15	Pin — Suspension	BAT-508	56	BAT-509	64	BET-2817	40
		BAT-510	2	BAT-511	2	BET-2818	2



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Figure 7. Motor and Gearbox Assembly.
(3-1/8" & 5" c/c Pins.)

ORDERING INSTRUCTIONS: Furnish complete data from motor and gearbox nameplates with parts order. Replacement parts cannot be provided without this information.

Ref. No.	Part Number	Description	Qty. Req'd.
	BAT-1000	Motor and Gearbox Assembly — Complete	1
1	BAT-800	Motor (Includes Ref. No. 2)	1
2	BET-3802	Key — Motor	1
	BET-3803	Gearbox Assembly — Complete	1
3	BET-3804	Cap Screw — Hex Socket Head	4
4		Lockwasher	4
5	BET-3805	Flange — Motor	1
6	BET-3806	Seal — Oil	1
7		Lockwasher	4
8		Bolt — Hex Head	4
9	BET-3807	Plug — Breather	1
10	BET-3808	Gearbox	1
11	BET-3809	Plug — Drain	3
12		Plug — Filler	1
13		Ring — Retaining	1
	BET-3810	Worm, Gear Set (Includes Ref. Nos. 14 and 26)	1
14	*	Worm Shaft	1
15	BET-3811	Bearing	1

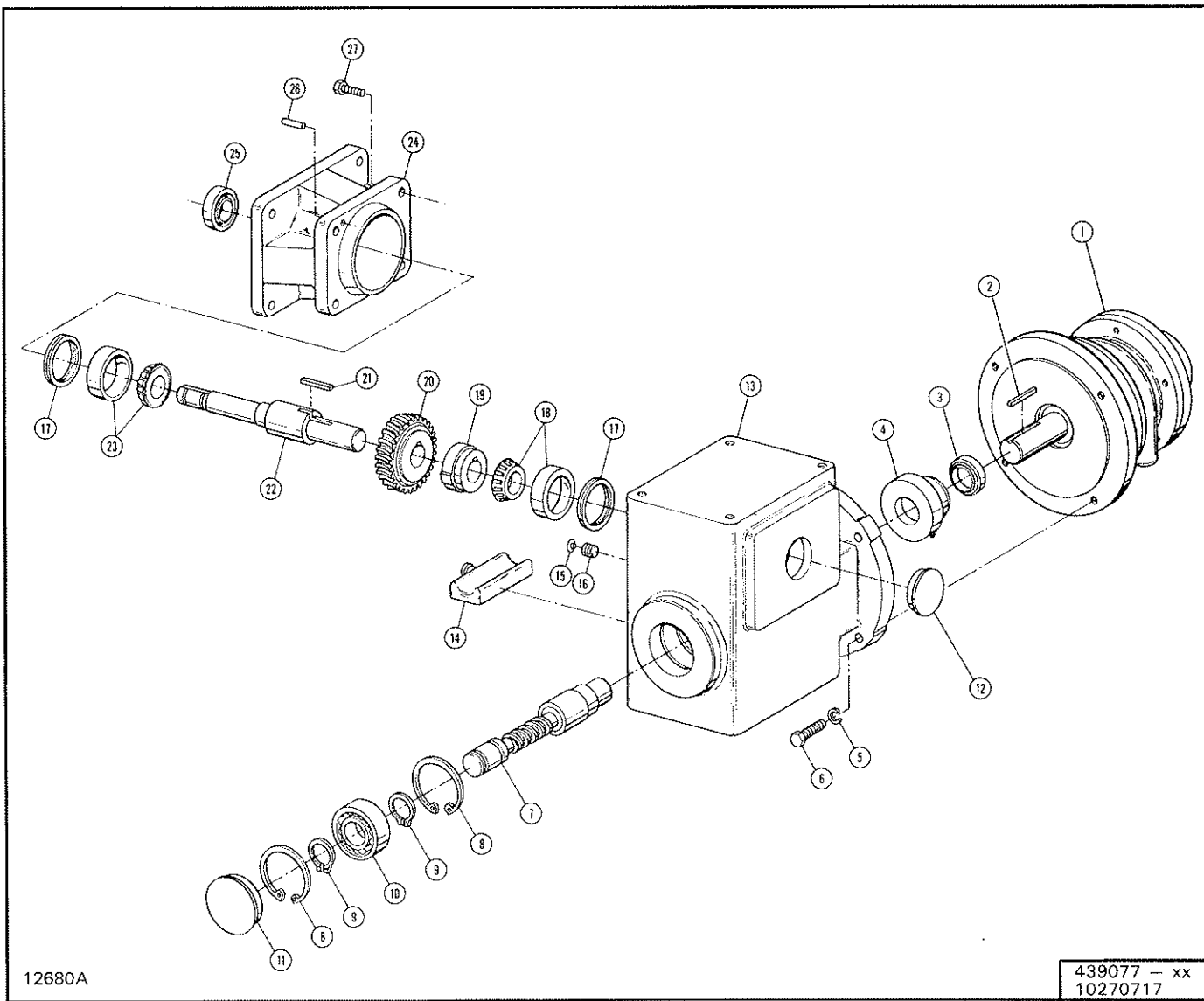
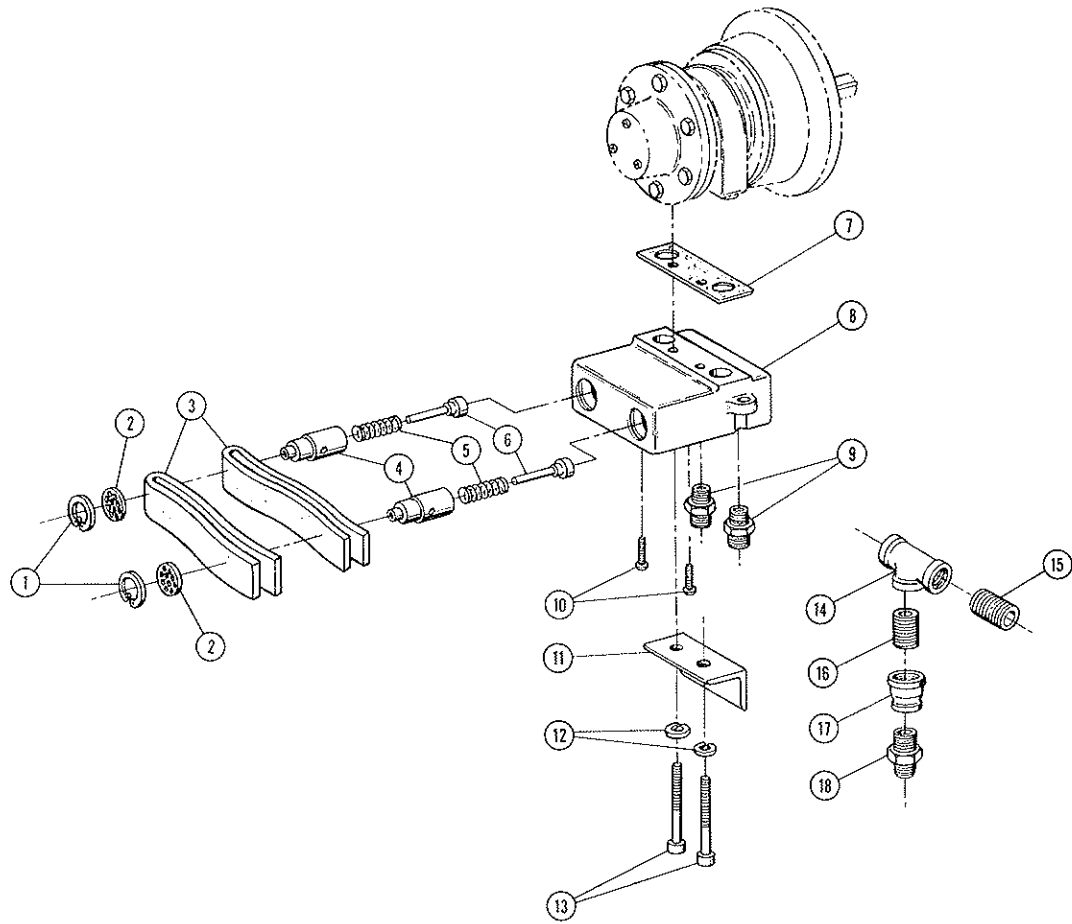


Figure 8. Motor and Gearbox Assembly.
(6" c/c Pins.)

ORDERING INSTRUCTIONS: Furnish complete data from motor and gearbox nameplates with parts order.
Replacement parts cannot be provided without this information.

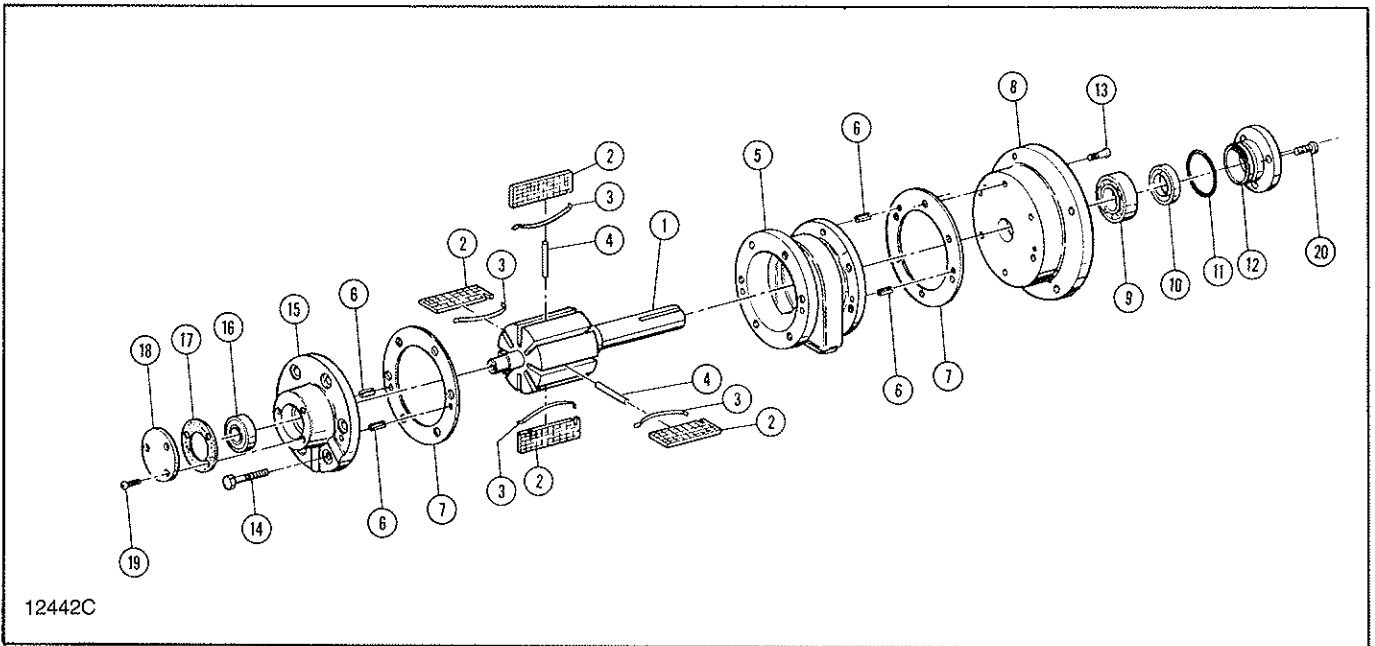
Ref. No.	Part Number	Description	Qty. Req'd.
	BAT-600	Motor and Gearbox Assembly — Complete	1
1	BAT-800	Motor (Includes Ref. No. 2)	1
2	BET-3002	Key — Motor	1
	BET-3003	Gearbox Assembly — Complete	1
3	BET-3004	Seal — Oil	1
4	BET-3005	Adaptor — Seal	1
5	BET-3006	Lockwasher	4
6	BET-3007	Bolt — Hex Head	4
	BET-3008	Worm, Gear Set (Includes Ref. Nos. 7 and 20)	1
7	*	Worm Shaft	1
8	BET-3009	Ring — Retaining	2
9	BET-3010	Ring — Retaining	2
10	BET-3011	Bearing — Ball	1
11	BET-3012	Plug — Bore	1
12	BET-3013	Plug — Bore	1
13	BET-3014	Gearbox	1
14	BET-3015	Compression Chamber	1
15	BET-3016	Caplug	1
16	BET-3017	Set Screw — Socket Head	1



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Figure 9. Supply Head Assembly.

Ref. No.	Part Number	Description	Qty. Req'd.
1	BAH-5105	Ring — Internal Retaining	2
2	BAH-5104	Screen — Exhaust Valve	2
3	BAH-5103	Muffling Material	2
4	BAH-5125	Sleeve — Valve	2
5	BAH-5124	Spring — Valve	2
6	BAH-5123	Stem — Valve	2
7	BAH-5114	Gasket — Supply Head	1
8	BAH-5100	Supply Head	1
9	BAH-5107	Adaptor Fitting	2
10	BAH-5106	Screw — Self Tapping	2
11	BAT-700	Anchor — Cable	1
12	BAH-5113	Lockwasher	2
13	BAH-5112	Cap Screw — Hex Socket	2
14	BAT-701	Tee — Reducing	1
15	BAT-702	Nipple — Close Pipe	1
16	BAH-5110	Nipple — Close Pipe	1
17	BAT-703	Coupling — Reducing	1
18	BAH-5107	Adaptor Fitting	1

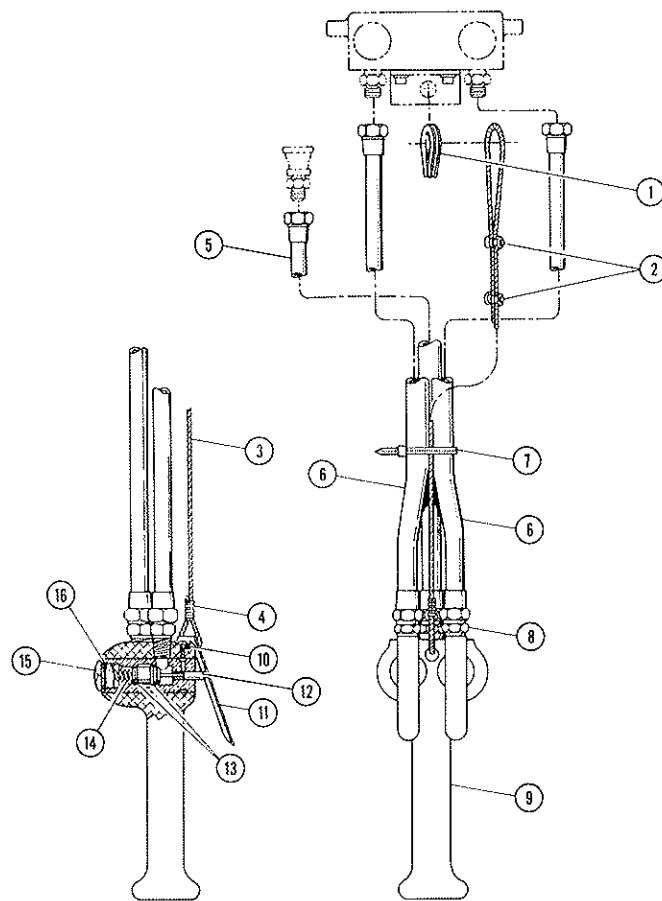


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Figure 10. Air Motor.

Ref. No.	Part Number	Description	Qty. Req'd.
1	BAT-800	Air Motor Assembly	1
	BAT-801	Rotor and Shaft Assembly	1
2	BAH-5202	Vane	8
3	BAH-5203	Spring — Vane	8
4	BAT-808	Push Pin	4
5	BAT-802	Body — Air Motor	1
6	BAH-5206	Pin — Dowel	4
7	BAH-5207	Gasket — Body	2
8	BAT-803	End Plate — Drive End	1
9	BAT-804	Bearing — Drive End	1
10	BAT-805	Shaft Seal	1
11	BAT-806	“O” Ring	1
12	BAT-807	Cap	1
13	BAH-5222	Screw	6
14	BAH-5221	Screw	6
15	BAH-5215	End Plate — Dead End	1
16	BAH-5216	Bearing — Dead End	1
17	BAH-5217	Gasket — End Cap	1
18	BAH-5218	End Cap — Dead End	1
	BAH-5219	End Plate Puller Tool (Not Shown)	—
19	BAH-5220	Screw	3
20	BAT-809	Screw — Hex Socket Head	3

NOTES



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Figure 11. Pendant Throttle Control.

Ref. No.	Part Number	Description	Qty. Req'd.
1	BAH-5302	Thimble – Wire Rope	1
2	BAH-5304	Clip – Wire Rope	2
3	BAH-5305	Cable – Strain Relief (Specify Length Required) 7 ft. 6 in. for 10 ft. Hoist Lift 10 ft. 6 in. for 13 ft. Hoist Lift 12 ft. 6 in. for 15 ft. Hoist Lift 17 ft. 6 in. for 20 ft. Hoist Lift	1
4	BAH-5306	Sleeve – Pressed	1
5	BAT-900	Hose Assembly – Supply For 10 ft. Hoist Lift	1
	BAT-901	For 13 ft. Hoist Lift	1
	BAT-902	For 15 ft. Hoist Lift	1
	BAT-903	For 20 ft. Hoist Lift	1
6	BAT-904	Hose Assembly – Control For 10 ft. Hoist Lift	2
	BAT-905	For 13 ft. Hoist Lift	2
	BAT-906	For 15 ft. Hoist Lift	2
	BAT-907	For 20 ft. Hoist Lift	2
7	BAH-5316	Tie – Cable	4
8	BAH-5317	Adaptor Fitting	3
9	BAT-908	Pendant Throttle Handle Assembly – Complete (Includes Ref. Nos. 10 thru 16 Plus Handle)	1
10	BAH-5319	Pin – Throttle Lever	1
11	BAH-5320	Throttle Lever	2
12	BAH-5321	Valve – Throttle	2
13	BAH-5322	Ring – Throttle Valve Seal	4
14	BAH-5323	Spring – Throttle Valve	2
15	BAH-5324	Cap – Throttle Valve	2
16	BAH-5325	Seal – Throttle Valve Cap	2

Yale[®] HOISTS



WARRANTY

Every hoist is thoroughly inspected and tested prior to shipment from the factory. Should any problem develop, return the complete hoist prepaid to your nearest Yale Hoists Authorized Warranty Repair Station. If inspection reveals that the problem is caused by defective workmanship or material, repairs will be made without charge and the hoist will be returned, transportation prepaid. This warranty does not apply where: **(1)** deterioration is caused by normal wear, abuse, improper or inadequate power supply, eccentric or side loading, overloading, chemical or abrasive actions, improper maintenance, or excessive heat; **(2)** problems resulted from repairs,

modifications, or alterations made by persons other than factory or Yale Authorized Warranty Repair Stations personnel; **(3)** the hoist has been abused or damaged as a result of an accident; **(4)** repair parts or accessories other than those supplied by Yale Hoists are used on the hoist. Equipment and accessories not of the seller's manufacture are warranted by the manufacturer.

Except as stated herein, Yale Hoists makes no other warranties, express or implied, including warranties or merchantability and fitness for a particular purpose.

⚠ WARNING

Overloading and Improper Use Can Result In Injury

To Avoid Injury:

- Do not exceed working load limit, load rating, or capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain and attachments for overhead lifting.
- Read and follow all instructions.

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